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ASSESSMENT INEQUITIES OF RESIDENTIAL PROPERTIES  
IN NINE MICHIGAN TOWNSHIPS

by

Sivaswami Amarnath

A Dissertation  
Submitted to the  
Faculty of The Graduate College  
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requirements for the  
Degree of Doctor of Public Administration  
School of Public Affairs and Administration

Western Michigan University  
Kalamazoo, Michigan  
December 1989

## ASSESSMENT INEQUITIES OF RESIDENTIAL PROPERTIES IN NINE MICHIGAN TOWNSHIPS

Sivaswami Amarnath, D.P.A.

Western Michigan University, 1989

Horizontal equity in property tax administration has been neglected by researchers in favor of research on incidence of the property tax. The present study, conducted within nine townships in Allegan, Barry, and Grand Traverse Counties in Michigan, investigated differences of practices in assessing residential properties. Three hypotheses test differences in ratio of assessed value to sale price for properties owned by nonresidents and residents, properties with water frontage and without water frontage, and properties of higher value and those of lower value. Both parametric and nonparametric statistics were utilized to test the research hypotheses.

The study findings were:

1. Properties owned by nonresidents had a higher ratio of assessed value to sale price than did properties owned by residents.
2. Properties without water frontage had a higher ratio of assessed value to sale price than did properties with water frontage.
3. Properties of lower value had a higher ratio of assessed value to sale price than did properties of higher value.

A number of possible explanations are offered to explain observed assessment inequities, and a number of recommendations are advanced to correct inequities observed.

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Western Michigan University, 1989

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Sivaswami Amarnath

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## CHAPTER I

### INTRODUCTION

Black (1968) defined taxes as "a pecuniary burden laid upon individuals of property to support the government" (p. 1628). Although perceived primarily as a means of raising revenue, taxes are also generally recognized as a major instrument of national economic policy. When government spending comes to equal one-fourth to one-third of gross national product, as in Western Europe and North America, taxes play a crucial role not only as a source of revenue but as a balance wheel of the economy.

The power to levy taxes is frequently reserved to the central government and is an integral part of the constitution of many nations. For example, Article I, Section 8, of the Constitution of the United States declares that:

The Congress shall have power to lay and collect taxes, duties, imposts, and excises, to pay the debts and provide for the common defense and general welfare of the United States; but all duties, imposts, and excises shall be uniform throughout the United States.

Although the power of taxation was granted to the federal government, American history provides evidence that a number of controversies involving taxes have nonetheless arisen. One controversy, of interest in this dissertation, is the conflict about taxing jurisdictions. States have long feared that the federal government would usurp the power of taxation from lower-level

government units and thus deprive them of the revenue necessary to fund local government services.

When the Constitution was enacted in 1787, some states opposed the grant of taxing power to the federal government. As a concession to these interests, Article I, Section 9, of the U.S. Constitution declares that "No capitation or other direct tax shall be laid unless in proportion to the census or enumeration hereinfoe directed to be taken."

This lack of power to levy direct taxes prevented the federal government from imposing taxes on general property, including land, which constitutes the primary source of wealth. Thus, in the United States, general property taxes have always been a domain of the states and local units.

#### Property Taxes

Historically, the property tax has played an important role in the U.S. tax system. Although total property tax revenue in the U.S. has declined as a percentage of total tax revenue from 51.4% in 1902 to 11.9% in 1970, partially because of the growth in revenue from federal income tax and state sales and income taxes, it is still the primary source of tax revenue for local governments. In 1980, the last year for which complete data are available, local property tax collections amounted to \$62.5 billion, or 50.5% of total local revenue. For Michigan, the figures are more dramatic; property tax collections amounted to \$4.4 billion or 61% of total



local revenue in 1980. In 1985, local units in Michigan collected \$5.6 billion in property taxes or 60.1% of total local revenue.

Despite heavy dependence on them, property taxes have come under heavy criticism ever since they were first levied. In 1895, after reviewing the history and problems of property taxation, Seligman issued his classic indictment of such taxes. He declared:

Practically, the general property tax as actually administered is beyond all doubt one of the worst taxes known in the civilized world. Because of its attempt to tax intangible as well as tangible things, it sins against the cardinal rules of uniformity, of equality and of universality of taxation. It puts a premium on dishonesty and debauches the public conscience; it reduces deception to a system, and makes a science of knavery; it presses hardest on those least able to pay; it imposes double taxation on one man and grants entire immunity to the next. In short, the general property tax is so flagrantly inequitable, that its retention can be explained only through ignorance or inertia. It is the cause of such crying injustice that its alteration or its abolition must become the battle cry of every statesman and reformer. (p. 61)

More recently, in 1966, the Research and Policy Subcommittee of the Committee for Economic Development found that:

Real property tax administration suffers from two major sources of inequity: unequal assessment and underassessment. In view of the primary reliance on real property taxes, it is quite shocking that in most parts of the country, whether urban or rural, its administration may be accurately described as inequitable, inefficient, incompetent or corrupt. There is no more vivid illustration of the need for reform of local institutions. (p. 54)

Despite criticism, the property tax survives on the American fiscal scene. In 1931 Jensen came to the defense of this venerable, if imperfect, institution, saying: "If any tax could have been eliminated by adverse criticism, the general property tax should

have been eliminated long ago" (p. 478). More recently, Netzer (1966) asserted:

The American property tax abounds in anomalies. During the past century no major fiscal institution, here or abroad, has been criticized at such length and with such vigor; yet no major fiscal institution has changed so little in modern times. The demise of the property tax as a major factor in the American fiscal scene has long been heralded; yet it continues to finance more than one-fifth of the civilian general expenditures of federal, state and local governments. (p. 1)

To better understand the criticisms, it is appropriate to examine what property tax means. Groves (1954) defined property tax as follows:

In its broadest meaning the general property tax is a tax on all wealth, tangible and intangible, which possesses exchange value. It is levied according to exchange value, at least in theory, and at a common rate for all property in the same district. It is thus a uniform and universal tax based upon the value of goods owned. Usually it is levied upon property wherever located, and the tax paid by the owner. (p. 43)

#### Property Taxes in Michigan

Property taxation was first practiced by cities and villages in the territory of Michigan pursuant to specific charter powers. In 1827, a territorial law established township government in Michigan and, in a companion measure, gave townships the power to levy ad valorem taxes upon property: real, personal, tangible, and intangible. The Revised Statutes of 1838, which streamlined and updated relevant territorial laws adaptable to the newly created State of Michigan, continued the provisions for ad valorem taxation

granted to townships under Title V, denominated "Of the assessment and collection of taxes."

The first Michigan Constitution, enacted in 1835, did not contain provisions for property taxation. Indeed, the legislature provided for operation of schools, which consumed a sizable amount of revenue, by establishing a perpetual fund derived from the sale of all lands granted by the U.S. government to Michigan. Thus, the power to levy property taxes remained exclusively with townships.

Article 14, Sections 11 and 12 of the Michigan Constitution of 1850, provided specifically for the levy of taxes on property in the state and established assessment levels at the cash value of property. More importantly, the uniformity provision of the Michigan Constitution has as its basic purpose establishment of an identical level of assessment throughout local units; that uniform level or standard was true cash value for the remainder of the nineteenth century and well into the twentieth century. Since January 1, 1966, the effective date of the 1963 Michigan Constitution, that standard has been 50% of true cash value, as is evident from the following quotation:

The legislature shall provide for the uniform general ad valorem taxation of real and tangible personal property not exempt by law. The legislature shall provide for the determination of true cash value of such property; the proportion of true cash value at which such property shall be uniformly assessed, which shall not, after January 1, 1966, exceed 50 percent, and for a system of equalization of assessments. The legislature may provide for alternative means of taxation of designated real and tangible personal property in lieu of general ad valorem taxation. Every tax other than

the general ad valorem property tax shall be uniform upon the class or classes on which it operates. (Art. IX, sect. 3)

It is a well-known human weakness that, whenever a tax is imposed, some members of the population will attempt to avoid paying it, either legally or illegally. With the income tax, a classic example of such avoidance is tax shelters. Avoiding property tax is more difficult because it is imposed on real estate. Politicians, however, have used statutory exemptions to help certain individuals or groups avoid paying property tax. In fact, exemptions probably are as old as taxes themselves.

What are exemptions? In his book The Free List, Balk (1971) defined exemptions as "the privilege of being excused from paying any property taxes on all or part of a parcel of real estate" (p. 4). Balk classified exemptions into two groups: general and incentive.

#### General Exemptions

Because property taxes pay for operation of local government throughout most of the United States, citizens soon concluded that any institution which provides a public service and thus indirectly reduces the burden of local government should be exempted from taxation. Schools, colleges, libraries, and other institutions of higher learning are thus exempt from property taxes. Almost all states provide exemptions to religious property. Federal, state, and local government property is also exempt from taxation.

These types of exemptions, even though statutorily granted by the legislatures of various states, originated in a long-standing tradition. The next group of exemptions, which are fairly recent, were established because of rising public indignation at the ever-increasing burden of property taxes in the 1960s and 1970s. These exemptions are generally referred to as homestead exemptions, which apply to all or part of the tax on property possessed by a homeowner, senior citizen, or veteran (P.A. 20, 1973). These exemptions frequently have income limitations and are phased out after the taxpayer has reached a certain specified income level, which is usually high enough to exempt a majority of taxpayers.

#### Incentive Exemptions

Other types of exemptions have been given to special interest groups; Balk (1971) called these incentive exemptions. Such exemptions have been passed into law by various state legislatures to attract or retain industry, such as the Plant Rehabilitation and Industrial Development Districts Act (P.A. 198, 1974) in Michigan, or to induce commercial property owners to renovate dilapidated properties (P.A. 255, 1978). Farmers as a group have benefited from incentive exemptions. Under the Farmland and Open Space Preservation Act (P.A. 116, 1974), the State of Michigan limits property taxes on farms to 7% of household income if the taxpayer enters into a contract with the state and promises to keep land in farming for at least 10 years.

Incentive exemptions have also been granted to developers of multiple housing for senior citizens and low-income families. These exemptions ostensibly are geared to induce developers to invest venture capital in high-risk operations. In addition, almost all states have exempted air- and water-pollution-control equipment from taxation in an effort to encourage manufacturers to control discharges into the environment.

All such incentive exemptions--ostensibly established to correct inequities, compete with other states, or otherwise induce taxpayers to do certain things--have distorted the property tax burden on taxpayers. In Michigan, for example, a new company moving into a community can take advantage of the provisions of Act 198 and obtain an exemption on 50% of the taxes on both real and personal property, whereas an established company in the same community cannot receive a similar benefit. The established company is thus at a competitive disadvantage relative to the new arrival.

Exemptions of any kind distort equity and uniformity provisions of the property tax. They shift the tax burden from one group of taxpayers to another. Exemptions to the property tax have been mandated legislatively in one form or another by numerous states and apply in general to all taxpayers of a certain class who choose to take advantage of them. The following discussion focuses on practices used by legislatures and local assessors to give preferential treatment to a particular group at the expense of other groups.

Almost all states have mandated a set percentage of market value at which properties are to be assessed for taxation purposes (the Michigan legislature set it at 50%). In most states, this percentage is the same for all classes of property, such as agricultural, industrial, residential, commercial, and so on. But some states, Minnesota for example, have established different percentages of market value at which various classes of property will be assessed (e.g., agricultural at 10%, commercial at 40%). This gives a distinct advantage to farmers at the expense of those who own commercial property.

Even when there exists a set standard at which all assessments are to be made, whether it be 100% or 50%, local assessors take it upon themselves to assess various classes of property at different levels. Thus, the agricultural class may be assessed at 45%, commercial property at 55%, and so on down through the remaining four categories of the Michigan assessment roll. This variation in assessment ratios creates a basic inequity in the assessment roll and has been corrected in Michigan to some extent by the enactment of equalization by class. Equalization by class is the process of adding to or subtracting from the total assessed value as set by the local assessor, so that a particular class of property in a given township bears its proportional share of that class relative to the total assessed value in the county and the state.

