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# The Michigan Circuit Breaker and its Impact on the Incidence of the Property Tax

By PHILLIP MAY and MOKHLIS ZAKI \*

ABSTRACT. In the absence of any program of *property tax relief*, the relationship between *homestead property values* and *household incomes* in *Michigan* introduces an inherent bias towards regressivity into the property tax. Analysis of a sample of 15,620 owner-occupied households showed a tax relief program, called the *Michigan Circuit Breaker*, and in particular the special relief afforded to taxpayers 65 and over (*senior citizens*), to be highly effective in reducing this inherent regressivity in the tax. As a result of the circuit breaker, this tendency towards regressivity in the property tax is effectively offset to the extent of producing near proportionality in the *incidence* of the tax as applied to *owner-occupied housing*.

## I

### INTRODUCTION

STUDENTS OF TAXATION have long considered the property tax on housing to be a regressive tax (1). In addition, it is generally held by the American public that the property tax is excessive and growing at an unacceptably high rate and that it places an unfair and in many instances an intolerable financial burden on low-income individuals, particularly the handicapped and the aged. In response to this widespread sentiment, the legislatures of every state in the Union have enacted programs to provide property tax relief for residential property, with more than 20 states employing circuit breaker property tax relief programs to supplement and in some instances to replace previous homestead exemption programs (2).

Recently some economists have begun to question this conventional wisdom and thus *implicitly* the need for programs of property tax relief. Mieszkowski has argued that the property tax must be viewed as an element in the costs of using capital and concludes that, through adjustment out of high-taxed and into low-taxed uses of capital, the overall rate of return of capital is lowered, and all owners of capital share the tax. And since the ratio of capital owned to income varies positively with income, it may be expected that the ratio of tax burden

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to income will also vary positively with income; that is, the property tax may well be progressive. Aaron (1974) has followed the lead of Mieszkowski and has in addition questioned the supposed regressivity of the tax on the grounds that previous studies have typically classified households on the basis of annual measured income which imperfectly reflects long-run economic circumstances.

The Mieszkowski-Aaron "new view" of the property tax has not gone unchallenged. Among others, Musgrave has questioned the assumptions of the Mieszkowski model and has concluded that under almost any set of assumptions the tax on housing remains regressive over the lower to middle end of the income scale (3). In addition, Netzer (1974) has argued that it is not possible to make reliable empirical statements about the burden distribution of *the* property tax on a nationwide scale, and that to be at all useful, empirical work on this subject must be specific to place and time. We are in agreement with Netzer but would add that investigation of tax incidence should place greater emphasis on the situation of the individual taxpayer, for it can be both misleading and nonproductive to conclude from a study of broadly aggregated data that a tax is nonregressive "overall" when in fact it may impose a highly regressive burden upon a significant number of low-income individuals. Concerning Aaron's question of the preferred measure of household income, there is a compelling practical argument for the use of current measured rather than normal income. For although the prevalence of high ratios of property tax to current measured income among the currently poor may be evidence of poorly-planned distribution of lifetime income, the severe burdens placed on low-income households are very real (4).

The present paper investigates the relationship between income, value of homestead, and property tax liabilities of owner-occupied households within the State of Michigan for the year 1969. The purpose is to determine (a) whether there existed an *inherent* bias towards regressivity in the Michigan tax on owner-occupied property; (b) the extent to which the burden of the tax would have varied from household to household in the absence of any system of property tax relief, and (c) the effectiveness of the Michigan circuit breaker in reducing the property tax burden for the low-income homeowner, particular attention being paid to the senior-citizen household. Thus the present paper is specific to both time and place and pays attention to the situation of the individual taxpayer.

## II

PROPERTY TAX BURDEN IN THE ABSENCE OF THE  
CIRCUIT BREAKER

A SIMPLE MEASURE of the ratio of dollar tax payment to income may not be an accurate indicator of tax incidence. Taxes may sometimes be shifted by owners of taxed assets to buyers of the services provided by these assets so that the nominal taxpayer does not bear the full burden of his tax payment. There is also the question of benefits received. Higher or lower tax payments may be explained by higher or lower values of public services consumed, and an accurate measure of incidence must adjust for these benefits (5). In addition there are differences in local per unit costs of producing public services and differences in local administrative practices. All of the above tend to obscure the inherent incidence of the tax.

