

AN ANALYSIS OF THE RELATIONSHIPS
BETWEEN THE ASSESSED VALUATIONS
AND SALES VALUES OF REAL PROPERTY
IN INGHAM COUNTY, MICHIGAN

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By

OTHMAR ALFRED LIMBERGER

AN ABSTRACT

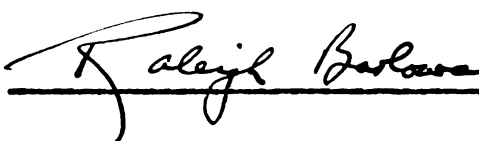
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ABSTRACT

The property tax is an important item in the tax bill of the citizens of Michigan. It is also a major source of revenue for local governments.

Michigan law requires that the property tax be spread among taxpayers in direct proportion to the true market value of their tangible property. Local assessors assign values to the individual properties for this purpose. At the present time assessments of real property usually range far below true market values.

At any relative level of assessment the assessed valuations have to be equal in terms of market values of properties to assure equality of taxation. Therefore the quality of assessment deserves close attention.

The main objective of this study was to analyze the relationships of assessed valuations to sales values of real properties in Ingham County, Michigan. A sample of bona fide real estate sales transacted in the years from 1950 to 1953 was collected from the deed records in the County Register of Deeds office. The corresponding tax assessment data were obtained from the assessment rolls in the County Treasurer's office.

Ratios of the assessed valuations of real properties to their cash sales values were then calculated for all the properties studied.

The variations of individual assessment ratios within certain classes of properties were investigated by determining the ranges between the ratios at different percentile levels of the properties. The total range and three successively smaller percentile ranges were used. For comparisons between the average levels of relative assessment of different classes of properties the averages of the assessment ratios of the properties in each class were computed.

The relationships of assessed valuations to sales values were investigated in terms of several individual questions, which dealt with specific aspects of the overall problem.

1. The variations of individual assessments in terms of sales values within assessment districts were expressed by the total range and the $P_{95} - P_{05}$, $P_{90} - P_{10}$, and $P_{75} - P_{25}$ percentile ranges. These variations were found to be considerable. Less than 50 percent of the assessments conformed to standards of good assessment.
2. Systematic inequalities of assessment were associated with different sales values of properties. The assessments in the majority of the assessment districts followed the usual pattern of decreasing relative assessments with increasing sales values.
3. Individual assessors assessed their districts at different average fractions of sales values. Some of the assessment districts had average assessment ratios which were more than twice as high as those found in other districts. County equalization compensates for some but not all of these differences.
4. The properties were classified by areas of different degree of urbanization. Rural properties were found to be assessed highest in terms of sales values, followed by urban properties, whereas suburban and urbanized properties showed the lowest assessment levels.
5. Comparisons of the assessment ratios of different properties by years of sale and by age of buildings indicated that no significant differences can be attributed to these factors.

The considerable inequalities of assessments of real properties for tax purposes which were discovered in this study demonstrate an urgent need for improvements in this field.

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TABLE OF CONTENTS

Chapter	Page
I INTRODUCTION	1
Real Property Taxation in Michigan	4
The Problem Investigated	8
Methods of Analysis	10
Characteristics of the Area Studied	13
II COLLECTION OF DATA	18
Processing of the Data	22
Limitations of the Study	26
III INEQUALITIES OF ASSESSMENT RATIOS WITHIN ASSESSMENT DISTRICTS	30
Variations of Assessment Ratios of Individual Properties Within Each Assessment District	30
Variations of Relative Assessment Associated With Total Value of Properties	40
Variations of Relative Assessment During the Time Period of the Study	48
Variations of Relative Assessment Between Buildings of Different Age in the City of East Lansing	54
IV COMPARISONS OF RELATIVE ASSESSMENT BETWEEN VARIOUS AREAS IN INGHAM COUNTY	60
Variations of Relative Assessment Levels Between Assessment Districts	60
Variations of Relative Assessment Associated with Different Degrees of Urbanization	76
Comparison of Relative Assessment Levels in East Lansing and Adjoining Residential Areas of Lansing and Meridian Townships	89

Chapter	Page
V SUMMARY, CONCLUSIONS AND RECOMMENDATIONS	92
Summary and Conclusions	92
Recommendations	97
DEFINITION OF TERMS	99
APPENDIX	100
BIBLIOGRAPHY	104

LIST OF TABLES

Table	Page
I Number of Transfers in the Sample of Each Assessment District Which Were Actually Used in the Analysis, Broken Down by Sales Value Classes and Summarized for Each Assessment District and the Whole County	21
II Median Assessment Ratios, Average Assessment Ratios, Total Range and P ₉₅ - P ₀₅ , P ₉₀ - P ₁₀ and P ₇₅ - P ₂₅ Percentile Ranges of the Individual Assessment Ratios in all 24 Assessment Districts of Ingham County, Michigan, Expressed in Percents of Sales Values	32
III Total Range and P ₉₅ - P ₀₅ , P ₉₀ - P ₁₀ , P ₇₅ - P ₂₅ Percentile Ranges, Expressed in Percent of Average Assessment Ratios, in 24 Assessment Districts in Ingham County, Michigan	38
IV Important Factors Influencing the Average Assessment Ratios of Various Sales Value Classes of Real Properties in Ingham County, Michigan	42
V Average Assessment Ratios by Sales Value Classes. A: Weighted Average for Ingham County and Four Selected Urban and Urbanized Assessment Districts. B: Weighted Average for 13 Rural or Suburban Townships and Four Typical Townships	44
VI Average Assessment Ratios and P ₉₀ - P ₁₀ Percentile Ranges for 1950 - 1953 for the 24 Assessment Districts of Ingham County, Michigan	49
VII Average Assessment Ratios and Equalized Ratios for the Years 1950 - 1953 in Eight Selected Assessment Districts of Ingham County, Michigan	51
VIII Important Characteristics of Samples of Old and New Building Properties in the City of East Lansing, which were Compared to Determine the Significance of Differences Between Their Average Relative Assessment Levels	55
IX Summary of Important Facts Relating to Changes of Assessments of Old and New Building Properties Between the Year of Sale and the Year After Sale in the City of East Lansing, Michigan	58

X	Average Assessment Ratios of All The Properties and of the Properties on the Highest and Lowest Sales Value Classes, and P ₉₅ - P ₀₅ Percentile Assessment Ratios in 24 Assessment Districts of Ingham County, Michigan, the Sample Includes Transfers made in the Years from 1950 to 1953	62
XI	Average Assessment Ratios and Equalized Ratios of the Assessment Districts of Ingham County, Michigan, for the Years 1950 - 1953.	66
XII	Actually Applied and Suggested County Tax Rates for the Assessment Districts of Ingham County, Michigan in 1950-1955, Expressed in Mills of Assessed Valuations . . .	70
XIII	Average Relative Assessment Levels of Rural, Suburban, Urbanized and Urban Properties in Ingham County, Michigan, by Sales Values Classes, Assessment Ratios Covering the Whole County are Given as A: Weighted Averages of Individual Properties and B: Unweighted Means of Assessment District Averages. Assessment Ratios Covering Selected Assessment Districts Which Include More Than One Area Classification Are Given Under C and D as Weighted Averages of Individual Properties	79
XIV	Average Relative Assessment Levels of Rural, Suburban, and Urbanized and Urban Properties in Ingham County, Michigan, by Years of Sale. Assessment Ratios Covering the Entire County are Given A: As Weighted Averages of Individual Properties. B: As Unweighted Means of Assessment District Averages. Assessment Ratios Covering Assessment Districts With More Than One Area Classification Under C and D Are Given as Weighted Averages of Individual Properties	80
XV	Important Characteristics of Three Groups of Subdivisions of Lansing and Meridian Townships and the City of East Lansing Which Were Compared to Determine the Extent and Significance of Inequalities Between Their Respective Average Relative Assessment Levels	90

LIST OF FIGURES

Figure	Page
1 Ingham County, Michigan, showing the classification of the county into rural, suburban, urbanized and urban areas	15
2 Total range, and P95 - P05, P90 - P10, and P75 - P25 percentile ranges of individual assessment ratios in 24 assessment districts of Ingham County, Michigan. The median assessment ratio is assumed as origin for each assessment district	33
3 Average assessment ratios and median assessment ratios in 24 assessment districts of Ingham County, Michigan.	35
4 Average assessment ratios of properties of different sales values in Ingham County, Michigan.	
A: County average and selected urban and urbanized districts	46
B: Average of 13 rural townships and four selected rural townships	47
5 Average assessed valuations in terms of book values and equalized values, expressed in percent of sales values, for three selected assessment districts of Ingham County, Michigan in the years 1950 - 1953	53
6 Average relative assessment level of lowest and highest assessed districts in Ingham County, Michigan compared to 100 percent of sales values	64
7 Average relative assessment levels of real properties in four types of areas characterized by different degrees of urbanization, by sales value classes, in Ingham County, Michigan	81
8 Average relative assessment levels of real properties in four types of areas characterized by different degrees of urbanization, by years of sale, in Ingham County, Michigan	82
9 Average relative assessment levels of real properties in rural and suburban areas in five selected townships, by sales value classes, in Ingham County, Michigan	83

Figure		Page
10	Average relative assessment levels of real properties in rural and suburban areas of five selected townships, by year of sale, in Ingham County, Michigan	84
11	Average relative assessment levels of real properties in suburban and urbanized areas of three selected townships, by sales value classes, in Ingham County, Michigan	85
12	Average relative assessment levels of real properties in suburban and urbanized areas of three selected townships, by year of sale, in Ingham County, Michigan	86

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CHAPTER I

INTRODUCTION

It is nothing new that people dislike taxes. Everybody knows the story from the New Testament which tells about the Pharisees who brought the question about their taxes up to Christ, apparently hoping that they would obtain a divine condemnation of taxes for the world thereafter. The Bible also mentions that tax collectors at that time were despised as public sinners. Even today people often think of the Director of Internal Revenue as their archenemy particularly at income tax report time.

Rising taxes were one of the contributing causes of the American Revolution, yet Americans today pay more taxes than ever. Still nobody seems to be preparing a revolution or planning a plot. People realize that they need strong armed forces, better highways, better police protection, bigger and better schools, more and better research and scores of other government services. All this costs money - tax money.

One of the oldest taxes in this country is the property tax. Originally it provided revenues for state and local governments. The State of Michigan has withdrawn from this source, however, with the exception of the state-collected tax on certain public utilities. The property tax is still a major source of revenue for county and local governments.

At the same time the property tax is also an important item in the large total tax bill of the citizens. It still amounts to more than one-third of the taxes raised in the State of Michigan besides federal taxes.¹

Since taxes are a painful matter anyway, it hurts especially when someone thinks that he has to pay more than his fair share. All taxes are spread according to some criteria which make it possible to determine just how big a share of the total load everybody has to bear. Such criteria which determine the basis for the spreading of taxes are the ability to pay, benefits received, uniformity of yield, ease of administration and others.

An example will illustrate the importance of basic criteria for a tax. The school tax is spread as part of the property tax on the basis of the value of a person's tangible property. If it were charged according to benefits received this would result in a considerable hardship for families with several school age children, whereas an assessment of the tax according to the ability to pay would certainly look unreasonable to a rich bachelor. It could be argued, however, that either system was a just way to spread the school tax.

When the property tax was introduced it was intended to spread it among the citizens according to their ability to pay. Since at that time people had most of their wealth tied up in farms, houses, stores and so on it was easy to accept the value of the tangible property as a basis for taxation. These assets would easily be observed by tax authorities and did not change much over time so that tax evasion was made rather difficult.

¹Denzel C. Cline, "Pay the Piper", Governmental Service Publications No. 1. Governmental Research Bureau, Michigan State College, 1953, p. 12.

The ownership of tangible property is no longer a good indication of a person's wealth since the property held in securities, bonds and other valuable papers sometimes make up a large share of a person's wealth. Despite this change in the nature of the assets held by individual taxpayers, the general property tax remained pretty much unchanged. It meets the need for additional tax revenues and offers great advantages through ease of administration and uniformity of its yield.

Many other taxes have been added to the citizen's tax bill after the property tax had been introduced. Such taxes as the important income tax and in Michigan the retail sales tax use other criteria than the property tax to distribute the tax load among the taxpayers.

The general property tax is usually administered on a local basis. In Michigan the assessment of property for tax purposes is usually carried out by the township supervisors and in cities by appointed professional city assessors. Separate village assessors assess the properties in incorporated villages for the purpose of the village tax only. The taxes are collected by the treasurers of local governments.

The Property Tax Law of 1843 provided that the township supervisors should be the assessors of their townships. Since supervisors are primarily elected for the administration of township affairs they do not necessarily have at the same time the qualifications to perform the difficult and complex task of assessment. The situation in Michigan, however, is not typical of the United States. In most of the other states separate assessors are elected or appointed besides the supervisors or the assessment is made on a county basis.

It is not easy to achieve uniformity of assessment in a county, which is necessary to assure equality of taxation, as long as individual assessors assess the properties in their districts independently from each other. It is usually the desire of local people, however, to have as many government functions as possible reserved for local governments. People have to decide therefore, between the goals of good assessment and strong local governments. So far this decision was in most cases made in favor of the home rule.

Real Property Taxation in Michigan

The Legal Background. The Constitution of Michigan states that "the legislature shall provide by law a uniform rule of taxation. . ."²

This is carried out in the General Property Tax Law by the provision that ". . . all property, real and personal, within the jurisdiction of this state, not expressly exempted, shall be subject to taxation."³ This leaves no doubt as to whether a piece of real property is subject to taxation or not.

This general rule for property taxation is then carried out in further detail by later sections of the law. Real property has to be assessed in the township or place where it is situated. The assessment is to be made to the owner or, if he is not known, to the occupant. Administrators, guardians and heirs can take the place of the owner.⁴

²Constitution of Michigan of 1908, General Property Tax Laws, State of Michigan, 1944, Article I, Sec. 3.

³General Property Tax Act, Act 206, 1893. General Property Tax Laws, State of Michigan, 1944, Sec. 1.

⁴Ibid, Sec. 3.

Of major importance in connection with this study is the rule which says that "All assessments hereafter authorized shall be on property at its cash value."⁵ The term cash value is defined by the General Property Tax Law as "The usual selling price at the place where the property to which the term is applied shall be at the time of assessment, being the price which could be obtained therefore at a private sale, and not forced or auction sale . . ."⁶

At the present time properties are usually assessed at a level below the true market value. This practice is generally accepted in the state. In fact, the state board of equalization used 1941 property values as a guide for the level of the state equalized valuations for the last decade. For the 1954 state equalization this level of assessment was raised to 110 percent of 1941 values.

Although no state taxes were levied on general property since 1934 the values determined by the state board of equalization are highly important for most of the counties, especially in Southern Michigan. According to a decision of the Attorney General these values have to be used in counties with overlapping school districts if an appeal to the state tax commission is made. The Supreme Court ruled later that these state figures have to be used by all counties with overlapping school districts even if no appeal is made. As a result of this decision many counties will therefore be equalized at the level of state equalized figures in the future.

⁵ Constitution of Michigan, op. cit., Sec. 7.

⁶ General Property Tax Act, op. cit., Sec. 27.

The actual market values of real properties, however, have more than doubled since 1941. This shows that the state equalized values at 110 percent of 1941 values still lag considerably behind the price movements of the last one and one-half decades. This would have no serious consequences for the uniformity of taxation as long as the ratio of cash value to assessed value would be equal in all cases.

A few additional legal provisions might be helpful to complete the picture of property taxation in Michigan.

"An assessment of all the property in the state, liable to taxation, shall be made annually, . . ."⁷ which means in other words that the assessment is to be kept up to date as a basis for annual tax levies. Only few assessors, however, actually revise all the assessments in their districts annually. Many assessed valuations are copied without changes year by year from the previous tax rolls and only property additions and changes are given consideration in the assessed valuations. Very often increasingly unrealistic assessments result from this process after a number of years.

The legislators who drafted the Property Tax Laws did not expect perfect results from local assessments and anticipated the necessity for corrections. Provisions were made as it was mentioned earlier to make the equalizations of assessment possible, within assessment districts by the local board of review,⁸ within counties by the board of supervisors,⁹

⁷ General Property Tax Act, op. cit., Sec. 10.

⁸ Ibid, Sec. 28, 29, 30.

⁹ Ibid, Sec. 34.

and in 1911 and at least every fifth year thereafter for the state by a state board.¹⁰ In case of a grievance as a result of the county equalization the local supervisor can appeal for his assessment district to the state tax board.¹¹

The assessment resulting from the process described above is the basis for the property tax as determined by law: "The supervisor . . . shall procede to assess the taxes apportioned to his township . . . according and in proportion to the valuations entered . . . in the assessment roll . . ."¹²

This last section shows clearly the basic necessity of equal assessment on all properties if the tax burden shall be distributed justly and in compliance with the law.

The county equalization is supposed to eliminate differences between the relative assessment levels of local assessment districts in a county. This is accomplished through differences between the county tax rates which are applied in the various districts. The relationship of the applied county tax rate in a certain assessment district to the rate charged to the county equalized value is equal to the total equalized valuation in the particular district relative to the total assessed valuation.

The county tax rate which is expressed in mills of assessed valuation or dollars per thousand composes together with the school and township tax rate the total tax rate for regular taxes. This total regular tax rate has been limited by law¹³ to 15 mills of assessed valuation. The assessed

¹⁰ Constitution of Michigan, op. cit., Sec. 8.

¹¹ General Property Tax Act, op. cit., Sec. 34.

¹² Ibid, Sec. 39.

¹³ Constitution of Michigan, op. cit., Sec. 21.

valuation has been defined for this purpose by decisions of the Michigan Supreme Court¹⁴ as the assessed valuation corrected by the process of equalization.

It is sometimes difficult to raise a sufficient amount of taxes within this 15 mill limit. Special taxes beyond this limit can be voted in by the people of a taxing district up to a total of 50 mills. Municipal taxes for cities and incorporated villages are not included in the 15 mill limitation according to a law of 1948. Taxes for the payment of debts which were incurred before the passing of the 15 mill limitation in 1932 are also outside the legal allowance.

The Problem Investigated

Considering the fact that the assessment for property tax purposes is performed partly by individual supervisors, who are untrained for the job, and on a local basis it is not surprising that considerable inequalities of assessment do exist in many areas. The legislature anticipated such inequalities and established by law boards of equalization on the local, county and state level to deal with and eliminate existing inequalities. The success of the equalization process depends on the quality and completeness of information available to the boards of equalization. It cannot be expected that their work will always result in perfect equality of assessment.

Objectives. In this study the main objective was to analyze the relationship of assessed valuations to market values of real properties in

¹⁴St. Ignace City Treasurer v. Mackinac County Treasurer, 310 Mich. 108.

Ingham County, Michigan. The analysis involved the relationships of relative assessments within single assessment districts, between assessment districts and between areas classified according to selected characteristics.

The various problems investigated as part of this overall objective are listed below in the order in which they are dealt with in the following discussion of the analysis:

A. Analysis of relative assessment within individual assessment districts:

This analysis involves comparisons between the levels of relative assessment of properties located within the same assessment districts.

1. The assessment ratios were listed in arrays and the values for total ranges and certain percentile ranges were determined to obtain information about the extent of variations of individual assessment ratios within a district.
2. The individual assessment ratios were grouped in classes according to:
 - a. sales values
 - b. years of saleto find variations of assessment associated with these factors.
3. The relative assessments in the city of East Lansing were classified and compared in respect to age of buildings to find whether different building ages affected the relative level of assessment.

B. Comparisons of relative assessment levels between different areas of assessment:

In this connection the assessed valuations determined by different assessors or for areas separated by distinct characteristics were compared in relation to sales values.

1. Average assessment ratios of the 24 assessment districts of the county were compared to show differences in the average level of assessment in these districts.
2. Relative assessments of properties located in areas which were characterized by different degrees of urbanization were compared in terms of:

- a. sales values

- b. years of sale

to discover influences of urban expansion and suburbanization on the level of relative assessment.

3. A comparison of average relative assessments was made between the city of East Lansing and neighboring subdivisions in adjoining townships to find what differences, if any, existed between the assessment of closely comparable residential properties in these assessment districts.

Methods of Analysis

In this study the relationship of assessed valuations to sales values, but not actual tax loads, of real properties were analyzed. The assessment - sales ratio method was employed throughout the study. By this method assessments are expressed in percent of the sales values of the properties in question, which makes it possible to compare these ratios on an equal basis.

$$\text{Assessment sales ratio} = \frac{\text{Assessed valuation}}{\text{Sales value}} \cdot 100$$

In order to make the handling and processing of the total number of 5393 sales included in the study workable the data were recorded on punched cards and processed by IBM machines. The method of obtaining the data and their weakness and limitations will be discussed in the next chapter of this thesis.

The data obtained for the analysis were investigated first to obtain some knowledge about their ranges and distributions as a basis for selection of suitable methods of analysis. It was discovered that the individual assessment ratios did not follow a normal distribution. Instead the distribution was skewed left with a greater concentration of assessment ratios at values below the average ratio and a smaller number of cases ranging up to high levels of relative assessment. With the exception of two problems the commonly used statistical tests of significance which are based on the normal distribution could not therefore be used in this study.

In the analysis of the variations of relative assessments of individual properties within assessment districts the assessment ratios for all the properties transferred in each district had to be compared. This was done by listing the assessment ratios for each district in order from low to high ratios. From these arrays the total ranges of assessment ratios and the ranges at the $P_{95} - P_{05}$, $P_{90} - P_{10}$ and $P_{75} - P_{25}$ percentile levels were selected. On the basis of this information the variations of individual relative assessments were presented and appraised.

The second major question was related to the differences in the average level of relative assessments between assessment districts. In this case the averages of the assessment ratios in each of the districts were computed

and the values of these averages, which represent the percentage of total value at which the properties of each district were assessed, were compared to each other.

Averages of assessment ratios were also used for comparisons between various sales value classes of properties, between different years of sale and between areas showing different degrees of urbanization.

In two of the investigations t-Tests could be used to test the significance of differences between average levels of relative assessment. In the case of the comparison of assessments by age of buildings in the city of East Lansing as well as for the comparison between assessment levels in East Lansing and in adjoining residential areas of Lansing and Meridian Townships all the properties were included in subdivisions. It was assumed that the subdivision averages, which were used in the comparisons, were normally distributed within each assessment district.

For value comparison purposes, the property value data were divided into the following seven sales value classes:

1. Below \$5,000
2. \$ 5,000 - \$ 9,999
3. \$10,000 - \$14,999
4. \$15,000 - \$19,999
5. \$20,000 - \$29,999
6. \$30,000 - \$49,999
7. \$50,000 and above

In the study of the relationships of assessment ratios to building age, the city properties of East Lansing were divided into two age groups, - those built before and those built after 1942. A city map of 1942, showing

location and house number of all the buildings then in existence, was used in classifying properties into these two groups.

The necessary information for the classification of area degrees of urbanization was obtained from a United States Census map of 1950 and from local real estate dealers.

These breakdowns and classifications are discussed in more detail with the presentation of the analyses performed.

Characteristics of the Area Studied

The area covered by this study includes all of Ingham County, Michigan. Ingham County is located in South Central Michigan in the line between Detroit, Grand Rapids, Muskegon. It covers an area of 559 square miles.