Much research has been done concerning the incidence of property taxes on various sectors of the population. The literature on this subject is reviewed in Chapter II.



## CHAPTER II

### REVIEW OF THE LITERATURE

No discussion of property tax would be complete without an inquiry into the incidence of taxes. Just who bears the burden of property taxes? Economists classify a tax as (a) regressive if lower income groups pay a higher proportion of their income on a tax or taxes than do higher income groups, (b) progressive if lower income groups devote a smaller proportion of their income to a tax or taxes than do higher income groups, and (c) neutral if the tax or taxes are proportional to income throughout the entire range of incomes.

The incidence of property tax is a matter of controversy. As late as the mid-1960s, most professional economists maintained that the property tax was regressive in incidence, probably the most regressive of all taxes. This view still persists among the public and is reflected in political speeches, governmental reports, and standard textbooks on urban problems. Recent tax reform proposals have been based on this viewpoint, but it no longer reflects a consensus among economists. Almost every aspect of the incidence theory is now a subject of debate, as the following examples illustrate.

According to Gaffney (1972), the property tax is progressive. He writes:

Negative information on the property tax now circulating makes a long scroll. But high on the list is the refrain that it is regressive. A high-powered, organized, well-oiled campaign has been mounted to persuade us that we can help the poor by shifting taxes of property on to the federal payroll tax.

To make the property tax look as though it socks the poor when most property is so closely held calls for some fancy sophisms. The main argument has to be that the tax is shifted. Indeed, some go so far that they seem to say that big owners shift it and only widows and orphans get stuck with it. (p. 142)

Groves (1967) asserts that the property tax is roughly neutral in incidence. He suggests:

A standing complaint against the property tax on housing is that it is highly regressive in distribution, but recent evidence and analysis have cast doubts on this conventional wisdom. The earlier evidence was based on the relation of owner-occupied housing costs to annual cash income. The newer evidence includes rental property in the measure, broadens the definition of income to include the imputed annual value of owner-occupied homes and broadens the time span of income beyond annual receipts. The new evidence poses the possibility that for income classes of a lifetime income, differences in burden over most of the income scale may pretty well average out. Of course, this is the very long run in which we are all dead. (p. 20)

Shannon (1973), however, was not impressed with attacks on the conventional wisdom. He states:

State legislators are not buying the new economic doctrine that claims that the property tax is truly a progressive tax. . . . Our evidence supports the state legislators' intuitive judgments. As a tax on housing, the residential property tax can and does impose truly extraordinary burdens on low income families, both elderly and non-elderly. (p. 185)

Aaron (1973) disagreed with Shannon's evidence. He comments:

The theory of tax incidence embodied in the numerous studies now influencing public policy, most notably, the recent computations of the Advisory Commission on Intergovernmental Relations, can be described, perhaps unfairly, as an atavistic attachment to naive and obsolete theory in defiance of

published theoretical advances that demolish the previous orthodoxy. (p. 60)

With arguments against property taxes running the gamut from regressive to progressive, it is perhaps easiest to agree with Netzer (1970), who wrote:

There is by no means universal agreement on the theory of tax incidence. Indeed, years of theoretical dispute and empirical testing have left us with tenaciously held but diametrically opposed hypotheses regarding the shifting of every important form of taxation. (p. 462)

In this study, no attempt was made to choose among these competing views. Some of the assumptions that underlie the rival interpretations are discussed in the following sections.

#### Assumption About Incidence: The Conventional Wisdom

According to conventional wisdom, the proportion of property tax that falls on reproducible capital is borne largely by consumers of goods and services produced by that capital. Its incidence is regressive because the poor consume a greater proportion of their income than do the rich. The tax on land cannot be shifted forward to the user since, for all practical purposes, the supply of land is fixed. Because the ownership of land is highly concentrated among the wealthy, this portion of the property tax is progressive. The tax on land is probably less than 20%, so it only minimally counters the generally regressive direction of the tax. In most estimates of incidence, the tax on land can be safely ignored.

### Assumptions About Incidence: New View

Almost every assumption constituting the conventional economic wisdom regarding the incidence of property tax came under attack in the late 1960s and early 1970s. In fact, a new conventional wisdom is emerging, which holds that the property tax, if neutrally administered, would be neutral or slightly progressive in incidence.

Revisionists have argued that a much higher proportion of the property tax than was traditionally assumed is absorbed by the owners of capital and not passed forward to consumers as higher prices for goods and services. Furthermore, even if the tax were shifted forward, current money income does not properly measure incidence of the residential property tax. If a more appropriate measure--ability to pay--were used, the residential property tax would be only mildly regressive, even under an assumption that most of the tax is shifted forward to tenants. Whatever regressivity remains, such critics maintain, is more a function of regressive property tax administration than an inherent defect.

The overall position of those who oppose the property tax was perhaps best summarized by Netzer (1973):

It is possible to grant virtually all the points of revisionist critics and still maintain that the residential component of the property tax in practice in most metropolitan areas is distinctively regressive, if one recognizes the pattern of tax rate differentials in metropolitan areas, the associated geographic distribution of owners and renters at various income levels, the way in which assessments are actually made, the incomplete relevance of permanent income as a measure of incidence for current tax policy purposes and the existence of income tax deductibility. (p. 531)

One point on which almost all economists agree is that better administration would make the property tax less regressive (or more progressive). Both revisionists and their critics argue that assessment bias against low-value properties, especially those in the poorest urban neighborhoods, has important effects on incidence.

Some tax differentials arise because assessors intentionally apply different standards to different properties. As Aaron (1975) noted:

Intentional inequalities arise when the administrators purposely reduce assessments for certain taxpayers. They do so out of a variety of motives. They may wish to induce certain firms to locate or remain within the jurisdiction because the firms will pay more taxes than the value of public services they will consume or because they will provide jobs and thereby increase local income and property values. The authorities may wish to induce middle and upper class residents to remain within the jurisdiction or to discourage poor or black families from entering. (p. 59)

Unintentional inequalities arise because determining the market value of real property is not an exact science, because administering the property tax is costly, and because many local government officials do not use available resources efficiently to estimate true market value. As Paglin and Fogarty (1972) demonstrated, the degree of unintended inequality depends on variations in growth rates of property values, the period between reassessments, and the accuracy of each assessment.

Poor administration is not the only cause of regressivity in property taxes; there are other reasons, as well. In a study of distributive effects created by the appeal process in Kalamazoo,

Michigan, Ross (1971) found that the process increased regressivity in property tax assessments. This was not because assessment review decisions were biased in favor of high-value properties. On the contrary, Ross found that owners of low-value properties actually fared better when they applied for tax reductions than did owners of more expensive properties. But the process was so dominated by wealthier individuals, by those with a significant stake in the outcome, that on the whole it increased assessment inequities.

Most of the research on assessment inequities and tax incidence has been directed primarily toward determination of vertical inequities in the property tax system. Very little research has been conducted to evaluate the horizontal inequities within a single class of property. One such study, done in Wisconsin by David and Skurski (1966), sought to determine whether there was a bias in the assessment of properties owned by residents and nonresidents. The study was conducted on riparian properties around the city of Madison. David and Skurski concluded that there was no bias in assessment against nonresident owners. On the contrary, nonresident owners were assessed at a lower rate than resident owners. An extensive review of the study is found in Chapter III.

## CHAPTER III

### METHODOLOGY

#### The Wisconsin Study

The Wisconsin study, conducted by David and Skurski (1966), attempted to analyze patterns of deviation in property tax assessments from the legally established norm of "full market value." Specifically, a hypothesis that locally owned property was underassessed relative to absentee owners' property was tested by measuring and comparing assessments in successive years. The initial assessment was performed by local assessors, and the second and comparative assessment was conducted by state-approved assessment firms.

Using assessment as an approximation of market value, David and Skurski (1966) compared the value of initial and second assessments by general classifications of residences. A second objective of the study was to describe types of differences and to offer possible explanations for differences that did appear. A third objective of the Wisconsin study was to discover whether the assessed value of property by type of ownership approximated its probable market value.

### Description of Data

The study used data on plot size, residence of owner, and assessment value for 3,341 riparian properties in 13 Wisconsin towns. To establish a benchmark, the assessed value of land and improvements, if any, in the initial year was determined by the local assessor. The second-year assessments on the same properties were performed by state-approved assessment firms. Each property was classified by size. Plots were in three groups: those of less than 2 acres, those of 2 acres or more, and those of unknown size. Plots were then classified by residence of the owner. "Local" referred to owners whose permanent legal residence was within the town. "Adjacent town" owners were those whose normal legal residence was in any adjoining town, whether or not in the same county. "State" owners were permanent residents of the state but not of the town adjoining that in which the property was located. "Out of state" residents had a permanent legal residence outside Wisconsin.

### Statistical Approach

David and Skurski (1966) computed four ratios to test their hypothesis. These ratios measured change in assessed value from an initial assessment determined by the local assessor to an assessment done by a state-approved assessor during the succeeding year. Two ratios tested the relative or percentage change in assessed value,



whereas the remaining two ratios tested absolute changes in assessments. The two ratios of relative or percentage change differed in that the first compared land values and the second compared land and improvements. Similarly, for absolute change there was one ratio for land alone and a second for land plus improvements. Each ratio was an average (mean) of the ratios for individual plots in that size and residence classification.

If the hypothesis that the absentee owners were discriminated against was true, they should have been relatively overassessed in the first year and thus should have shown a smaller increase from local to state assessment. Using the state assessment as a measure of market value, all of the ratios of market value to assessed value would have been larger for local than nonlocal owners if discrimination existed. Each of the four measures selected was computed for each combination of residence and size, and the mean ratio of each absentee class was individually compared to the local mean ratio. A one-tailed  $t$  test was used in each comparison to test the hypothesis.

### Results

David and Skurski (1966) concluded that the evidence strongly supported rejection of the hypothesis and concluded that absentee owners were not discriminated against in any consistent pattern. The results indicated that when statistically significant differences actually existed between assessments of locally and

nonlocally owned property, they were usually not in the expected direction. Rather than being overassessed, absentee-owned property was underassessed relative to locally owned property in a statistically significant number of cases. The authors explained the results they obtained by saying that:

1. Property of higher market value was assessed at a lower rate than less valuable property, and nonresident owners tended to own properties of higher value.

2. Local assessors underassessed properties belonging to non-resident owners because they believed that such nonresident owners were not fully using services provided by the local community supported by property taxes.

3. Towns that depend on tourist business may compete to attract nonresident property owners by assessing their property at a lower rate.

#### Critique of the Wisconsin Study

In the Wisconsin study, David and Skurski (1966) employed only the  $t$  test to test their hypothesis. Gloudemans (1977) has stated that assumptions made by researchers in the field of assessment regarding normal distribution of assessment rolls may be erroneous and that nonparametric tests, which are distribution free, should be employed to test hypotheses. In view of this assertion, it would have been advisable for David and Skurski to employ other tests before rejecting the hypothesis.

A second methodological weakness of the Wisconsin study is that all of the data were lumped into one set. This procedure may have masked variations in assessment practices employed by different jurisdictions. Only riparian properties were included in this study; including other types or classes of properties might have given a different picture.

David and Skurski (1966) assumed that the value placed on property by the state-approved assessors was market value. This assumption may have been erroneous because the assessments were made by different assessors, and the standards could have varied among them. To test the validity of that assumption, a sales-ratio study, in which selling prices were compared to assessments, should have been carried out.

Another criticism of the study is that all of the data were gathered from the Madison metropolitan area and may not have been representative of assessment practices throughout the state. A more acceptable procedure would have been to include data from diverse locations in Wisconsin.

#### Research Methodology

The present study was undertaken to determine whether the Wisconsin study (David & Skurski, 1966) could be replicated or improved upon in Michigan. To overcome some of the weaknesses of the Wisconsin study, this researcher decided to include property in a number of Michigan counties in the investigation.