Since we restrict our investigation to the incidence of the tax on owner-occupied housing, it is reasonable to conclude that the owner-occupants will have no options for shifting the tax. This conclusion is consistent with the traditional view of tax incidence which holds that property taxes in the long run are borne in proportion to consumption of goods produced by property. And assuming that differences in property tax rates within Michigan will not have a significant effect on the overall return to capital, this conclusion is also consistent with the "new view." To avoid the complexities and likely errors involved in analysis of differences in benefits received, differences in per unit costs and differences in local administrative practices, we limit our consideration to two basic questions: How does value of homestead relate to current household income, and does this relationship act to introduce an underlying element of regressivity into the Michigan property tax as applied to owner-occupied homes, *independent* of differences in benefits received, differences in per unit costs and differences in administrative practices? What is the effect of the circuit breaker, as currently administered, on the incidence of the Michigan property tax as applied to owner-occupied homes?

To answer the first question, ratios of homestead property values to household income ( $PV/I$ ) were related to household income ( $I$ ), defined as the total income of all members of the immediate family residing in a given homestead (6). The data for both variables ( $PV/I$  and  $I$ ) were obtained from the 1970 Census (7). The Michigan census data for 1970 covered a sample size of 88,686 individuals

comprising 31,569 households. Of that total number only 15,260 households were considered in this study; this was dictated by the fact that not all the households resided in owner-occupied homes. The census data for property values and household incomes were presented in terms of class intervals; hence the specific income and property values assigned to individual households were the midpoints of these intervals. Because the extreme upper intervals for both property value and household income are open ended and have no midpoint (above \$49,151 for household income and above \$50,000 for household property value), it was necessary to exclude from the analysis those households whose income and/or property values were in these open-ended intervals (8). The sample of 15,260 households was divided into 20 groups of 763 households arranged in order of household income. Mean values of PV/I are presented in column 1, Table I.

To determine the effect of the Michigan circuit breaker on the incidence of the property tax, property values were translated into property tax liabilities (PT) assuming a statewide single-rate tax on property. For this purpose the 1969 statewide average of 47.32 mills was used. The mean PT/I values for each of the 20 household groups are presented in column 2, Table I; simple correlations between PT/I and I are presented in column 3. Since PT for each household in the sample was obtained by applying the factor  $0.04732/2$  to individual homestead values, the simple correlations between PV/I and I would be identical to the correlations of PT/I to I (9).

The correlation coefficient of PT/I to I for the entire sample is  $-0.20$  and statistically significant at the 1 percent level, reflecting the inherent overall regressivity of the property tax. In addition, correlation coefficients for the lowest three income groups are relatively high, negative and significant at the 5 percent level, thus suggesting regressivity within these three income groups. Because the values of the remaining correlation coefficients do not seem to differ significantly from zero, no inference about regressivity within the other income groups can be made.

It is clear from columns 1 and 2 in Table I that, in the absence of any system of tax relief, the property tax is *inherently* regressive over the 20 income groups. Mean PV/I values decrease as household income increases, and this is particularly true for household income groups up to and including the eighth income group. The mean

