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Property Tax Equity: A Study of Bemidji, Minnesota

L.E. JOHNSON,* ROBERT D. LEY**

ABSTRACT — The paper seeks to evaluate the equity of property tax assessments in a rural northern Minnesota area. Criteria of both vertical and horizontal equity were examined in terms of the ability to pay and benefits measures of the interdecile relationships. In addition, other variables affecting intra-decile horizontal equity such as age and lakeshore location were considered. The data upon which the results were based were drawn from random sampling of 1000 households in the R-31 school district at Bemidji, Beltrami County, Minnesota. The sample represented 20 percent of all such households. A total of 216 households responded to a questionnaire which asked for adjusted gross income, tax assessments, number of children enrolled in R-31 schools, property tax credits, age of taxpayers, and whether the property was lakeshore or not. The study concludes that the property tax assessments in Bemidji violate both vertical and horizontal standards for equity whether measured in terms of the ability to pay or of benefits. It also appears that intra-decile horizontal equity is violated in terms of lakeshore versus non-lakeshore assessments. Finally, older people in the lower income deciles are taxed more heavily than average.

The equity of local property tax assessments has long been of interest to economists and politicians, as well as the general public. This concern stems from a number of sources.

First, this levy has traditionally represented the major source of local tax revenue.

Second, it is the most obvious of all taxes, since the property tax requires large, explicit, and recurrent payments.

Third, it can no longer be assumed, as it once was, that real property holdings and income or wealth are proportionally related.

Finally, the equity of the property tax, like all taxes, is being re-evaluated because of the perceived size of the overall personal tax burden. In fact many persons believe that this tax is particularly inequitable, which raises numerous questions concerning the proper place of the property tax in the overall tax structure.

Though earlier studies addressing this issue suggest some "rules of thumb" regarding property tax equity, this study was desirable on a number of counts. There is, for example, an uncommonly high proportion of retired persons in rural areas like Bemidji. This area is further characterized by a high proportion of residential lakeshore property. Also,

Bemidji is the major population center in a county that is rated the fourth most depressed in the state of Minnesota. Finally, studies done a decade or more ago may provide a very misleading picture of current distribution of the tax burden.

So, if one is concerned with property present-day tax equity in a specific locale, it would appear prudent to examine the actual impact of the tax there, rather than to make inferences based on the tax's impact in other times and places.

Horizontal and Vertical Equity

For a tax to be judged equitable it must satisfy the criteria of horizontal and vertical equity simultaneously, whereby "likes" are treated alike and "unlikes" differently.

The difficulty lies in determining "likeness," for which there is no objectively correct answer. Two alternative measures are, however, often employed to establish the likeness or dissimilarity of taxpayers. First, there is the ability to pay principle, where people with like incomes are counted as equals for tax purposes. Second, there is the benefits principle. Here, people are analyzed in terms of what they receive from the public budget, and it is asserted that those who receive equal public benefits are equal for tax purposes and so should be taxed similarly.

To some extent, the concepts of vertical and horizontal equity are redundant when speaking of a single variable analysis based on either incomes or benefits. Some say that when vertical equity has been achieved, conditions for horizontal equity also have been satisfied, or visa versa. Partially for this reason, and partially as a reflection of the analyst's values, most studies of tax equity focus on this type of analysis.

This study continues to emphasize the ability to pay and benefits measures of vertical and horizontal equity. However, factors other than income and benefits, when they syste-

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matically and independently influence property tax assessments, may be additional sources of horizontal inequity. Therefore, these investigators also examine whether such sources of horizontal inequity are presently in the Bemidji assessment pattern.

Ability to Pay and Tax Incidence

The rationale behind the ability to pay principle is that the tax should impose an equal marginal sacrifice on all taxpayers in subjective terms. The general belief that the marginal utility of money diminishes requires unequal tax payments in order to establish equal subjective burdens.

Given those assumptions, and using the average tax rate, each dollar of tax should be taken from whoever would suffer the smallest loss of satisfaction as a result. The application of this rule would minimize the burden of the tax on the community. Its application also would require that taxes be progressive, that is, the percentage of income paid as tax must rise with the levels of income. Under this ability to pay principle, progressivity becomes the measure of both vertical and horizontal equity.

The Benefits Principle and Tax Incidence

Under the benefits principle, the tax side of the public budget is linked directly to expenditures, and it is asserted that the incidence of the tax ought to be such that the amount people pay should relate to the benefits they receive from the goods and services provided by government. Linking of costs and benefits is desirable from the economist's point of view as a means of encouraging an efficient allocation of resources. General public acceptance of this measure for equity, however, more commonly depends on the principle of justice that one should pay for what one gets.