Assessment of real property in Michigan takes place in 1,517 townships and cities. Local assessors, either appointed or elected, are certified by the State Assessors Board. Local assessment is equalized at both the county and state levels. Equalization in Michigan is utilized to correct inequities between taxing units which may have resulted from consistent underassessment or overassessment. County equalization corrects inequities between local units, and state equalization corrects inequities between counties. It should be emphasized, however, that equalization does not correct any inequity present in an individual assessment.

Three criteria were used to select local government units for study:

1. Presence of an adequate number of nonresident property owners in the local unit.
2. Proximity of the local unit to one of the Great Lakes or presence of an inland lake.
3. Preponderance of residential properties in the local unit.

Urbanized local units were eliminated from consideration to reduce the influence of other property classes on results of the study.

Using the criteria enumerated above, three counties were selected for study: Allegan, Barry, and Grand Traverse. Nine townships within these counties were chosen, based on the selection criteria. (See Map 1.)



Allegan County has a population of 86,700 and borders the east coast of Lake Michigan. Over time, it has experienced an influx of people from Chicago, who own waterfront properties and are considered nonresident owners. Ganges and Casco Townships were selected within Allegan County because a majority of these nonresidents own property there. (See Map 2.)

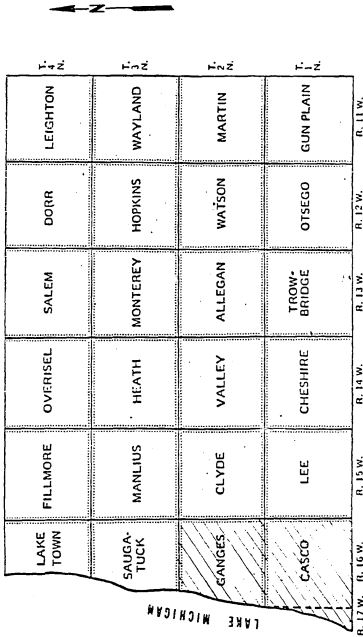
Barry County, with a population of 48,100, has one of the larger inland lakes (Gun Lake) in Michigan, and a substantial number of lakefront residences are owned by people from surrounding counties and Indiana. Orangeville and Yankee Springs Townships, which abut Gun Lake, were also included in this study. (See Map 3.)

Grand Traverse County, with a population of 58,900, is situated in the northwestern part of the lower peninsula, on Lake Michigan. It boasts a large number of nonresidents from around the country. The county has extensive water frontage on Grand Traverse Bay. Acme, East Bay, Green Lake, Long Lake, and Peninsula Townships were selected for inclusion in this study. (See Map 4.)

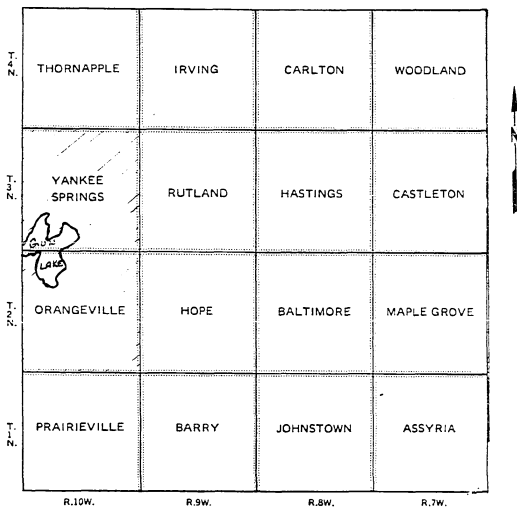
#### Data Collection

Data for the study were collected from the equalization departments of Allegan, Barry, and Grand Traverse Counties. Information required for the analysis included sales price, assessed value, residence of the seller, and water frontage of the property.

In Michigan, properties sold are conveyed to the buyer through warranty deeds, land contracts, memoranda of land contracts, and

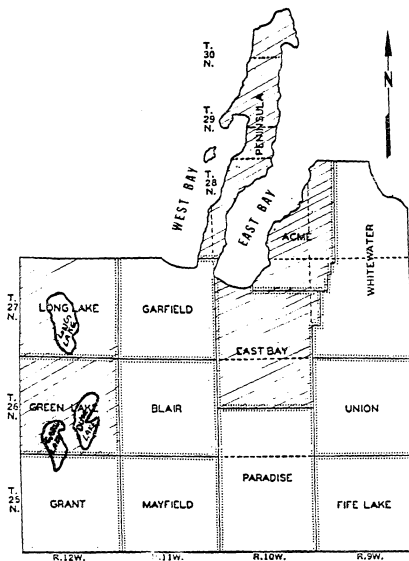


Map 2: Allegan County.



Map 3: Barry County.





Map 4: Grand Traverse County.

quit claim deeds, which are registered with the register of deeds. These instruments of conveyance include the names of both seller and buyer, amount of consideration (selling price), address of the property, and date of sale. Instruments of conveyance are available for public inspection and were used to gather the data needed for this study. The study included 1,670 property sales made during 1985 and 1986.

Local assessors compile the assessment roll in their units by December 31 of each year. The assessment roll includes name and legal residence of the owner, address of the property, and assessed value of the property. Properties included in this study were matched with corresponding assessments on the assessment roll for the year of sale. If the legal residence of the owner differed from the property address, the owner was classified as nonresident. If the owner address and property address were identical, the owner was classified as a resident.

Assessments made by assessors are equalized by the County Board of Commissioners and by the State Tax Commission. All assessments used in this study were equalized valuations. This enabled the researcher to compare townships in the sample.

Information regarding water frontage of properties included in this study was obtained from land maps, which show graphically all properties in a township. Land maps from all nine townships were used to differentiate between properties with water frontage and those without.

### Formulation of the Hypotheses

As indicated above, a major goal of this study is to replicate findings from the Wisconsin study (David & Skurski, 1966); thus, the first hypothesis was formulated.

Hypothesis 1: A statistically significant difference exists in the ratio of assessed value to sale price between properties owned by residents and those owned by nonresidents.

The second hypothesis resulted from the fact that there is a substantial number of waterfront properties in the nine townships where the study was conducted. The researcher decided to test whether a bias existed between waterfront and nonwaterfront properties.

Hypothesis 2: A statistically significant difference exists in the ratio of assessed value to sale price between waterfront properties and nonwaterfront properties.

In their studies, Black (1971) and Hendon (1968) found that a bias existed in the assessment ratios between properties of higher value and those of lower value. It is often assumed that higher-valued properties are generally owned by people with higher incomes and that lower-valued properties are owned by those with lower incomes. The writer was interested in testing whether bias existed in assessment ratios between properties owned by higher- and lower-income individuals. Thus, the third hypothesis was formulated.

Hypothesis 3: A statistically significant difference exists in the ratio of assessed value to sale price between higher-value properties and lower-value properties.

If the study confirms these hypotheses, it can be concluded that there exists in Michigan bias in assessment practices, at least for the class of property and locations included in this study.

#### Statistical Procedures

Researchers on this topic have used the assessment to sales (A/S) ratio, which is defined as:

A/S Ratio: Assessed Value/Sale Price

where: A (assessed value) = a dollar amount assigned to taxable property, both real and personal, by the assessor for the purpose of taxation and is frequently a statutorily determined percentage of market value

S (sale price) = the price at which a property actually sold.

Analyzing the assessment to sales ratio allows one to determine whether inequities exist in the assessment practices of local units. This study continued the tradition of using an A/S ratio analysis to determine bias.

To overcome some of the criticisms made against the Wisconsin study, the researcher employed two separate statistical tests of significance to test the hypotheses.

### T Test

The  $t$  test employs a normal distribution, which expresses the ratio between standard normal and chi-square distributions and has no reference to the parameters of a population. It may therefore be used when population parameters are unknown. The test is most frequently used (a) to compare the means of two small samples and (b) to compare the mean of a small sample with that of a population whose variance is not known.

When employing the  $t$  test, the data are divided into two groups, depending on the hypothesis to be tested. The mean of each group is computed. A null hypothesis, which states that the means of the two groups are equal, is formulated. The  $t$  statistic is computed using the following formula:

$$t = \frac{\bar{X}_1 - \bar{X}_2}{\sqrt{\frac{s_1^2}{N_1} + \frac{s_2^2}{N_2}}}$$

where:  $\bar{X}_1$  = mean of Group 1

$N_1$  = number in Group 1

$\bar{X}_2$  = mean of Group 2

$N_2$  = number in Group 2

$s_1$  = standard error of Group 1

$s_2$  = standard error of Group 2

From a computed  $\underline{t}$  statistic, the probability that both groups were drawn from the same population can be determined. One drawback of the  $\underline{t}$  test is that it assumes the population is normally distributed. As Gloudemans (1977) has pointed out, this may not be true in most assessment jurisdictions.

The results of the  $\underline{t}$  test were cross-checked with results obtained with the Mann-Whitney test. The Mann-Whitney test is a nonparametric test; that is, test results are independent of the underlying distribution.

#### The Mann-Whitney Test

Mann-Whitney is a test of significance applicable to two independent samples where measurement is on the ordinal level. The test statistic  $\underline{U}$  assesses the probability of a particular pattern of results in relation to the total number of possible patterns. The test assumes that the two samples are independent and that sampling is random.

To use the Mann-Whitney test, the data were divided into two groups, and the assessment to sales ratio was computed for each property in the two groups. The ratios were rank ordered in both groups, and the test statistic  $\underline{U}$  was computed using the formula:

$$\underline{U} = N_1 N_2 + \frac{N_2(N_2 + 1)}{2} - R_2 \quad \text{or}$$

$$\underline{U}' = N_1 N_2 + \frac{N_1(N_1 + 1)}{2} - R_1$$

where:  $N_1$  = number of cases in Group 1

$N_2$  = number of cases in Group 2

$R_1$  = sum of ranks in Group 1

$R_2$  = sum of ranks in Group 2

If  $U$  is either unusually small or unusually large, an assumption that the two samples were drawn from the same population can be rejected. (For an illustration, see Appendix A.)

The data were processed on an IBM PC using the Statistical Package for the Social Sciences (SPSS). The results of the study are discussed in Chapter IV.

## CHAPTER IV

### RESULTS

The results of the study are presented in Tables 1 through 5. Table 1 provides an overall depiction of the results. This table indicates the overall percentage of townships in each county for which the research hypothesis was accepted or, in other words, the null hypothesis was rejected at the .10 level.

Table 1  
Percentage of Townships in the Three Counties for Which the  
Hypothesis Was Significant at the .10 Level

| Hypothesis  | Allegan | Barry | Grand Traverse |
|---|---------|-------|----------------|
| Significant difference in ratio of assessed value to sale price between resident-owned and nonresident-owned properties | 50%     | 0     | 80%            |
| Significant difference in ratio of assessed value to sale price between waterfront and nonwaterfront properties         | 100%    | 0     | 80%            |
| Significant difference in ratio of assessed value to sale price between higher-value and lower-value properties         | 100%    | 100%  | 100%           |



Table 2 shows the probabilities associated with each of the hypotheses. The probabilities listed in the table are the lower of the two probabilities established by the  $t$  test and the Mann-Whitney test. The results of the two tests were comparable.

Tables 3, 4, and 5 provide results of the statistical data analyses for Hypotheses 1, 2, and 3, respectively. (For interpretation of the tables, see Appendix A.)

#### Hypothesis 1

The null hypothesis, that no statistically significant difference exists in the ratio of assessed value to sale price between properties owned by residents and those owned by nonresidents, was rejected at the .10 level for five of the nine townships, two of the three counties, and the combined sample of all nine townships. This is shown in Table 3.

A statistically significant difference was found in the ratio of assessed value to sale price between properties owned by residents and those owned by nonresidents in a majority of local units in the sample. Properties owned by nonresidents were assessed at a significantly higher A/S ratio than properties owned by residents.