Table I

The Effect of the Circuit Breaker as if Applied in 1969

Subgroups by Household Income	Tax Incidence with Zero Tax Relief			Tax Incidence with Tax Relief		
	Mean PV/I	Mean PT/I	Corr. PT/I to I	Mean NPT <sub>1</sub> /I	Mean NPT <sub>2</sub> /IF	Corr. NPT <sub>2</sub> /IF to I
1. 0 - 1850	(1) 20.8	(2) 0.493	(3) -0.53	(4) 0.207	(5) -0.53	(6) 0.114
2. 1851 - 3250	5.2	0.122	-0.29	0.058	-0.20	0.028
3. 3251 - 4750	3.4	0.082	-0.25	0.045	-0.16	0.024
4. 4751 - 6150	2.5	0.060	-0.17	0.040	-0.03*	0.030
5. 6151 - 7450	2.0	0.048	-0.10	0.036	0.00*	0.033
6. 7451 - 8350	1.8	0.041	-0.10	0.034	-0.04*	0.033
7. 8351 - 9150	1.6	0.039	+0.03*	0.033	0.03*	0.00*
8. 9151 - 10050	1.5	0.037	-0.06	0.032	-0.05*	0.031
9. 10051 - 10550	1.5	0.036	-0.03*	0.032	-0.09	0.032
10. 10551 - 11250	1.5	0.035	-0.02*	0.031	-0.02*	0.031
11. 11251 - 12050	1.4	0.033	+0.10	0.030	0.06	0.030
12. 12051 - 12850	1.4	0.032	-0.05*	0.030	-0.11	0.029
13. 12851 - 13850	1.3	0.032	-0.10	0.029	-0.11	0.029
14. 13851 - 14550	1.3	0.030	-0.02*	0.028	-0.04*	0.028
15. 14551 - 15850	1.2	0.029	+0.02*	0.027	0.03*	0.027
16. 15851 - 16750	1.2	0.028	-0.07	0.026	-0.06	0.026
17. 16751 - 18150	1.1	0.028	-0.05*	0.025	-0.07	0.025
18. 18151 - 20250	1.1	0.026	0.00*	0.024	-0.01*	0.024
19. 20251 - 23850	1.0	0.024	-0.05*	0.022	-0.07	0.022
20. 23851 - 49150	0.8	0.020	-0.18	0.019	-0.15	0.019
OVERALL	2.69	0.064	-0.20	0.041	-0.20	0.032

PV is property value.  
 I is household income.  
 PT is property tax liability with zero tax credit.  
 Corr. is correlation.  
 NPT<sub>1</sub> is property tax net of tax credit without special treatment to heads of household aged 65 and over.  
 NPT<sub>2</sub> is property tax net of tax credit with special treatment to heads of household aged 65 and over.  
 \*Insignificant at the 0.05 level.

PV/I values continue to decrease beyond the \$10,050 household income level but much less perceptibly than for lower incomes. The implication is that, in the absence of tax relief, property tax liabilities would have been particularly burdensome for the lower income groups (see column 2); the average of the mean PT/I for households with income of less than \$10,051 is 11.5 percent as compared to an average mean PT/I of 2.9 percent for households with incomes of \$10,051 or higher.

Variations in the relative tax burden for individual households was even greater. It was found that large numbers of PT/I ratios within each income group varied substantially from their corresponding means; this was particularly true for the low income groups. When coefficients of variation corresponding to the PT/I column were computed, a high degree of variation was indicated for all income groups with highest values occurring for the lowest five income groups and the highest three income groups. Additional evidence that the variation in the mean PT/I values fails to reflect the extent of variation in the tax burden of individual households is given by the fact that of the total 850 households with incomes of less than \$2,000, 14.4 percent had ratios of PT/I in excess of 0.5, while of the 4,337 households with incomes in excess of \$15,000, 3.1 percent had ratios of PT/I of less than 0.01 (10).

The above findings clearly reveal the importance of disaggregating the analysis of tax incidence to the level of the individual household and lend support to the argument that sole reliance on broadly aggregated averages of PT/I do not provide a complete picture of tax incidence.

### III

#### *PROPERTY TAX BURDEN WITH THE CIRCUIT BREAKER*

IN 1973 THE STATE OF MICHIGAN implemented a circuit breaker type of tax relief system to replace the then existing system of sliding scale property tax credits (11). Except for special treatment accorded to certain veterans and widows of veterans, the blind, the disabled, and senior citizens (heads of households who are 65 years or older), the property tax relief obtained under the Michigan circuit breaker for tax years 1973, 1974, and 1975 was computed by taking 60 percent of the excess of property taxes over 3.5 percent of *joint income* (I') up to a maximum of \$500.00. Joint income as defined for computation of tax relief refers to the sum of the income (including welfare

and retirement) of the head of household plus the income of the spouse. Thus, the tax relief (TR) is computed as follows (12):

$$1) \quad \text{TR} = 0.6 (PT - 0.035I) \leq \$500.00$$

The tax credit for senior citizens is more generous. The 0.6 becomes 1.0 and the 0.035 assumes lower values with lower incomes (13). Starting with tax year 1976, the maximum credit of \$500.00 has been raised to \$1200.00.