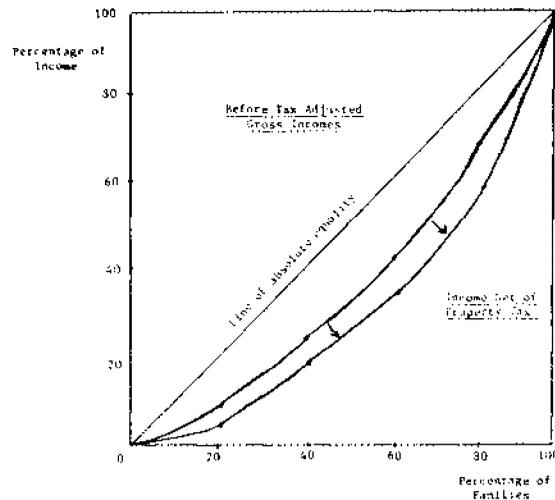
Other Possible Tax Influences: Implications for Equity

Under either measure of equity just described, if one and only one variable were to determine tax assessments, horizontal and vertical equity would be satisfied simultaneously. It is, however, possible for a tax to display vertical and horizontal equity in terms of this single variable analysis and yet to display horizontal inequity because of the influences of some other variable.

One possible source of this type of bias is the age of the taxpayer. There is some concern that older people pay higher taxes proportionately than do younger taxpayers in similar circumstances. Similarly, some believe that in northern Minnesota, owners of lakeshore property pay higher taxes than do similar owners of non-lakeshore property. Should either of these influences be present in the Bemidji assessment pattern, the tax would be horizontally inequitable. The final task of the study, therefore, is to test for horizontal inequity on assessments due to the influence of age and/or lakeshore status.

The data on which the results of the survey are based were drawn from a random sample of 1,000 households in the Bemidji area and represent approximately 20 percent of the owner-occupied housing units in the R-31 school district. The sampled families were asked to fill out a questionnaire containing information regarding tax assessments and information relating to our criteria of equity. A total of the 216 households responded. Of these, seventeen questionnaires were incomplete and unusable. Responses on four other questionnaires were inconsistent; the property tax credit claimed by these respondents on their state tax returns was inconsistent with the household incomes and tax assessments reported. Based on the reported assessments, which were

FIGURE 1: Lorenz Curves for Bemidji, Minnesota; Before and After Property Tax Assessments.



among the highest in the sample, the incomes reported by these respondents were entitled to much larger credits. Whether the error was in the reported income or reported assessment, the apparent inconsistency led to exclusion of those responses. The net result was a sample of 195 usable responses, or 19.5 percent of the total sample and 90 percent of the responses.

A household's reported 1978 adjusted gross income was used as a measure of ability to pay. Unfortunately, adjusted gross income excludes the value of transfer payments such as food stamps and medicaid. As a result, the use of this measure of income may tend to understate the real consumption ability of those with low money incomes. It may thus overstate the dispersion of purchasing power among households. In spite of such factors, however, it is the measure most frequently used by applied economists, since it avoids the very real difficulties involved in assigning dollar values to those public goods and services provided to households directly.

As a measure of benefits received, the study used the number of children from a household had enrolled in the R-31 school district in 1978. Of course, some households reporting zero benefits in the present instance have sent children to school in the past or expect to do so in the future. One could thus argue that these households receive some long-run benefits in exchange for their tax payments. The short-run perspective seems desirable, however, because of the difficulty in obtaining accurate data regarding benefits received in other time periods or a standard for comparing the value of benefits received at different times.

Respondents were asked to report their tax assessments rather than assessed valuations in order to allow for the possible impact of differing tax rates between townships. If there are differences in assessment rates that do not reflect differences in service levels, the multiplicity of jurisdiction becomes another possible source of horizontal inequity, but this issue was not addressed in the present study.

Tax assessments, of course, overstate the actual tax burden borne by households. If actual tax rates are lower than assessment rates, households are better off in welfare terms than the data indicate. However, if tax assessments overstate actual payments uniformly, the relative rates levied on different households will be unaffected. The major reason for the difference in actual and assessment rates is that Minne-

TABLE I: Tax Assessments by Income

(1) Decile	(2) Mean Assessment, 1978	(3) Average Tax Rate
1	\$ 254.14	7.5%
2	617.22	9.4
3	1415.84	16.3
4	720.31	6.3
5	319.54	2.4
6	462.15	3.0
7	522.45	3.0
8	677.32	3.3
9	483.76	1.9
10	872.71	2.2

sota has a Homestead credit whereby the state absorbs a share of the tax assessments on owner-occupied housing. Since the credit results, in essence, to a proportionate reduction in the actual taxes of all homeowners, it has the effect of lowering the actual property tax rates without affecting the relative burden distribution. It is relative rather than absolute rates which are critical to the equity issue.