#### Hypothesis 2

The null hypothesis, that no statistically significant difference exists in the ratio of assessed value to sale price

Table 2  
Probabilities Associated With Each Hypothesis for Each Unit in the Study

| County         | Township       | Hypothesis 1<br>Probability | Hypothesis 2<br>Probability | Hypothesis 3<br>Probability |
|----------------|----------------|-----------------------------|-----------------------------|-----------------------------|
| Allegan        | Casco          | .039*                       | .000* <sup>a</sup>          | .009*                       |
|                | Ganges         | .491                        | .092*                       | .010*                       |
|                | County         | .021*                       | .264                        | .011*                       |
| Barry          | Orangeville    | .492                        | .495                        | .008*                       |
|                | Yankee Springs | .115                        | .135                        | .001*                       |
|                | County         | .088*                       | .095*                       | .000*                       |
| Grand Traverse | Acme           | .594 <sup>b</sup>           | .075*                       | .006*                       |
|                | East Bay       | .002*                       | .038*                       | .001*                       |
|                | Green Lake     | .083*                       | .194                        | .063*                       |
|                | Long Lake      | .088* <sup>b</sup>          | .001*                       | .052*                       |
|                | Peninsula      | .065*                       | .010*                       | .038*                       |
|                | County         | .026*                       | .000*                       | .000*                       |
| State          |                | .072*                       | .000*                       | .000*                       |

\*Significant at the .10 level.

<sup>a</sup>A/S ratio for waterfront properties was higher than for nonwaterfront properties.

<sup>b</sup>A/S ratio for properties owned by residents was higher than for those owned by nonresidents.

Table 3  
Results of Statistical Analysis of Data for the Units in the Study: Hypothesis 1

| County                                      | Township       | Resident<br>Owned                         | Nonresident<br>Owned                     | t Test               | Mann-Whitney<br>Test     |
|---|----------------|---|--|----------------------|--------------------------|
| Allegan                                     | Casco          | N =26<br>$\bar{X}$ =42.9204<br>SE=1.743   | N =58<br>$\bar{X}$ =49.0477<br>SE=1.479  | $t$ =-2.68<br>p=.009 | $U$ =530.0<br>p=.0302    |
|   | Ganges         | N =36<br>$\bar{X}$ =45.3649<br>SE=1.497   | N =33<br>$\bar{X}$ =47.0879<br>SE=1.985  | $t$ =-0.69<br>p=.491 | $U$ =538.5<br>p=.505     |
|   | County         | N =62<br>$\bar{X}$ =44.3398<br>SE=1.137   | N =91<br>$\bar{X}$ =48.3370<br>SE=1.184  | $t$ =-2.33<br>p=.021 | $U$ =2283.5<br>p=.0456   |
| Berry                                       | Grangeville    | N =16<br>$\bar{X}$ =42.1582<br>SE=3.002   | N =22<br>$\bar{X}$ =44.3897<br>SE=2.215  | $t$ =-0.33<br>p=.744 | $U$ =152.0<br>p=.4918    |
|   | Yankee Springs | N =47<br>$\bar{X}$ =38.2827<br>SE=1.889   | N =55<br>$\bar{X}$ =41.6205<br>SE=1.392  | $t$ =-1.45<br>p=.151 | $U$ =1057.5<br>p=.1146   |
|   | County         | N =63<br>$\bar{X}$ =39.5208<br>SE=1.613   | N =77<br>$\bar{X}$ =42.4117<br>SE=1.18   | $t$ =-1.48<br>p=.142 | $U$ =2018.5<br>p=.0882   |
| Grand Traverse                              | Acme           | N =163<br>$\bar{X}$ =48.6466<br>SE=0.816  | N =63<br>$\bar{X}$ =47.8123<br>SE=1.324  | $t$ =0.54<br>p=.594  | $U$ =5035.0<br>p=.6214   |
|   | East Bay       | N =307<br>$\bar{X}$ =48.7953<br>SE=0.411  | N =114<br>$\bar{X}$ =51.8081<br>SE=1.126 | $t$ =-2.51<br>p=.013 | $U$ =14074.5<br>p=.002   |
|   | Green Lake     | N =107<br>$\bar{X}$ =48.4093<br>SE=1.092  | N =84<br>$\bar{X}$ =51.3356<br>SE=1.272  | $t$ =-1.75<br>p=.083 | $U$ =3997.0<br>p=.190    |
|   | Long Lake      | N =191<br>$\bar{X}$ =49.4916<br>SE=1.310  | N =79<br>$\bar{X}$ =46.507<br>SE=1.152   | $t$ =1.71<br>p=.088  | $U$ =7035.5<br>p=.2133   |
|   | Peninsula      | N =166<br>$\bar{X}$ =48.2464<br>SE=0.691  | N =103<br>$\bar{X}$ =49.6061<br>SE=0.867 | $t$ =-1.23<br>p=.221 | $U$ =7481.0<br>p=.0851   |
|   | County         | N =934<br>$\bar{X}$ =48.3457<br>SE=0.337  | N =443<br>$\bar{X}$ =49.6929<br>SE=0.517 | $t$ =-2.23<br>p=.026 | $U$ =191746.5<br>p=.0281 |
| Composite<br>(Sum of the<br>Nine Townships) |                | N =1059<br>$\bar{X}$ =47.5862<br>SE=0.326 | N =611<br>$\bar{X}$ =49.5734<br>SE=0.450 | $t$ =-1.80<br>p=.072 | $U$ =310676.0<br>p=.1759 |

between waterfront properties and nonwaterfront properties, was rejected at the .10 level for six of the nine townships and for two of the three counties. The null hypothesis was rejected at the .01 level for the combined sample of all nine townships. This is illustrated in Table 4.

A statistically significant difference was found in the ratio of assessed value to sale price between waterfront and nonwaterfront properties in a majority of local units in the sample. Nonwaterfront properties were assessed at a significantly higher A/S ratio than waterfront properties.

#### Hypothesis 3

The null hypothesis, that no statistically significant difference exists in the ratio of assessed value to sale price between properties of lower value and those of higher value, was rejected at the .10 level in three of the nine townships. The null hypothesis was rejected at the .01 level in six of the nine townships, in all of the counties, and for the combined sample of all nine townships. This is illustrated in Table 5.

A statistically significant difference was found in the ratio of assessed value to sale price between properties of higher value and those of lower value in all local units in the sample. Properties of lower value had a significantly higher A/S ratio than did properties of higher value.

Table 4  
Results of Statistical Analysis of Data for the Units in the Study: Hypothesis 2

| County                                      | Township       | Waterfront Property                              | Nonwaterfront Property                            | $z$ Test                  | Mann-Whitney Test             |
|---|----------------|--|---|---------------------------|-------------------------------|
| Allegan                                     | Casco          | $N = 2$<br>$\bar{X} = 58.0107$<br>$SE = 0.723$   | $N = 82$<br>$\bar{X} = 46.8863$<br>$SE = 1.205$   | $z = -7.92$<br>$p = .000$ | $U = 32.0$<br>$p = .1423$     |
|   | Canges         | $N = 14$<br>$\bar{X} = 41.907$<br>$SE = 2.73$    | $N = 55$<br>$\bar{X} = 47.2789$<br>$SE = 1.343$   | $z = 1.77$<br>$p = .093$  | $U = 272.0$<br>$p = .0918$    |
|   | County         | $N = 16$<br>$\bar{X} = 43.92$<br>$SE = 2.747$    | $N = 137$<br>$\bar{X} = 47.0439$<br>$SE = 0.897$  | $z = 1.12$<br>$p = .264$  | $U = 920.0$<br>$p = .2940$    |
| Berry                                       | Orangeville    | $N = 22$<br>$\bar{X} = 43.2582$<br>$SE = 2.476$  | $N = 16$<br>$\bar{X} = 44.7139$<br>$SE = 2.575$   | $z = 0.41$<br>$p = .686$  | $U = 153.0$<br>$p = .4965$    |
|   | Yankee Springs | $N = 64$<br>$\bar{X} = 38.7481$<br>$SE = 1.346$  | $N = 38$<br>$\bar{X} = 42.3299$<br>$SE = 2.091$   | $z = 1.51$<br>$p = .135$  | $U = 1015.5$<br>$p = .1652$   |
|   | County         | $N = 86$<br>$\bar{X} = 39.9018$<br>$SE = 1.197$  | $N = 54$<br>$\bar{X} = 43.0362$<br>$SE = 1.651$   | $z = 1.57$<br>$p = .119$  | $U = 1931.5$<br>$p = .0946$   |
| Grand Traverse                              | Acme           | $N = 11$<br>$\bar{X} = 43.0397$<br>$SE = 3.963$  | $N = 215$<br>$\bar{X} = 48.6890$<br>$SE = 0.697$  | $z = 1.76$<br>$p = .080$  | $U = 805.5$<br>$p = .0747$    |
|   | East Bay       | $N = 90$<br>$\bar{X} = 48.7198$<br>$SE = 1.157$  | $N = 331$<br>$\bar{X} = 49.8535$<br>$SE = 0.450$  | $z = 0.91$<br>$p = .363$  | $U = 12774.0$<br>$p = .0382$  |
|   | Green Lake     | $N = 68$<br>$\bar{X} = 48.5223$<br>$SE = 1.342$  | $N = 123$<br>$\bar{X} = 50.3453$<br>$SE = 1.06$   | $z = 1.07$<br>$p = .288$  | $U = 3706.5$<br>$p = .1937$   |
|   | Long Lake      | $N = 59$<br>$\bar{X} = 44.4892$<br>$SE = 1.046$  | $N = 211$<br>$\bar{X} = 49.7651$<br>$SE = 1.221$  | $z = 3.28$<br>$p = .001$  | $U = 4864.0$<br>$p = .0047$   |
|   | Peninsula      | $N = 60$<br>$\bar{X} = 46.4211$<br>$SE = 0.997$  | $N = 209$<br>$\bar{X} = 49.4405$<br>$SE = 0.628$  | $z = 2.56$<br>$p = .012$  | $U = 4905.5$<br>$p = .0102$   |
|   | County         | $N = 288$<br>$\bar{X} = 47.1106$<br>$SE = 0.591$ | $N = 1089$<br>$\bar{X} = 49.2204$<br>$SE = 0.321$ | $z = 3.04$<br>$p = .002$  | $U = 130435.5$<br>$p = .000$  |
| Composite<br>(Sum of the<br>Nine Townships) |                | $N = 390$<br>$\bar{X} = 45.3901$<br>$SE = 0.543$ | $N = 1280$<br>$\bar{X} = 48.7266$<br>$SE = 0.300$ | $z = 5.38$<br>$p = .000$  | $U = 195245.5$<br>$p = .0000$ |