We were particularly interested in the special tax relief provided senior citizens as it has often been proposed that this group, more than any other, suffers from the regressivity of the property tax (14). Hence we estimated the tax credit for each household in our sample under the assumption that senior citizens do not receive special tax treatment, and then estimated the tax credit for each household in our sample under the current circuit breaker system which does provide for special treatment. Net property tax payments (property tax liability less property tax credit) were then calculated under both sets of circumstances in order to provide an index of the burden of the property tax with and without special treatment for senior citizens. For both cases, mean values of the ratio of net property tax to household income and the correlations of these ratios with household income are presented for each group of 763 households, see columns 4–7 in Table I.  $\text{NPT}_1$  refers to net property tax payment of each household without special tax treatment for senior citizens and  $\text{NPT}_2$  with the special tax treatment.

Looking at column 4 of Table I we find that the mean value of  $\text{NPT}_1/I$  is lower than the mean value of  $\text{PT}/I$  for all of the 20 income groups with the percent reduction being greater for the low-income groups. However, as is the case for the mean values of  $\text{PT}/I$ , mean values of  $\text{NPT}_1/I$  are highest for low-income households and decrease significantly as household income rises. It is therefore clear that, in the absence of the special credit for senior-citizen head of households, the circuit breaker reduces but does not eliminate regressivity. Of course this result is not really surprising, for if the property tax on owner-occupied homes is to achieve the objective of being a nonregressive tax, it should not treat households with different income levels but equal property values in the same manner. Rather, the structure of the property tax should insure that special treatment be extended for low-income groups, and senior-citizen households do make up a large portion of these low-income households (15).



Column 6 of Table 1 illustrates the effect of the introduction of the special tax credit for senior citizens and reveals a substantial *incremental* reduction in regressivity of the tax. The mean value of  $NPT_2/I$  for the entire sample is 3.2 percent as compared to a value of 4.1 percent for the mean value of  $NPT_1/I$ , and although some additional tax relief is obtained by households at both high and low levels of income, the major impact of the introduction of special treatment for senior-citizen households occurs for the lower four income levels.

It should be noted that the increase in the maximum tax credit from \$500.00 to \$1,200.00 can only benefit those households which qualified for the \$500.00 maximum. Tax credits under the \$1,200.00 maximum have been calculated, and as was to be expected, the higher limit benefits a relatively small portion of the total sample and primarily the low-income households. Of the total 15,260 households, only 182 (1.2 percent) obtained additional tax relief. And of this number, 130 (71.4 percent) received less than \$100.00 of additional benefit, 154 (84.6 percent) were senior-citizen households, and 121 (66.5 percent) had household incomes of less than \$5,000.00.

#### IV

#### *THE CIRCUIT BREAKER AND THE PROPERTY TAX BURDEN ON SENIOR CITIZENS*

SINCE WE HAVE A PARTICULAR INTEREST in the effect of the circuit breaker on senior-citizen households and since this effect cannot be clearly determined from the figures presented in Table I, the comparisons carried out above for our total sample have also been carried out for senior-citizen households only. The results of these comparisons are reported in Table II. However, since nearly all the values of the correlation coefficients for this senior-citizen sample were found to be exceedingly low and insignificant at the 5 percent level, they are not presented in Table II.

In our total sample of 15,260 households, 2,533 are senior-citizen households. The sample of 2,533 households, arranged in order of household income, was divided into 19 groups each of 127 households plus a last group containing 120. Where the median household income for our total population is \$11,250, the median income for the senior-citizen group is \$4,150. And where senior-citizen households make up 17 percent of our total sample of 15,260 households, they include more than 61 percent of households with incomes less than \$5000 and 67 percent of households with incomes less than \$3,000.

