11-1972

An Analysis of Effective Property Tax Rates in the City of Omaha

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CENTER FOR APPLIED URBAN RESEARCH

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Concern over the nature and extent of local property tax rate variation is not uncommon. Yet published empirical evidence is practically nonexistent. This is especially so when intrajurisdictional comparisons are made. This study was undertaken to shed light on this issue as it relates to census tracts and housing markets in the City of Omaha.

The general conclusions of the study suggest: (1) there exists substantial inequality in the levying of property taxes between housing market areas, hereafter referred to as HMA's,[1] (2) there is a lack of uniformity in tax assessments, and (3) the property tax, as now administered, is discriminatory and tends to undermine and reduce the capability of an area to improve the quality of its housing stock.

Specifically, evidence suggests that the highest effective tax rates prevail in the Northeast HMA; an area characterized by low property values and a high density of blacks, low-income families, and renter-occupied dwellings. On the other hand, the lowest effective tax rates prevail in the "newer" or "better" housing market areas. These areas are characterized by relatively high family incomes and property values, a relatively low density of renter-occupied dwellings, and a low density of blacks. The higher effective tax

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*The author is Director of the Center for Applied Urban Research at the University of Nebraska at Omaha. He wishes to thank Dr. David Hinton for helpful comments and suggestions, but the author bears sole responsibility for the analysis and conclusions presented here.

[1]The Center for Applied Urban Research defines six housing market areas. These HMA's are geographically divided into the Southeast, Southcentral, Southwest, Northeast, Northcentral, and Northwest housing markets.

rates levied on property in the Northeast HMA may be considered a deterrent to the growth of, and improvement in, the quality of housing in the area.

Data, Definitions, and Methodology

The primary source of data in this study were records of 1,122 individual residential property transactions in Omaha during 1971. Data on housing from the Omaha Metropolitan Area Planning Agency (MAPA) and housing, income and population data from the Bureau of the Census were also employed.[2]

The terms assessment-sales ratio and effective tax rate are used interchangeably in this study because variations in each are identical.[3] The effective tax rate is the annual tax bill stated as a percentage of the market value (sales price) of property. The assessment-sales ratio is the assessed value as shown on local tax records prior to sale of the property stated as a percentage of sales price.

The assessment-sales ratio (effective property tax rate) was determined for each of the 1,122 residential properties. The degree of uniformity in tax

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[2]Omaha-Council Bluffs Metropolitan Area Planning Agency, 1970 Housing Study, (Preliminary Census Tract Data), and U.S. Department of Commerce, U.S. Bureau of the Census, Census of Population and Housing: 1970, Census Tracts, Final Report PHC (1)-153 Omaha, Nebraska-Iowa SMSA (Washington, D.C.: Government Printing Office, 1972)

[3]For example, assume that two pieces of property (X and Y) both sell for $20,000. Second, assume that prior to the transactions the local assessor had valued X at $15,000 and Y at $20,000. The taxable value of property is determined by multiplying the legal assessment ratio (35 percent) times the total assessed value of property. Therefore, X has a taxable value of $5,250 (35% x $20,000). The assessment-sales ratio will be .2625 for property X ($5,250/$20,000) and .35 for property Y ($7,000/$20,000). The effective tax rate is computed by applying the tax levy to the taxable value of the property. Assuming a tax levy of $9.60 per hundred dollars, property X will be taxed $504 ($9.60 per hundred x $5,250) and property Y will be taxed $672 ($9.60 per hundred x $7,000). The effective tax rate is 2.52 percent for X ($504/$20,000) and 3.36 percent for Y ($672/$20,000).

The reader should note that the assessment-sales ratio for Y is 133 percent of that for X. The effective tax rate for Y is also 133 percent of that for X.

assessments was also computed. In technical terms the measure of uniformity is referred to as the coefficient of dispersion which indicates how individual assessment ratios differ on the average from the median assessment ratio. Assessment-sales ratios were then grouped by 1970 census tracts into six HMA's.[4] Both average assessment-sales ratios and uniformity in assessments were compared along with income, housing and population characteristics of each HMA. In the regression analysis, the average assessment-sales ratios were regressed on selected income, housing and population characteristics by census tract.