Table 5  
Results of Statistical Analysis of Data for the Units in the Study: Hypothesis 3

| County                                      | Township       | Low Income<br>Low Value                          | High Income<br>High Value                        | $\bar{X}$ Test                  | Mann-Whitney<br>Test          |
|---|----------------|--|--|---------------------------------|-------------------------------|
| Allegheny                                   | Casco          | $N = 42$<br>$\bar{X} = 50.2185$<br>$SE = 1.793$  | $N = 42$<br>$\bar{X} = 44.0837$<br>$SE = 1.437$  | $\bar{X} = -2.67$<br>$p = .009$ | $U = 597.5$<br>$p = .0109$    |
|   | Ganges         | $N = 34$<br>$\bar{X} = 48.2317$<br>$SE = 1.870$  | $N = 35$<br>$\bar{X} = 44.2045$<br>$SE = 1.543$  | $\bar{X} = -1.66$<br>$p = .102$ | $U = 462.5$<br>$p = .1118$    |
|   | County         | $N = 76$<br>$\bar{X} = 48.8969$<br>$SE = 1.337$  | $N = 77$<br>$\bar{X} = 44.5658$<br>$SE = 1.017$  | $\bar{X} = -2.58$<br>$p = .011$ | $U = 2255.0$<br>$p = .0143$   |
|   | Orangeville    | $N = 19$<br>$\bar{X} = 47.5233$<br>$SE = 2.164$  | $N = 19$<br>$\bar{X} = 40.2190$<br>$SE = 2.613$  | $\bar{X} = -2.15$<br>$p = .038$ | $U = 90.0$<br>$p = .0082$     |
|   | Yankee Springs | $N = 51$<br>$\bar{X} = 43.6964$<br>$SE = 1.933$  | $N = 51$<br>$\bar{X} = 36.4685$<br>$SE = 1.066$  | $\bar{X} = -3.27$<br>$p = .001$ | $U = 826.5$<br>$p = .0015$    |
|   | County         | $N = 70$<br>$\bar{X} = 44.618$<br>$SE = 1.543$   | $N = 70$<br>$\bar{X} = 37.6037$<br>$SE = 1.055$  | $\bar{X} = -3.75$<br>$p = .000$ | $U = 1511.5$<br>$p = .0001$   |
| Grand Traverse                              | Acme           | $N = 113$<br>$\bar{X} = 50.3055$<br>$SE = 1.140$ | $N = 113$<br>$\bar{X} = 46.5226$<br>$SE = 0.753$ | $\bar{X} = -2.77$<br>$p = .006$ | $U = 5271.5$<br>$p = .0235$   |
|   | East Bay       | $N = 211$<br>$\bar{X} = 50.9873$<br>$SE = 0.744$ | $N = 210$<br>$\bar{X} = 48.2283$<br>$SE = 0.416$ | $\bar{X} = -3.24$<br>$p = .001$ | $U = 19267.0$<br>$p = .0207$  |
|   | Green Lake     | $N = 96$<br>$\bar{X} = 51.2341$<br>$SE = 1.500$  | $N = 95$<br>$\bar{X} = 48.1423$<br>$SE = 0.687$  | $\bar{X} = -1.87$<br>$p = .063$ | $U = 4119.5$<br>$p = .2476$   |
|   | Long Lake      | $N = 135$<br>$\bar{X} = 50.6459$<br>$SE = 1.872$ | $N = 135$<br>$\bar{X} = 46.7142$<br>$SE = 0.729$ | $\bar{X} = -1.96$<br>$p = .052$ | $U = 8601.0$<br>$p = .1668$   |
|   | Peninsula      | $N = 134$<br>$\bar{X} = 49.8968$<br>$SE = 0.950$ | $N = 135$<br>$\bar{X} = 47.6456$<br>$SE = 0.507$ | $\bar{X} = -2.09$<br>$p = .038$ | $U = 8060.0$<br>$p = .1226$   |
|   | County         | $N = 688$<br>$\bar{X} = 50.0599$<br>$SE = 0.500$ | $N = 689$<br>$\bar{X} = 47.5003$<br>$SE = 0.256$ | $\bar{X} = -4.56$<br>$p = .000$ | $U = 211253.5$<br>$p = .0005$ |
| Composite<br>(Sum of the<br>Nine Townships) |                | $N = 835$<br>$\bar{X} = 49.3132$<br>$SE = 0.454$ | $N = 835$<br>$\bar{X} = 46.5816$<br>$SE = 0.264$ | $\bar{X} = -5.20$<br>$p = .000$ | $U = 308662.0$<br>$p = .0001$ |

### Summary of Findings by Individual Units

In Ganges Township (Allegan County) the sample consisted of 69 properties. Of this number, 36 (52%) were resident owned and 33 (48%) were nonresident owned; 14 (20%) were waterfront properties and 55 (80%) were nonwaterfront properties; and 34 (49%) were lower-value properties and 35 (50%) were higher-value properties. At the .10 significance level, no statistically significant difference (.491) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.092) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.010) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Casco Township (Allegan County) the sample consisted of 84 properties. Of this number, 26 (31%) were resident owned and 58 (69%) were nonresident owned; 2 (2%) were waterfront properties and 82 (98%) were nonwaterfront properties; and 42 (50%) were lower-value properties and 42 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.009) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.0001) was found to exist in the ratio of assessed value to sale price between waterfront and

nonwaterfront properties; and a statistically significant difference (.009) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Allegan County as a whole, the sample consisted of 153 properties. Of this number, 62 (41%) were resident owned and 91 (59%) were nonresident owned; 16 (10%) were waterfront properties and 137 (90%) were nonwaterfront properties; and 76 (50%) were lower-value properties and 77 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.021) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; no statistically significant difference (.264) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.011) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Orangeville Township (Barry County) the sample consisted of 38 properties. Of this number, 16 (42%) were resident owned and 22 (58%) were nonresident owned; 22 (58%) were waterfront properties and 16 (42%) were nonwaterfront properties; and 19 (50%) were lower-value properties and 19 (50%) were higher-value properties. At the .10 significance level, no statistically significant difference (.492) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist;



no statistically significant difference (.495) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.008) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Yankee Springs Township (Barry County) the sample consisted of 102 properties. Of this number, 47 (46%) were resident owned and 55 (54%) were nonresident owned; 64 (63%) were waterfront properties and 38 (37%) were nonwaterfront properties; and 51 (50%) were lower-value properties and 51 (50%) were higher-value properties. At the .10 significance level, no statistically significant difference (.115) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; no statistically significant difference (.135) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.001) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Barry County as a whole, the sample consisted of 140 properties. Of this number, 63 (45%) were resident owned and 77 (55%) were nonresident owned; 86 (61%) were waterfront properties and 54 (39%) were nonwaterfront properties; and 70 (50%) were lower-value properties and 70 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference

(.088) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.095) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.000) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Acme Township (Grand Traverse County) the sample consisted of 226 properties. Of this number, 163 (72%) were resident owned and 63 (28%) were nonresident owned; 11 (5%) were waterfront properties and 215 (95%) were nonwaterfront properties; and 113 (50%) were lower-value properties and 113 (50%) were higher-value properties. At the .10 significance level, no statistically significant difference (.594) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.075) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.006) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In East Bay Township (Grand Traverse County) the sample consisted of 421 properties. Of this number, 308 (73%) were resident owned and 13 (27%) were nonresident owned; 90 (21%) were waterfront properties and 331 (79%) were nonwaterfront properties;

and 21 (50%) were lower-value properties and 210 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.002) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.038) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.001) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Green Lake Township (Grand Traverse County) the sample consisted of 191 properties. Of this number, 107 (56%) were resident owned and 84 (44%) were nonresident owned; 68 (36%) were waterfront properties and 123 (64%) were nonwaterfront properties; and 96 (50%) were lower-value properties and 95 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.083) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; no statistically significant difference (.194) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.063) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Long Lake Township (Grand Traverse County) the sample consisted of 270 properties. Of this number, 191 (71%) were resident owned and 79 (29%) were nonresident owned; 59 (22%) were waterfront properties and 211 (78%) were nonwaterfront properties; and 135 (50%) were lower-value properties and 135 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.088) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.001) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.052) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Peninsula Township (Grand Traverse County) the sample consisted of 269 properties. Of this number, 166 (62%) were resident owned and 103 (38%) were nonresident owned; 60 (22%) were waterfront properties and 209 (78%) were nonwaterfront properties; and 134 (50%) were lower-value properties and 135 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.085) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.010) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically

significant difference (.038) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

In Grand Traverse County as a whole, the sample consisted of 1,377 properties. Of this number, 935 (68%) were resident owned and 442 (32%) were nonresident owned; 288 (22%) were waterfront properties and 1,089 (78%) were nonwaterfront properties; and 689 (50%) were lower-value properties and 688 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.026) in the ratio of assessed value to sale price between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.0001) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.0001) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

The composite sample of all nine townships consisted of 1,670 properties. Of this number, 1,059 (63%) were resident owned and 611 (37%) were nonresident owned; 390 (23%) were waterfront properties and 1,280 (77%) were nonwaterfront properties; and 835 (50%) were lower-value properties and 835 (50%) were higher-value properties. At the .10 significance level, a statistically significant difference (.072) in the ratio of assessed value to sale price

between resident-owned and nonresident-owned properties was found to exist; a statistically significant difference (.0001) was found to exist in the ratio of assessed value to sale price between waterfront and nonwaterfront properties; and a statistically significant difference (.0001) in the ratio of assessed value to sale price between higher-value and lower-value properties was found to exist.

#### Chapter Summary

Inequities were found in the assessment practices employed in the State of Michigan. Specifically, in a majority of townships comprising the sample, nonresident homeowners were being assessed at a significantly higher level than residents. Further, owners of waterfront properties were being assessed at a significantly lower level than owners of nonwaterfront properties in all nine townships in the study. Finally, in all of the townships, owners of higher-valued properties were assessed at a significantly lower rate than were owners of lower-valued properties.

The importance of these results and possible explanations for inequities are discussed in Chapter V. Policy implications and recommendations for practice and further research are also offered.

## CHAPTER V

### SUMMARY, DISCUSSION OF RESULTS, POLICY IMPLICATIONS, AND RECOMMENDATIONS FOR PRACTICE AND FUTURE RESEARCH

#### Summary

This study was designed to determine whether assessment bias existed against nonresidents and owners of nonwaterfront and low-value properties located in nine townships in Allegan, Barry, and Grand Traverse Counties in Michigan. Assessment to sales ratio of residential properties was used as a benchmark to compare differences in assessment practices. Both the  $t$  test (parametric) and the Mann-Whitney test (nonparametric) were employed to establish statistically the bias and significance levels.

The major findings were as follows:

1. In five of the nine townships studied, nonresident-owned properties had a higher assessment to sales ratio than did resident-owned properties.
2. In five of the nine townships, nonwaterfront properties had a higher assessment to sales ratio than did waterfront properties.
3. In all nine townships, lower-value properties had a larger assessment to sales ratio than higher-value properties.

## Discussion of Results

### Implications of the Results

The research results are noteworthy because a majority of local units in this study failed the uniformity standard established in the state constitution. The consequence of this failure is that the tax burden is shifted from one group of properties to another, which is contrary to the intended result of this constitutional mandate. Based on the results of this study, the legislature and other bodies enforcing constitutional requirements should take action to make local assessors conform to the standard. Policy changes should be initiated before the problem becomes acute and action is forced upon assessors and local units by an outside agency, such as the courts, as has happened in several states.

### Possible Explanations of the Inequities

It is obvious that there exists a bias in the assessment practices of local units when assessing nonresident properties, nonwaterfront properties, and properties of lower value. Following are a number of possible explanations for observed inequities in the assessment practice.

1. Nonresident property owners may not be aware of provisions of the property tax law which allow them to protest assessment valuations to Boards of Review by mail. Further, if taxpayers are not satisfied with the action of a Board of Review, they may appeal



to the Michigan Tax Tribunal (MTT). However, MTT procedures make it difficult for nonresidents to prove inequity in assessments. The tribunal requires that taxpayers establish the market value of their property in comparison to other similar properties and then prove that their assessments are higher than are the assessments on those properties. This is difficult, if not impossible, to prove. Last, even if the taxpayer perseveres, the tribunal has generally ruled that, if the assessment ratio is less than the statutorily mandated percentage (50% in Michigan), no relief is due. By setting the assessment ratio just below the statutory limit, local assessors may be discouraging assessment appeals on properties owned by nonresidents.

2. A second reason for overassessment might be the "zip code factor." Because these homes are not primary residences, local assessors may think that nonresidents can afford to pay higher taxes and thus assess them at a higher ratio than residents.

3. Waterfront properties are generally more expensive but are nonetheless assessed at a lower ratio than nonwaterfront properties. The consensus among assessors may be that buyers are paying far more than the property is really worth and that the sale price does not reflect true market value (Shannon, 1967).

4. Much of the value of a lakefront property is attributed to land value, and because assessments are based on total property value, assessors may tend to underassess land and assess buildings

at market value. This results in overall underassessment and a lower assessment ratio for waterfront than nonwaterfront properties (Gaffney, 1972).