The land is described as undulating plains of irregular relief with sometimes fairly steep short slopes, only in rare places as hilly. The county soil survey classified a large portion of the county as muck. Veatch¹⁵ describes the soils of Ingham County as intermediate drainage loams to silt loams to sandy loams. Most of the land falls into the use classes I and II, only a small portion is classified as use class III.¹⁶ The farming enterprises of the area are described as being part of the Michigan Type of Farming Area V in which dairy and general farming predominate. Moore¹⁷ observed that the farms of the area, especially in

¹⁵ J. O. Veatch, Soils and Land of Michigan, Michigan State College Press, 1953.

¹⁶ From a soil conservation standpoint land is classified into the land use classes I to VI. Class I thus requires no special precautions against erosion, class VI would be entirely unsuitable for agricultural use.

¹⁷ E. Howard Moore. The Effects of Suburbanization on Land Use in a Selected Segment of the Lansing Rural-Urban Fringe. Unpublished Ph. D. thesis. Michigan State College, 1953, Chapter III.

the vicinity of residential areas tend to have less dairy cows and hogs and more cash crops and beef cattle than the average farms of Type of Farming Area V. The relatively larger number of farms in this area that were operated on a part-time basis might be one factor responsible for this development. Part-time farmers prefer enterprises that do not require long and regular hours of work in addition to their off farm jobs.

According to the United States Census of 1950¹⁸ the population of Ingham County was 173,000 and had experienced an increase of 42,000¹⁹ persons or 32.4 percent since 1940. A major portion of these settled in the Greater Lansing area. According to the same source²⁰ Ingham County ranks sixth in Michigan so far as population is concerned. The population density of the county, 309 per square mile, also ranks sixth in Michigan.

The largest city in the area is Lansing with a population of 92,000. It is located in the northwest corner of the county on the main highways US-16 and US-127 which are important east-west and north-south routes in Michigan. Highways US-27, M-78, M-43 and M-99 connect Lansing to the northeast, west and southwest. An extensive system of mostly hard topped county roads and gravel township roads covers the county. Some commercial districts and considerable residential developments extend beyond the city limits of Lansing into the townships of Delhi, Lansing and Meridian and

¹⁸ Number of Inhabitants: Michigan, United States Census of Population: 1950, U. S. Department of Commerce, Bureau of Census, p. 13.

¹⁹ Between one-fourth and one-third of this increase represents an increase in the student population at Michigan State University. These students were enumerated as residents of their home counties in 1940 but as Ingham County residents in 1950.

²⁰ Ibid, pp. 13-14.

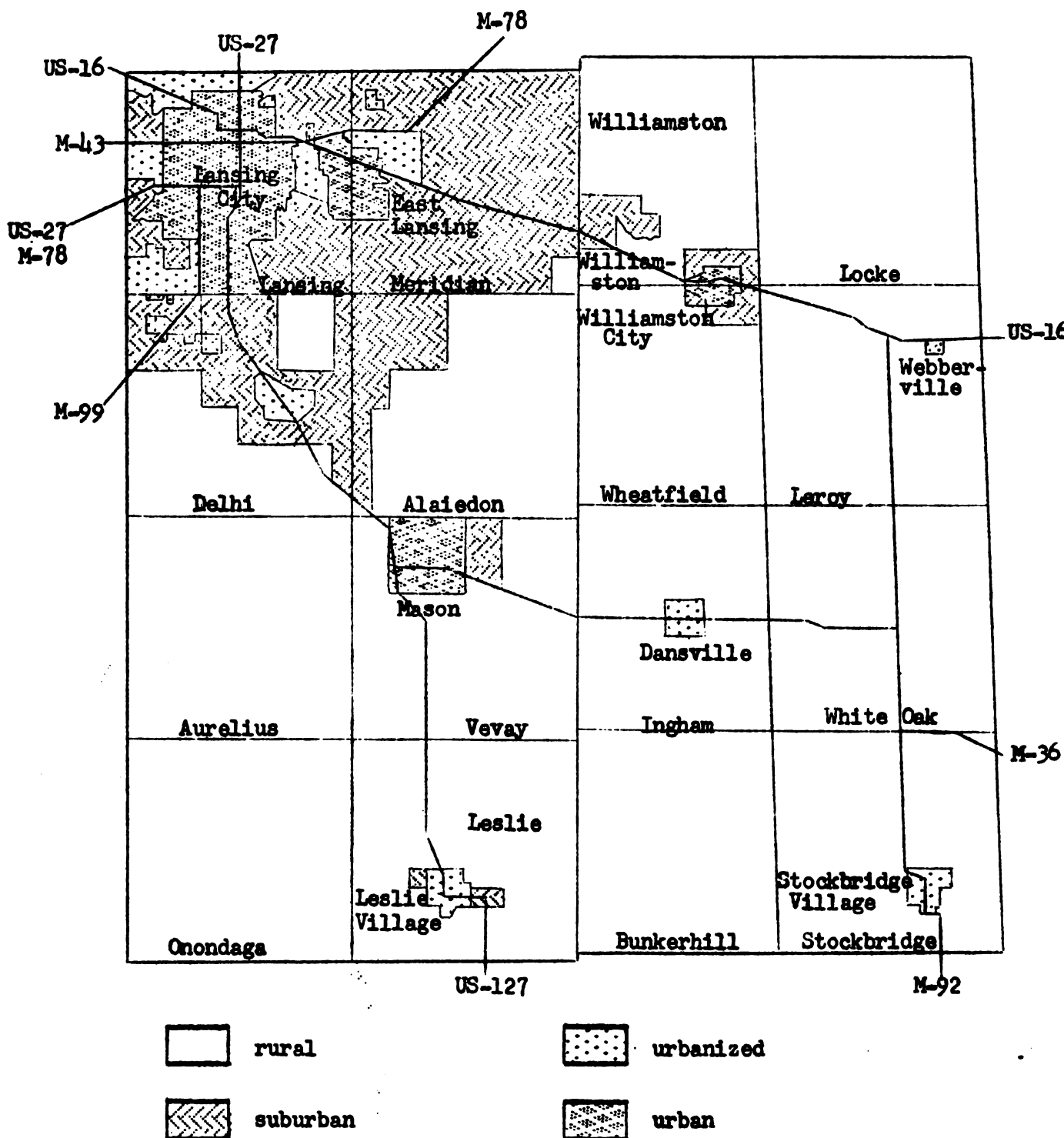


Figure 1. Ingham County, Michigan, showing the classification of the county into rural, suburban, urbanized and urban areas.

comprise with the city of East Lansing the Greater Lansing Area. This is the main business and industrial area of the county with the greatest concentration of population.

The city of Mason, which is the county seat, lies roughly in the center of the county on highway US-127, the city of Williamston in the northeast can be reached on highway US-16. The rest of the county is predominantly rural and lately in the north and northwest strongly suburbanized.

Since the phenomenon of rapid urban expansion and extensive suburbanization was considered to be an outstandingly important factor in Ingham County and since these developments were expected to have a considerable influence on assessed valuations of properties (parallel to their influence on market values²¹) special attention was given to these factors. With the aid of a census map of 1950²² and the counsel of local real estate dealers, the county was divided into four types of areas, each reflecting a different degree of urbanization.

The areas incorporated in the four cities in the county were classified as urban. The urbanized areas include all areas outside those cities in the townships of Delhi, Lansing and Meridian which were classified as such by the United States Census of 1950 on a population density basis. The urbanized area includes completely built up residential and commercial areas and also the incorporated villages in the county. All other sections which included extensive subdivisions that were already built up or in the

²¹ E. Howard Moore, op. cit., Chap. IV.

²² Number of Inhabitants: Michigan, op. cit., p. 36.

planning and construction stage were classified as suburban. This area covers the remainder of Lansing Township, almost all of Meridian Township and large parts of Delhi and Alameda Townships and extends further east and southeast from Lansing along the major highways. All the rest of the county was classified as rural.

CHAPTER II

COLLECTION OF DATA

It was mentioned earlier that the assessment-sales ratio method was used in this study. Information on sales of real properties made in Ingham County were obtained for this purpose.

The deed records in the County Register of Deeds office were searched for all bona fide sales transacted in the year 1953. Sales involving a consideration of \$1,000 or less were not included in the sample to avoid the disturbing influence of inaccurate data. Frequently such low considerations are used in paper transfers which are performed to change ownership arrangements and therefore do not report the true value of the property. This procedure also excluded sales of extremely small and low valued properties which were expected to show wide variations in their assessment ratios.

The consideration involved in a transfer was computed from the amount of federal revenue stamps attached to the deed. A federal revenue stamp costing 55 cents must be attached to the deed for every \$500 of the consideration or fraction thereof. This procedure was necessary since most deeds do not list the actual amount of the consideration involved. The United States Department of Agriculture, in studies of land values, has often based its estimates of price levels on revenue stamps. It was therefore very important to know the degree of reliability of this source of information to justify its use in studies involving the sales values of properties.

Some investigations have been conducted¹ to test the reliability of tax stamps as an indication for considerations in transfers and found them to be highly accurate as long as non-bona fide sales were excluded and mortgages were taken into consideration.

Great care was used to eliminate, as far as possible, all non-bona fide sales such as family transfers, mortgaged properties without a precise statement of the mortgage balance, and transfers on contract involving loan institutions. In the last two examples the federal revenue stamps attached to the deeds account only for the cash balance paid at the time of the transfer which is only a fraction of the true market value of the property. The use of these fractional sales values would cause an error in the assessment ratios which would appear to be higher than the true ratio.

The sample started with a complete record of all bona fide real estate sales involving a consideration of more than \$1,000, of which the deeds were recorded in 1953. More than half of the sales transacted involved properties located in the city of Lansing. Since this Lansing sample was considered large enough no attempt was made to gather more cases from the transfers recorded in earlier years. Most of the transfers from 1950 to 1952 in the city of Lansing involved land contracts which were paid off in 1953. The data collected from the 1953 records included a large sample of building lots.

¹ See: Norman Nybroten. "Estimating Cash Considerations in Real Estate Transfers from Internal Revenue Stamps." Journal of Farm Economics, Vol. 30, No. 3, Aug. 1948, pp. 558-561. Robert L. Tontz, Jeppe Kristensen and C. Curtis Cable, Jr. "Reliability of Deed Samples as Indication of Land Market Activity." Land Economics, Vol. 30, No. 1, Feb. 1954, pp. 47-48. The high reliability of sales value estimates from federal revenue stamps has also been verified by a recent study conducted by the Federal Land Bank which involved several selected counties in Southern Michigan.

For the predominantly suburban townships in Lansing, Delhi and Meridian data on bona fide transfers were also assembled from the deed records of 1952. Since only a small number of real property transfers could be obtained for the rural townships from the deed records of 1953 and 1952 the sales recorded in 1950 and 1951 were also included in the samples. In 1952 and in the years previous to it the transfers involving considerations of less than \$4,000, which usually represented vacant lots, were excluded from the sample.

A special study was planned for the city of East Lansing involving the comparison of assessments according to different building ages. For this purpose a further enlarged sample seemed desirable. Therefore the sales transacted in 1954 were also included. It was discovered in the process of the analysis, however, that the assessment ratios computed from these values were not fully comparable to the rest of the sample. The reason for this will be discussed in the next section of this chapter. These ratios were therefore not included in the final analysis.

Table I shows the number of transfers that were assembled for each of the assessment districts and actually used in the final analysis. The district samples are divided into groups according to the sales value of the properties. The table lists also the total number of transfers in each assessment district and in the whole county.

The information obtained from the deeds was in each case the date of sale (date of land contract), the parties involved, the exact description of the property transferred, the amount of internal revenue stamps attached, the consideration involved whenever mentioned in the deed and a sale on land contract, if so indicated.

TABLE I

NUMBER OF TRANSFERS IN THE SAMPLE OF EACH ASSESSMENT DISTRICT WHICH WERE ACTUALLY USED IN THE ANALYSIS, BROKEN DOWN BY SALES VALUE CLASSES AND SUMMARIZED FOR EACH ASSESSMENT DISTRICT AND THE WHOLE COUNTY

Value Class	Alatedon	Aurelius	Bunkerhill	Delhi	Ingham	Lansing Twp.	Leroy	Leslie Twp.	Locke	Meridian	Onondaga	Stockbridge Township	Vevay	Wheatfield	White Oak	Williamston Township	Dansville	Leslie Village	Stockbridge Village	Webberville	East Lansing	Lansing City	Mason	Williamston City
Below \$ 5,000	22	18	13	138	16	249	6	17	22	165	21	12	15	14	9	20	7	31	17	12	23	302	37	22
\$ 5,000 - \$ 9,999	23	19	9	167	14	204	17	24	20	115	17	24	26	23	9	31	3	45	37	21	72	544	84	60
\$10,000 - \$14,999	15	7	7	43	1	209	10	16	11	145	7	3	14	3	11	11	--	7	9	1	124	456	31	12
\$15,000 - \$19,999	7	1	4	17	3	72	2	3	2	49	4	5	7	1	1	5	1	1	1	--	138	157	7	2
\$20,000 - \$29,999	2	--	1	6	2	18	5	1	-	39	1	3	5	6	1	2	--	1	--	--	112	63	4	1
\$30,000 - \$49,999	--	--	--	2	--	5	--	--	--	5	--	--	1	1	--	--	--	--	--	--	46	16	2	--
\$50,000 & above	--	--	--	--	--	7	--	--	--	6	--	--	--	--	--	--	--	--	--	--	5	19	--	--
Total:	69	45	34	373	36	764	40	61	55	524	50	47	68	48	31	69	11	85	64	34	520	1557	165	97
Total in County: 4847																								

To facilitate the checking against the assessment rolls the cases selected from the deed records were then arranged according to assessment districts and subdivisions. Care was used to identify the corresponding property descriptions in the tax rolls with those given on the deeds. The identification was sometimes rather difficult since the same properties were frequently described in different ways in the two sources. Whenever there was reason for doubt whether the descriptions involved the same piece of property the case was omitted from the sample.

From the assessment rolls the assessed valuation and the amount of regular taxes were obtained for the year of sale and the year after sale. This then provided the basic available information from which the computations and analyses were made.

Processing of the Data

The amount of the consideration for each deed was determined by dividing the value of the internal revenue stamps attached to the deed by .0011.

$$\text{Sales value} = \frac{\text{Value of federal revenue stamps in \$}}{1.1} \cdot 1,000$$

The assessment sales ratio which was used exclusively in the analysis throughout the study was then computed by using the formula:

$$\text{Assessment sales ratio} = \frac{\text{Assessed value}}{\text{Sales value}} \cdot 100$$

This means that the assessed value is always expressed in percent of the sales value.

As a rule the assessment sales ratio was computed from the assessed valuation of the year after the property was sold. This assessment is made as of January 1 of the year after the sale. It seemed most accurate to use this value rather than the assessed value of the year of sale since

it usually reflected the condition of the property at the time of sale better, whereas the assessment of the year of sale took only account of the nature of the property in the earlier year. When, for instance, a new house was sold the assessment of the year after the sale included the house. The assessment made on January 1 of the year of sale was often made on the empty lot only or on the partially completed building. The same was true for the sale of older buildings if changes or improvements were made shortly before the sale or if the assessor decided to change the assessed valuation of the particular property during this year.

In a limited number of cases the assessed valuation of the year of sale had to be used in the computation of the assessment ratio. This was the case if the property could not be identified in the assessment rolls of the year after the sale. Sometimes pieces of property were integrated with other parcels as a result of the sale and were treated as one property in the assessment rolls. Whenever discrepancies in the value data suggested that the property had undergone marked changes between the sale and the first assessment after the sale the assessed valuation of the year of sale had to be used. Sometimes, for example, the deed only covered a vacant lot whereas the assessment after the sale apparently was made on a building also which had been erected in the meantime.

This problem leads immediately to the question of changes in the assessed valuation from the year of sale to the year after sale. It was discovered that a sizable portion of the properties included in the study experienced changes of assessment between the two years observed. In three out of the 24 assessment districts more than 40 percent of the properties were found to have undergone assessment changes, 25 percent

of the assessment districts showed changes in assessment on more than 30 percent of the properties studied and in two-thirds of the assessment districts more than 20 percent of the properties experienced changes in assessment.

Since it was considered that these changed assessments could show a significant difference from the unchanged assessments, a preliminary investigation was made to determine whether these changed assessments would necessitate or justify a separate treatment of the properties involved.

For this purpose all the assessment ratios were classified into the following six groups:

1. No changes of assessment were made between the year of sale and the year after sale.
2. Upward adjustments of less than 75 percent of the original assessed valuation.
3. Upward adjustments of 75 percent or more of the original assessed valuation.
4. Downward adjustments of less than 75 percent of the original assessed valuation.
5. Downward adjustments of 75 percent or more of the original assessed valuation.
6. The assessment of the year of sale was used to compute the assessment ratio.

It was finally decided to treat the groups in which changes had been made together with the properties with unchanged assessment but to keep separate only the properties where the assessment of the year of sale had been used to compute the assessment ratio.

Two reasons justified this decision:

1. One practical reason was found in the fact that no systematic difference could be detected in the relative level of assessment of the properties with changed assessments as compared to those with no such changes. From an inspection of the individual cases the expectation seemed justified that these changes were generally an improvement of the quality of assessment in terms of the deviation of individual assessment ratios from the average assessment ratio in each class.

A different kind of observation was made in cases in which the assessed valuation of the year of sale had to be used in the computation of the assessment ratio. In two assessment districts the average level of assessment of these properties deviated considerably from the level of assessment of the properties for which the assessment of the year after sale had been used to compute the assessment ratio. This seemed to make a separate treatment of these properties necessary, especially since their number amounted to a large fraction of the respective class samples.

2. The logical reason for the way in which the properties were grouped together was the consideration that any change in an assessment made by a local assessor must have been made for the purpose of improving the assessment so that it seems only fair to use the assessments after the adjustments without distinction from unchanged assessments when a study of the quality of assessment is made. For the same reason the properties for which the assessment previous to an adjustment had to be used could not be treated in the same group.

To facilitate the handling of the large sample of the study the information obtained and computed was recorded on punch cards for processing

on IBM machines. All the information necessary for classifications was coded, and as a preparation for final analyses arrays of assessment ratios and necessary computations for statistical tests were obtained for all the classifications desired.

Limitations of the Study

The method of computing the consideration of a transfer was explained in the previous section. Reference was also made in the first section of this chapter to three sources² which reported on critical tests of the reliability of internal revenue stamps as indications of considerations in deeds. A few more details from these sources seem to be appropriate in this connection. It was mentioned in Tontz' article that the estimates of low considerations from revenue stamps are not very accurate.

This is one reason why the properties with a sales value of \$1,000 or less were eliminated from the sample for the year 1953. For the same reason the transfers with a consideration of less than \$4,000 were excluded from the sample for the years 1950 to 1952.

A possible error in the range of \$500 given by the internal revenue stamps could be fairly great relative to small total value. The estimate for the total value, however, could only be too high which would result in an assessment ratio that would be too low. Since low value properties are usually assessed at a relatively higher level than high value properties, an increase in accuracy would only support the findings of this study.

² Norman Nybroten, op. cit., pp. 59-60. Robert L. Tontz, Jeppe Kristensen and C. Curtis Cable, Jr., op. cit., p. 47. Federal Land Bank study in Southern Michigan counties.

Nybrotten indicated in his article that for higher sales values an increasing number of properties show a sales value that actually coincides with the \$500 tax classes. This leads us to expect a high accuracy of the sales value estimates at high sales values.

Criticisms might be raised against the use of the sales price to determine the relative assessment. The Michigan Property Tax Law speaks in this connection about the "usual selling price."³ It is certainly possible that the sales price of a piece of property does not correspond to the "usual selling price." Since, however, no other data indicating the cash value are available, the actual sales price provides the best measure for this purpose. Special attention was given, as mentioned in the previous section, to the elimination of at least the systematic biases from the sales values obtained.

Renne and Lord have suggested⁴ that more attention should be given to the use of land productivity values instead of prices in the assessment process and in the evaluation of the quality of assessment. They argue that the use of the productivity value of land might result in a more realistic ratio of assessed valuations to true values. It would eliminate the influence that lack of information and unequal bargaining positions of the parties in a sale have on sales prices. This approach holds considerable promise for strictly farm lands if a suitable index of land productivity

³ General Property Tax Act, Act 206, 1893. General Property Tax Laws, State of Michigan, 1944, Sec. 27.

⁴ R. R. Renne and H. H. Lord. "Assessment of Montana Farm Lands." Montana Agricultural Experiment Station, Bulletin No. 348, Bozeman, Montana, 1937, p. 18.

values were available. It would have to be modified considerably, however, where property values are affected by urbanization influences. It also could not be used where residential city properties are involved.

Properties of different types and values are likely to be assessed at different percentage levels of their market values. A sample would have to be representative of the percentage shares of these various types of properties of the total property value in a sample area to permit a valid estimate of the average relative level of assessment in this area. For this purpose a stratified sample would have to be taken. The sample used in this study was determined solely, however, by the frequency of bona fide sales transacted during the years in study. One cannot assume, therefore, that this sample is representative of the composition of the total property value in Ingham County or in any assessment district thereof. This limitation was kept in mind when the average assessment ratios calculated from the available sample were used in some sections of this study as the best estimates of the relative assessment levels that could be obtained.⁵

This also brings up the problem of the best measure of central tendency which would indicate the "normal" or "right" level of relative assessment.

⁵ Roy Elough in his article on "Recent Developments in Methods of Real Estate Equalization in Wisconsin," published in Volume X of the Journal of Land and Public Utility Economics, presents similar considerations. He describes the modification of the sales ratio method, which was used as a basis for tax equalization in Wisconsin, by more reliance on personal judgment and mass assessment of all the properties in an assessment district. More realistic and representative sampling results were the goal of the change in methods.

Much could be said for using the mode indicating the most frequently found level of relative assessment. The arithmetic mean, however, takes also account of extreme values in the assessment ratios and also offers advantages for application of statistical tests. Therefore, the arithmetic mean was used as a measure of central tendency throughout most parts of the study. The only exception to this rule was made for the presentation of the various percentage ranges in Figure 2. There the properties were centered around the median to provide for a more informative arrangement of the ranges shown.

The conditions related to assessment of real property for tax purposes, which were analyzed and presented in this study, are probably typical for the whole State of Michigan. The findings, however, cannot be applied directly to areas outside of Ingham County without further study.

CHAPTER III

INEQUALITIES OF ASSESSMENT RATIOS WITHIN ASSESSMENT DISTRICTS

Variations of Assessment Ratios of Individual Properties Within Each Assessment District

The most basic task in the process of assessment for tax purposes is the assessment of individual properties on a local level. The resulting assessed valuation represents the basis for taxation of each piece of property. The taxes which are to be raised in a taxing district are spread among the property owners in direct proportion to the assessed valuations of their properties. This means that the amounts of taxes paid for various properties stand in the same relationship to each other as their assessed valuations.

To assure that the taxes levied by this method are spread justly the legislature has provided that the assessed valuations be tied directly to the market values of the respective properties. If the individual assessments do not conform to this rule the tax load will be spread unequally. Corrections can only be made by reassessment of the individual properties. The local board of review is supposed to adjust the assessments annually before the taxes are assessed to the property owners. The equality of taxation within a taxing district depends therefore exclusively upon the equality of assessment in terms of market values of the taxable properties.

In order to determine the quality of assessment within each assessment district the individual assessment ratios within these districts had to be compared with each other and their distribution around the average level of assessment had to be studied.