In addition to tax assessments, information also was requested on the property tax credit received by households against their state income tax liability. This provision, too, has the effect of somewhat reducing the direct burden of the tax on property owners. In this case, too, it served as a check to insure consistency between assessments and incomes. There was some concern that respondents, misreading the questionnaire, might report the assessed value of their property rather than the tax assessment. The size of income tax credit reported, which depends on the property payment and income, was thus used as a guide in judging whether the correct piece of information had been reported.

The questionnaire asked for a distinction between lakeshore and non-lakeshore property and also asked respondents to place themselves in one of three age categories: under 30; 30 to 65; and over 65. This information was intended to allow testing for alleged horizontal inequities.

Equity Measure According to Ability to Pay

To assess the vertical and horizontal equity under the ability to pay measure, responses were arranged in income deciles. Mean tax assessments by decile are presented in Column (2) of Table I. The pattern while not smooth, shows absolute assessments lowest towards the middle of the distribution, rising at either end. In spite of this overall impression, there are seemingly erratic changes in assessments moving from one decile to the next. This is not consistent with an equitable distribution of the tax's burden according to the ability to pay measure of equity. Even in acknowledging that as a result of acceptable assessments errors, it is unreasonable to expect assessments to increase smoothly with income, the U-shaped pattern of assessments observed in the data cannot be reconciled with this approach to equity. Column (3) of Table I records the average assessment ratio for members of the various income groups, and was obtained by dividing their total assessments by their combined income. The overall pattern is one of regressivity, assessment rates tending to be higher at the lower end of the income distribution and lower for the more affluent. This regressivity by

TABLE II: Distribution of Tax Assessments and Benefits

(1) Number of Children in schools	(2) Families	(3) Total Tax	(4) Tax Per Family
0	115	\$66,784.42	\$580.73
1	29	15,650.02	539.66
2	29	11,939.82	411.72
3	16	3,820.64	238.79
4	5	983.65	196.73
5	0	-0-	N.A.
6	1	262.00	262.00

definition violates the ability to pay principle as we have defined it.

While these deciles are not large enough for valid statistical test of horizontal equity (there are not enough identical incomes to show whether, in general, they pay identical taxes) the degree of vertical inequity is enough to disqualify the tax as equitable under the ability to pay measure.

One of the implications of this pattern may be seen in Figure 1, which presents before and after tax Lorenz curves for the Bemidji area based on the sample data.

The inner curve shows the distribution of adjusted gross incomes in Bemidji and it displays a degree of income inequity comparable to that for the nation as a whole. The outer curve shows what the distribution looks like when income is measured net of property tax assessments. The fact that it is further from the line of perfect equality suggests that the present assessment pattern, to a small but positive degree, adds to the inequality of after-tax incomes in the Bemidji area. In terms of the ability to pay principle, it is not surprising that an inequitable tax contributes to income inequality.

Equity According to the Benefits Principle

That the Bemidji property tax is inequitable according to the ability to pay does not prove it inequitable in any ultimate sense. It is entirely possible for a tax which is inequitable according to ability to pay to be perfectly equitable horizontally and/or vertically under the benefits measure. Indeed, some would argue that even if the ability to pay principle is appropriate at the national level, where distributional concerns are a major influence on policy, the benefits principle is more appropriate for relatively homogeneous local communities where the link between tax payments and public services is more obvious and direct.

Using children from a household enrolled in the public schools as a measure of benefits received, results are summarized in Table II. In that Table, families are grouped according to the number of their children enrolled. Dividing this total by the number of families in the group Column (2), yields the tax per family in Column (4). The column thus shows the pattern of tax assessments of different groups of households ranked according to the educational benefits they receive. These results must be considered vertically inequitable according to the benefits criteria. For the case to be otherwise, tax payments would have to rise when reading down Column (4) in Table II. Yet, although the

pattern is irregular, it is a fair generalization that tax payments decline as benefits increase; the exact opposite of an equitable tax burden under the benefits principle.

The tax is also manifestly inequitable horizontally according to the benefits principle. It is simply not true that people with the same number of children in school pay similar taxes. Rather, there is wide variation in assessments within each benefit group. Individuals in a given benefit group often pay property taxes approaching the average for higher and lower benefit groups.