Table II  
The Effect of the Circuit Breaker on Senior-Citizen Households, 1969

Subgroups by Household Income	Tax Incidence with Zero Tax Credits		Tax Incidence with Tax Relief	
	Mean PV/I	Mean PT/I	NPT <sub>1</sub> /I	Mean NPT <sub>2</sub> /I
	(1)	(2)	(3)	(4)
1. 50 - 850	43.9	1.041	0.429	0.099
2. 851 - 1250	11.3	0.268	0.110	0.018
3. 1251 - 1550	8.7	0.206	0.084	0.005
4. 1551 - 1850	7.1	0.168	0.072	0.009
5. 1851 - 2150	6.1	0.144	0.064	0.011
6. 2151 - 2550	4.8	0.113	0.050	0.004
7. 2551 - 2950	4.6	0.109	0.050	0.009
8. 2951 - 3250	4.4	0.104	0.050	0.008
9. 3251 - 3650	3.9	0.092	0.046	0.004
10. 3651 - 4150	3.5	0.082	0.043	0.006
11. 4151 - 4650	3.1	0.073	0.040	0.006
12. 4651 - 5250	2.9	0.070	0.039	0.008
13. 5251 - 5950	2.6	0.060	0.036	0.008
14. 5951 - 6650	2.4	0.057	0.036	0.020
15. 6651 - 7750	1.8	0.043	0.030	0.016
16. 7751 - 9150	1.8	0.043	0.030	0.021
17. 9151 - 10950	1.5	0.036	0.025	0.017
18. 10951 - 13450	1.3	0.032	0.024	0.019
19. 13451 - 17951	1.1	0.026	0.021	0.016
20. 17951 - 48250	0.9	0.022	0.019	0.016
OVERALL	5.9	0.140	0.065	0.016

PV is property value.  
 I is household income.  
 PT is property tax liability with zero tax credit.  
 NPT<sub>1</sub> is property tax net of tax credit without special treatment to heads of household aged 65 and over.  
 NPT<sub>2</sub> is property tax net of tax credit with special treatment to heads of household aged 65 and over.

Given the characteristically low incomes of senior-citizen households, it is not surprising that, in the absence of property tax relief, this group would be the hardest hit by the property tax and, conversely, would gain most under the circuit breaker.

When the results of Table II are compared with those in Table I, we find that the mean PV/I for the group of 2,533 senior-citizen households is 5.9 while for the entire sample of 15,260 households the mean PV/I is 2.69 and that, with zero tax relief, the mean PT/I is 14.0 percent for the senior-citizen group but only 6.4 for the entire sample. Given tax relief but without special treatment for senior citizens, the  $NPT_1/I$  columns in Tables I and II show that for both groups property tax burdens as well as the degree of regressivity are substantially reduced, especially for low-income households. However, the overall mean  $NPT_1/I$  of 6.5 percent for senior citizen households remains significantly higher than the mean  $NPT_1/I$  of 4.1 percent for the entire sample. By contrast, with special treatment accorded to senior-citizen households, the overall mean value of  $NPT_2/I$  of 1.6 percent for senior-citizen households turns out to be significantly lower than the overall  $NPT_2/I$  of 3.2 percent for the entire sample. Moreover, for senior-citizen households with income of less than the senior-citizen median of \$4,151, the group which tends to be hardest hit by the property tax, the extent of tax relief is particularly significant. For this particular segment of the senior-citizen population, the mean  $NPT_2/I$  is 1.7 percent as compared to a mean value of 10 percent for  $NPT_1/I$  (16).

Finally, it should be noted that, in addition to any effect on the distribution of the property tax, the circuit breaker mechanism has the effect of making the overall state and local tax system less regressive. This is the case because credits against the local property tax are financed out of state income tax revenues, and the income tax, due to sizeable personal exemptions, tends to be somewhat progressive in incidence.

## V

### CONCLUDING REMARKS

THE PURPOSES OF THIS PAPER were to determine to what extent the distribution of homestead property values and household income may tend to produce an inherent bias towards regressivity into the Michigan tax on owner-occupied housing and in addition to evaluate the effectiveness of the Michigan circuit breaker system in reducing the

property tax burden for the low-income property owner. Using 1970 U.S. Census data, a total sample of 15,260 owner-occupied households were arranged into 20 groups of 763 households each in order of ascending household incomes, and both property values and property taxes were related to household incomes both *within* subgroups and *across* the total population.