The investigation in connection with this question was mainly concerned with the ranges of assessment ratios at various percentile levels of all the properties studied in each district. These different percentile ranges are presented in Table II and Figure 2 for each of the 24 assessment districts of the county.

Besides the total range of assessment ratios in each assessment district three more ranges of successively smaller fractions of the number of cases involved were computed. These ranges were studied for 90 percent of the cases by excluding the upper and lower five percent and in a similar way for 80 and 50 percent of the cases in each district.

The total range and the various percentile ranges were listed in Table II for the 24 assessment districts. The averages of the assessment ratios and the median assessment ratios were also given. The table shows that in each of the assessment districts the median assessment ratio is smaller than the average which demonstrates the skewness of the distributions of the ratios within each district.

The ranges of assessment are also shown in Figure 2. There the assessment districts were corresponding to Table II listed in order from the narrowest to the widest total range. The median assessment ratio was chosen as the origin in each assessment district so that the number of properties are split in half in each case. The 50 percent of the properties in each district, with assessment ratios smaller than

TABLE II

MEDIAN ASSESSMENT RATIOS, AVERAGE ASSESSMENT RATIOS, TOTAL RANGE AND P₉₅ - P₀₅, P₉₀ - P₁₀ AND P₇₅ - P₂₅ PERCENTILE RANGES OF THE INDIVIDUAL ASSESSMENT RATIOS IN ALL 24 ASSESSMENT DISTRICTS OF INGHAM COUNTY, MICHIGAN, EXPRESSED IN PERCENTS OF SALES VALUES

District	Median assessment ratio	Mean of assessment ratios	Lowest assessment ratio	Highest assessment ratio	Total range	P ₉₅ - P ₀₅	P ₉₀ - P ₁₀	P ₇₅ - P ₂₅	Percentile ranges
Dansville	37.5	44.02	31.0	71.4	40.4	--	30.5	14.7	
Williamston Township	26.7	29.74	9.8	64.4	54.6	48.3	35.7	15.0	
Stockbridge Village	23.5	27.07	5.0	65.0	60.0	36.7	30.1	10.0	
Locke	38.9	39.03	10.0	72.9	62.9	53.7	44.4	21.3	
Williamston City	33.3	35.61	10.8	76.9	66.1	27.0	24.3	11.3	
Bunkerhill	35.2	42.76	12.5	84.0	71.5	62.9	59.0	21.8	
Webberville	22.4	26.36	12.7	90.0	77.3	47.9	25.7	13.6	
Leroy	34.4	35.08	9.5	92.0	82.5	42.0	36.5	17.1	
Aurelius	32.2	36.33	11.2	93.9	82.7	69.0	44.0	22.7	
Stockbridge Township	33.7	37.69	18.3	106.0	87.7	53.9	30.5	12.3	
Vevay	37.5	38.92	10.0	97.8	87.8	61.0	44.9	23.9	
White Oak	39.1	43.45	4.4	93.3	88.9	63.7	54.6	24.0	
Alaiedon	32.0	35.67	10.0	100.0	90.0	47.1	31.1	13.3	
Wheatfield	43.0	44.77	17.8	108.6	90.8	66.0	46.0	23.8	
Ingham	38.8	43.51	10.0	102.8	92.8	49.8	27.9	16.7	
Delhi	26.7	30.20	9.8	106.7	96.9	45.0	31.3	14.3	
Meridian	18.9	20.47	1.0	100.7	99.7	41.7	26.4	10.5	
Leslie Township	42.9	47.00	10.0	114.3	104.3	58.6	48.8	25.7	
Lansing Township	27.0	30.28	1.7	113.3	111.6	49.0	28.3	11.8	
Onondaga	39.0	44.91	10.0	176.0	166.0	60.0	51.3	23.9	
East Lansing	33.9	37.30	11.6	260.0	248.4	39.4	25.5	10.2	
Lansing City	30.0	34.98	1.1	304.0	302.9	44.0	29.9	10.7	
Mason	26.6	30.09	6.2	367.5	361.3	45.6	25.6	12.7	
Leslie Village	33.3	41.43	7.3	503.1	495.8	52.2	35.0	14.2	

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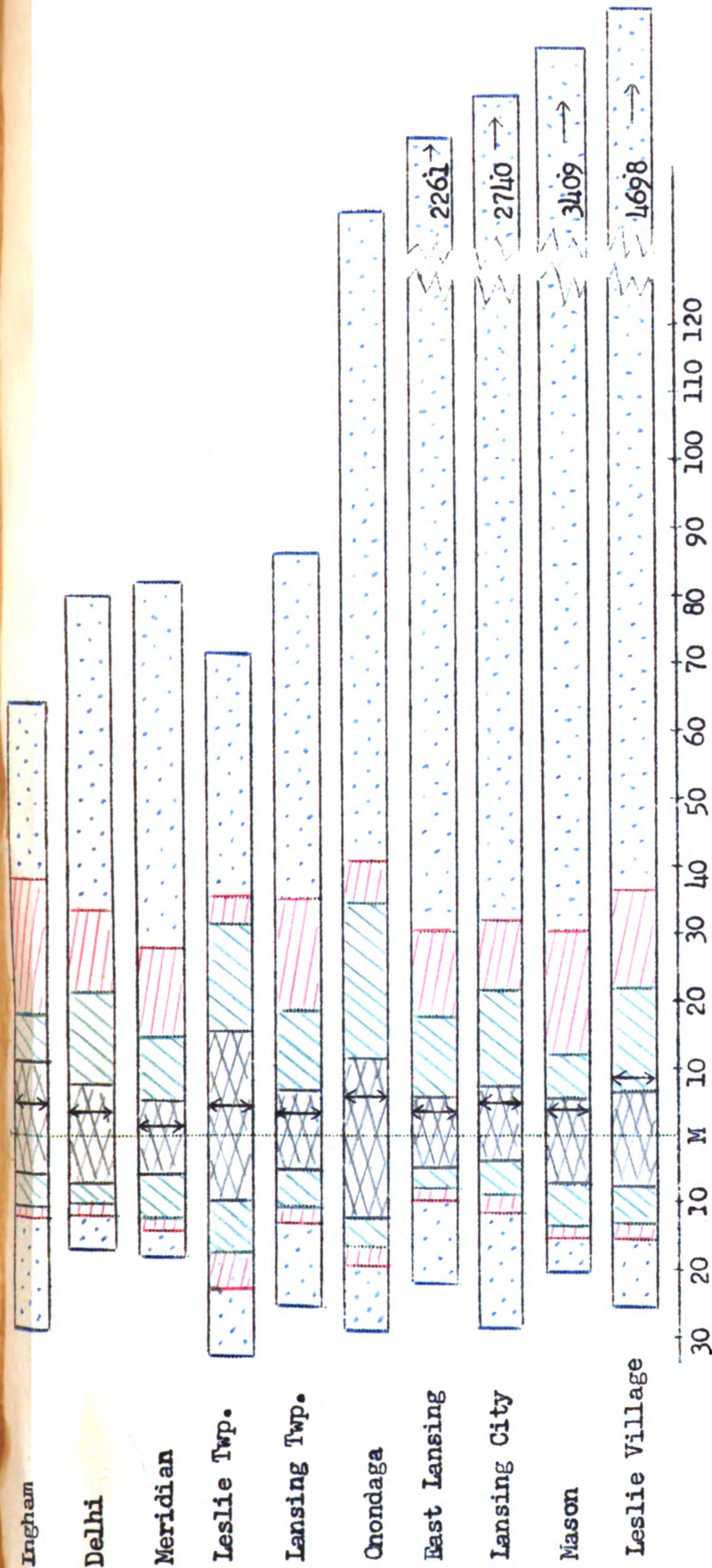
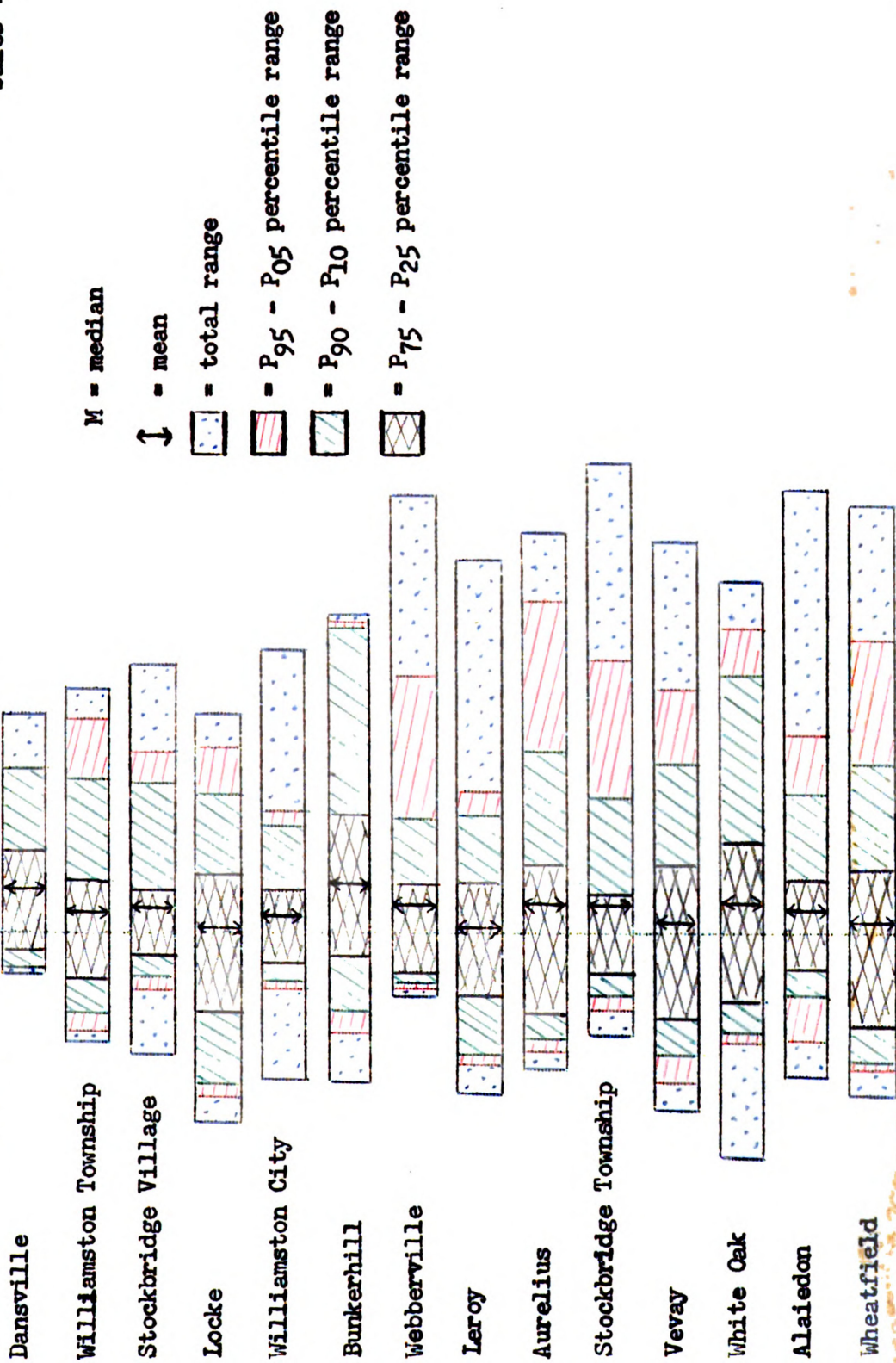


Figure 2. Total range, and P₉₅ - P₀₅, P₉₀ - P₁₀, and P₇₅ - P₂₅ percentile ranges of individual assessment ratios in 24 assessment districts of Ingham County, Michigan. The median assessment ratio is assumed as origin for each assessment district.

30 20 10 M 10 20 30 40 50 60 70 80 90 100 110 120 Percent of sales value



the median, are symbolized by the bar to the left of the origin. The 50 percent with higher ratios are shown to the right of the zero point. This median assessment ratio at the origin assumes a different value in each case, however. These values are given in Table II and Figure 3. Thus Figure 2 does not place these ranges into their original position in terms of percent of sales values but aligns them at their midpoints for direct comparison. The full ranges as given in Table I are broken up into a negative section below the median and a positive section above it in Figure 2.

In order to illustrate the extent to which the ranges in Figure 2 were shifted by assuming the median as the origin for each assessment district the average and median assessment ratios are shown in Figure 3. The largest deviation of medians appears between Wheatfield and Meridian Townships. It amounts to 44.1 percent of sales values. The assessment districts were arranged in Figure 3 in order from the highest to the lowest average assessment ratio.

Figure 2 shows also that in all the assessment districts the distribution of the assessment ratios is skewed left. More than half the number of properties in this case are assessed at a relative level of assessment below the average and a relatively large number of assessment ratios of individual properties are found to be concentrated in a relatively small range which necessarily is limited in regard to its lowest possible value by zero assessment. No such limit is given for high assessments.

The total range will therefore be mostly affected by the highest assessment ratio since too high assessment ratios can be and are found to be spread over an unlimited range. Total ranges are found to vary

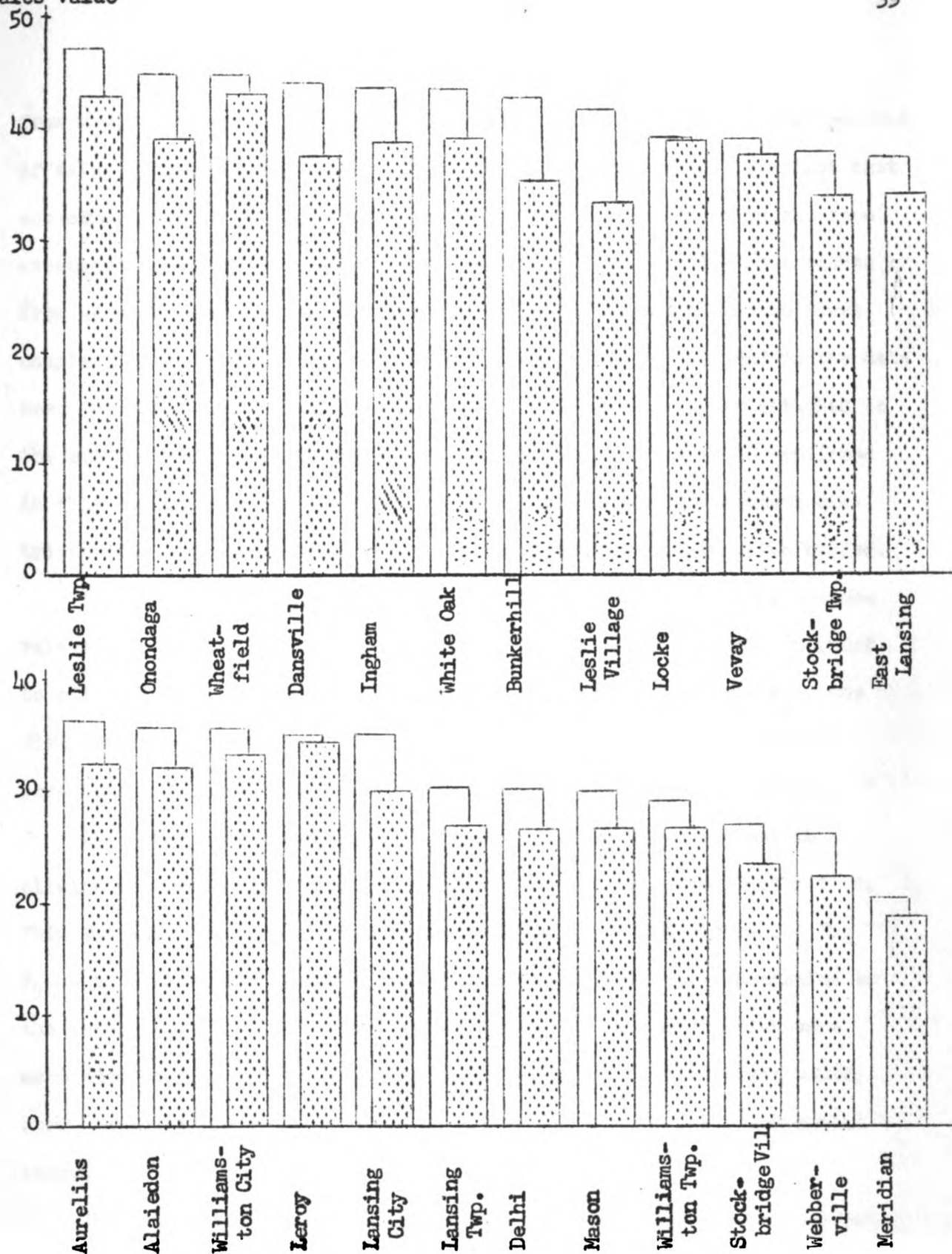


Figure 3. Average assessment ratios and median assessment ratios in 24 assessment districts of Ingham County, Michigan.

from a difference in the assessment ratios of 40.4 percent to 495.8 percent of sales values. Ranges up to 100 percent are very common. The fact that assessment ratios of 7.3 percent and 503.1 percent are found in the same assessment district indicates extreme deviations of relative assessments from an equal average value. Since, however, as indicated in the first chapter, undetectable errors of various kinds might be included in the data used for this study, only limited emphasis and importance was attached to the extreme values as indicated by the total range. It may be mentioned in this connection, however, that three out of the four assessment districts with the widest total ranges of assessment ratios involved cities.

It was assumed that errors were responsible for some of the extreme values of assessment ratios which determined the total ranges. In order to eliminate these errors and to obtain a more realistic picture of the distribution of assessment ratios the relative assessments of various percentile levels of the transfers in each district were determined.

The percentile range $P_{95} - P_{05}$ was assumed to be sufficient to eliminate errors causing extreme values of individual assessment ratios. This was actually accomplished as shown in Table II and Figure 2. The $P_{95} - P_{05}$ percentile ranges do not show any similarity or association to the total ranges. All four cities in the county, three of which were mentioned to have extremely large total ranges of relative assessments, show comparatively small or average ranges for the $P_{95} - P_{05}$ percentile range.

The values for the $P_{95} - P_{05}$ percentile ranges vary from 27 percent to 69 percent. This is still very high for a good assessment. Deviations of 10 percent of the average assessment ratio can be accepted as a tolerance

for a good quality of assessment in a district. The $P_{95} - P_{05}$ percentile ranges go far beyond these tolerance limits in all cases.

To compare the quality of assessment as indicated by the various percentile ranges on an equal and comparable basis for all the assessment districts these ranges were expressed in terms of the average assessment ratio in each assessment district and are presented in Table III.

From this table we see that the best, that means the smallest, $P_{95} - P_{05}$ percentile range still amounts to 75.8 percent of the average assessment ratio. In all other cases this range is still larger than 100 percent of the average assessment ratio and extends over more than 200 percent in one district.

This means that in the case of the district with the smallest $P_{95} - P_{05}$ percentile range (measured in terms of the average assessment ratio) the highest assessed property shows an assessment ratio more than twice as high as the lowest assessed property which distributes their respective tax loads according to the same proportions. The assessment ratio of the lowest assessed property in this percentile range amounts to seven-tenths of the average ratio in this district whereas the assessment ratio of the highest assessed property is almost one and one-half times as high as the average. In the district with the highest $P_{95} - P_{05}$ percentile range of assessment ratios, however, the highest assessed property pays proportionally more than nine times as much in taxes as the lowest assessed property, the lowest assessment ratios amounting to one-fourth of the average and the highest is 2.3 times as high as the average.

The values in Table III representing the various ranges in percent of the average ratios are a direct indication of the quality of assessment.

TABLE III

TOTAL RANGE AND P₉₅ - P₀₅, P₉₀ - P₁₀, P₇₅ - P₂₅ PERCENTILE RANGES,
EXPRESSED IN PERCENT OF AVERAGE ASSESSMENT RATIOS, IN 24
ASSESSMENT DISTRICTS IN INGHAM COUNTY, MICHIGAN

	Total range	P ₉₅ - P ₀₅	P ₉₀ - P ₁₀	P ₇₅ - P ₂₅
Dansville	91.78	--	69.29	33.39
Williamston Township	183.59	162.41	120.04	50.44
Stockbridge Village	221.65	135.57	111.19	36.94
Locke	161.16	137.59	113.76	54.57
Williamston City	185.62	75.82	68.24	31.73
Bunkerhill	167.21	147.10	137.98	50.98
Webberville	293.25	181.71	97.50	51.59
Leroy	235.18	119.73	104.05	48.75
Aurelius	227.64	189.93	121.11	62.48
Stockbridge Township	232.69	143.01	80.92	32.63
Vevay	225.59	156.73	115.36	61.41
White Oak	204.60	146.61	125.66	55.24
Alaiedon	252.31	132.04	87.19	37.29
Wheatfield	202.81	147.42	102.75	53.16
Ingham	213.28	114.46	64.12	38.38
Delhi	320.86	149.01	103.64	47.35
Meridian	487.05	203.71	128.97	51.29
Leslie Township	221.91	124.68	103.83	54.68
Lansing Township	368.56	161.82	93.46	38.97
Onondaga	369.63	133.60	114.23	53.22
East Lansing	665.95	105.63	68.36	27.35
Lansing City	865.92	125.79	85.48	30.59
Mason	1200.73	151.55	85.09	42.21
Leslie Village	1196.72	126.00	84.48	34.27

Since the tolerance limits for a good assessment are expressed in percent of the average the ranges computed as relative values of the average show immediately how the actual assessments compare to the tolerance limits. A range of five percent at an average assessment of 25 percent would be rated equal by this method to a range of 16 percent at an average of 80. Both ranges would be equal to the total tolerance of 20 percent of the average in this case.

The $P_{90} - P_{10}$ percentile range was investigated next. If some of the extreme assessment ratios caused by errors in the data had not yet been eliminated at the $P_{95} - P_{05}$ percentile range, the elimination of the upper and lower 10 percent of the cases from the district samples at the $P_{90} - P_{10}$ percentile range was assumed sufficient to exclude these errors. The range between the assessment ratios at the $P_{90} - P_{10}$ percentile levels was necessarily somewhat narrower than the $P_{95} - P_{05}$ percentile range but no significant variations were discovered between the two ranges. The elimination of a typical extreme value seems to have been accomplished at the $P_{95} - P_{05}$ percentile range already. The narrowest $P_{90} - P_{10}$ percentile range amounted to 24.3 percent of sales values whereas the widest range in any one district was equal to 59 percent.

Measured again in terms of the average assessment ratios as shown in Table III the smallest $P_{90} - P_{10}$ percentile range amounts to 64.1 percent of the average and the widest range is still 138 percent of the average of its district. Since it was demonstrated that at this range exceptionally high and low values were already eliminated from the sample, this range should fall within the tolerance limits set for a good quality of assessment. Table III shows, however, that the ranges in all the districts amount

to upward from 64 percent of the corresponding average assessment and thus are three to seven times as wide as the accepted tolerance limits.

To find more information about the nature of the distribution and the degree of variation of the assessment ratios around the average the $P_{75} - P_{25}$ percentile ranges were computed. It was found that the smallest $P_{75} - P_{25}$ percentile range was 10 percent whereas the widest one amounted to almost 26 percent of sales values. Again expressed in terms of the average assessment ratios the $P_{75} - P_{25}$ percentile ranges varied between 27.4 percent and 62.5 percent. If the same tolerance of 10 percent above or below the average is used as a standard for good assessment as it was mentioned earlier there is no assessment district which would conform to this standard of good assessment even at the $P_{75} - P_{25}$ percentile range which only includes 50 percent of the cases involved. In fact the widest range is more than three times as wide as the tolerance limits would permit.