5. The disparity in assessment ratios between high-value and low-value properties may be due in part to assessors' lack of qualifications and knowledge when assessing high-value properties. Assessors may be more comfortable and knowledgeable when assessing less expensive homes, which are ordinarily more numerous in local units.

6. In the past few years, properties of greater value have increased in market value more rapidly than properties of less value. Sales studies, which assessors use to establish valuations, include a preponderance of medium-priced homes and underrepresent properties of greater value. This use of sales studies may result in overassessment of properties in lower price ranges (Haettenschwiller, 1974).

7. Homes of greater value, which in many instances are being overbuilt, are adversely affected by economic obsolescence in a number of regions, and local assessors may recognize this diminution of value. Therefore, they assess these properties at this lower value.

8. Owners of higher-value properties may be more knowledgeable regarding taxes and are more vocal than are owners of lower-value properties. Likewise, residents are electors in the local community, whereas nonresidents are not permitted to vote in local

elections. Assessors, aware of the political ramifications of their decisions, tend to assess properties of local residents and those of greater value at a lower ratio than properties of low value and those owned by nonresidents (Haettenschwiller, 1974).

### Policy Implications

The findings indicate that assessment procedures are inequitable in a majority of the townships sampled. If left uncorrected, the problem may escalate until a major overhaul of the property tax system becomes necessary.

A serious examination of property tax policy must include the important components of that problem, including the tax itself, assessors, county equalization directors, the State Tax Commission, and the legislature. The role of each of these is discussed separately in the following paragraphs.

#### Property Tax

The property tax is highly visible, and many individuals resent the tax. Taxpayers often transfer this resentment to the assessment process believing erroneously that high taxes are the result of assessment practices. The general public does not fully understand that they determine the property tax rate directly by their votes on millage issues and indirectly by actions of local boards with tax authority. There is also great need for educating the public to

accept changes in property tax administration and to correct inequities brought about by improper assessments.

#### The Assessor

Individual assessors have the basic responsibility to establish a value for each property taxed. It is their duty under the Michigan Constitution to assess all property within the local unit at a uniform level; under present property tax laws, this is 50% of market value. The findings of this study suggest that assessors are not adequately performing this constitutional mandate. As postulated in the section on possible explanations, the problem may stem from inadequate education of assessors and underfunding of assessing offices--given the low priority assigned by local units to property tax administration. Except in larger units of government, full-time assessors are rare. In a majority of units clerical help is inadequate. These problems are difficult to overcome, largely because there are a large number of assessment jurisdictions in Michigan. One possible way to improve assessment administration would be to remove it from the local unit and assign it to a larger unit or higher authority.

#### The County Equalization Director

The county equalization director is at the next higher level in the chain of property tax administration; s/he is empowered to oversee the equalization process at the county level. At present,

problems which plague the assessor also afflict county equalization departments. They are frequently underfunded and, consequently, understaffed. Equalization directors, who are in charge of county equalization offices, are controlled by the County Board of Commissioners. Being elected officials, commissioners are usually desirous of minimizing property tax for electors and are averse to any change in the system. They often mistake improvement in assessment administration for increases in tax rates.

Equalization directors have little support to improve or change assessment administration, either at the local or the county level. Because the county equalization director's office is understaffed, directors are unable to do sales studies of their own and frequently compile a sales study of residential properties based on instruments of conveyance recorded with the register of deeds. Other classes of property, such as agricultural or commercial, of which sales are few, tend to be studied by means of an appraisal, in which stratification of properties is possible. Hence, it is suggested that the same procedures be adopted for residential properties and that stratification be based on water frontage and value of houses.

#### The State Tax Commission

The State Tax Commission is charged with the supervision and administration of property tax laws in Michigan. The Commission equalizes all counties annually and has broad powers to seize

assessment rolls if the local unit is not following guidelines established by the Commission. The Commission has been reluctant to use this power of enforcement, largely because it is understaffed and does not have enough field people to examine assessment practices in all 1,517 local units in Michigan. The Commission staff is largely relegated to doing appraisal studies of agricultural and small commercial properties and is resigned to accepting studies presented by the county equalization departments in the residential class.

To correct the inequities revealed in this study, the State Tax Commission must insist on separate sales studies for waterfront properties and stratification of neighborhoods by value of houses. This would not require adopting a new procedure for the residential class because the Commission already accepts stratification of properties in the commercial class.

A second area in which the State Tax Commission can be of tremendous help is in education of assessors. The Commission can establish training workshops to instruct assessors in proper procedures for conducting sales studies and stratifying properties by neighborhoods and water frontage. The Commission can also help local assessors catalogue waterfront properties in their jurisdictions. Field personnel could accomplish this task within the next two years, using existing staff.

The assessor's office, the county equalization department, and the State Tax Commission are all executive agencies and can

accomplish some of the changes proposed by simply adopting improved procedures for administration of the property tax. However, limits on their authority prevent them from overhauling the system, and such may be needed to streamline the property tax system and make it more equitable.

#### The Michigan Legislature

The legislature is the only body that can mandate changes in the property tax system. It can fully fund the State Tax Commission, thereby enabling the Commission to more aggressively pursue errant assessors and bring them in line with uniform assessment practices.

More importantly, the legislature should change the present fractional assessment standard to full-value assessment. This would eliminate the mystery surrounding assessments because full-value assessments are easier for taxpayers to understand, and assessors would find it more difficult to conceal unequal assessments.

This major change in policy would abolish local units as assessment jurisdictions and to move Michigan into county assessing. At present, Michigan is one of only a few states that still rely on local assessing. Each county assessor should be responsible to the State Tax Commission and thus be free from political pressures by the County Board of Commissioners. Politically, county assessing may be hard to achieve. Legislators currently prefer to conduct

property tax assessing at the township level. Many Michigan legislators began their political careers at the local level and do not wish to see control passed to the county and state levels. Also, such groups as the Michigan Townships Association, which are dedicated to maintaining control at the township level, are opposed to county assessing.

As is apparent from the preceding discussion, the problem of inequities in property tax generally stems from manpower shortages and inadequate education of assessors. The following recommendations reflect these concerns.

#### Recommendations

The first three recommendations apply to all local units in Michigan and would substantially improve uniformity in assessments. The remaining recommendations relate directly to the findings of this study.

1. It is recommended that Michigan legislators consolidate assessment units into larger districts, possibly to include entire counties. The National (now International) Association of Assessing Officers (1941), the U.S. Advisory Commission on Intergovernmental Relations (1963), Black (1971), and, more recently, the Governor's Advisory Task Force on Property Tax (1976) recommended district assessing as a means to achieve more efficient and uniform assessing practices. Countywide assessing would provide better financial support for assessing departments, thus enabling them to employ



well-trained, professional assessors. Countywide assessing would also provide for computerization of assessments and, in general, motivate assessors to do a better job.

2. All assessing units should employ full-time assessors. Of the nine local units included in this study, five had part-time assessors who worked from 100 to 1,400 hours per year. Such part-time employment is not conducive to professional assessment practices.

3. As indicated earlier (Chapter I), the Michigan Constitution mandates that assessments equal 50% of market value. The problem with a fractional percentage, such as 50%, is that it provides an opportunity for assessors to manipulate assessments (Shannon, 1965). Any departure from the standard is magnified considerably as the fractional standard moves further away from full market value. Full-value assessment reduces the possibility of manipulation, and, as an added benefit, taxpayers find it easier to make comparisons of assessments in their neighborhoods.

4. During the data-collection phase of this study, it was noted that listings of waterfront properties in local units were virtually nonexistent. An assessor has no way to compare assessment levels between waterfront and nonwaterfront properties. Thus, at a minimum, as the International Association of Assessing Officers recommended in 1980, cataloging of all waterfront properties should be undertaken throughout Michigan.

5. Sales studies submitted by many local units surveyed in this study did not list properties by class. Rather, all sales within the local unit were lumped together, and an average ratio was computed for the sales study. Sales ratios ranged from 20% to 200%; the average was close to 50%. It is suggested that, as recommended by the International Association of Assessing Officers (1980), sales studies be stratified on the basis of type of property, i.e., nonresident versus resident, waterfront versus nonwaterfront. This can be accomplished quite easily if the fourth recommendation is implemented.

6. To overcome the bias against properties of lesser value, it is imperative that assessors have separate sales studies for different neighborhoods. Without such differentiation, properties of lower value will continue to be overassessed relative to high-value properties (International Association of Assessing Officers, 1980).

7. The appeals process should be streamlined so that all taxpayers have equal and uniform access to it. Ross (1971) suggested that Boards of Review hold night and Saturday sessions to enable working-class citizens to appear and appeal their assessments without taking time off from work. Some progressive communities have added night sessions, but Saturday sessions are still not offered.

8. Another roadblock in the appeals process is the Michigan Tax Tribunal. The tribunal takes years to decide on cases and

causes much frustration to both the taxpayer and the assessor. It is recommended that appeals be decided before taxpayers receive the final tax bill in December.

#### Recommendations for Future Research

In view of the preceding recommendations, it becomes apparent that a number of opportunities are available to conduct further research in the field.

As noted in Chapter II, few studies have been conducted on horizontal equity in the property tax system. It is hoped that this study will stimulate similar studies in other states and, possibly, comparisons between states. It would be interesting to conduct a similar study in townships on the east coast of Wisconsin, on Lake Michigan, and to compare the results with those obtained in the present study.

This study included local units that had a substantial number of nonresident property owners. Future researchers could concentrate on areas such as Oakland County, where there are many inland lakes but virtually no nonresident property owners.

It would be interesting and informative if future researchers compared property tax assessment practices in states such as Michigan with states that have county assessing. To this researcher's knowledge, no studies of this nature have been undertaken.

Even though no discernible difference was found in the assessment practices of full-time and part-time assessors, it would be worthwhile to pursue this avenue of inquiry. Such an inquiry would determine if there are differences in the number of appeals before the Board of Review in local units employing full-time assessors and those employing part-time assessors.

Assessment practices in Michigan (fractional-value assessments) should be compared with those in states where full-value assessments are used. The research data obtained and conclusions drawn should be made available to legislators and others in the property tax field to enable them to investigate policy changes needed in the property tax system in Michigan.

One recommendation of this study was to improve the education and training of assessors so they could do a better job of assessing. At present, the State Assessors Board, which certifies assessors in Michigan, sponsors a number of courses to help assessors prepare for the certification examination. These courses are geared toward understanding by assessors of property tax law and appraisal of properties by various methods. There is no emphasis on statistical aspects of the assessing function. It would be interesting to include statistical instruction for a few groups of assessors and then to compare their performance to a control group which would not have gone through the statistical instruction. This would be a good area for research and would be useful in establishing educational requirements for the assessing profession.

Other areas of inquiry that may not be directly related to the present research but which are still within the property tax field are (a) the effect of exemptions on the incidence of property tax, and (b) whether exemptions such as the Plant Rehabilitation and Industrial Development Districts Act (P.A. 198, 1974) have influenced companies in their locational decisions.

APPENDIX A  
METHODOLOGICAL EXPLANATIONS

One important methodological problem which arose during the course of this study was the issue of multicollinearity, or the degree to which independent variables are correlated with one another relative to overall correlation. If two independent variables are not highly intercorrelated, there will be less overlap in explained variance and less ambiguity in the explanation of results, but to the degree that independent variables are highly correlated, the results will become increasingly sensitive to sampling and measurement errors.

The independent variables used were sales price, DummyNR (a dummy variable designating the ownership of a sale property, set at zero for resident ownership and one for nonresident ownership), DummyW (a dummy variable designating the location of property on the water, zero for nonwaterfront properties and one for waterfront properties), and DummyInc (a dummy variable indicating the location of the property relative to the median sales price, zero for properties below the median sales price and one for properties above the median sales price). The dependent variable was the assessed value of the particular sale property.

Because two different hypotheses were being tested, one for bias in assessment against nonwaterfront properties and the second for bias in assessment against lower-value properties, it was suggested that waterfront properties could also be high-value properties. In short, these two independent variables were highly correlated.