Descriptive Results

Based on evidence in this study, the average assessment-sales ratio for the city is estimated to be 31 percent; four percentage points lower than the 35 percent assessment rate required by Nebraska State law. The average assessment-sales ratio computed from the sample of sales transactions compares favorably with 31.6 and 32.2 percent reported for Douglas County in 1970 for single and multiple family suburban properties respectively.[5] The measure of uniformity (coefficient of dispersion) indicates that individual assessment ratios in the City of Omaha differ on the average from the median by 19 percent. For purposes of comparison, the coefficient of dispersion for the U.S. was 19.2 percent.[6]

The aggregate assessment-sales ratio and dispersion rate indicate that local property values tend to be underassessed, and the assessment practices

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[4]In census tracts split between the City of Omaha and Douglas County, only sales transactions within the City are included as units of observation.

[5]Nebraska, 1970 Real Estate Assessment Ratios, published in accordance with LB 20, Eightieth Session of the Nebraska Legislature.

[6]U.S. Bureau of the Census, Census of Governments, 1967, Vol. 2, Taxable Property Values, (Washington, D.C.: U.S. Government Printing Office: 1968), Tables 16 and 19.

tend to be within tolerable limits.[7] However, when variation among the HMA's is examined, both the assessment-sales ratios and coefficients of dispersion display considerable variance.

Boundaries and the mean assessment-sales ratio for each of the six housing market areas are presented on Map I. The reader should note that the mean varies from 27 percent in the Southcentral HMA to 37 percent in the Northeast HMA. A comparison of the percentage difference between effective tax rates in the Northeast HMA and the other housing market areas is presented in Table I.

TABLE I

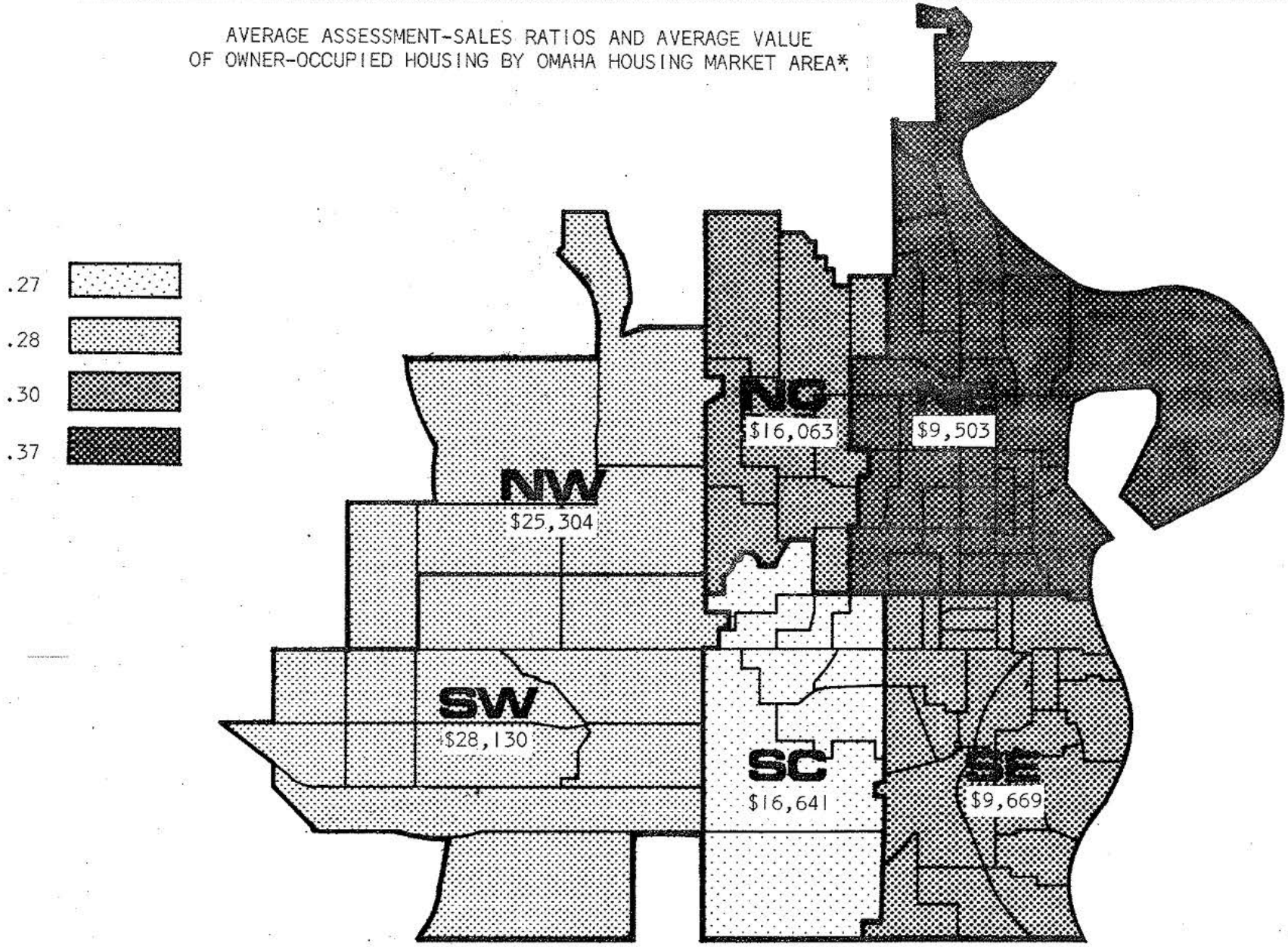
COMPARISON OF PERCENTAGE DIFFERENCES IN EFFECTIVE TAX RATES AMONG NORTHEAST OMAHA AND OTHER HOUSING MARKET AREAS