This shows that even if some of the deviations of assessment ratios were caused by errors the distribution of only 50 percent of the cases, after excluding the upper and lower 25 percent, was still too wide to conform to standards of uniform assessment.

Variations of Relative Assessment Associated With Total Value of Properties

Numerous studies indicate a strong tendency for assessors to assess low valued properties at a higher percentage of their total value than

properties of higher total value.¹ Some inequality of assessment for different valued properties was therefore expected to prevail in a similar way in Ingham County.

To examine this dependency of the relative level of assessment all the properties included in the study were grouped into seven classes according to their sales values. The class limits which were chosen for the property values were discussed in Chapter I and are reported in Tables IV and V together with corresponding assessment levels and other related information.

The total sample was distributed in such a way between value classes and districts that a simple comparison between the assessment ratios of properties in each value class did not provide much valuable information. Some of the facts that are responsible for this situation are recorded in Table IV. The number of districts represented in each value class shows that only in a small group of districts were sales of high valued properties transacted in the period of the study. Even more important seems to be the number of districts represented with more than two sales in a value class. This eliminates the districts with only one or two sales which do not provide reliable information. This column shows clearly that at sales values of more than \$15,000, the average assessment ratios were

¹R. R. Renne and H. H. Lord. "Assessment of Montana Farm Lands," Montana Agricultural Experiment Station, Bulletin No. 348, Bozeman, Montana, 1937; Estal E. Sparlin. "Inequalities in the Arkansas Property Tax Assessment System," University of Arkansas Agricultural Experiment Station Bulletin No. 369; and C. C. Taylor and G. H. Hull. "Assessment of Farm Real Estate for Tax Purposes in South Carolina," South Carolina Agricultural Experiment Station Bulletin No. 416, Clemson, South Carolina, 1954.

TABLE IV

IMPORTANT FACTORS INFLUENCING THE AVERAGE ASSESSMENT RATIOS OF VARIOUS
SALES VALUE CLASSES OF REAL PROPERTIES IN INGHAM COUNTY, MICHIGAN

Value Class	Number of districts represented	Number of districts represented by more than 2 transfers	Total number of properties included	Number of properties in largest group	Average re- lative assess- ment of largest group	Average re- lative assess- ment of the whole county	Average re- lative assess- ment of 13 rural and sub- urban townships
Below \$5,000	24	24	1208	302	43.29	37.62	43.87
\$ 5,000 - \$ 9,999	24	24	1608	544	34.59	33.27	39.46
\$10,000 - \$14,999	23	21	1153	456	30.45	29.23	35.55
\$15,000 - \$19,999	23	14	490	157	31.44	30.32	32.89
\$20,000 - \$29,999	19	10	273	112	31.65	30.04	33.60
\$30,000 - \$49,999	8	5	79	47	31.86	33.03	--
\$50,000 and above	4	4	37	19	46.05	35.09	--

determined by properties located in a small number of assessment districts and therefore do not really represent a weighted average of the county. The values obtained would rather reflect the average level of assessment of only a few districts.

Another factor is shown by the following two columns in Table IV which give the total number of properties in each value class and the number in the largest district sample for each class. Except for the values from \$20,000 to \$50,000 all the classes are dominated by the city of Lansing with the largest number of transfers. The figures given in these two columns show that especially in the higher value classes, where one assessment district is represented with more than half the total number of properties and where only a small number of districts are represented in the sample, the averages of the value classes can hardly be accepted as being representative of the situation in the whole county. The assessment levels in the dominating district will rather cover up the tendencies prevailing in smaller districts.

To show the general tendency more clearly the presentation of the results were split in two groups in Table V. Group A contains the weighted average for the whole county and lists the assessment ratios for four urban or predominantly urbanized districts. In these districts the majority of the transfers represent residential properties. Most of the sales with a consideration of less than \$5,000 involve lots only. The highest value classes include commercial or industrial properties and luxury housing.

Group B gives the selected weighted average of 13 rural and partly suburban townships and the assessment ratios of four of these townships.

TABLE V

AVERAGE ASSESSMENT RATIOS BY SALES VALUE CLASSES

A: WEIGHTED AVERAGE FOR INGHAM COUNTY AND FOUR SELECTED URBAN AND URBANIZED ASSESSMENT DISTRICTS

B: WEIGHTED AVERAGE FOR 13 RURAL OR SUBURBAN TOWNSHIPS AND FOUR TYPICAL TOWNSHIPS

Value Class	A				B					
	24 District Average	Meridian Township	Lansing Township	City of East Lansing	City of Lansing	13 Township Average	Alaiedon Township	Vevay Township	Stockbridge Township	Williamston Township
Below \$5,000	37.62	19.43	34.07	54.64	43.29	43.87	42.47	48.67	43.64	35.99
\$ 5,000 - \$ 9,999	33.27	25.37	29.40	50.91	34.59	39.46	35.00	39.57	38.02	31.67
\$10,000 - \$14,999	29.23	20.16	27.12	36.14	30.45	35.55	33.44	35.26	32.13	19.47
\$15,000 - \$19,999	30.32	18.17	27.43	34.71	31.44	32.89	22.37	36.51	28.90	20.54
\$20,000 - \$29,999	30.04	16.23	29.15	31.65	34.42	33.60	--	22.02	31.43	--
\$30,000 - \$49,999	33.03	13.72	26.58	31.86	43.59	--	--	--	--	--
\$50,000 and above	35.09	14.23	21.34	37.70	46.05	--	--	--	--	--

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In these areas the sales usually involve inexpensive residential properties and farm properties from smaller tracts of land to whole farms.

Figure 4 visualizes the information contained in Table V. In part A of Figure 4 the curve representing the weighted averages of the whole county for each value class surprisingly shows hardly any general decline of relative assessments for rising property values. A decline in the first half of the curve is followed by an almost equivalent rise in its second half. The other four curves, however, representing individual assessment districts show some variations that are only partly reflected in the county curve. Three of them show a clear, although not very steep, downward slope indicating that the generally observed fact of declining relative assessments with rising total values of properties holds true in these districts also.

For the city of Lansing, however, a decline of relative assessment is shown only for some lower sales value classes, whereas the assessment ratios increase considerably for higher valued properties. In fact the assessment ratios of the two highest value classes exceed those of the lowest one. The city of Lansing actually represents a major part of Ingham County as far as the number of inhabitants and the total value and number of properties are concerned. Therefore a curve showing the average relationship between sales values and relative assessment levels, which is determined by a large number of transfers in the city of Lansing, might be representative of the conditions which affect the majority of the properties in the county. However, it covers up the situation which prevails in most of the assessment districts.

Part B of Figure 4 represents the rural and suburban townships of Ingham County. In this case the declining relative assessments with increasing

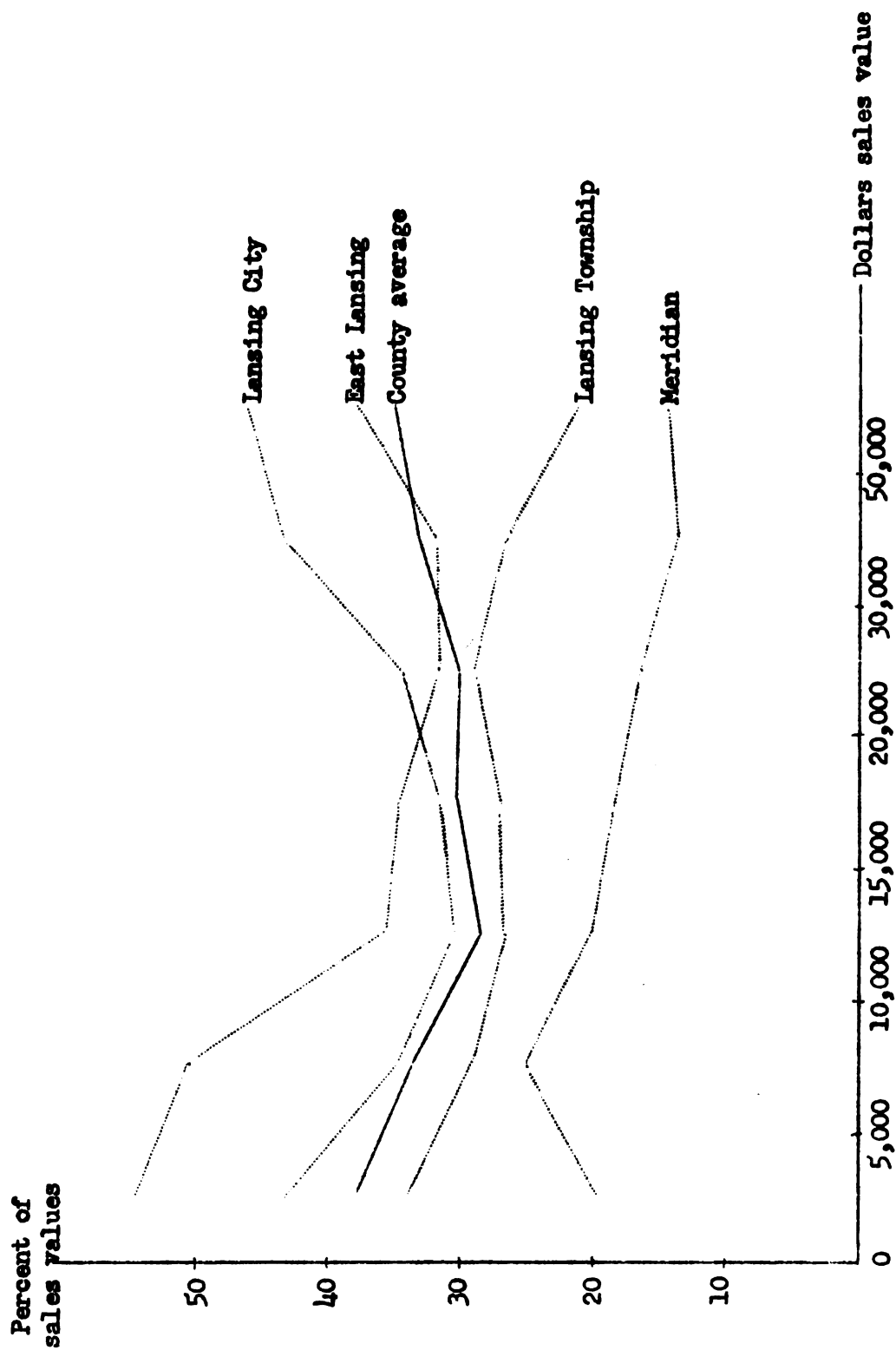


Figure 4. Average Assessment Ratios of Properties of Different Sales Values in Ingham County, Michigan.

A: County Average and Selected Urban and Urbanized Districts.

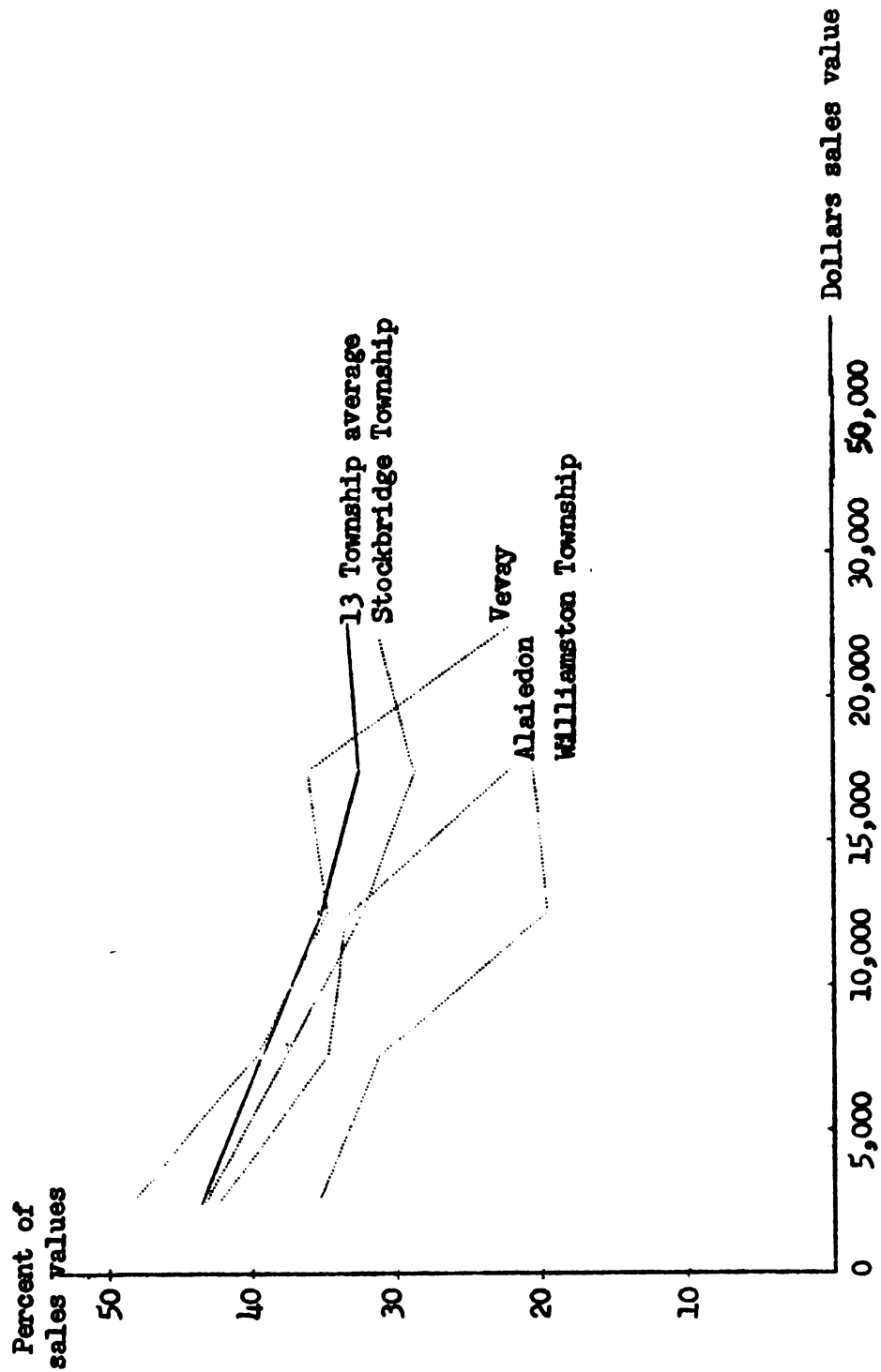


Figure 4. Average Assessment Ratios of Properties of Different Sales Values in Ingham County, Michigan.

B: Average of 13 Rural Townships and Four Selected Rural Townships.

property values are clearly demonstrated indicating that the same systematic inequality of assessment that was found in other parts of the country is also present in the county although not in as drastic forms as was indicated by other studies.²

Variations of Relative Assessment During the Time Period of the Study

The data used in this study include sales transacted in four consecutive years. Since significant changes might have been made during this time in the assessments of the area the question arose concerning the comparability of the data collected from transfers of different years.

If a major reassessment were made in an assessment district during the time period under study the use of assessment data from years before and after the reassessment in a district sample covering the entire period would be considerably complicated. According to information obtained from the county treasurer's office no assessment district in Ingham County had been reassessed between 1950 and 1953. Since then the city of Williamston has been reassessed in 1954 and the city of Lansing in 1955. A reassessment in Meridian Township will be completed soon.

Another significant type of change, which would have to be considered in the use of the data, would be a gradual and systematic adjustment of the assessments over a number of years in any one district.

To determine whether any significant changes might have occurred between 1950 and 1953 the properties studied were classified by years of sale. The average assessed valuation was computed for every class and the

² See footnote on p. 41.

TABLE VI

AVERAGE ASSESSMENT RATIOS AND P₉₀ - P₁₀ PERCENTILE RANGES BY YEARS FOR 1950 - 1953
FOR THE 24 ASSESSMENT DISTRICTS OF INGHAM COUNTY, MICHIGAN

Year	Alaiedon			Aurelius			Bunkerhill			Delhi			Ingham			Lansing Township		
	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀
1950	39.37	27.8	53.3	31.17	16.7	36.4	35.44	23.3	54.4	26.92	18.3	33.3	42.72	28.6	56.5	29.81	22.5	40.0
1951	32.53	23.3	50.0	37.35	20.0	57.0	48.90	33.3	62.5	30.86	18.3	53.3	45.70	30.0	53.3	32.86	22.0	44.1
1952	34.88	16.7	53.3	38.68	22.2	51.0	42.10	23.5	75.0	29.40	17.9	45.0	37.99	26.7	45.9	30.24	18.0	40.0
1953	35.33	23.1	50.0	35.88	16.0	83.3	47.09	24.5	82.3	30.96	16.4	52.0	49.30	35.6	56.5	29.95	15.2	48.9
	Leroy			Leslie Township			Locke			Meridian			Onondaga			Stockbridge Twp.		
	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀
1950	46.47	39.2	53.7	41.00	24.0	60.0	40.40	22.0	60.0	22.36	13.6	31.2	54.40	33.3	87.5	38.70	25.9	53.7
1951	26.76	14.4	35.0	50.22	33.4	66.7	43.30	15.6	67.5	23.35	11.8	35.3	49.87	23.3	64.0	36.84	28.0	40.0
1952	34.75	33.9	36.6	41.38	24.0	64.8	32.51	18.6	40.0	21.51	11.8	30.0	35.40	12.0	50.0	37.68	18.5	56.7
1953	37.73	16.0	56.0	55.93	33.3	78.6	37.02	13.3	48.0	19.00	5.0	32.0	42.42	22.4	75.0	36.74	25.0	46.1
	Vevay			Wheatfield			White Oak			Williamston Twp.			Dansville			Leslie Village		
	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀
1950	53.61	41.0	66.7	53.93	34.5	83.3	48.55	22.0	91.4	35.59	21.3	60.0	--	--	--	50.98	20.0	56.4
1951	34.03	20.8	50.0	43.28	22.0	76.2	37.53	26.7	52.6	36.94	18.7	60.0	52.13	--	--	32.26	23.1	40.0
1952	35.31	18.7	53.0	35.01	26.7	44.0	40.13	25.7	48.5	25.20	12.9	36.4	36.17	--	--	37.94	23.3	62.5
1953	37.62	12.5	73.3	40.02	22.5	53.3	45.77	--	--	26.01	16.7	30.0	43.86	--	--	38.03	15.4	57.9
	Stockbridge Village			Webberville			East Lansing			Lansing City			Mason			Williamston City		
	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀	$\bar{X}$	P ₉₀	P ₁₀
1950	25.46	14.3	32.9	27.53	--	--	40.91	30.0	60.0	33.63	25.7	48.8	29.05	17.3	38.6	38.02	27.3	50.0
1951	25.14	22.0	30.0	21.06	15.0	30.0	34.73	26.6	46.1	34.69	20.5	54.3	29.33	18.0	36.4	34.93	28.6	45.9
1952	28.02	19.0	47.5	26.59	14.6	62.0	35.21	25.8	53.3	35.77	16.7	52.0	32.76	12.6	36.0	33.30	25.0	51.1
1953	27.71	16.0	46.6	29.85	14.3	39.0	37.00	25.5	48.6	35.01	22.1	51.8	28.70	11.8	44.0	34.02	25.7	42.7

total ranges as well as the $P_{95} - P_{05}$, $P_{90} - P_{10}$, $P_{75} - P_{25}$ percentile ranges were listed. Part of these results are shown in Table VI.

From the results obtained, no significant changes by year of sale were observed for any one district. It appears therefore, that no significant changes in the assessed valuations of the county has been made between 1950 and 1953.

Every year the county board of equalization determines an equalized total assessed valuation for all property in each assessment district. To this equalized value a uniform county tax rate is applied to determine the total amount of county taxes to be raised in the particular year. This total county tax is then divided into the total assessed valuation as given by the assessment rolls to determine the actual tax rate which is then applied to the assessed valuation of taxable property in this assessment district to determine the amount of county tax to be paid by each property. This process of equalization is supposed to eliminate any differences in the assessment level between assessment districts. The total value for the county should be equal to that prescribed by the state board of equalization.

The discussion of the differences between assessment districts was reserved for the next chapter. Here short reference only will be made to the effect of this process of equalization upon the relative assessment within each assessment district for four consecutive years.

The results for eight selected assessment districts were presented in Table VII to show the relationship prevailing from year to year between assessment ratios and equalized ratios. The selection was made according to the smallest variations of assessment ratios from year to year. Such variations are assumed to be caused by small sample sizes which result in

TABLE VII

AVERAGE ASSESSMENT RATIOS AND EQUALIZED RATIOS FOR THE YEARS 1950 - 1953
IN EIGHT SELECTED ASSESSMENT DISTRICTS OF INGHAM COUNTY, MICHIGAN

Year	Delhi Township		Lansing Township		Meridian Township		City of East Lansing		Lansing City		City of Mason		Williamston City		Vevay Township	
	a	e	a	e	a	e	a	e	a	e	a	e	a	e	a	e
1950	26.92	34.22	29.81	31.71	22.36	28.75	40.91	43.15	33.63	35.92	29.05	41.66	38.02	43.20	53.61	64.89
1951	30.84	40.66	32.86	33.32	23.35	31.18	34.73	36.17	34.69	36.56	29.33	45.94	34.93	39.61	34.03	40.78
1952	29.40	38.60	30.24	20.75	21.51	28.44	35.21	36.28	35.77	35.77	32.76	51.32	33.30	37.52	35.31	41.89
1953	30.96	40.54	29.95	29.12	19.00	25.00	37.00	37.72	35.01	36.09	28.70	43.89	34.02	38.23	37.62	46.69

a = Average assessment ratios.
e = Equalized assessment ratios.

large deviations of sample means from the average relative assessment level of the district. The districts with the smallest variations turned out to be the urban and urbanized districts of the county for which a large number of sales were recorded each year than for rural townships.

The equalized ratios were computed in accordance with the equalized valuations in the assessment districts to that the relationship of assessment ratios to equalized ratios corresponds to the relationship of total assessed valuations to total equalized valuations in each district. The method of computing these values is explained in great detail in Chapter IV.

The results shown in Table VII indicate that a rather stable relationship existed between the assessment ratios and equalized ratios from year to year in each of the districts. This only shows that a certain order of treatment of the assessment districts had been adopted by the county board of equalization which was not amended for any of these districts during the years from 1950 to 1953. At the same time the total assessed valuations and with them the equalized valuations rose steadily in all the assessment districts. Since the relative level of assessment did not rise significantly at the same time the increase in total assessed values must have been caused by an actual increase in the total number and value of properties. More will be said about the assessment and equalized ratios in connection with a comparison between assessment districts in the next chapter.

Three of the districts listed in Table VII were shown graphically in Figure 5. The lines demonstrating the assessed and equalized valuations in percent of sales values in these districts show the rather constant relationship between these corresponding ratios from year to year in each district. Only small differences can be found in the relative treatment of these districts during the observed number of years.