A multiple regression procedure (stepwise regression) was carried out to determine the correlation among independent variables. Regression matrices for the counties included in the study are shown below. As is apparent from these matrices, the independent variables employed in the study were not highly correlated relative to sale price and assessed value.

Table 6  
Regression Matrix: Allegan County

|          | Sale  | Assessed | DummyNR<br>(Non-<br>resident) | DummyW<br>(Water-<br>front) | DummyInc<br>(Income) |
|----------|-------|----------|-------------------------------|-----------------------------|----------------------|
| Sale     | 1.000 | .933     | -.249                         | .354                        | .660                 |
| Assessed | .933  | 1.000    | -.197                         | .336                        | .634                 |
| DummyNr  | -.249 | -.197    | 1.000                         | .065                        | -.234                |
| DummyW   | .354  | .336     | .065                          | 1.000                       | .211                 |
| DummyInc | .660  | .634     | -.234                         | .211                        | 1.000                |



Table 7  
Regression Matrix: Barry County

|          | Sale  | Assessed | DummyNR<br>(Non-<br>resident) | DummyW<br>(Water-<br>front) | DummyInc<br>(Income) |
|----------|-------|----------|-------------------------------|-----------------------------|----------------------|
| Sale     | 1.000 | .879     | -.122                         | .185                        | .760                 |
| Assessed | .879  | 1.000    | -.084                         | .148                        | .739                 |
| DummyNr  | -.122 | -.084    | 1.000                         | .198                        | -.043                |
| DummyW   | .185  | .148     | .198                          | 1.000                       | .059                 |
| DummyInc | .760  | .739     | -.043                         | .059                        | 1.000                |

Table 8  
Regression Matrix: Grand Traverse County

|          | Sale  | Assessed | DummyNR<br>(Non-<br>resident) | DummyW<br>(Water-<br>front) | DummyInc<br>(Income) |
|----------|-------|----------|-------------------------------|-----------------------------|----------------------|
| Sale     | 1.000 | .967     | -.103                         | .193                        | .731                 |
| Assessed | .967  | 1.000    | -.091                         | .167                        | .740                 |
| DummyNr  | -.103 | -.091    | 1.000                         | .181                        | -.126                |
| DummyW   | .193  | .167     | .181                          | 1.000                       | .096                 |
| DummyInc | .731  | .740     | -.126                         | .096                        | 1.000                |

Table 9  
Regression Matrix: State

|          | Sale  | Assessed | DummyNR<br>(Non-<br>resident) | DummyW<br>(Water-<br>front) | DummyInc<br>(Income) |
|----------|-------|----------|-------------------------------|-----------------------------|----------------------|
| Sale     | 1.000 | .958     | -.134                         | .194                        | .733                 |
| Assessed | .958  | 1.000    | -.127                         | .151                        | .734                 |
| DummyNr  | -.134 | -.127    | 1.000                         | .183                        | -.150                |
| DummyW   | .194  | .151     | .183                          | 1.000                       | .108                 |
| DummyInc | .733  | .734     | -.150                         | .108                        | 1.000                |

#### Interpreting the Tables

Tables 3, 4, and 5 are identical in their make-up, except for the type of property used to test the hypothesis. Column 1 lists the county, column 2 the township, columns 3 and 4 the type of property, column 5 results of the  $t$  test, and column 6 results of the Mann-Whitney test.

Thus, going across row 1, Table 3, which gives the results of testing Hypothesis 1, we have:

Column 1 Allegan County

Column 2 Casco Township

Column 3  $N_1$  = 26 (number of properties in the sales study  
owned by residents)

$\bar{X}_1 = 42.9204$  (mean of resident-owned properties)

$SE_1 = 1.743$  (standard error of resident-owned properties)

Column 4  $N_2 = 58$  (number of properties in the sales study owned by nonresidents)

$\bar{X}_2 = 49.0477$  (mean of nonresident-owned properties)

$SE_2 = 1.479$  (standard error of nonresident-owned properties)

Column 5  $t = -2.68$  (computed  $t$  statistic)

$p = .009$  (probability of making a Type I error)

Column 6  $U = 530.0$  (computed  $U$  statistic)

$p = .0302$  (probability of making a Type I error)

In the  $t$  test, the probability of making an error by rejecting the null hypothesis ( $\bar{X}_1 = \bar{X}_2$ ) was less than 1%. In other words, one can be confident about 99% of the time that the two samples did not come from the same population.

In the Mann-Whitney test, based on  $U = 530.0$ , the probability of making an error by rejecting the null hypothesis ( $\bar{X}_1 = \bar{X}_2$ ) was less than 3%. In other words, one can be confident about 97% of the time that the two samples did not come from the same population.

#### Illustration of Mann-Whitney Test

Assume, for example, that we are interested in determining at the 90% confidence level whether or not higher-value and lower-value

properties in Orangeville Township, Barry County, are being assessed at the same percentage of market value.

Research Hypothesis ( $H_1$ ): A statistically significant difference exists in the ratio of assessed value to sale price between higher-value properties and lower-value properties.

Null Hypothesis ( $H_0$ ): No statistically significant difference exists in the ratio of assessed value to sale price between higher-value properties and lower-value properties.

To test  $H_0$ , we consider assessment ratios for the two groups of properties that have sold in the township for the last two years. There were 38 sales in all, 19 for higher-value properties and 19 for lower-value properties, with assessment ratios shown in Table 10 in descending order, irrespective of property group.

The Mann-Whitney test is based on the statistic  $U$ , which may be calculated as either

$$U_1 = n_1 n_2 + \frac{n_1(n_1 + 1)}{2} - R_1$$

or alternatively,

$$U_2 = n_1 n_2 + \frac{n_2(n_2 + 1)}{2} - R_2$$

where  $R_1$  is the sum of ranks assigned to assessment ratios whose sample size is  $n_1$ , and  $R_2$  is the sum of ranks assigned to assessment ratios whose sample size is  $n_2$ . While these two formulas yield different values for  $U$ , the net results of the analysis are

Table 10  
Assessment/Sales Ratios of Higher-Value and Lower-Value Properties

| Higher-Value Properties |            | Lower-Value Properties |            |
|-------------------------|------------|------------------------|------------|
| A/S Ratio               | Rank       | A/S Ratio              | Rank       |
| 73.84                   | 1          | 60.38                  | 2          |
| 55.08                   | 7          | 60.00                  | 3          |
| 52.56                   | 9          | 59.57                  | 4          |
| 46.95                   | 14         | 58.33                  | 5          |
| 46.67                   | 15         | 56.82                  | 6          |
| 43.33                   | 18         | 54.27                  | 8          |
| 39.63                   | 23         | 52.31                  | 10         |
| 39.52                   | 24         | 48.90                  | 11         |
| 38.81                   | 26         | 48.70                  | 12         |
| 38.46                   | 27         | 46.08                  | 13         |
| 37.62                   | 28         | 43.81                  | 16         |
| 36.53                   | 30         | 43.68                  | 17         |
| 35.63                   | 31         | 43.02                  | 19         |
| 32.63                   | 32         | 42.67                  | 20         |
| 32.20                   | 33         | 41.57                  | 21         |
| 31.71                   | 34         | 40.33                  | 22         |
| 31.32                   | 35         | 38.89                  | 25         |
| 27.00                   | 36         | 36.62                  | 29         |
| 24.70                   | 38         | 25.00                  | 37         |
|                         | <u>461</u> |                        | <u>280</u> |

identical. It is generally easier to calculate  $\underline{U}_1$  if  $n_1 < n_2$  and  $\underline{U}_2$  if  $n_2 < n_1$ . In the present example, both  $\underline{U}_1$  and  $\underline{U}_2$  are calculated to illustrate that they produce identical conclusions.

Summing the ranks assigned to higher-value properties yields  $R_1 = 461$ , and summing the ranks assigned to lower-value properties yields  $R_2 = 280$ . Substituting these values along with those for  $n_1$  (19) and  $n_2$  (19) into the above formulas for  $\underline{U}_1$  and  $\underline{U}_2$ ,

$$\underline{U}_1 = (19)(19) + (19)(20)/2 - 461 = 90$$

$$\underline{U}_2 = (19)(19) + (19)(20)/2 - 280 = 271$$

As long as either (a) both  $n_1$  and  $n_2$  are greater than 8 or (b)  $n_2$  is greater than 20, where  $n_2$  is the larger of the two samples, the significance of  $\underline{U}$  may be evaluated on the basis of the normal probability ( $z$ ) table. To do so, we must normalize  $\underline{U}$ , that is, express it in terms of standard deviation from its mean. Mean  $\underline{U}$  is given by

$$\underline{U} = n_1 n_2 / 2$$

and the standard deviation of  $\underline{U}$  is

$$\sigma_{\underline{U}} = \sqrt{\left[ \frac{n_1 n_2 (n_1 + n_2 + 1)}{12} \right]}$$

and the significance of  $\underline{U}$  is determined as

$$z = \frac{U - \bar{U}}{\sigma_U} = \frac{U - n_1 n_2 / 2}{\sqrt{n_1 n_2 (n_1 + n_2 + 1) / 12}}$$

Thus, we have

$$z = [90 - (19)(19)/2] / [(19)(19)(39)/12] = -2.64$$

or

$$z = [271 - (19)(19)/2] / [(19)(19)(39)/12] = 2.64$$

We need a value of  $z$  greater than 1.64 or less than -1.64 to reject  $H_0$  in favor of  $H_1$ . Since the calculated  $z$  value is greater than +1.64, we reject  $H_0$  and accept  $H_1$ .

It is concluded that in Orangeville Township there exists a statistically significant difference in the ratio of assessed value to sale price between higher-value properties and lower-value properties.

APPENDIX B

PROPERTY TAX ASSESSMENT AND ABSENTEE OWNERS



## PROPERTY TAX ASSESSMENT AND ABSENTEE OWNERS

By

E. L. David and Roger B. Skurski  
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## 1. Summary

The primary objective of this study was to analyze the pattern of deviation of property tax assessments from the legally established norm of uniform assessments at full market value. Specifically, the hypothesis to be tested was that locally-owned property is under-assessed relative to absentee-owned property. This was done by comparing assessments on property in two successive years. The initial assessment was that of local assessors, the second assessment was conducted by state-approved assessment firms. Using the second assessment as an approximation of market value the study compared the ratio of the initial to second assessment by several classifications of residence and plot sizes. The evidence convincingly points to the rejection of the hypothesis. The absentee owner is not discriminated against in any consistent pattern.

The second objective was to describe the types of differences and possible biases that do appear. The results of the study indicate that when any differences actually existed between the assessing of locally and non-locally owned property, they are usually not in the expected direction. Rather than being

over-assessed, absentee property is under-assessed relative to locally-owned property. The significant differences are both relative and absolute, and they vary with the size of the plot and residence of the owner. Comparing various types of absentee owners the results are much less obvious. It may be that people who live out of the state are less well-off on the assessment of their improvements than the two in-state groups. Although one absentee group seems to be markedly better off than any other if land irrespective of improvements is considered, people who live in-state may be better off than those who live in the adjacent town or out-of-state.

The third objective was to discover whether the assessed value of property by type of ownership was close to its probable market value. For the towns we studied, the assessed value of property in the initial year was substantially below market value. In the second year assessed values were all raised and in most towns the new values were very close to full market value. An average full market value, by town, is determined by the Wisconsin Department of Taxation from a continuing analysis of sales. This suggests that although for any individual plot there may be deviations from market value, for residence classes as a whole the second year's assessment on the average should be close to market value.

These conclusions are based on two assumptions. One is that the estimate of sales values computed by the Department of Taxation are reasonably accurate; the other is that the state-approved

assessors did not know or were not interested in the full time residence of each property owner. Had they been interested in the residence one might assume that they too would have been biased against out-of-town owners. Since we obtained the residence of each property owner by interviewing local assessors, it was obvious that the local assessor did know the residence of each property owner. Of 3428 plots in the 13 towns, we were able to obtain the residence of 98 per cent of the owners.