Housing Market Area	Northeast Omaha HMA (Percent by which Northeast HMA exceeds others)
Southcentral	37
Northwest	32
Southwest	32
Northcentral	23
Southeast	23

Table II presents the mean assessment-sales ratio, coefficient of dispersion, number of sales transactions, and the mean assessment-sales ratio by value of residential property for the six HMA's. The reader should note that in both the Northeast and Southeast markets the coefficient of dispersion

[7]The general rule of thumb holds that an intra-area coefficient of dispersion of less than 20 percent indicates a tolerable degree of nonuniformity. See: Advisory Commission on Intergovernmental Relations, State-Local Finances and Suggested Legislation, (Washington, D.C.: U.S. Government Printing Office, 1970), p. 112.

AVERAGE ASSESSMENT-SALES RATIOS AND AVERAGE VALUE
OF OWNER-OCCUPIED HOUSING BY OMAHA HOUSING MARKET AREA*



*In census tracts split between the City of Omaha and Douglas County, only sales transactions within the city are included as units of observation. Average value of owner-occupied housing computed by CAUR from 1970 census tract data.

TABLE II

PROPERTY TAX CHARACTERISTICS OF THE SIX HOUSING MARKET AREAS

Region	Mean Assessment Sales Ratio[a] (percent)	Coefficient of Dispersion[b] (percent)	Number of Sales Transactions	Mean Assessment-Sales Ratio by Value of Residential Property	
				Under 15,000	Over 15,000
Southcentral	27	11	132	29	27
Southwest	28	12	135	N.A.	28
Northwest	28	12	194	N.A.	28
Northcentral	30	12	185	32	29
Southeast	30	27	208	31	27
Northeast	37	25	268	39	31

[a]The mean assessment-sales ratio for the City of Omaha is 31 percent.
[b]This represents the percentage by which the various assessment-sales ratio differ on the average from the median. The coefficient for the City of Omaha is 19 percent.

is more than double that in the Central and Western HMA's. What is of particular interest is the fact that despite the lack of uniformity in the Eastern section, the tax rate is relatively low for the Southeastern HMA.