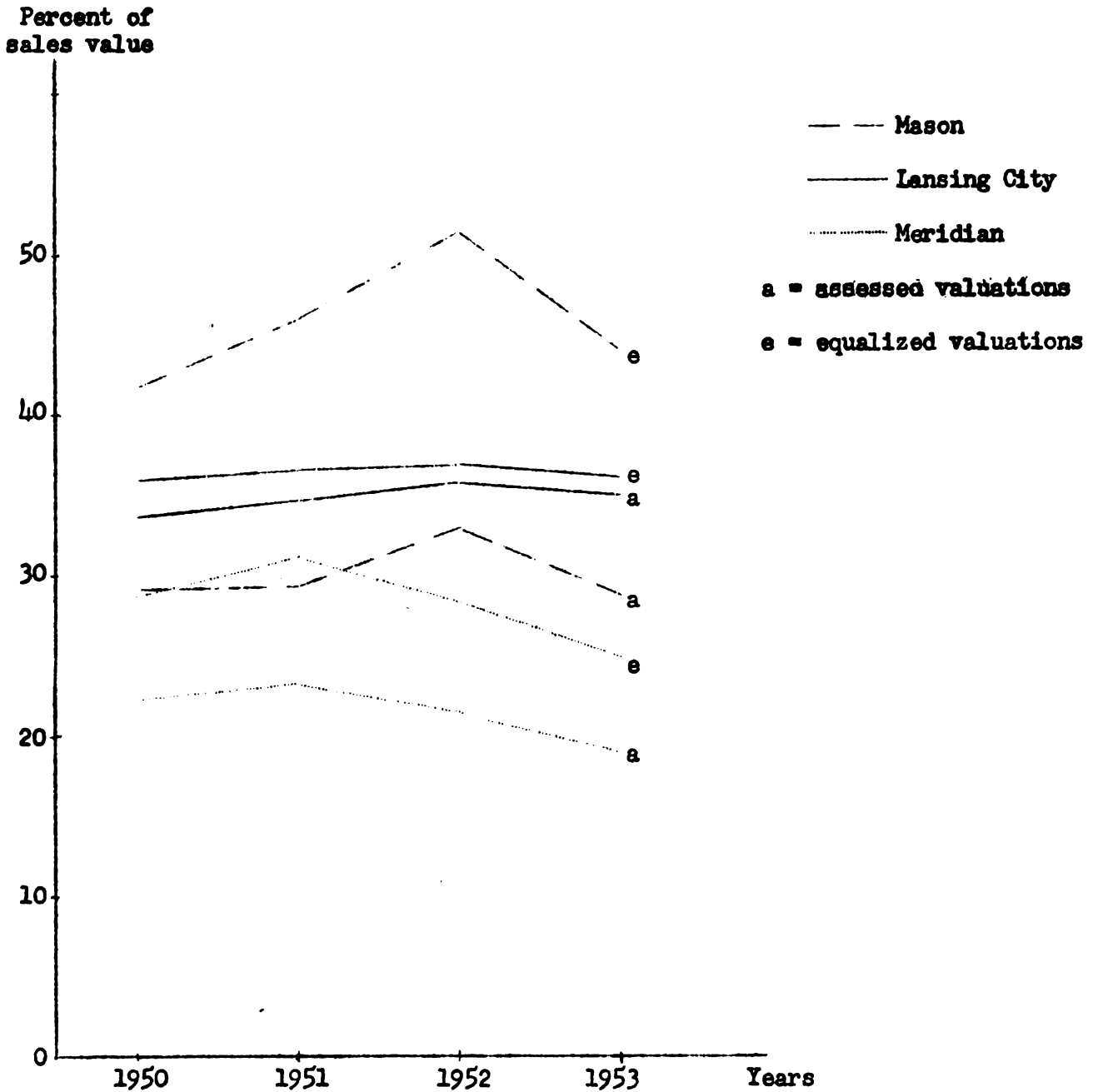


Figure 5. Average assessed valuations in terms of book values and equalized values, expressed in percent of sales values, for three selected assessment districts of Ingham County, Michigan, in the years 1950 - 1953.

Variations of Relative Assessment Between Buildings of
Different Age in the City of East Lansing

In times like the present, which are characterized by continuously changing price levels, changing styles and techniques of construction, and a building boom, important problems arise particularly in residential areas regarding the assessment of building properties of different age. Owners of new houses tend to suspect that their properties were over-assessed in comparison to older houses. At the same time the obsolete style and depreciation of values of older houses often makes their owners feel that the tax load on these properties is too high in comparison to new housing properties.

To examine whether any differences existed between properties of different building ages a special study was conducted in the city of East Lansing in which the relative assessment levels of old and new houses were compared.

The dividing line between "old" and "new" buildings was drawn with the help of a city map of the year 1942. The individual deed records were checked against this map and houses which were recorded on the map were classified old, others as new. The dividing date has the advantage that the building activity was interrupted during the war and early postwar years so that this year represented a distinct dividing point between old and new houses.

Important characteristics of the samples representing the old and new building properties in the city of East Lansing were listed in Table VIII. The number of subdivisions and individual properties in each group show that a larger sample was available for old buildings. The highest

TABLE VIII

IMPORTANT CHARACTERISTICS OF SAMPLES OF OLD AND NEW BUILDING
 PROPERTIES IN THE CITY OF EAST LANSING, WHICH WERE COMPARED
 TO DETERMINE THE SIGNIFICANCE OF DIFFERENCES BETWEEN THEIR
 AVERAGE RELATIVE ASSESSMENT LEVELS

	Old Building	New Building
No. of subdivisions	36	24
No. of subdivisions containing only old or new buildings	15	3
No. of individual properties	330	118
(In percent of sales value)		
Highest average assessment ratio in a subdivision	57.18	49.37
Lowest average assessment ratio in a subdivision	28.84	29.92
Average assessment ratio of the individual properties	37.25	36.08
Mean of subdivision averages	37.05	35.33
Standard deviation of sub- division averages	6.27	5.76
Total Range	11.6 - 135.4	16.5 - 75.0
P ₉₅ - P ₀₅ Percentile range	24.6 - 68.7	26.4 - 47.7
P ₉₀ - P ₁₀ Percentile range	26.2 - 53.3	28.1 - 43.5
P ₇₅ - P ₂₅ Percentile range	28.8 - 39.3	31.2 - 38.5

and lowest average assessment ratios are quite similar in each group. The total range and the various percentile ranges of the individual assessment ratios are wider in all cases for the older buildings, which might partly be a result of the larger sample. The means of the subdivision averages, the difference of which was tested for significance in this section, are compared to the average assessment ratios of individual old and new buildings. The standard deviations of both groups of subdivision averages are also given in Table VIII.

To test the significance of any difference in the assessment levels of old and new houses a t-Test³ was applied on the assumption that the means of the assessment ratios of old and new houses of the individual subdivisions in the city are normally distributed.

³ Dixon and Massey. Introduction to Statistical Analysis, New York: McGraw-Hill, 1951, pp. 102-103.

² To prove or disprove that two populations have the same mean when σ^2 is not known.

$$t = \frac{\bar{X}_1 - \bar{X}_2}{S_p \sqrt{(1/N_1 + 1/N_2)}}$$

$$\text{where } S_p^2 = \frac{\sum X_{1i}^2 - \frac{(\sum X_{1i})^2}{N_1} + \sum X_{2i}^2 - \frac{(\sum X_{2i})^2}{N_2}}{N_1 + N_2 - 2}$$

when $\sum X_{1i}^2$ = sum of squares of averages for old houses

$\sum X_{2i}^2$ = sum of squares of averages for new houses

$\sum X_{1i}$ = sum of averages for old houses

$\sum X_{2i}$ = sum of averages for new houses

The difference of the average assessments of old and new houses being 37.05 percent for old houses and 35.33 percent for new houses was found to be not significant at the five percent level. This means that no systematic inequalities of assessment are associated with different ages of buildings in the city of East Lansing.

In connection with this comparison the questions arose as to the kind and number of adjustments of assessments which were made by the assessor between the two years which were recorded for every transaction. A summary of the facts discovered in connection with the changes of assessment is given in Table IX.

In each age group the number of changes which had been made on the assessments of the observed properties were expressed in percent of the total number of transfers. It might have been expected that more adjustments were required for old properties to take account of varying building and neighborhood conditions causing different rates of appreciation or depreciation. It was actually found, however, that almost twice as many changes had been made in the case of new building properties than for old ones. The respective figures were 10.30 percent of all the old building properties and 18.64 percent of all the new building properties included in the study. An explanation for this fact, however, is at least partially found in the fact that some of these changes of assessment on new houses are actually original assessments on the newly constructed house whereas the assessment in the previous year was on the empty lot only or on a partially completed building. Furthermore the values of new properties are often changed shortly before or after the sale through finishing of

TABLE IX

SUMMARY OF IMPORTANT FACTS RELATING TO CHANGES OF ASSESSMENTS
OF OLD AND NEW BUILDING PROPERTIES BETWEEN THE YEAR
OF SALE AND THE YEAR AFTER SALE IN THE CITY OF
EAST LANSING, MICHIGAN

	Old Buildings	New Buildings
No. of changes	34	22
Percentage of changed properties	10.30	18.64
No. of increases of lower than average assessment	25	14
No. of decreases of higher than average assessments	2	0
No. of increases of higher than average assessments	7	8
No. of averages of subdivisions raised	12 out of 36	13 out of 24
No. of averages of subdivisions lowered	2 out of 36	0

basements and other rooms of the house and addition of garages and improvements around the house.

Most of the adjustments made were increases of low assessments, thus diminishing the deviations of assessment ratios from the average value, i.e. improving the quality of assessments. In two cases a downward adjustment of high relative assessments had the same final effect. In some cases assessments were increased which already amounted to a higher than average fraction of the sales value of the respective properties. Few of these increases of high assessments resulted in a widening of the range of assessment ratios both in terms of percent and sales values and relative to the average level of assessment.

CHAPTER IV

COMPARISONS OF RELATIVE ASSESSMENT BETWEEN VARIOUS AREAS IN INGHAM COUNTY

Variations of Relative Assessment Levels Between Assessment Districts

Except in the cities, most of the assessing of property for tax purposes in Michigan is done by township supervisors. Since these officials are rarely elected because of their ability to appraise properties, wide variations often occur between the levels of assessment found in different assessment districts.

Political considerations, failure to adjust to changing market values, general ease in administration and other similar factors often cause assessors to keep the level of assessment low in their districts. Other factors such as the need for a larger tax base often cause higher levels of relative assessments. Since individual assessors tend to follow their own inclinations, wide differences often exist between the assessment levels found in contiguous taxing districts.

These differences in assessment were anticipated by the state legislature when it arranged for the equalization functions carried on by the county boards of equalization. To improve the tax base which is provided by the assessment figures established by township and city assessors and approved by local boards of review the county board of equalization has to obtain estimates of the existing differences between the relative level of assessment in the various assessment districts. The success of

the county board of equalization in compensating these differences depends largely on the precision of these estimates. It was one objective of this study to discover the extent of the inequalities which existed between the levels of relative assessment of Ingham County.

The sample used in this study has one shortcoming when used for this purpose. For accurate measurement of the average level of relative assessment to find the differences between the assessment districts the sample should be representative of the various types of properties which compose the total property value in each assessment district. The sample of this study was determined, however, by the frequency of bona fide sales which were transacted during the observed period. Since the average assessment ratios, which were computed from the available sample, were the best estimates of the relative assessment levels in the assessment districts of Ingham County which could be obtained from the collected data, these values were used for interdistrict comparisons of relative assessment levels. The limitations of these values must be kept in mind, however.

The averages of the assessment ratios in each district are listed in Table X in order from the lowest to the highest average relative assessment. This list shows that considerable differences in the levels of assessment do exist between the various assessment districts of the county. The fact that the highest assessment ratio, which was found in Leslie Township with 47.00 percent of sales values, is more than twice as high as the relative assessment level of 20.47 percent in Meridian Township illustrates this clearly. The ratios for the other 22 districts are distributed over this whole range; but a relative large number falls between 34 and 39 percent of sales values. These assessed valuations are also shown in Figure 3 for all

TABLE X

AVERAGE ASSESSMENT RATIOS OF ALL THE PROPERTIES AND OF THE PROPERTIES ON THE HIGHEST AND LOWEST SALES VALUE CLASSES, AND P₉₅ - P₀₅ PERCENTILE ASSESSMENT RATIOS IN 24 ASSESSMENT DISTRICTS OF INGHAM COUNTY, MICHIGAN, THE SAMPLE INCLUDES TRANSFERS MADE IN THE YEARS FROM 1950 to 1953

	Average relative assessment	Average assessment ratio of:		P ₉₅ - P ₀₅
		Highest assessed value class	Lowest assessed value class	
Meridian	20.47	25.37	13.72	5.0 - 46.7
Webberville	26.36	30.51	24.55	14.1 - 62.0
Stockbridge Village	27.07	32.79	23.36	15.0 - 51.7
Williamston Township	29.74	35.99	19.47	11.7 - 60.0
Mason	30.09	38.21	20.95	11.5 - 57.1
Delhi	30.20	37.14	20.80	15.0 - 60.0
Lansing Township	30.28	34.07	21.34	13.3 - 62.3
Lansing City	34.98	46.05	30.45	18.2 - 62.2
Leroy	35.08	41.80	28.15	14.0 - 56.0
Williamston City	35.61	41.60	30.30	25.0 - 52.0
Alaiedon	35.67	42.47	22.37	15.4 - 62.5
Aurelius	36.33	40.63	33.30	14.3 - 83.3
East Lansing	37.30	54.64	31.65	24.6 - 64.0
Stockbridge Township	37.69	43.64	28.90	21.7 - 75.6
Vevay	38.92	48.67	22.02	14.0 - 75.0
Locke	39.03	43.81	34.44	13.8 - 67.5
Leslie Village	41.43	55.88	29.37	17.8 - 70.0
Bunkerhill	42.76	50.50	33.96	20.0 - 82.9
White Oak	43.45	45.90	41.73	22.0 - 85.7
Ingham	43.51	46.96	40.31	26.7 - 76.5
Dansville	44.02	45.77	45.13	-- - --
Wheatfield	44.77	55.30	36.20	22.0 - 88.0
Onondaga	44.91	53.44	33.14	20.0 - 80.0
Leslie Township	47.00	47.85	45.80	20.0 - 78.6

[illegible]

the assessment districts of the county, together with the median assessment ratios.

Table X lists also the average assessment ratios of the highest and lowest assessed value classes in each assessment district. The higher assessment level was in the majority of the districts found in a lower sales value class than the lowest assessment level. One of the few exceptions to this rule was found in the city of Lansing which makes these exceptions very important in terms of numbers and value of properties in the county. On the average the variations of average assessment levels between different value classes of properties are, although considerable, not as wide as in some other parts of the United States according to some earlier studies.¹

The P_{95} - P_{05} percentile ranges are also listed in Table X for each of the assessment districts. It is not surprising that the assessment ratios at the 05 and 95 percentile levels rise with rising assessment levels in the districts.

The information contained in Table X is illustrated in Figure 6 for the lowest and highest assessed district in the county. As this figure indicates, the average level of assessment in terms of sales values was more than twice as high in Leslie Township than in Meridian Township. For comparison the average level of relative assessment for the whole county is shown. Further information visualized in Figure 6 includes the average assessment ratios of the highest and lowest assessed value classes and the P_{95} - P_{05} percentile ranges of Leslie and Meridian Townships.

¹ See footnote No. 1 on p. 41.

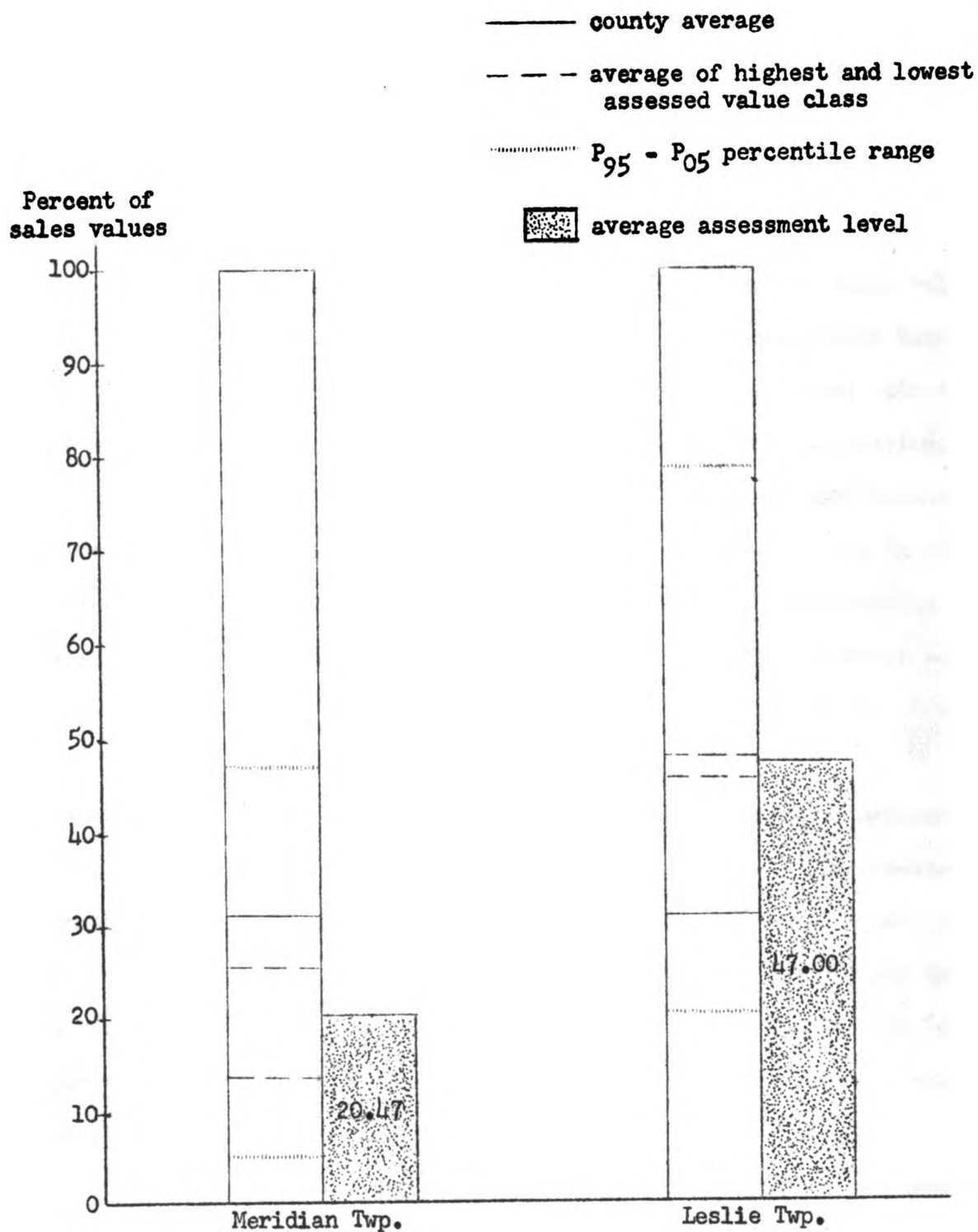


Figure 6. Average relative assessment level of lowest and highest assessed districts in Ingham County, Michigan, compared to 100 percent of sales values.

The average variation of relative assessments associated with different value classes in Leslie Township happens to be the smallest in Ingham County with only 2.05 percent of sales values. The variation shown for Meridian Township is about average. The highest degree of variation between sales value classes was found in Vevay Township with 26 percent of sales values.

The differences in the average levels of relative assessment between assessment districts discussed above are not directly projected into the respective tax loads of these districts. The process of equalization, the purpose of which is the elimination of differences between the relative assessment levels of assessment districts, was described shortly in the previous chapter. It is the task of the county board of equalization to assign values to the individual assessment districts which in every case are supposed to represent equal fractions of the respective total value of property in these districts.

The county tax is spread on the basis of the equalized valuations of the assessment districts. A county tax rate is charged to the assessed valuations of the individual properties which makes the total amount of county tax raised in the district equal to the total tax determined on the basis of the equalized valuation. This applied county tax rate is supposed to compensate for any differences in the average level of assessment between assessment districts.

The county equalized figures for the years since 1950 were examined to determine the extent to which complete equalization had been attained. In Table XI the average assessment ratios of the years 1950 to 1953 were listed for each assessment district together with the corresponding equalized ratios. The equalized ratios were calculated from the proportional equation:

TABLE XI

AVERAGE ASSESSMENT RATIOS AND EQUALIZED RATIOS OF THE ASSESSMENT DISTRICTS
OF INGHAM COUNTY, MICHIGAN, FOR THE YEARS 1950 - 1953

Year	Alaiedon		Aurelius		Bunkerhill		Delhi		Ingham ¹		Lansing Township		Leroy ¹		Leslie Township ¹	
	a	e	a	e	a	e	a	e	a	e	a	e	a	e	a	e
1950	39.37	44.04	31.17	36.71	35.44	41.53	26.92	34.22	42.72	44.81	29.81	31.71	46.47	59.48	41.00	42.76
1951	32.53	36.23	37.35	43.73	48.90	55.45	30.84	40.66	--	--	32.86	33.32	41.06	52.56	46.87	48.88
									45.70	46.54			26.76	35.65	50.22	51.77
1952	34.88	38.66	38.68	44.94	42.10	46.21	29.40	38.60	47.18	48.05	30.24	30.75	24.86	33.12	40.68	41.93
									37.99	38.63			34.75	46.16	41.38	42.33
1953	35.33	38.96	35.88	42.78	47.09	50.08	30.96	40.54	37.57	38.20	29.95	29.12	29.31	38.93	39.09	39.99
									49.30	50.10			37.73	50.39	55.93	56.39
									47.03	47.80			33.35	44.54	46.17	46.55
	Locke		Meridian		Onondaga		Stockbridge ¹ Township		Vevay		Wheatfield		White Oak		Williamston Township	
	a	e	a	e	a	e	a	e	a	e	a	e	a	e	a	e
1950	40.40	48.00	22.36	28.75	54.40	64.56	38.70	47.93	53.61	64.89	53.93	63.92	48.55	57.90	35.59	41.65
1951	43.30	51.76	23.35	31.18	49.87	59.54	30.03	40.91	34.03	40.78	43.28	48.94	37.53	44.86	36.94	45.52
							36.84	45.74								
1952	32.51	38.02	21.51	28.44	35.40	42.26	32.02	39.75	35.31	41.89	35.01	39.18	40.13	47.91	25.20	30.97
							37.68	45.56								
1953	37.02	43.23	19.00	25.00	42.47	50.56	32.85	39.72	37.62	46.69	40.02	44.84	45.77	54.49	26.01	32.53
							36.74	43.56								
							29.52	35.00								
	Dansville		Leslie Village		Stockbridge Village		Webberville		East Lansing		Lansing City		Mason		Williamston City	
	a	e	a	e	a	e	a	e	a	e	a	e	a	e	a	e
1950	--	--	50.98	53.17	25.46	31.53	27.53	35.24	40.91	43.15	33.63	35.92	29.05	41.66	38.02	43.20
1951	52.13	53.09	32.26	33.25	25.14	31.21	21.06	28.06	34.73	36.17	34.69	36.56	29.33	45.94	34.93	39.61
1952	36.17	36.78	37.94	38.81	28.02	33.88	26.59	35.32	35.21	36.28	35.77	36.97	32.76	51.32	33.30	37.52
1953	43.86	44.58	38.03	38.34	27.71	32.86	29.85	39.87	37.00	37.72	35.01	36.09	28.70	43.89	34.02	38.23

22.36 = Marks lowest average assessment ratio and equalized ratio in each year.

54.40 = Marks highest average assessment ratio and equalized ratio in each year.

a = Assessment ratios.

e = Equalized ratios.