The Possible Influence of Other Variables on Assessments

It appears that neither the ability to pay principle nor the benefits principle can be used to rationalize the pattern of tax assessments in Bemidji. As mentioned earlier, however, there is some concern that other factors such as the age of the taxpayer and whether or not the property assessed is lakeshore, might systematically influence intra-class assessments. Should that happen, the pattern of interclass assessments might roughly conform to some standard of vertical equity and yet display horizontal inequity because some factor, such as age, would influence assessments within each vertical category. For the tax to be truly equitable, it must be true that no variables other than income and/or benefits significantly influence assessments.

Unfortunately, that does not appear to be the case. Consider Table III, which reveals average tax payments for lakeshore and non-lakeshore property owners grouped by income classes. In seven of the eight deciles in which both types of property appear, lakeshore owners pay higher taxes than do non-lakeshore owners. The apparent tendency for lakeshore owners to pay higher taxes means the tax is inequitable under the ability to pay principle. The source of this bias is no doubt the higher average market value (on which assessments are based) of lakeshore property. There is no basis in economic theory, however, for consumers with a stronger preference for this type of housing to bear a greater tax burden than people with the same income and different tastes.

Since lakeshore owners do not on average send more children to public schools, indeed they send fewer according to these data, this bias cannot be justified by appeal to the benefits criteria. Lakeshore property does appear to be more highly taxed than non-lakeshore, an additional source of inequity under both of the accepted measures of tax equity.

Another possible source of horizontal inequity within classes is the age of the taxpayer. To examine this possibility, taxpayers were assigned to three age groups: those under 30; those from 30-65; and those over 65. The average tax payments for the various age groups in each income

TABLE IV: Mean Tax Assessments by Age for Income Groups

(1) Income Decile	(2) Under 30	(3) Age Group 30-65	(4) Over 65
First	\$ 358	\$ 317	\$ 235
Second	N.A.	685	762
Third	N.A.	1,402	1,914
Fourth	315	789	610
Fifth	269	364	182
Sixth	985	313	302
Seventh	732	484	357
Eighth	371	747	431
Ninth	129	521	98
Tenth	2,750	758	N.A.

group is shown in Table IV. Overall, age does not appear to influence the tax burden of members of a given income class. The youngest group pays the highest tax in four deciles, the middle group pays the highest average tax in four deciles, and the oldest group is the most heavily taxed in the two remaining deciles.

By this simple test, the tax does not appear to discriminate against older homeowners. A word of caution is in order, however. Older people in the lower reaches of the income distribution pattern do tend to be more heavily taxed than younger taxpayers in the same deciles. Both the second decile and the third show older people paying significantly larger taxes. Thus, while it cannot be said that the tax discriminates against older people in general, it does appear to place a disproportionately heavy burden on older homeowners if they happen to be less affluent.

Under the benefits principle, older people, none of whom have children enrolled in school, ought to pay lower taxes. Indeed they do. The average assessment tax for those over sixty-five is \$432, approximately two-thirds the average assessment of younger taxpayers, so the older taxpayers as a group are treated equitably according to the benefits measure.

The primary conclusion of this study is that the structure of the Bemidji property tax, as manifest in assessments patterns, is both vertically and horizontally inequitable according to accepted measures of tax equity. Neither ability to pay as measured by adjusted gross income, nor benefits as measured by children enrolled in public schools can be used to explain assessments in the Bemidji area. This fundamental inequity is compounded by the fact that assessments also depend on whether or not the property assessed is lakeshore. Neither measure of equity can be used to justify such a pattern. Lakeshore ownership, therefore, represents an additional source of horizontal inequity. Finally, while it is not true that older people are uniformly more heavily assessed than younger people in similar circumstances, it does appear that older people in the lower income groups are taxed more heavily than average. This might be seen as a concern on the part of anyone who feels that older, low income people, are already a disadvantaged group.

It should be noted that these inequities are not the result of failure in tax administration procedures in the Bemidji area. Rather, the inequities appear inherent in the structure of the tax. Apparently, the estimated market value of the real estate owned by taxpayers is not a suitable proxy for either their income or children in schools. This is not surprising; one would be hard pressed to explain why it should be otherwise.

TABLE III:

The Effect of Lakeshore Property on Tax Assessments

By Income

(1) Income Decile	(2) Lakeshore	(3) Non-Lakeshore
First	\$ 341	\$ 259
Second	N.A.	726
Third	2,594	1,160
Fourth	835	682
Fifth	N.A.	320
Sixth	565	411
Seventh	465	543
Eighth	733	663
Ninth	959	452
Tenth	918	852