Average assessment-sales ratios were calculated separately for property valued over and under $15,000 (see columns 4 and 5 in Table II). Both tend to be closely associated with the aggregate rate developed in column one. Yet the range of assessment-sales ratios on property over $15,000 is narrower (27-31) than on property under $15,000 (29-39). Finally, the Northeast HMA has higher effective tax rates for both categories.

Examination of the housing, income, and population characteristics of the six housing market areas reveals that the highest effective tax rates occur in a housing market area characterized by relatively low income, a low density of owner-occupied units, a high density of deteriorated and dilapidated

units, and a high density of blacks. Upon close examination of census tract characteristics, the Southeast HMA also possesses many of these characteristics. However, two crucial differences exist. The Northeast is characterized by both a higher average effective tax rate and a higher density of blacks. Other things equal, this suggests an assessment-sales ratio discrimination on the basis of race. Table III presents information related to these characteristics.

TABLE III

SELECTED CHARACTERISTICS OF SIX OMAHA HOUSING MARKETS

Housing Market	Average Family Income in Housing Market as a Percent of Average Family Income-Omaha	Percent of Blacks	Percent of Families with Incomes less than 50 Percent of Poverty Level	Percent of Deteriorated & Dilapidated Housing	Percent of Owner-Occupied Units
Southcentral	113	--	1	4	74
Southwest	150	--	1	--	75
Northwest	125	--	1	1	81
Northcentral	103	1	2	2	64
Southeast	79	2	4	14	44
Northeast	75	34	5	17	49

Source: Compiled by the Center for Applied Urban Research from 1970 Census of Population and Housing and 1970 MAPA Housing Study.

Variation by race can best be demonstrated by comparing selected census tracts by racial composition. The average assessment-sales ratio for tracts 52 and 53 in Northeast Omaha (80 and 50 percent black respectively) is .60.[8] On the other hand, the average assessment-sales ratio for tracts

[8]Some census tracts have a greater density of black population, however, there were no sales transactions. The reader should also note that variation in assessment-sales ratios by race is not unique to Omaha. For example, see David E. Black, "The Nature and Extent of Effective Property Tax Rate Variation Within the City of Boston," National Tax Journal, Vol. XXV, June, 1972, p. 207.

21,31, and 34.02 in Southeast Omaha (zero percent black) is .27. This represents a difference of 122 percent in effective property tax rates. If the average assessment-sales ratio in the Northeast HMA is compared with the City average of .31, the difference is still significantly large.

Results of Correlation and Regression Analysis

To determine the relationships between the assessment-sales ratios and census tract characteristics, simple correlation coefficients were computed. These relationships are shown in Table IV.

TABLE IV

SIMPLE CORRELATIONS BETWEEN ASSESSMENT-SALES RATIOS AND CENSUS TRACT CHARACTERISTICS

Census Tract Characteristics	Correlation Coefficients
Median value of property	-.38
Density of owner-occupied units	-.43
Density of low-income families	.40
Density of black population	.78
Density of deteriorated and dilapidated units	.40

The simple correlations indicate that effective tax rates are positively associated with the densities of low-income families, black population, and deteriorated and dilapidated units. The effective tax rates are negatively associated with the densities of owner-occupied units and the median value of property.

The assessment-sales ratio and selected characteristics of the census tracts were further examined to determine the extent to which variations in the effective tax rates can be explained by variations in census tract characteristics. Specifically, the assessment-sales ratios were regressed on the density of deteriorated and dilapidated units and the density of

black population.[9] The results of this regression are presented in equation (1)

$$(1)\quad A/S = \underset{[46.5788]}{.2819} + \underset{[8.2555]}{.3285B} + \underset{[2.5693]}{.2014D} \qquad R^2 = .66^{10} \quad (.0337) \quad DF = 47$$

where A/S = average assessment-sales ratio

D = density of deteriorated and dilapidated units

B = density of black population

The R^2 (coefficient of determination) of equation (1) indicates that the two independent variables used in the regression account for about two-thirds of the variation in effective tax rates. The signs of the coefficients estimated in equation (1) indicate that, other things remaining constant, assessment-sales ratios bear a positive and significant relationship to density of deteriorated and dilapidated units and density of black population.[11]

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[9]The assessment-sales ratios used are averages for each census tract.