¹ The assessed and equalized ratios listed first in each year apply to the rural parts of the townships only, the second figures include the incorporated villages on a weighted basis.

$$A\% : E\% = r_e : r_a$$

which was derived by analogy from the equation

$$A : E = r_e : r_a$$

The equalized ratio is then expressed in the formula

$$E\% = \frac{A\% r_a}{r_e}$$

Where A = total assessed valuation of an assessment district

E = total equalized valuation of an assessment district

r_e = No. of mills of equalized valuation charged for county tax

r_a = No. of mills of assessed valuation charged for county tax

A% = Average assessment ratio

E% = Average equalized ratio

A few words should be said about the information that can be obtained from Table XI regarding the county equalization in the years from 1950 to 1953 in Ingham County. If the average assessment ratios for the districts were assumed to be the correct levels of assessment and the equalization were perfect the equalized ratios for all the assessment districts would have to be equal in each year. This could not be expected from the available data since some of the variations in average assessment ratios from year to year are obviously caused by inadequate sample sizes. But even after excluding these deviations of sample means from the evaluations considerable differences between the levels of the equalized ratios can still be observed.

A comparison of some of the values which appear in Table X will illustrate the existing differences. The lowest and highest values of assessment and equalized ratios for each of the four years are marked in Table XI by underlining. From this it can be seen that in three out

of the four years the lowest assessment as well as equalized ratios were found in Meridian Township. Obviously the equalization did not go far enough in this case.

No clear reason can be given for the wide distribution of the highest assessment ratios and equalized ratios among the districts during the four years. In some cases, however, a tentative explanation can be given why the highest equalized ratios occur in certain assessment districts. Surprisingly in one year the city of Mason shows the highest equalized value although in terms of the four year average assessment ratio this city ranks only as fifth lowest out of the 24 districts. The list of actually applied tax rates in Table XII shows that the assessment of the city of Mason was raised more by the county equalization in each of the four years than the assessment in any other district. This study would suggest, however, that the assessments of four other districts which show lower levels of relative assessment than the city of Mason should be raised more in the process of equalization. In this case the board of equalization must have based its decisions during these years on information that was in disagreement with the findings of this study.

In two other years the highest equalized values were found in the townships of Lealie and Onondaga which rank highest and second highest in regard to the average assessment ratio. The changes made by the equalization in these cases might have tended in the right direction but were not sufficient to compensate for the high assessment level of these townships. In the case of Vevay Township a large deviation of the class mean seems to have been responsible for the highest equalized ratios of the year 1950.

Table XI shows that equality in the relative levels of assessment and with it equality of taxation was not achieved between assessment districts through county equalization in the years from 1950 to 1953. Therefore a set of county tax rates were computed which would restore equality of taxation according to the relative levels of assessment discovered by this study. These rates were computed on the basis of the county equalization figures since 1950 and the average assessment ratios found in this study. The tax rates being the number of mills of the assessed valuation that were used by the township treasurers, or suggested for use by the county treasurer, to spread the county tax between the individual properties of their districts are listed in the left column of each assessment district in Table XII. These rates reflect the results of the process of equalization. The rates that were suggested as a result of this study are listed in the right column of Table XII for each assessment district.

These rates were again calculated from the basic formula:

$$E\% : A\% = r_s : r_e$$

The suggested rate is therefore equal to

$$r_s = \frac{E\% r_e}{A\%}$$

Where $E\%$ = the average equalized ratio for the whole county in a single year.

$A\%$ = the average assessment ratio for each assessment district and year.

r_e = No. of mills of equalized valuation charged for county tax.

r_s = suggested No. of mills of assessed valuation to be charged for county tax.

It must be kept in mind that these suggested tax rates cause a complete

TABLE XII

ACTUALLY APPLIED AND SUGGESTED COUNTY TAX RATES FOR THE ASSESSMENT DISTRICTS OF INGHAM COUNTY,
MICHIGAN IN 1950-1955, EXPRESSED IN MILLS OF ASSESSED VALUATIONS

Year	Alaiedon		Aurelius		Bunkerhill		Delhi		Ingham		Lansing Township		Leroy		Leslie Township	
	a	s	a	s	a	s	a	s	a	s ¹	a	s	a	s ¹	a	s ¹
1950	7.55	7.18	7.95	9.07	7.91	7.98	8.58	10.50	7.08	6.62	7.18	9.49	8.64	6.09 6.89	7.04	6.90 6.03
1951	7.24	7.33	7.61	6.38	7.37	4.87	8.57	7.73	6.62	5.22	6.59	7.25	8.66	8.91	6.70	4.75
1952	7.26	6.11	7.61	5.51	7.19	5.06	8.60	7.25	6.66	5.05 5.61	6.66	7.05	8.70	9.59 6.13	6.70	5.86 5.15
1953	6.77	5.94	7.32	5.85	6.53	4.46	8.04	6.78	6.24	5.67 4.26 4.46	5.97	7.01	8.20	7.27 5.56 6.29	6.19	5.45 3.75 4.55
1954	7.25	6.51	7.84	6.40	7.20	5.43	8.78	7.69	6.32	5.34	6.28	7.67	9.16	6.49 7.48	6.81	4.94 5.31
1955	7.38	6.48	8.85	6.36	8.05	5.40	9.32	7.65	9.32	5.33 5.31 5.30	7.08	7.63	9.32	6.45 7.44	7.08	4.92 5.28
Year	Locke		Meridian		Onondaga		Stockbridge Township		Vevay		Wheatfield		White Oak		Williamston Township	
	a	s	a	s	a	s	a	s ¹	a	s	a	s	a	s	a	s
1950	8.02	7.00	8.68	12.65	8.01	5.20	8.36	7.31 8.56	8.17	5.28	8.00	5.24	8.05	5.82	7.90	7.95
1951	7.77	5.50	8.68	10.21	7.76	4.78	8.07	6.47 7.44	7.79	7.00	7.35	5.51	7.77	6.35	8.01	6.45
1952	7.66	6.56	8.66	9.91	7.82	6.02	7.92	5.66 6.49	7.77	6.04	7.33	6.09	7.82	5.31	8.05	8.46
1953	7.17	5.67	8.08	11.05	7.31	4.94	7.28	5.71 7.11	7.62	5.58	6.88	5.24	7.31	4.59	7.68	8.07
1954	7.68	5.95	8.87	11.35	8.02	5.17	7.76	6.17 7.36	7.99	5.97	7.43	5.19	7.83	5.35	8.40	7.81
1955	7.70	5.92	11.80	11.29	8.43	5.15	8.05	6.13 7.32	9.32	5.94	8.85	5.16	8.05	5.32	10.41	7.77
Year	Dansville		Leslie Village		Stockbridge Village		Webberville		East Lansing		Lansing City		Mason		Williamston City	
	a	s	a	s	a	s	a	s	a	s	a	s	a	s	a	s
1950	--	--	7.04	5.55	8.36	11.11	8.64	10.27	7.12	6.91	7.21	8.41	9.68	9.73	7.67	7.44
1951	6.62	4.57	6.70	7.39	8.07	9.48	8.66	11.32	6.77	6.86	6.85	6.87	10.18	8.13	7.37	6.82
1952	6.66	5.89	6.70	5.62	7.92	7.61	8.70	8.02	6.75	6.05	6.77	5.96	10.26	6.51	7.38	6.40
1953	6.24	4.79	6.19	5.52	7.28	7.57	8.20	7.03	6.26	5.67	6.33	6.00	9.39	7.31	6.90	6.17
1954	6.32	5.28	6.81	5.61	7.76	8.58	9.16	8.82	6.81	6.23	6.93	6.64	10.23	7.72	7.31	--
1955	9.32	5.25	7.08	5.58	8.05	8.54	9.32	8.77	6.81	6.19	6.56	--	9.83	7.68	6.81	--

a = Applied county tax rate.

s = Suggested county tax rate.

¹The suggested rate listed first in each year applies to the rural parts of the townships only, the second figure includes the incorporated villages on a weighted basis.

change of the tax base in the county so that they cannot be applied directly to the assessed valuations. This is shown in the following illustration.

The amount of county tax which is allocated to an assessment district is determined by application of a uniform county tax rate to the equalized valuation of the district. A tax rate is then actually applied to the total assessed valuation of the district to obtain the prescribed amount of taxes. This applied rate is inversely related to the uniform rate which is charged to the equalized valuation as compared to the relationship of the assessed valuation of the equalized valuation of the district. This is shown in the following formula:

$$E \cdot r_e = A \cdot r_a$$

$$E : A = r_a : r_e$$

Where E = the total equalized valuation of the assessment district

A = the total assessed valuation of the assessment district

r_e = uniform county tax rate charged to the equalized valuation

r_a = county tax rate applied to the assessed valuation

The suggested tax rate, as listed in Table XII, yields a different amount of tax, however, when applied to the assessed valuation. It actually implies a different equalized valuation for the assessment district. This is shown in an example:

The data given for a selected district were:

Total assessed valuation:	\$ 1,768,300
Total equalized valuation:	\$ 2,555,652
County tax rate applied to the equalized valuation:	5.1 mills
Tax rate applied to the assessed valuation:	7.38 mills
County tax prescribed:	\$ 13,033.83
County tax spread:	\$ 13,050.05

To equalize the relative levels of assessment between the assessment districts of the county a tax rate of

6.48 mills

was suggested for this district. With this tax rate applied to the assessed valuation of the district the total amount of county tax raised would only amount to

\$ 11,458.58

The equalized valuation of the district which is implied by the suggested rate is only equal to

\$ 2,246,780

In a similar way the equalized valuations of all the other assessment districts are changed. They do not add up to the original total equalized valuation of the county so that another tax rate would have to be charged to the new equalized valuation to obtain the originally prescribed amount of taxes. To simplify the example it is assumed that the assessment district which was used as an example, is the only assessment district of the county so that the originally prescribed tax has to be raised in this district alone. The tax rate to be charged to the new equalized valuation would then be

5.80 mills

This new tax rate would again change the rate which has to be applied to the assessed valuations of the district. In this simplified case this applied tax rate would again be equal to the original applied rate. It would certainly change, however, if more than one district were included in the example.

The suggested tax rates were based on the average equalized ratio for the county to make them closely comparable to the applied tax rates. This was actually achieved as the rates listed in Table XII show. The important point to be demonstrated was not their individual value, however, but their relative level indicating how much higher or lower the tax rate charged in one district has to be than in another district to make the tax loads equal in terms of property values in all districts.

The variations of sample means around the average level of assessment from year to year caused by small sample sizes have a disturbing effect on the resulting suggested rates. Nevertheless Table XII shows that the variations between the rates suggested for each of the assessment districts are much wider than the variations between applied rates. This indicates that the equalization did not go far enough to compensate for the differences which actually existed between the relative assessment levels of different assessment districts.

In 1950, for example, the extreme values of the suggested rates were 5.20 mills and 12.65 mills whereas the respective values of the applied rates read 7.04 mills and 9.68 mills. For 1952 the extreme values listed in Table XII as suggested rates were 5.06 mills and 9.91 mills, while the actually applied rates ranged from 6.66 mills and 10.26 mills. The highest suggested rate did not appear in the same assessment district with the highest applied rate, nor is the lowest suggested rate found in the same district with the lowest applied rate. In both years which were listed as examples for extreme values of tax rates the highest suggested rates were found in Meridian Township whereas the highest rates were actually applied in the city of Mason. This shows that Mason was assumed to be

the relatively lowest assessed district in the county by the board of equalization. Meridian Township was found to be the lowest assessed district according to this study.

A special situation is involved in the case of the townships of Ingham, Leroy, Leslie, and Stockbridge which include the incorporated villages of Dansville, Webberville, Leslie, and Stockbridge. These villages are kept separate from the townships in the assessment rolls but are assessed by the township supervisors for the purpose of the county and school taxes and equalized together with the townships. The properties in these villages are assessed separately by a village assessor for village tax purposes. In Tables XI and XII two figures are therefore shown for the assessment and equalized ratios and for the suggested tax rate. The first figure always takes only the township into consideration, the second figure combines the township with the incorporated village on a weighted basis. A comparison of these figures shows also that in three out of the four townships in question the relative assessment was considerably higher on the farms in the township than on the village properties.

In Table XII the actually applied and suggested tax rates are also listed for the years 1954 and 1955. Since no data on assessments for these years were available at the time of this study the suggested rates were computed by using the average assessment ratios of the years 1950 to 1953 for each district. These values could not be used as a basis for computing the suggested tax rates whenever general reassessments had been made in an assessment district. This was the case in the city of Williamston in 1954 and in the city of Lansing in 1955.

Since no data on the new assessments in these districts were available yet no suggested rates were computed for these two cities in the years affected by the reassessments.

A special equalization committee was appointed in Ingham County in 1955 to obtain improved information as a basis for the 1955 equalization. Table XI shows some remarkable changes in the applied tax rates for 1955 as compared to rates in earlier years. For the first time the applied rate for Meridian Township was higher than that of the city of Mason in 1955. It approaches the suggested rate much closer than in the years before. Considerable changes were also made in some other townships which more or less agree with the suggested rates.

It was found to be a common practice in many school districts of most of the assessment districts to charge a millage rate for school taxes that adds up with the county tax rate to 15 mills of the equalized valuation. Since in most cases the equalized valuation was higher than the assessed valuation this total tax rate amounts to more than 15 mills of the assessed valuation. The appendix to this paper shows a map of the school districts of Ingham County and lists the tax rates for the year 1954 to illustrate the property tax situation which applied for the various school districts. The tax rates do not include short term special assessments such as drainage and street improvement taxes.

The tax rates are given as applied to 1953 state equalized valuations. In 1954 the state equalized valuations had to be used for the first time by the county equalization boards according to a decision of the Attorney General. Since 1954 state equalized figures were not available early enough, however, the state equalized valuations of 1953 had to be used.

It is interesting to note that in the case of some school districts the total tax rates in terms of the assessed valuations amount to more than 50 mills. In the second fractional school district of Meridian Township, for example, the total tax rate amounts to 61.24 mills of assessed valuations in 1954.

The quality of the local assessment within the assessment districts was discussed in detail in the first section of Chapter III. The ranges of assessment at various percentile levels are demonstrated in Figure 2 and the high and low values of total ranges and the three investigated percentile levels were mentioned in the discussion in terms of percents of total sales values as well as in percent of the average assessment ratio. There are differences in skewness and in the width of the various ranges between the districts but no important conclusions can be drawn from these differences at this point. None of the assessments in the individual districts conforms to standards of a good assessment.

Variations of Relative Assessment Associated with Different Degrees of Urbanization

It was emphasized in the introduction to this study that Ingham County is presently characterized by rapid urban expansion in the Greater Lansing area and by an extensive suburban movement. This shift of land from farming into potential or actual residential and commercial land uses is accompanied by considerable increases in market values in the respective areas. If assessments do not follow these movements of market prices inequalities of relative assessment levels result between areas that are characterized by different degrees of urbanization. An attempt

was made to determine whether and to what extent inequalities of assessment were associated with different degrees of urbanization in Ingham County at the time under study.

For the purpose of a comparison between such areas the county was classified into four types of areas according to different degrees of urbanization: (1) rural, (2) suburban, (3) urbanized, and (4) urban areas. These areas are drawn into the county map shown in Figure 1. The territory incorporated into the four cities of Ingham County was classified as urban. Certain areas around the city of Lansing, in Lansing, Delhi and Meridian Township classified as "urbanized" by the United States Census of 1950 together with the incorporated villages of the county were treated as urbanized areas. These are mostly built up residential areas outside the cities which include important commercial establishments. Extensive suburban areas or areas in the process of suburbanization surround the city of Lansing and to a lesser degree other communities of the county and stretch out along the major highways not only in the area under study but also in neighboring counties. A large area of the county, however, especially in the south and east portion of it is still classified as rural. According to this classification all the properties which are located in nine out of the sixteen townships are classified as rural, the properties of the remaining seven townships fall according to their location in the township, into rural, suburban or urbanized groups.

To find the differences, if any, in the level of relative assessment between the four classes of properties, the sales studied were sorted into these four classes by IBM and broken down by value classes and years. The average assessment ratios were then computed for all the properties in each

class. The results are listed in Tables XIII and XIV, and demonstrated in Figures 7 and 8 as broken down by value classes and years.

An inspection of these Tables and Figures shows us the following results: The highest relative assessments are in each value class associated with the group of rural properties. City properties show the second highest assessment levels whereas urbanized and suburban properties are assessed at the lowest levels in terms of sales values. There is practically no difference between the levels of relative assessments in urbanized and suburban areas, which is remarkable since urbanized areas usually include somewhat older residential properties and also commercial properties whereas suburban areas are characterized by mostly new residential properties or zones of rapid changes in land use. This equality of assessment agrees, however, with the results of the comparison between properties of different building ages in the city of East Lansing, which was discussed in the previous chapter.

Doubts could be raised whether these results gave a true picture of the existing situation or were accidentally caused by differences in the relative levels of assessment between assessment districts. The majority of the properties constituting the four classes according to degrees of urbanization are located in separate assessment districts. In the seven townships that are divided into two or three of these classes usually the rural or the suburban-urbanized properties are by far in the majority. This suggested the possibility that differences in the average level of relative assessment between the four classes were overshadowed or entirely caused by the distribution of the taxing districts among those four areas.

TABLE XIII

AVERAGE RELATIVE ASSESSMENT LEVELS OF RURAL, SUBURBAN, URBANIZED AND URBAN PROPERTIES IN INGHAM COUNTY, MICHIGAN, BY SALES VALUES CLASSES, ASSESSMENT RATIOS COVERING THE WHOLE COUNTY ARE GIVEN AS A: WEIGHTED AVERAGES OF INDIVIDUAL PROPERTIES AND B: UNWEIGHTED MEANS OF ASSESSMENT DISTRICT AVERAGES. ASSESSMENT RATIOS COVERING SELECTED ASSESSMENT DISTRICTS WHICH INCLUDE MORE THAN ONE AREA CLASSIFICATION ARE GIVEN UNDER C AND D AS WEIGHTED AVERAGES OF INDIVIDUAL PROPERTIES

	Value Classes						
	Below \$5,000	\$5,000- \$9,999	\$10,000- \$14,999	\$15,000- \$19,999	\$20,000- \$29,999	\$30,000- \$49,999	\$50,000 & above
A	Weighted average assessment ratio of rural properties	44.18	40.00	36.93	34.82	37.75	--
	Weighted average assessment ratio of suburban properties	27.74	28.09	23.92	22.54	16.78	28.32
	Weighted average assessment ratio of urbanized properties	34.89	27.94	23.73	25.77	24.00	22.26
	Weighted average assessment ratio of urban properties	43.38	35.32	31.55	32.79	32.38	35.39
B	Unweighted mean of average assess- ment ratios of rural areas	43.46	40.22	35.65	35.59	33.57	--
	Unweighted mean of average assess- ment ratios of suburban areas	30.62	30.27	21.72	23.81	17.76	--
	Unweighted mean of average assess- ment ratios of urbanized areas	36.98	29.90	23.85	23.51	25.13	20.29
	Unweighted mean of average assess- ment ratios of cities	44.44	36.82	31.70	30.19	29.01	37.97
C	Weighted average assessment ratio of rural properties in five rural-suburban townships	44.04	39.25	38.33	32.89	36.15	--
	Weighted average assessment ratio of suburban properties in five suburban townships	35.33	28.62	20.35	27.41	21.43	21.20
D	Weighted average assessment ratio of suburban properties in three suburban-urbanized townships	27.30	27.71	24.11	22.38	16.09	28.36
	Weighted average assessment ratio of urbanized properties in three suburban-urbanized townships	32.76	27.54	23.60	25.13	24.00	22.26

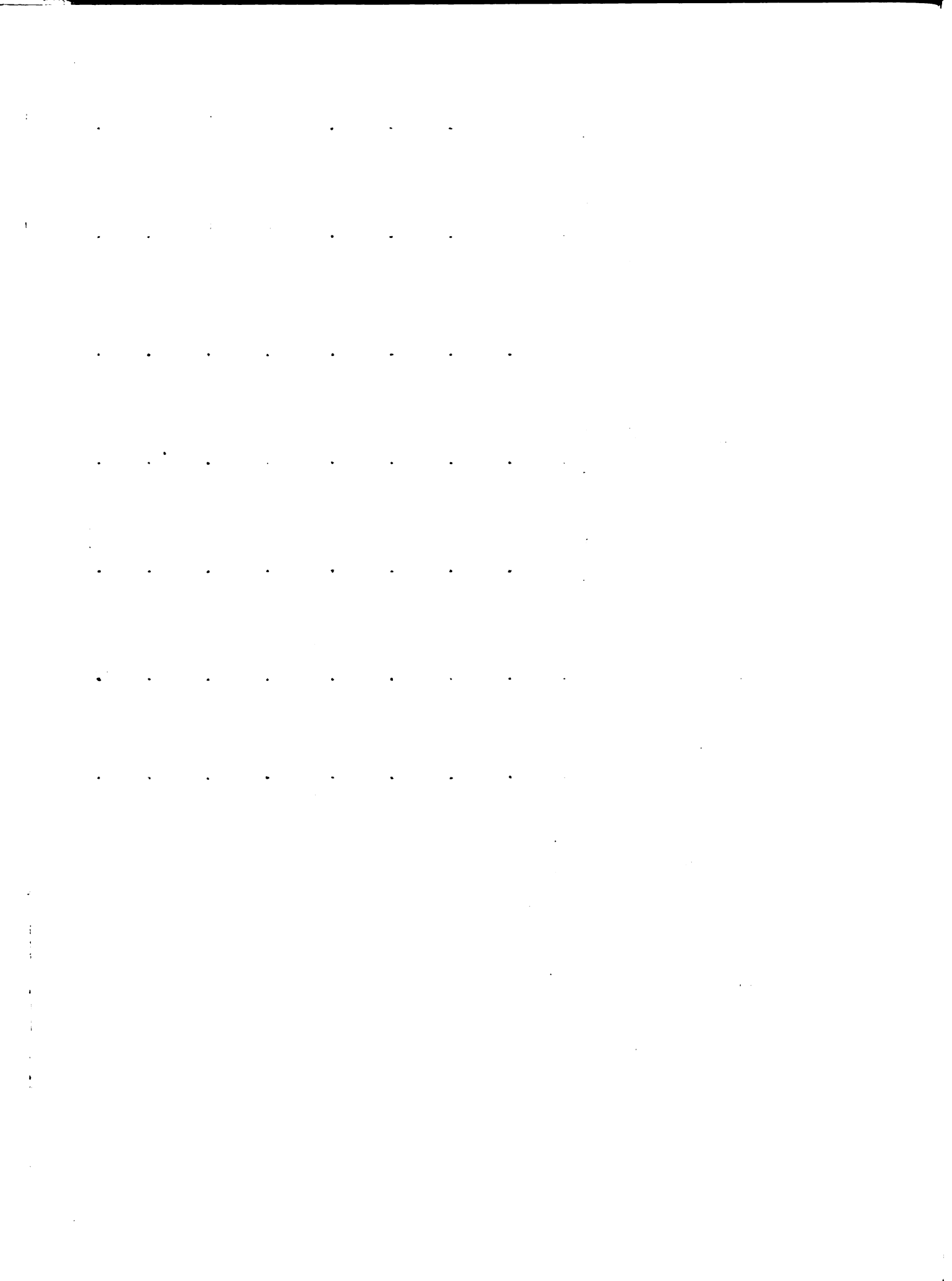


TABLE XIV

AVERAGE RELATIVE ASSESSMENT LEVELS OF RURAL, SUBURBAN, AND URBANIZED AND URBAN PROPERTIES IN INGHAM COUNTY, MICHIGAN, BY YEARS OF SALE. ASSESSMENT RATIOS COVERING THE ENTIRE COUNTY ARE GIVEN A: AS WEIGHTED AVERAGES OF INDIVIDUAL PROPERTIES. B: AS UNWEIGHTED MEANS OF ASSESSMENT DISTRICT AVERAGES. ASSESSMENT RATIOS COVERING ASSESSMENT DISTRICTS WITH MORE THAN ONE AREA CLASSIFICATION UNDER C AND D ARE GIVEN AS WEIGHTED AVERAGES OF INDIVIDUAL PROPERTIES