The result was a clear indication that, *independent* of differences in levels of public service received, geographic differences in per unit costs of delivering public services, and differences in local administrative practices, the structure of property values to household incomes in Michigan does tend to build into the property tax on owner-occupied households a significant degree of regressivity. However, taking into account the tax relief provided under the Michigan circuit breaker, and in particular the special treatment accorded to senior-citizen households, this inherent tendency towards regressivity is effectively offset to the extent of producing near proportionality in the incidence of the tax.

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#### REFERENCES

- Aaron, H. (1974) "The Property Tax: Progressive or Regressive?" *American Economic Review* 64 (May): 212-221.
- (1975) *Who Pays the Property Tax?* Washington, D.C.: The Brookings Institution.
- Feldstein, M. S. "Tax Incidence in a Growing Economy with Variable Factor Supply." *Quarterly Journal of Economics* 88 (November 1974): 531-73.
- The Governor's Advisory Task Force. *Property Tax Revision Task II: Evaluation of Property Tax Relief Programs*, Interim Report to the Governor. Lansing: The Governor's Advisory Task Force, 1976.
- Hamilton, B. "Capitalization of Intra-jurisdictional Differences in Local Tax Prices." *American Economic Review* 66 (December, 1976): 743-53.
- Michigan Department of Treasury. 1969 Michigan Individual Income Tax Returns and Instructions. Lansing: Michigan Department of Treasury, 1969.
- Mieszkowski, P. M. "The Property Tax: An Excise or a Property Tax?" *Journal of Public Economics* 1 (April 1972): 73-96.
- Musgrave, R. "Is a Property Tax on Housing Regressive?" *American Economic Review* 64 (May): 222-229. (May, 1974): 222-29.
- Netzer, D. (1973) "The Incidence of the Property Tax Revisited." *National Tax Journal* 26 (December): 515-35.
- (1966) *Economics of the Property Tax*. Washington, D.C.: The Brookings Institution.
- (1974) "The Property Tax—Discussion." *American Economic Review* 64 (May): 231-32.
- Peckman and Okner *Who Bears the Tax Burden?* Washington, D.C.: The Brookings Institution, 1974.
- Seligman, E. R. A. *Essays in Taxation*. New York: Macmillan, 1895.
- Tiebout, C. "A Pure Theory of Local Public Expenditure." *Journal of Political Economy* 64 (October, 1956): 416-24.

## NOTES

1. See, for example, Seligman (1895) and Netzer (1966). It should be remembered that questions of regressivity, acceptable rates of tax increase and fairness of tax burdens are questions of individual judgment rather than of economic logic.

2. See report of the Governor's Advisory Task Force (1976).

3. Feldstein also questions the assumptions and conclusions of Mieszkowski's model when he concludes that the incidence of any tax depends on the net effect of the tax on relative factor supplies. That is, if the supply of capital is responsive to expected returns, a portion of the tax may be shifted.

4. The argument for the use of current measured income rather than normal income takes on additional force when a high ratio of property tax to income is the result of inflation of property values due to unexpected change in demand and/or prolonged inflationary monetary policy.

5. See Hamilton and Tiebout.

6. The U.S. Census defines household income as follows: (a) earnings from wages, salary, commissions, bonuses or tips from all jobs; (b) earnings from non-farm business, professional practice or partnership; (c) earnings from own farm; (d) income from Social Security or railroad retirement; (e) income from public assistance or welfare, and (f) income from all other sources. The income figures utilized in this study are measures of cash flow and as such do not include nonmarket income or changes in net worth. Unfortunately, data on this broader concept of household ability-to-pay are not available.

7. The Census property values for owner-occupied housing are obtained from owners' estimates of current market value rather than assessed values. The authors have been in contact with Census officials in Washington, D.C. and have determined that, although owner estimates are not checked against assessed values, they have been checked against values of recently purchased homes as available at Records Offices. The finding is that, although certain estimates are observed to vary widely from the mark, property values as reported in the Census are on the aggregate relatively accurate. Also, since great parcel-to-parcel variations in ratios of assessed to sales values have been typically observed, it is not at all clear that the use of assessed values would increase the reliability of our results, even were they available for the 15,260 households in our sample.