[10]The brackets below the estimated coefficients contain t statistics. In this and subsequent equations, the t statistics for the coefficients pass the two tail test at the 1 percent level. The parentheses contain the standard error of the estimate. DF equals degrees of freedom. Not all of Omaha's census tracts are included as units of observation. Tracts in which the turnover rate was not sufficient to provide an adequate number of transactions during 1971 were omitted.

[11]Additional independent variables were initially used to explain tax rate variation, e.g., density of low-income families, median property values, and density of owner-occupied units. Both variables representing property values and low-income families proved to be insignificant. On the other hand, density of owner-occupied units proved to be a significant independent variable when not included in the same equation with the variable representing density of deteriorated and dilapidated units. The results of such a regression is as follows: $A/S = \underset{[16.0]80]}{.3430} - \underset{[-2.5580]}{.0766H} + \underset{[8.0842]}{.3247B}$ $R^2 = .66$ (.0335) DF = 47

where H = density of owner-occupied units.

In equation (2) assessment-sales ratios were regressed on black population by census tract. The results are as follows:

$$(2)\quad A/S = \underset{[53.5834]}{.2898} + \underset{[8.7070]}{.3540B} \qquad R^2 = .61,\ (.0354),\ DF = 48$$

The results of equation (2) suggest that approximately 61 percent of the variation in effective tax rates can be explained by the density of black population.

All Southeast HMA census tracts were omitted for the third regression. The results are as follows:

$$(3)\quad A/S = \underset{[50.5278]}{.2815} + \underset{[7.2352]}{.2754B} + \underset{[4.3759]}{.4361D} \qquad R^2 = .77,\ (.0291),\ DF = 37$$

As in the case of the other regressions when Southeast HMA tracts are omitted, all coefficients are highly significant. R^2 is improved, indicating that two independent variables used in the regression account for about 77 percent of the variation in effective tax rates in 5 of 6 HMA's. The standard error of the estimate is also reduced.

Summary and Conclusions

Effective property tax rates in Omaha tend to bear a positive relationship to density of low-income families, density of black population and density of deteriorated and dilapidated units. Effective property tax rates tend to bear a negative relationship to median value of property and density of owner-occupied units.

Regression analysis indicates that two-thirds of the variation in effective tax rates can be explained by density of black population, and density of deteriorated and dilapidated housing or density of owner-occupied housing units. On the other hand, more than three-fourths of the variation

can be explained by similar variables when Southeast Omaha census tracts are omitted as units of observation.

The evidence of this study indicates that uniformity in assessments is beyond tolerable limits in both the Northeast and Southeast HMA's. At the same time, the significant difference in effective tax rates between the Northeast and Southeast HMA's suggests the need for a re-examination of local assessment practices.[12]

[12]The reader should note that in low-income and deteriorated housing market areas the impact of a high tax rate is different than it would be in better-off and newer areas of Omaha. First, in the better-off areas of the city the connection between property tax payments and local public services provided homeowners is a more clear one. Second, the federal income tax advantages of homeownership for relatively well-off taxpayers offset the property tax in large measure.

Census Tracts	Owner Occupied	Family Income to Poverty	Density of Blacks	Deteriorating and Delapidated Housing	Assessment Sales Ratio
59.02	.642	.051	.787	.100	.425
60	.638	.027	.105	.059	.351
61.01	.645	.006	.045	.009	.317
61.02	.739	.010	.075	.039	.333
62.02	.802	.015	.019	.023	.333
63	.679	.006	.023	.014	.289
64	.745	.019	.005	.007	.281
65.01	.825	.010	.003	.006	.264
65.02	.865	.013	.015	.000	.290
66	.676	.024	.003	.025	.266
67.02	.631	.000	.000	.000	.272
68.01	.717	.008	.001	.000	.295
68.02	.844	.007	.000	.001	.272
69.01	.837	.011	.001	.000	.279
69.02	.761	.009	.001	.000	.284
70	.647	.014	.002	.028	.277
71	.745	.018	.004	.081	.289
74.02	.616	.009	.003	.001	.289
74.04	.972	.000	.003	.000	.281
74.06	.810	.000	.000	.000	.280
74.07	.834	.000	.000	.000	.287
74.08	.855	.009	.005	.000	.275
74.09	.749	.000	.000	.000	.265