	1950	1951	1952	1953	
	Weighted average assessment ratio of rural properties	43.87	40.44	36.40	40.87
	Weighted average assessment ratio of suburban properties	29.14	29.44	26.25	24.79
A	Weighted average assessment ratio of urbanized properties	34.93	29.00	29.95	28.48
	Weighted average assessment ratio of urban properties	37.41	32.82	34.86	34.99
	Unweighted mean of average assessment ratios of rural areas	43.98	40.38	36.43	41.11
	Unweighted mean of average assessment ratios of suburban areas	26.54	27.72	26.42	26.96
B	Unweighted mean of average assessment ratios of urbanized areas	30.12	30.64	30.04	31.65
	Unweighted mean of average assessment ratios of cities	35.40	33.42	34.26	33.68
	Weighted average assessment ratio of rural properties in five rural-suburban townships	44.08	40.55	35.18	41.67
C	Weighted average assessment ratio of suburban properties in five rural-suburban townships	30.55	32.11	27.53	29.76
	Weighted average assessment ratio of suburban properties in three suburban-urbanized townships	27.69	29.37	26.38	24.54
D	Weighted average assessment ratio of urbanized properties in three suburban-urbanized townships	26.47	28.59	27.80	27.99

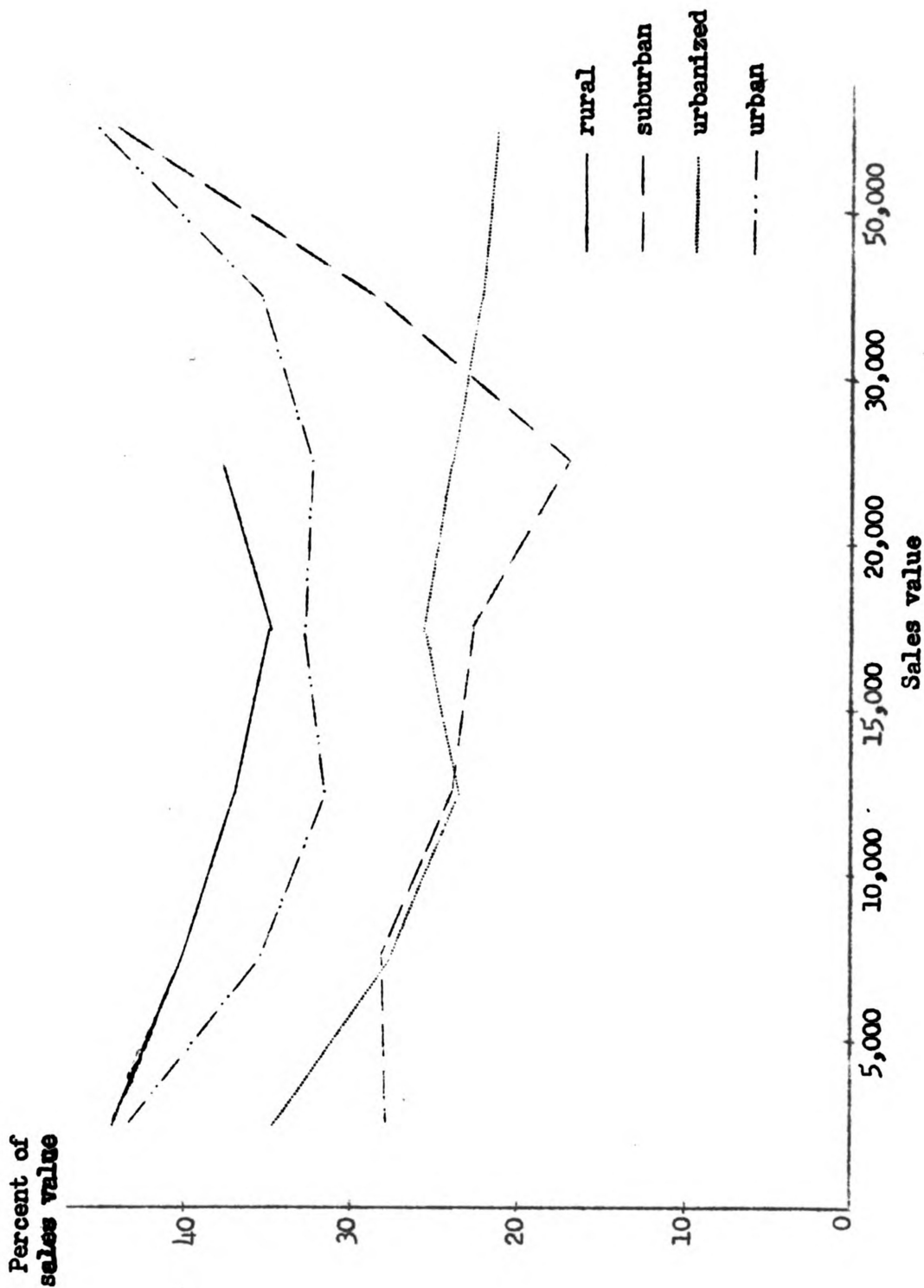


Figure 7. Average relative assessment levels of real properties in four types of areas characterized by different degrees of urbanization, by sales value classes, in Ingham County, Michigan.

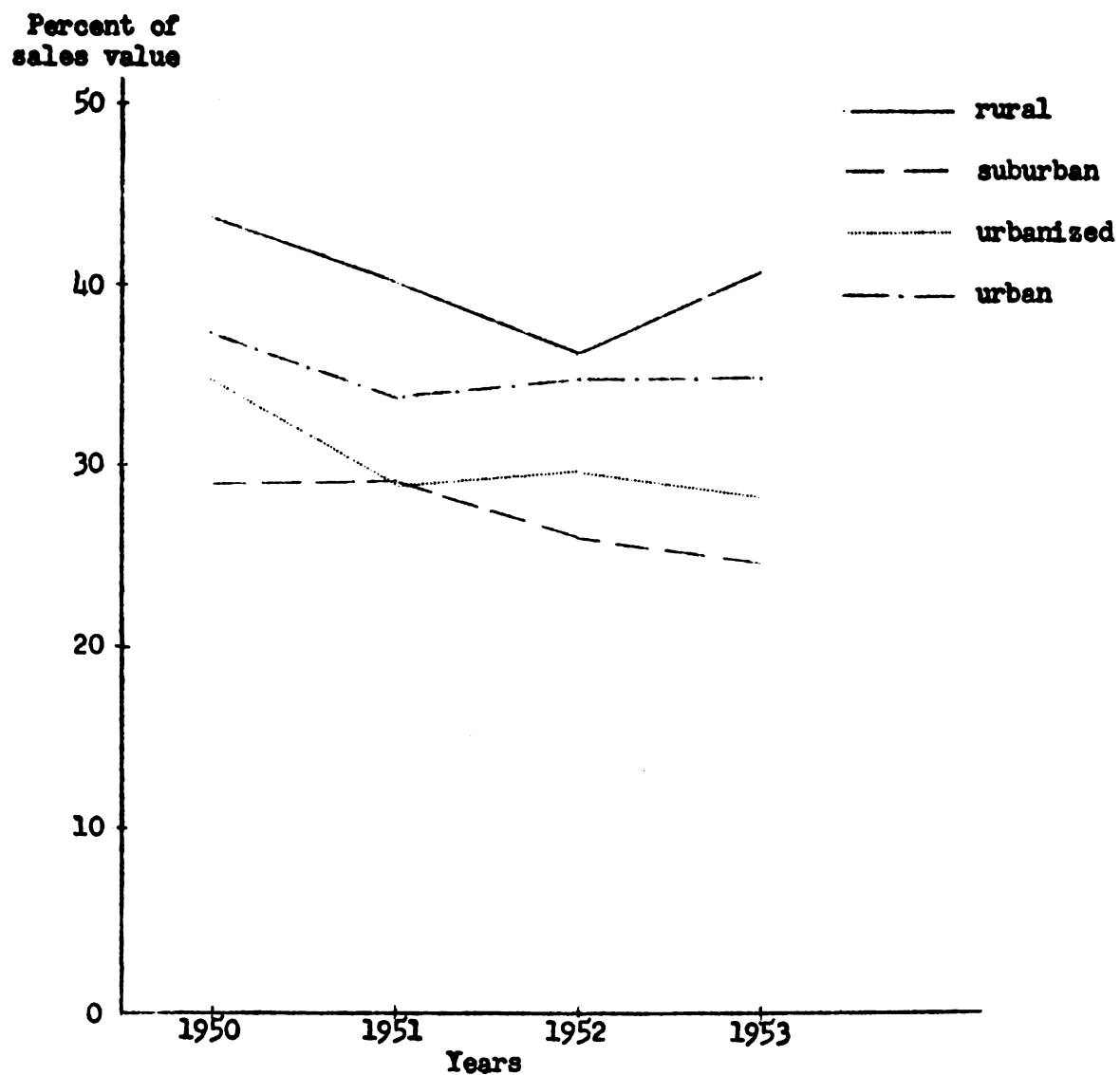


Figure 8. Average relative assessment levels of real properties in four types of areas characterized by different degrees of urbanization, by years of sale, in Ingham County, Michigan.

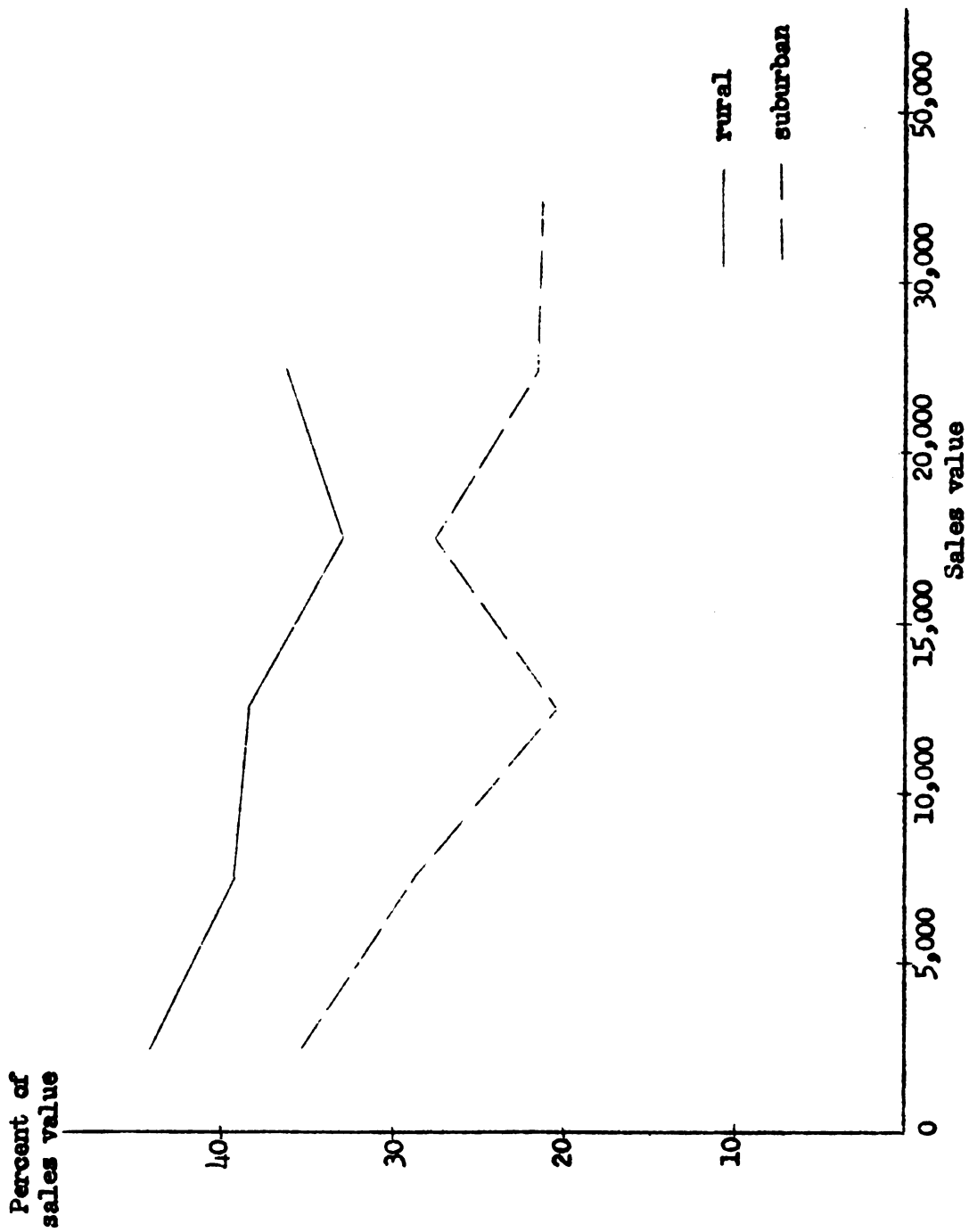


Figure 9. Average relative assessment levels of real properties in rural and suburban areas in five selected townships, by sales value classes, in Ingham County, Michigan.

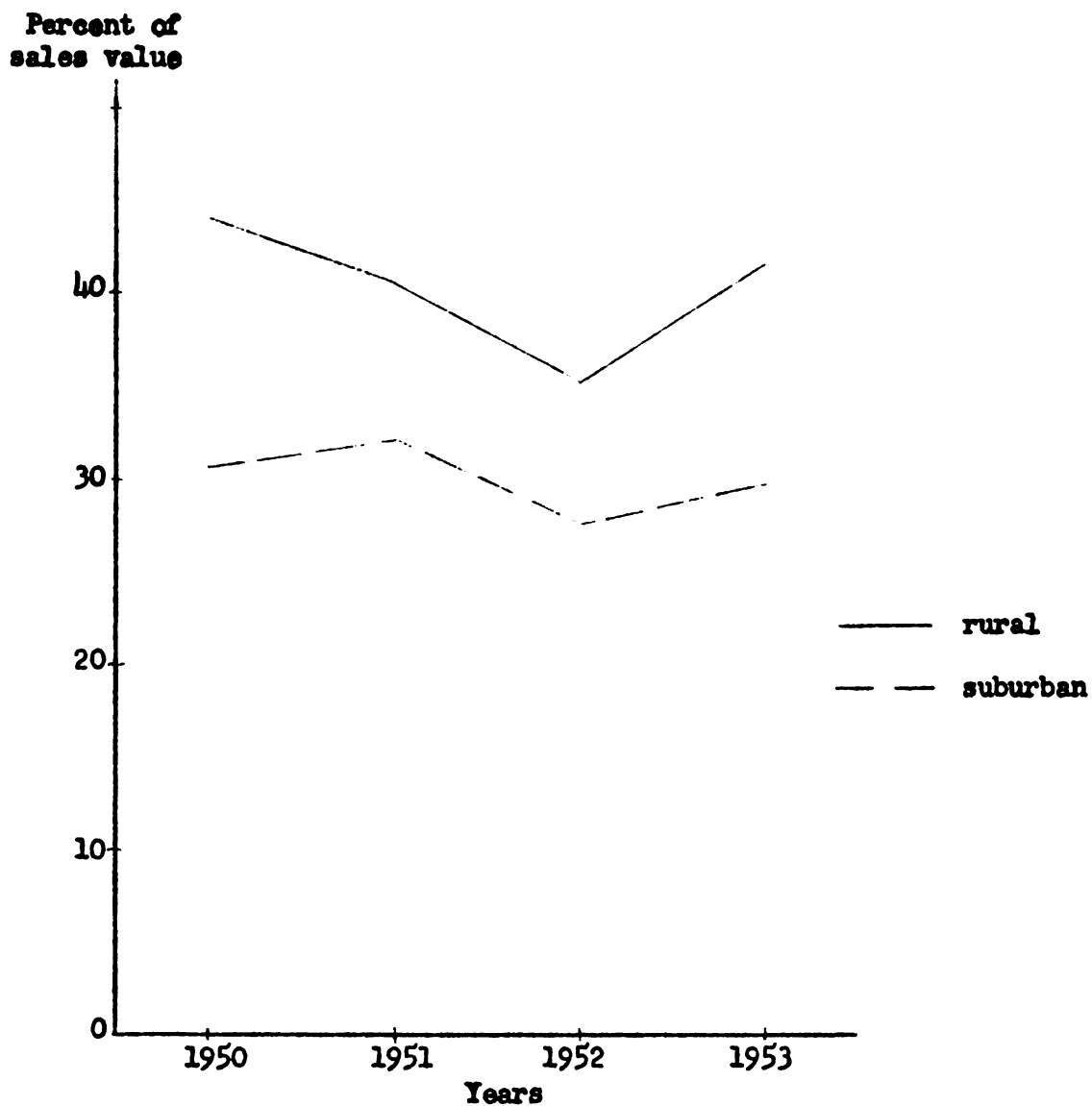


Figure 10. Average relative assessment levels of real properties in rural and suburban areas of five selected townships, by year of sale, in Ingham County, Michigan.

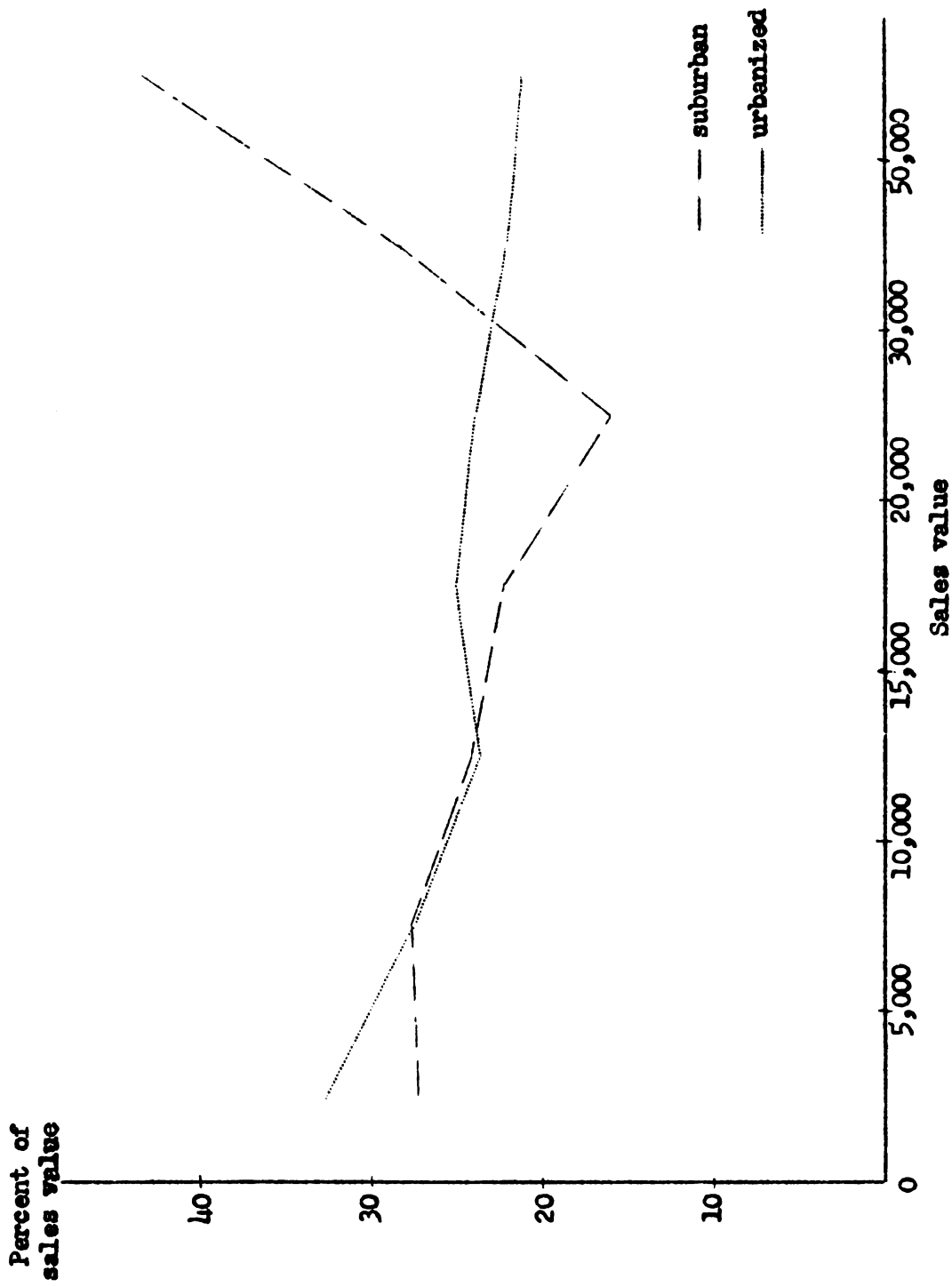


Figure 11. Average relative assessment levels of real properties in suburban and urbanized areas of three selected townships, by sales value classes, in Ingham County, Michigan.

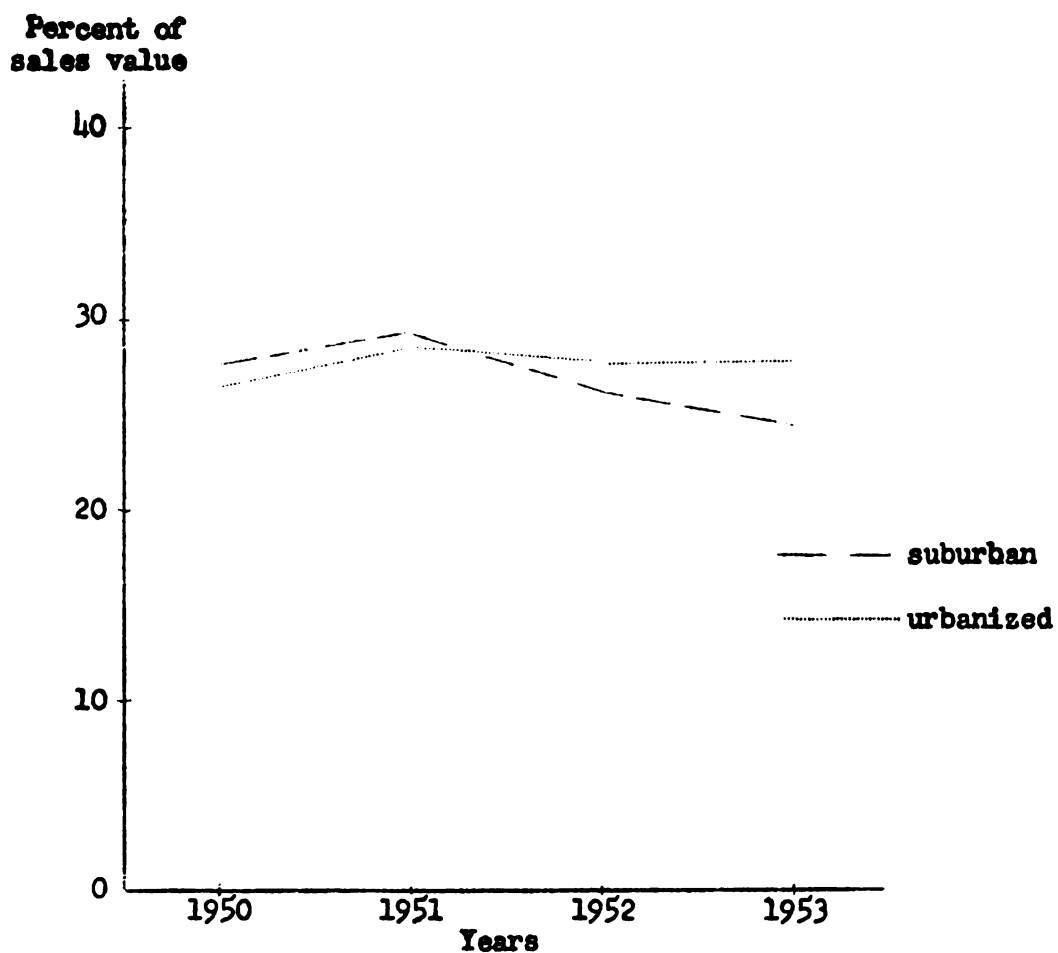


Figure 12. Average relative assessment levels of real properties in suburban and urbanized areas of three selected townships, by year of sale, in Ingham County, Michigan.