This assessment study was undertaken in conjunction with a larger study attempting to predict recreation land values on some of the lakes and rivers in Wisconsin. The data on land value which were most easily obtained for the bigger study was assessed rather than market values. The assessment study was one of the several tests made to determine the sources of bias introduced when using assessed values in place of market values. The data were collected only for riparian property.

## II. Background and Description of Data

The study employs data on plot size, residence of owner and assessment value for 3341 riparian properties in 13 towns in Wisconsin.<sup>1</sup> The assessed value of the land and the assessed value

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<sup>1</sup>In Wisconsin, a town is a political unit corresponding to the original geographic survey unit of the U.S. Geological Survey, less incorporated area. In our study there are 24 geographic units in the 13 political units. Each of the 13 political units has its own elected town assessor.

of the improvements, if any, in the initial year are the assessments of the local assessor. The second year are those which the state-approved assessors made.

Each piece of property was classified by size. Plots were in three groups: those of less than two acres, those of two acres or more, and those of unknown size. The latter were parcels for which no plot size appeared on the rolls. The plots were then classified by the residence of the owner. "Local" refers to owners whose permanent residence was within the town; "adjacent town" owners were those whose normal residence was in any adjoining town whether or not in the same county. (There were no towns in the sample whose borders joined another state.) "State" owners were permanent residents of the state but not of the adjoining town to that in which the property was located. "Out-of-state" residents had a permanent residence outside the state. Many of these lived in Illinois.

### III. Approach

To test the hypothesis, four ratios were computed. These ratios test the change in assessed value from the initial assessment determined by the local assessor to the assessment in the succeeding year, that done by the state-approved assessor, hereafter referred to as state assessment. Two of these test the relative or percentage change in assessed value, the other two test the absolute

change in assessment. The two ratios of relative change differ in that the first compares land values, the second compares land and improvements. Similarly for absolute change there is one ratio for land alone, the other for land and improvements. Each ratio is an average of the ratios for individual plots in that size and residence classification. At this point, a qualification should be made. Although the state assessment figures are a true estimate of the market value in the second year, they cannot be considered a true estimate of the market value of the previous year since in the intervening year the market value may have changed, if for example the property were improved. No such bias in the changes in market value of local as opposed to absentee property was found.

If the hypothesis that the absentee owners are discriminated against is true, then they should have been relatively over-assessed in the first year, and therefore should have shown a smaller increase from local to state assessment. (In almost every case the state-approved assessors raised the assessed value.) Using the state assessment as a measure of market value, all of the market to assessed value ratios would be larger for local than non-local if discrimination existed. Each of the four measures selected was computed for each combination of residence and size, and the mean ratio of each absentee class was individually compared to the local mean ratio. A one-tailed t-test was used in each comparison to test the hypothesis.

In all 30 comparisons can be made [sic] between local and absentee owners. Of these, seven showed a larger change in the value of property owned locally than of absentee-owned property, (i.e., that initially locally-owned property values were lower than absentee property,) but only two were significantly larger at the five per cent level. (Neither of these are significant at the one per cent level.) These two comparisons are of the ratio of locally-assessed land vs. state-assessed land of plots of unknown size between local and out-of-state owners and the difference between the assessments of local and out-of-state owners. All the comparisons where plot size was known suggest no bias against absentees. We, therefore, conclude that our initial hypothesis probably can be rejected.

Except for the difference in probable market value discussed later, there seems to be no good explanation for the bias shown in the plots of unknown size. It is probably not true that the explanation for this deviation is attributable to a few unusual plots. When the average of the ratios was compared with the ratio of the average land values, it seems still to be the case that the initial assessments of locally owned land were high relative to the assessments of those living in-state or out-of-state. It is not true that most locally-owned plots of unknown size were farms while most of the plots of unknown size not locally-owned were not farms and that farms were relatively underassessed, being assessed for

their agricultural rather than recreational value. Most plots of unknown size were in platted developments with all residence classes represented.

If there is no consistent evidence of discrimination against absentees, is there evidence of bias in favor of any residence group? Among both size and residence classes there are some differences in favor of the absentee owner, i.e., a greater change from the initial to the state assessment. Looking at the size classification of plots under two acres, the one most likely to encompass cottage sites, the  $t$  values in all but one instance are negative, rather than the expected positive, and only two of these are not statistically significant. This means that the absentees are favored in this size class. Further, half of the statistics for the plots over 2 acres show that the absentee is favored.

Looking at the data for each absentee ownership class separately, people living within the state borders whether in the adjacent town or just within the state borders whether in the adjacent town or just within the state [sic] seem to have an edge over those who live out-of-state. The out-of-staters are similar in most of the comparisons to the people living in the local area. However, there was a large variance in the ratio of land values in plots under two acres. As a result of this variance, the  $t$  test indicates no significant difference between out-of-staters and local people. But the ratios of the in-state and adjacent town owners are of the same order of magnitude as that of the out-of-state owners.

Of the three significant exceptions to this, two indicate bias in favor of the out-of-staters similar to those within the state or adjacent town. The one which indicates bias against the out-of-staters and against those living in the state as compared with those in the adjacent town or local area is for plots of unknown size a classification which is somewhat suspect.

#### IV. Explanations for Results

We can advance several factors that may explain the observed pattern of assessment. It is possible that the assessment ratio varies with the market value of the property, and that the residence of the owner is correlated with the market value. Oldman and Aaron<sup>2</sup> have found that their lowest priced properties (land and improvements) are assessed at the highest rates. There is reason to believe that this phenomenon is operating here simply from observation of the average values. If, as we assume, assessed values in the second year are a reasonable approximation of market values, then we can compare the value of properties (land and improvements) owned locally with that owned by absentees. For plots of less than two acres the average value per acre of land irrespective of improvements is lowest for locally-owned property. When improvements are added, locally-owned property is not less

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<sup>2</sup>Oldman, O. and Aaron, H. "Assessment Sales Ratio Under the Boston Property Tax," National Tax Journal (1965), pp. 36-49.



valuable than out-of-state but is less than the other two categories. By stretching the data and comparing local owners with all absentee owners lumped together, then it can be said that local owners have less valuable property. For plots over two acres the same relationships hold. Data on plots of unknown size also suggest that less valuable property is relatively overassessed. Absentee property (land and improvements) in this size class is less valuable than locally-owned property. As noted before land (though not land and improvements) in plots of unknown size is the only classification in which absentee owners may be discriminated against. However, this difference in land value by residence class should not be over-emphasized. For plots under two acres the correlation coefficient between residence class and the approximate land value was -.1126 for local owners, -.796 for owners in the adjacent town, +.1488 for in-state owners, and -.0136 for out-of-state owners. Although these figures by themselves do not indicate enough correlation to be interesting, they do show tendencies similar to the relative disadvantage previously discussed. Local owners were most likely to be at a disadvantage and in-state least likely to be.

As would be expected, the assessment to market value ratios of the towns in the study were relatively low before the state-approved assessors arrived. This is partially attributable to the tradition that assessors assess at substantially less than full value to give themselves a cushion against charges of overassessment. It is also

partly because although legally all property is to be reassessed each year, actually this is not done and assessments are carried from one year to the next. In the present era of rising land values this means that assessments go out of date relatively quickly.

It is possible that the increase in demand for riparian recreational land which over the past ten years has probably been on the order of magnitude of 100 per cent in Wisconsin,<sup>3</sup> may be in part responsible for the bias observed between people living in the adjacent town and those living outside the state. If people who live farther from the local area acquired their property more recently than those who live close by, theoretically there should be no difference in the assessment of the two groups because sale of a property is not supposed [to] be sufficient indication of a change in its value to indicate a new assessment before other property in the neighborhood is subject to a new assessment. However, any new improvement or increase in improvement must of course be newly assessed and this assessment may be close to market value. Therefore, if the people from farther away are more likely to have recently improved their property, this may be a reason for relative overassessment which would appear to be a bias on the part of the local assessor against them.

This explanation may be corroborate by several of our findings (1) that comparing the value of land irrespective of improvements

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<sup>3</sup>Figures obtained from forthcoming study by the authors of riparian land on artificial lakes in Wisconsin.

with the value of land and improvements, out-of-staters tend to be overassessed in several groups: those over two acres and in only some cases the plots having under 2 acres; (2) that in comparisons of value differences although in-staters' land is relatively over-valued vis a vis owners living in the adjacent town, land and improvements shows no such bias. This should not be pushed too far, however, since we do not find the same tendencies when comparing the relative changes between the other groups.

When the study was first undertaken and the hypothesis suggested that absentee owners would be discriminated against, one person familiar with assessment practices in the state said he doubted it, and that he would predict the opposite. The argument he advanced was that local assessors thought the outsiders were being cheated when paying such high prices for the land and that the assessor tended to downgrade the assessments toward what he thought the land was "worth." Now that the data tend to confirm his hypothesis about the direction of the bias, it would be interesting to interview the assessors as to the reasons for their biases and lack thereof.

It has also been suggested that another reason why absentee owners are not discriminated against and may be relatively underassessed is that towns dependent on or desirous of tourist business may compete with each other to attract nonresident property owners.

Concurrent with a possible competition for out-of-town dollars may be a feeling that people who live only part of the year in a town

receive only part of the benefits of the services provided by that town. Thus the assessment on out-of-town property may be suitably lowered to take benefits into account. Further, the idea that people should pay according to benefit may account to some degree for the possible discrimination against less valuable property. The argument is that owners of less valuable property do not get proportionally fewer benefits than owners of more valuable property, and therefore, the former are assessed at a relatively higher rate to cover the cost of the services they receive.

#### V. Conclusion

This study has shown that the absentee property owner, contrary to the often voiced charge, is not discriminated against in riparian property tax assessments in a sample of towns in Wisconsin. Whether or not the same results would be obtained in other states, or with urban or nonriparian property in this study is not known. These are possibilities for further research.

The study has also revealed some significant differences in assessments in favor of the absentee owner. The principal explanations for this were differences in land value, differences in assessment philosophy, and inter-district tax competition. The study includes one county, Door, noted for its recreational values. Other counties are less popular. No attempt was made to do a separate analysis of the more and less popular resort and recreation areas.

It would be instructive to conduct a large enough study so that adequate samples of land with different attractions could be compared.

Additional useful insights undoubtedly would be acquired if the assessors and perhaps also town boards were interviewed about their concepts of legitimate biases in assessment practice. Trends in assessment might be investigated by taking the assessments for not one but for a number of years before the state-approved assessors were requested and for several years thereafter.

Table I  
Relative Change in Valuation of Land and Improvements From  
Local to State Assessment

Ratio of State Assessment (Year 2) to Local Assessment  
(Year 1) Expressed as Per Cents

| Residence of<br>Owner |                    | Plots<br>Under<br>2 Acres | Plots<br>Over<br>2 Acres | Plots of<br>Unknown<br>Size |
|-----------------------|--------------------|---------------------------|--------------------------|-----------------------------|
| Local                 | $\bar{X}$ =        | 549%                      | 523%                     | 905%                        |
|                       | $\underline{Se}$ = | 46                        | 46                       | 202                         |
|                       | $\underline{N}$ =  | 152                       | 151                      | 122                         |
| Adjacent<br>Town      | $\bar{X}$ =        | 707%                      | 539%                     | 584%                        |
|                       | $\underline{Se}$ = | 75                        | 44                       | 50                          |
|                       | $\underline{N}$ =  | 211                       | 155                      | 224                         |
| In-State              | $\bar{X}$ =        | 623%                      | 514%                     | 571%                        |
|                       | $\underline{Se}$ = | 18                        | 36                       | 22                          |
|                       | $\underline{N}$ =  | 633                       | 136                      | 710                         |
| Out-of-State          | $\bar{X}$ =        | 604%                      | 542%                     | 505%                        |
|                       | $\underline{Se}$ = | 41                        | 52                       | 29                          |
|                       | $\underline{N}$ =  | 218                       | 115                      | 413                         |

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