Census Tracts	Owner Occupied	Family Income to Poverty	Density of Blacks	Deteriorating and Delapidated Housing	Assessment Sales Ratio
59.02	.642	.051	.787	.100	.425
60	.638	.027	.105	.059	.351
61.01	.645	.006	.045	.009	.317
61.02	.739	.010	.075	.039	.333
62.02	.802	.015	.019	.023	.333
63	.679	.006	.023	.014	.289
64	.745	.019	.005	.007	.281
65.01	.825	.010	.003	.006	.264
65.02	.865	.013	.015	.000	.290
66	.676	.024	.003	.025	.266
67.02	.631	.000	.000	.000	.272
68.01	.717	.008	.001	.000	.295
68.02	.844	.007	.000	.001	.272
69.01	.837	.011	.001	.000	.279
69.02	.761	.009	.001	.000	.284
70	.647	.014	.002	.028	.277
71	.745	.018	.004	.081	.289
74.02	.616	.009	.003	.001	.289
74.04	.972	.000	.003	.000	.281
74.06	.810	.000	.000	.000	.280
74.07	.834	.000	.000	.000	.287
74.08	.855	.009	.005	.000	.275
74.09	.749	.000	.000	.000	.265

The cost of operating public schools in Nebraska as in other States will probably increase in the future regardless of the type of tax levied (property vis-a-vis income or sales) and regardless of whether the taxes are levied by State or local governments. Factors such as rising price levels and an increasing demand for greater quality account for the conclusion that cost will rise. However, the implication that the average homeowner will pay higher total taxes if there is a shift in financing schools away from the local property tax to the State income and sales tax is untenable. Given the current tax structure, the "Average Homeowner" should benefit from such a switch.

Contrary to the evidence presented by the Nebraska Tax Research Council (World Herald, January 2, 1973) and the editorial of January 7, 1973, a shift toward more State funding of education means a shift in the relative financial burden of education away from the low and moderate income homeowner to the high income homeowner. If full State funding of education were to be accompanied by the percentage increases in the State sales and income tax as shown by the Nebraska Tax Research Council (120 percent increase in sales tax and a 126.7 percent increase in the income tax) in lieu of the local property tax levy for schools (currently representing 57 percent of the total property tax levy in the Omaha School District), the average homeowner would tend to pay out less in total taxes. This would necessarily follow because of the shift to a less regressive tax structure.

In the attached table, those homeowners with adjusted gross incomes of $18,000 or over would pay a larger share of the total educational cost. Low and moderate income homeowners would tend to benefit most. However, the reader should take care in interpreting the figures in the attached

table. For example, if the ratio of adjusted gross income to value of property is lower than indicated, a higher income could be earned before one would be paying more than he currently is paying. The reverse is true if the ratio is higher than indicated.

The analysis assumes, as did the Nebraska Tax Research Council, that property is uniformily taxed. This is open to question. A recent study of effective property tax rates in Omaha indicates that homeowners living in northeast, southeast, and northcentral Omaha could be the big gainers from such a tax shift. This follows from the fact that higher average sales/assessment ratios (effective taxes) are found on property in these parts of the City.

The fate of the renter is less clear, but it would appear to be different than pictured by the Nebraska Tax Research Council. It is likely that the renter is presently paying all or part of the levied property tax (assumes the landlord has the power to pass the tax forward).

The important question is the extent the rent structure would change after the landlord's property taxes are reduced. Assuming the desired rate of return on investment does not change and that competitive conditions exist, the rent structure should decline. Such things as inflation, landlord expectations and market conditions in the rental market will determine to what extent the rent structure will change.