Two types of comparisons were used to test the validity of the above findings. In the first of these, the average assessment ratios of the different assessment districts were averaged on an equal weight basis which eliminated the possibility of a dominating influence on the results by one single assessment district which happened to be represented with a large number of property transfers in one class. These unweighted averages, however, did not show any remarkable differences from the original findings.

The differences in the level of assessment of different classes of properties could best be shown within single assessment districts. This was not possible with the sample of this study, however, since the sample sizes were not sufficient for all classes within one district. To obtain an equivalent result without disturbance by assessment districts which entirely belonged into one development class, averages were computed for the five townships with both rural and suburban properties and for the three townships falling into the suburban and urbanized areas. The results of this check test are shown in Table XIII by value classes and in Table XIV by years of sale and are visualized in Figures 9 and 10 for the rural and suburban areas and in Figures 11 and 12 for the suburban and urbanized townships.

Comparisons of parts B, C and D of Tables XIII and XIV with part A of the same tables show that the check tests strongly support the findings, which were based on the weighted averages of the samples covering the whole county. The Figures 9, 10, 11 and 12 as compared to Figures 7 and 8 present the same information. Part D of Table XIV, comparing the assessment levels of suburban and urbanized properties by year of sale in townships which include both kinds of properties demonstrates clearly the equality

of assessment for these two classes. Figure 12 visualizes these ratios. The check tests thus remove the doubts which could have been raised against the findings from the original classifications of properties.

Reference must be made here also to a discussion of equalization rates in the previous section of this chapter regarding the incorporated villages of Ingham County. These villages are classified as urbanized areas in connection with the presently discussed problem. It was pointed out that in the case of three out of these four villages the village properties were assessed relatively lower than the properties in the rural part of the respective townships. This agrees fully with the findings of this investigation which establishes that rural properties show the highest average relative assessments while suburban and urbanized properties are assessed at a lower level. Urban properties are assessed at an intermediate level, higher than properties in suburban and urbanized areas but lower than rural properties.

It seems that township supervisors tend to underestimate the true market value of suburban properties since they are used to deal with farms and are therefore misled by the comparatively small size of building lots. Their often rural background also causes them to attach a high value to the productive nature of farm properties as compared to residential properties. They also fail to recognize fully the increase in land values which results from the change in land use so that farms which are sold for a higher price in suburbanized areas are still assessed at traditional levels.

Comparison of Relative Assessment Levels in East Lansing
and Adjoining Residential Areas of Lansing and
Meridian Townships

An almost continuous residential area extends from the city limits of Lansing east as far as Okemos and northeast to Haslett. This area includes the city of East Lansing and parts of Lansing and Meridian townships. Naturally a tendency exists for territorial expansion of the city of East Lansing and attempts were made to incorporate some of these sections into the city. These attempts were strongly opposed by the inhabitants of the respective areas. One of the principal arguments against the annexation was the prospect of higher taxes if these areas were added to East Lansing.

Assessed valuations are only one of the factors determining the actual tax loads of properties. But the assessed valuations as equalized by the county determine the maximum amount of regular taxes that can be allocated in a taxing district within the 15 mill limitation. These equalized valuations also determine the amount of county tax that is allocated in each district. If the equalization does not succeed in compensating the differences between the relative levels of assessment of the assessment districts in a county the tax loads will be spread unequally.

The assessment part of this local taxation problem was therefore made part of the study. For this purpose the relative assessment level of the subdivisions of the city of East Lansing was compared to the average assessment ratios of subdivisions outside the city which offer living conditions closely comparable to those in the city itself. Under this aspect 10 subdivisions were selected in Lansing Township which directly adjoin East

TABLE XV

IMPORTANT CHARACTERISTICS OF THREE GROUPS OF SUBDIVISIONS OF
LANSING AND MERIDIAN TOWNSHIPS AND THE CITY OF EAST LANSING
WHICH WERE COMPARED TO DETERMINE THE EXTENT AND SIGNIFI-
CANCE OF INEQUALITIES BETWEEN THEIR RESPECTIVE
AVERAGE RELATIVE ASSESSMENT LEVELS

	East Lansing	Lansing Township	Meridian Township
Number of subdivisions in- cluded in the comparison	44	10	23
Highest average assessment ratio of a subdivision	57.18%	44.09%	37.50%
Lowest average assessment ratio of a subdivision	29.38%	21.67%	5.70%
Average assessment ratio of all the transfers in- cluded in the comparison	37.29%	30.15%	19.13%
Mean of the subdivision averages	36.95%	30.22%	21.56%
Standard deviation of the subdivision averages	6.54%	6.90%	8.54%

Lansing on its west and northwest side. Twenty-three subdivisions of Meridian Township were included which extend as far east as Okemos and Haslett. Comparisons between the means of the average assessment ratios of the subdivisions in each of the three assessment districts were made by t-Test² on the assumption that the average assessment ratios of the subdivisions in each district are distributed according to the normal curve. This assumption is usually valid for the distribution of sample means; the samples in this case being the various subdivisions.

Some of the characteristics of the three groups of subdivisions which were compared for differences in the relative assessment level are listed in Table XV. The t-Tests showed that there was a significant difference between the average relative assessment of either two of the three areas in the comparison at the five percent level.

This shows that the average level of relative assessment in East Lansing with 36.95 percent of sales values is significantly higher than the assessment level of 30.22 percent in Lansing Township. The assessment at 21.56 percent of sales values in Meridian Township is significantly lower than the assessment in either of the other two residential areas.

These systematic differences in assessment were not fully eliminated by the process of county equalization. Table XI shows that there are still differences between the average levels of assessment of the three districts after the county equalization. The differences in assessment are therefore reflected in the tax loads of the selected residential sections in the respective taxing districts.

²See footnote No. 3 p. 56.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Summary and conclusions. It was the main objective of this study to analyze the relationship of assessed valuations to sales values in Ingham County, Michigan. A number of questions were investigated which dealt with particular aspects of the assessment problem. Thus a picture of the situation in the field of assessment in Ingham County was obtained from the results of these individual problems.

A summary of these results, characterizing the assessment situation in the area under study, indicates considerable variations between the relative levels of assessment of real properties. Equality of assessment, however, is a basic condition for equality of property taxation.

Many Michigan residents have a high regard for "home rule" and thus favor retention of these governmental functions now performed by local governments. The administration of the property tax can be listed as one of these functions. For this, however, a price has to be paid in many instances. If the local administration of the property tax results in inequalities of taxation, it weakens the financial basis of local governments and with it their stability, efficiency and reputation. The more efficient and satisfactory local governments perform their functions at the present the more stable and unquestioned will be their position in the future.

Inequalities of assessment also violate the provisions of the property tax law. The property tax is supposedly spread according to the true sales

values of property. The existing inequalities of assessment modify this order of distribution considerably, so that it sometimes seems that the tax could just as well be allocated according to the hat size of the property owners.

The investigations performed on the various problems of this study provided the following information:

Problems involving variations of relative assessments within assessment districts.

- A. Within each assessment district a low degree of variation between the relative levels of assessments and small deviations of the individual assessment ratios from the average level of assessment is desirable. Deviations of 10 percent from the average assessment ratio were accepted as tolerance limits for good assessments. In each of the assessment districts, however, less than 50 percent of all the cases studied fell within these tolerance limits. The total ranges of assessments frequently exceeded 100 percent of sales values. These inequalities are especially important since they are directly projected into the tax loads of the respective properties.
- B. Certain characteristics of real properties tend to influence the assessors in making their appraisals and thus cause systematic inequalities in the assessed valuation.

One of the characteristics for which the assessment ratios of properties were compared was the total amount of sales values. In most of the assessment districts the relative levels of assessment followed a generally observed pattern. In these cases the

low priced properties were assessed higher relative to sales values than higher priced properties. This results in a regressive taxation in the assessment districts which follow this pattern.

In some districts, however, as in the city of Lansing, medium priced properties are assessed lower than properties selling at low prices, whereas the assessments rise again considerably for properties in high value classes.

- C. The assessment ratios were compared by year of sale for two reasons. Firstly systematic changes of relative assessment during the period of the study would have to be considered if the samples of more than a year were used in an analysis. Secondly such systematic changes could also point out intentions of assessors to adjust or correct the assessments in their districts.

The analysis did not reveal that any significant changes had been made in the relative levels of assessment between the years from 1950 to 1953.

- D. The age of buildings has an important and complex influence on the market value of properties through different degrees of depreciation and obsolescence. Different building ages could therefore cause systematic differences in assessment levels if assessors over or underestimated the values of older buildings.

A special study was therefore made of East Lansing properties to determine the effect of building ages upon the quality of assessment. No significant differences between the average levels of assessment of houses built before and after World War II could be discovered.

Problems involving variations between assessments in areas distinguished by selected characteristics.

Characteristics which are common to all the properties in certain areas affect the assessment of these properties equally and are responsible for differences between the relative assessment levels of properties in contiguous areas.

- A. One distinguishing characteristic is the location in a certain assessment district, which is assessed by an individual supervisor or assessor. Differences in knowledge and opinion of different assessors result in differences in the average levels of relative assessment between the assessment districts. The lowest average assessment ratio was found in Meridian Township with 20.47 percent of sales values whereas the Leslie Township was assessed more than twice as high with 47 percent of sales values. This demonstrates that rather significant differences exist in the average levels of assessment between assessment districts.

In this connection the county equalization of the years 1950 to 1953 was investigated. The rates by which total assessed valuations in the assessment districts were changed by the county board of equalization did not restore equal levels of relative assessment when applied to the average assessment ratios of the respective districts. This means that equality of assessment was not restored through equalization in the period under study. The rates of change of assessed valuations through county equalization remained rather constant for each assessment district from year to year. Some changes in the relative treatment of assessment districts

were made in 1955, however, which resulted in an adjustment for the lowest assessed district.

- B. A large part of the county is found to be under some influence of urbanization. Some of the suburban areas have only recently come under the direct influence of the city of Lansing through a rapid expansion of the residential zone around Lansing. The assessments of real properties were compared according to the degree of urbanization of the area in which they are located. Some differences were found between the average levels of assessment of the classes of urban, urbanized, suburban and rural properties. The highest level of relative assessments was associated with rural properties, cities showed somewhat lower assessments, and urbanized and suburban areas were assessed lowest in terms of sales values.
- C. High city taxes are an important argument for residents of suburbs surrounding the city against annexation of their sections. The assessment levels of the subdivisions of the city of East Lansing were compared to those in adjoining subdivisions in Lansing and Meridian Townships to investigate the assessment part of these taxing differences. The average assessment level in East Lansing was found to be significantly higher than in the adjoining residential districts of the neighboring townships.

The analysis summarized above indicates considerable inequalities of relative assessments of real properties in Ingham County. Some of these inequalities can be traced to certain characteristics of the properties.

Recommendations. The inequalities of assessment discovered and reported by this study suggest that more attention should be given to the equality of assessment for property tax purposes. There is no doubt that the presently low quality of assessment needs to be improved. Whether this could be accomplished to a satisfactory extent within the present system of property tax administration or whether a change in the system should be made would have to be decided after careful examination.

On one side the advantages derived from the present system of independent local administration of the property tax have to be considered. These would have to be compared to the advantages for individual residents and the improvements of the basis of successful local governments which could be obtained from a change in the present system.

A number of measures to improve the quality of assessment could be taken without changing the present system of property taxation if this were preferred.

1. Assessor schools have proved successful in other states.

Information relating to real estate appraisal, current market prices of real estate, and improvements of usual weak points of property assessment would be useful for every assessor. Newly elected supervisors are especially in need of such assistance.

2. A return to assessment at 100 percent of true market values would eliminate an important source of inequalities. This would also build up the tax base of many taxing districts.
3. Employment of a professional assessor as advisor to the county board of equalization who is also available to assist local assessors has been successful in Oakland County.

The legislature could by law delegate the task of assessment to some other official than the township supervisor. Many other states have adopted a system of county-wide assessment which has some advantages over local assessment.

DEFINITION OF TERMS

"Assessment District": A political subdivision of a county, such as a township, incorporated village, or city which is assessed by an individual assessor.

"Taxing District": A subdivision of a county within which uniform tax rates are charged on the assessed valuations of properties. This is usually a school district.

"Assessment Ratio": The term used for the percentage ratio of assessed valuations to sales values of properties.

"Relative Assessment": The assessed valuation expressed relative to the sales values of a piece of property. It is used as a synonym of "assessment ratio."

"Equalized Ratio": The term used for the percentage ratio of equalized valuations to sales values of properties.

"Quality of Assessment": The general term used for the extent to which individual assessment ratios conform to standards of assessment.

"Applied Rate": The tax rate which is actually used to compute the amount of taxes from the assessed valuation of property.

"Suggested Rate": The tax rate, suggested on basis of the findings of this study, for the computation of taxes, to improve the equalization between assessment districts.

APPENDIX

TAX RATES CHARGED IN MILLS OF STATE EQUALIZED VALUATIONS IN THE SCHOOL DISTRICTS OF INGHAM COUNTY, MICHIGAN IN 1954

Special taxes like drain taxes, street improvement taxes, etc.
which are not spread equally in the regular taxing districts are not
included.

County Tax Rate for 1954: 5.064 mills.

Assessment district	Township or city rate		School district No.	School tax levy			Total	
	Allo- cated	Extra voted		Operating rate Allo- cated	Extra voted	Build- ing & site		Debt ser- vice
Aurelius	--	--	1 fr.	6.23				11.294
			2	8.28				13.344
			3 fr.	5.52				10.584
			4	5.52				10.584
			5	4.87				9.934
			6 fr.	4.06				9.124
			7 fr.	8.28				13.344
			9 fr.	6.18				11.244
			10	9.9				14.964
			11	8.41				13.474
Bunkerhill	--	--	1 fr.	4.19				9.254
			2	8.67				13.734
			4	4.07				9.134
			5 fr.	8.39				13.454
Delhi	--	--	1	9.9	2.5		11	28.464
			1 fr.	5.78		3		13.844
			2	9.9	7	5	7.1	34.064
			5 fr.	9.9	2		17	33.264
			6	6.42		5		16.484
			7	9.19				14.254
			8	4.06				9.124
			12 fr.	5.7				10.764

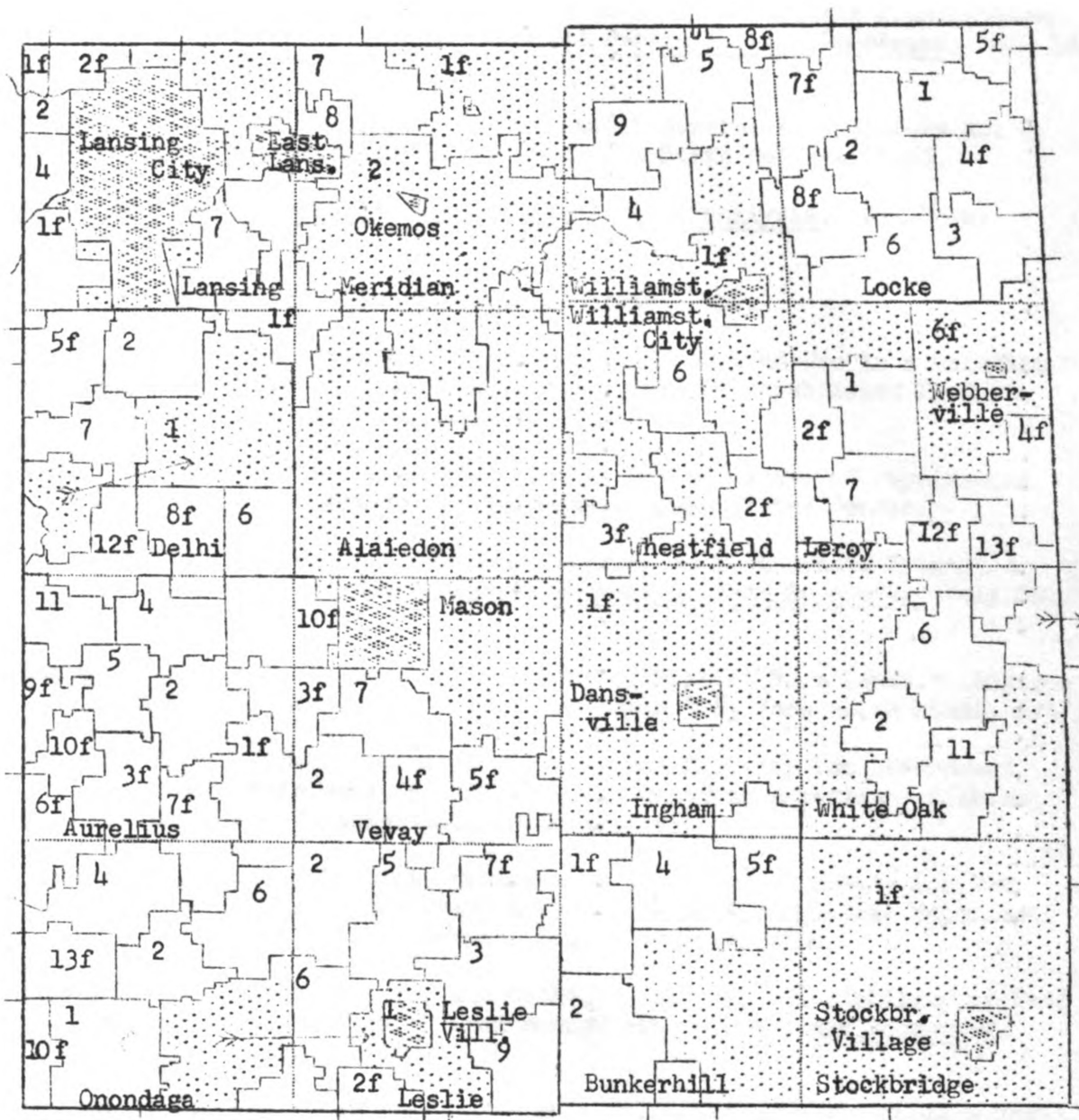
Assessment district	Township or city rate		School district No.	School tax levy		Build- ing & site	Debt ser- vice	Total
	Allo- cated	Extra voted		Operating rate Allo- cated	Extra voted			
Ingham	—	—	1 fr.	7.3			5	17.364
East Lansing	16.84		City	8			11.5	41.404 ¹⁾ 24.564
Lansing City	13.497		City	7.694		8		34.255 ¹⁾ 20.758
Lansing Twp.	—	—	1 fr. N					
			1 fr. S	9.9	13		5.5	33.464
			2	9.9		5	6	25.964
			2 fr.	9.9	3		11	28.964
			4	7.3			7.8	20.164
			7	9.9	10		13	37.964
Leroy	—	—	1	4.07				9.134
			2 fr.	6.88				11.944
			4 fr.	5.45				10.544
			6 fr.	7.4			3.1	15.564
			7	7.64				12.704
			12 fr.	5.9				10.964
			13 fr.	4.07				9.134
Leslie	—	—	1 fr.	6			6.7	17.764
			2	6.3				11.364
			2 fr.	8.34				13.404
			3	6.6				11.664
			5	5.3				10.364
			6	4.34				9.404
			7 fr.	7.02				12.084
			9	6.17				11.234
Locke	—	—	1	9.9	3			17.964
			2	4.16				9.224
			3	5.72				10.784
			4 fr.	7				12.064
			5 fr.	7				12.064
			6	5.3				10.364
			7 fr.	7.34				12.404
			8 fr.	8.86				13.924
Meridian	—	—	1 fr.	9.9	3		12	29.964
			2 fr.	9.9	7	5	8	34.964
			7	9.9			15	29.964
			8	9.9	3		7.4	25.364

Assessment district	Township or city rate		School district No.	School Tax levy			Total
	Allo-cated	Extra voted		Operating rate Allo-cated	Extra voted	Build-ing & Debt ser-vice	
Onondaga	—	—	1 fr.	8.5			13.56 ¹ / ₄
			2	5.66			10.72 ¹ / ₄
			4	5.95			11.01 ¹ / ₄
			6	9.9			14.96 ¹ / ₄
			10 fr.	5.4			10.46 ¹ / ₄
			13 fr.	9.9			14.96 ¹ / ₄
Stockbridge	.5	.5	1 fr.	7.5		1	14.56 ¹ / ₄
Mason, R.A.	8.87	—		7.8	5		23.73 ¹ / ₄ ¹) 17.86 ¹ / ₄
Vevay	—	—	2 fr.	5.34			10.40 ¹ / ₄
			3 fr.	9.9			14.96 ¹ / ₄
			4 fr.	6.81			11.87 ¹ / ₄
			5 fr.	4.07			9.13 ¹ / ₄
			7 fr.	4.07			9.13 ¹ / ₄
			10 fr.	5.9			10.96 ¹ / ₄
Wheatfield	—	—	2 fr.	5.36			10.42 ¹ / ₄
			3 fr.	6			11.06 ¹ / ₄
			6	5.13			10.19 ¹ / ₄
White Oak	—	—	2	4.06			9.12 ¹ / ₄
			6	4.06			9.12 ¹ / ₄
			11	4.56			9.62 ¹ / ₄
Williamston	10.40		1 fr.	9.9	2	5	37.36 ¹ / ₄ ¹) 26.96 ¹ / ₄
			4	6.23			11.29 ¹ / ₄
			5	7			12.06 ¹ / ₄
			8 fr.	6.05			11.11 ¹ / ₄
			9	5.33			10.39 ¹ / ₄

¹The total tax rates for city school districts include in the first figure the city tax rate for the city itself, the second figure except the city tax rates and applies to the consolidated districts outside the city limits.

SCHOOL DISTRICTS OF INGHAM COUNTY

1954



Cities or villages



12 grade districts

Source: School Districts of Ingham County, 1943, Michigan Public Education Study Commission, corrected for 1954.

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ROOM USE ONLY

Aug 1 '56

Jan 23 '57

May 2 '57

Oct 31 1960 > 1

NOV 14 1960

APR 29 1961

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JAN 18 1962

~~FEB 1 1965~~

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