8. The census data presentation of household income ranged from losses of \$9,000 or more to earnings of \$50,000 or more with \$100 intervals. The property values ranged from under \$5,000 to \$50,000 or more with nonuniform intervals.

9. In Michigan property is assessed at 50 percent of true cash value. Tax liability can thus be calculated by multiplying true cash value by one-half of the appropriate tax rate. That is,

$$2) \quad PT = (PV) (0.04732/2)$$

It should be noted that under 1970 Michigan tax law there existed a system of homestead exemptions for senior citizens, veterans and widows of veterans, the blind and the disabled. Our analysis which relates PV/I to I excludes such tax credits. This exclusion was purposeful, for the intent was to determine whether the Michigan tax on owner-occupied housing is inherently regressive.

10. Ratios were calculated using PV and I values as reported by heads of households, and it is expected that in individual instances reported values may vary significantly from true values. Although such errors in reporting might be expected to cancel out in calculation of means and simple correlations, they might affect extreme values of PT/I. In addition there is understatement of PT/I ratios for households that hold second homes or rental units, and this may explain some of the very low values of PT/I. However, even if 100 percent errors in reporting are assumed for the extreme values, the range between high and low PT/I ratios would still be great.

11. For an explanation of the 1969 system of sliding scale property tax credits, see Michigan Department of Treasury report. Since we did not have access to tax files, and due to the fact that the census data did not provide sufficient

information to determine whether heads of households were disabled or would qualify as veterans or widows of veterans, we could not estimate the tax credits for these households. It should be emphasized that during the first two years of the circuit breaker when by law tax credits had to at least equal credits obtainable under the previously existing sliding scale property tax credits, the tax relief provided to these groups as a percentage of tax credits was relatively small. In 1973 this amounted to 5.46 percent of total tax credit provided, and in 1974 it amounted to 7.07 percent. See the 1976 Task Force report, pp. 15-16).

12. There is a possible shortcoming of the system that we have not investigated in detail, and that is that tax relief is a function of joint income rather than household income. The result is that certain households with high total income may obtain considerable tax relief if joint income of the legal head of household and spouse is low. An example would be a retired head of household whose residing offspring earn substantial income. As shown in footnote 6 the Census data provide for each member of a household a sufficiently detailed breakdown of income from all sources to allow us to distinguish between household income (as defined in this paper) and joint income which is required for computation of tax relief.

13. For  $I'$  equal to or less than \$3,000, the coefficient 0.035 becomes zero, between \$3,001-\$4,000 the coefficient becomes 0.01, between \$4,001-\$5,000 it is 0.02, between \$5,001-\$6,000 it is 0.03 and for income greater than \$6,000 the coefficient 0.035 is not reduced.

14. This point is considered in detail in Section IV of this paper.

15. See Section IV of this paper.

16. It is interesting to note that the mean  $NPT_2/I$  for these low income groups (1.7 percent) is not substantially different from the overall mean (1.6 percent) for our sample of 2,533 households. This reflects the extent to which the special treatment of senior citizens was effective in reducing the tax burden of low-income senior citizens.

### *In Memoriam: C. V. Hill, 1901-1979*

CARROLL VICTOR HILL, one of the country's leading community planners, died on August 5, 1979, in Deltona, Fla., in Deltona, Fla., his winter home, and in his passing this *Journal* lost one of its most devoted supporters and the Robert Schalkenbach Foundation one of its most active directors.

Carroll Hill was born in New York City on May 1, 1901, and raised in Pittsfield and Worcester, Mass. Upon his graduation from the University of Massachusetts in Amherst he entered the field of city planning in Pittsburgh, Pa. There he became city planning director. His involvement in Pittsburgh's "Golden Triangle" revitalization, one of the country's outstanding central business district rehabilitation programs, attracted nationwide attention, according to Grandon E. Eckert, former city planner of East Liverpool, Ohio. His interests were remarkably broad. Early in his career he was called to Florida to undertake landscape planning of the type some communities there are noted for, and at the same time he took responsibility for golf course projects.

During the second world war, Carroll served as a colonel in the Army Corps of Engineers and later as National Food Administrator of South