The extent to which full State funding of education would bring about equalization of expenditures per student should also be considered. Studies show there is a wide variation in taxable property wealth by school

district. This suggests that homeowners living in school districts where taxpayer effort has been relatively high would gain most.

Finally, the Nebraska Tax Research Council concludes that business and industry generally would pay less if sales and income taxes rise and property taxes decrease. However, business and industrial firms could pay more or less depending on its earned income expressed as a percent of its taxable assets. Those firms paying less in taxes would be those where income is low relative to taxable assets, e.g., farmers and durable goods manufacturers. On the other hand, in service type firms, where income tends to be high relative to taxable assets, e.g., real estate firms, they would tend to pay a larger percent of the total cost of education.

In conclusion, there are arguments against full State funding, (e.g., loss of administrative control of schools at the local level) however, given the tax structure in the State of Nebraska an increase in State funding in lieu of local does not imply an increase in taxes on Mr. Average Nebraskan.

STATE AND LOCAL TAX BILL, FAMILY OF FOUR

Adjusted Gross Income	$ 7,000	$ 8,000	$ 9,000	$10,000	$11,000	$12,000	$13,000	$14,000
Value of Property (Includes Motor Vehicle(s))	14,000	16,000	18,000	20,000	22,000	24,000	26,000	28,000
Present System[1]								
Sales Tax	$ 132	$ 141	$ 151	$ 160	$ 168	$ 176	$ 185	$ 193
Income Tax	26	48	72	96	120	144	169	200
Property Tax	448	511	575	639	703	767	831	895
	$ 606	$ 700	$ 798	$ 895	$ 991	$ 1,087	$ 1,185	$ 1,288
Full Funding of Education by State[2]								
Sales Tax	$ 244	$ 262	$ 281	$ 296	$ 313	$ 327	$ 342	$ 359
Income Tax	110	159	213	268	322	378	433	504
Property Tax	194	222	250	278	306	333	361	389
	$ 548	$ 643	$ 744	$ 842	$ 941	$ 1,038	$ 1,136	$ 1,252

STATE AND LOCAL TAX BILL, FAMILY OF FOUR (Continued)

Adjusted Gross Income	$15,000	$16,000	$17,000	$18,000	$19,000	$20,000	$25,000	$ 50,000
Value of Property (Includes Motor Vehicle(s))	30,000	32,000	34,000	36,000	38,000	40,000	50,000	100,000
Present System								
Sales Tax	$ 202	$ 209	$ 216	$ 223	$ 230	$ 230	$ 252	$ 367
Income Tax	233	266	299	337	374	412	863	2,519
Property Tax	959	1,023	1,087	1,151	1,215	1,278	1,598	3,197
	$ 1,394	$ 1,498	$ 1,602	$ 1,711	$ 1,819	$ 1,920	$ 2,713	$ 6,083
Full Funding of Education by State								
Sales Tax	$ 374	$ 387	$ 400	$ 413	$ 426	$ 426	$ 467	$ 680
Income Tax	579	654	728	813	898	983	2,007	5,760
Property Tax	417	445	472	500	528	556	695	1,389
	$ 1,370	$ 1,486	$ 1,600	$ 1,726	$ 1,852	$ 1,965	$ 3,169	$ 7,829

Assumptions:

Average Assessment of Property is 32%

Taxpayer does not itemize Deductions and uses Schedule Y to determine Federal Income Tax.

Sales Taxes from Optional State Sales Tax Table

- Property Value (includes motor vehicle(s)) is Equal to 2X Adjusted Gross Income Adjusted Gross Income Equals Wages, Dividends, Interest, and other Income less sick pay, moving expenses, employee business expenses, etc.

Footnote:

[1]Present System based on 2-1/2% State Sales Tax, 1% Local Sales Tax, and 15% State Income Tax (less $40.00 Food Tax Credit). Total Property Tax Levy equals 99.9 mills.

[2]Full State Funded System based on 5-1/2% State Sales Tax, 1% Local Sales Tax, and 34% State Income Tax (Less $40.00 Food Tax Credit). Total Property Tax Levy equals 43.41 mills.