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An Investigation of the Effects of Urban
Expansion on the Taxation
of Real Property in West
Central Missouri

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Property Tax Problem on the Rural Urban Fringe

INTRODUCTION

Urban areas are larger and more complex today than ever before. As urban areas expand, new problems are imposed upon the rural areas which will eventually become part of the urban complex. This change in land use has outdated many of the public institutions¹ originating in rural-orientated economies. This is due to the need for more and different services and the increasingly complex nature of urban areas. Many public institutions appear capable of performing their tasks in either rural or urban areas but experience difficulties in serving a transitional area.

The purpose of this analysis is to examine one of the institutions functioning in a rural-urban transition area and to recommend possible improvements. The public institution studied is real property taxation.²

The Problem

Wide and varied attacks on the real property tax have been made for a long time—probably since its first use. One of the earliest and most unusual attacks on taxes was Lady Godiva's famous horseback ride through the town of Coventry.³ Although the protest was effective, it has not been used subsequently because one of the citizens, by the name of Tom, peeped. Had there not been a "Peeping Tom," this method of seeking tax relief might still be used today. Since that vogue no longer exists, other and more popular attacks will be examined.

In 1925 Edwin R. A. Seligman states in his *Essays in Taxation* that few institutions have evoked more angry protests and more earnest dissatisfaction than this very tax.⁴

In 1931 Jens P. Jensen wrote:

If any tax could have been eliminated by adverse criticism, the gen-

¹Commons defines an institution as "Collective action in control, liberation, and expansion of individual action." John R. Commons, *Institutional Economics*, (New York: The MacMillan Co., 1934), p. 5.

²Subsequently, property tax will mean real property tax.

³"Godiva," *Encyclopedia Britannica* (1967 ed.), X, 515.

⁴Edwin R.A. Seligman, *Essays in Taxation* (New York: The MacMillan Company, 1925), p. 19.

eral property tax should have been eliminated long ago. One searches in vain for one of its friends to defend it intelligently. It is even difficult to find anyone who has given it careful study who can subsequently speak of its failure in temperate language. . . . Should some prosecuting attorney drag the tax as a culprit before a bar of justice, he would be embarrassed by the abundance of expert evidence against it. No writer of repute writing on state and local taxation in the United States has failed to offer his bit of derogatory testimony. No commission appointed to investigate any state tax system, which has had time, means, and inclination to secure the evidence, has failed to recommend the abolition of the tax or measures tending toward fundamental modification. Where permanent administrative tax commissions have had time, capacity, and means to busy themselves with what ought to be one of their major tasks, the study and constructive criticism of the state tax system, they have without exception arrived at similar conclusions. Yet the tax persists.⁵

These were the thoughts of many in the early 1930s; and as the depression continued, they were given substantial political support. For example, in 1939 the Florida legislature introduced an amendment to abolish the *ad valorem* system and substitute a tax based on income or use value. It was defeated in the House of Representatives of the State Legislature by only seven votes.⁶ Most other state legislatures considered similar proposals, and several states imposed severe overall rate limits on local governments.

The "return to prosperity" softened much of the criticism, and by 1960 Frederick L. Bird was writing:

The property tax is far from being an ideal tax, and few tax theorists would claim that it is even a very good tax. . . . But it has behind it a tradition of great usefulness to local government; it has tremendous going-concern value; and it has qualities, not possessed by most other sources of revenue, that are exceedingly important for the financial stability and autonomy of local government.

The property tax is sometimes called the most inefficiently administered tax in the United States. It would be more fair to say that it has the most uneven quality of administration—because it is handled reasonably well in some jurisdictions. Given competent administration, it could be made more productive, more reliable, and less distasteful to the taxpayers.⁷

Jesse Burkhead also is of the opinion that the property tax is destined to continue as one of the main sources of local government revenue. He states, "Al-

⁵Jens P. Jensen, *Property Taxation in the United States* (Chicago: The University of Chicago Press, 1931) p. 478.

⁶Walter P. Fuller, "The Florida Movement to Abolish the Property Tax," *Property Taxes* (New York: J.J. Little & Ives Company, 1940), p. 77.

⁷Frederick L. Bird, *The General Property Tax: Findings of the 1957 Census of Governments* (Battleboro: The Vermont Printing Company, 1960), p. 77.

though the property tax has long been condemned by students of fiscal affairs, its recent behavior suggests that it would be far better to strengthen this levy than to plan for its eradication."⁸ A similar conclusion is reached by Dick Netzer. He states, "The indications then, are that the property tax is and will continue to be an attractive, productive source of local public funds."⁹

As evidenced above, many scholars in the field of taxation contend that the property tax is a permanent institution, although recognizing that with some reform it would be a much better institution.

Importance of the Property Tax to Local and State Governments

The basic principles of the local property tax were brought to the United States from Europe. However, Jens P. Jensen says, "Property taxation, as it now occurs in the United States, probably never existed in Europe, and certainly did not prevail in England when the colonial settlers transplanted her tax system to the new world. And in this country it has since undergone a long process of development."¹⁰ Nevertheless, the British government did use the amount of property the colonists owned as an indication of taxable wealth. Only in recent, highly sophisticated, and complex societies has a person's ability to pay not been closely associated with property owned.

In 1913 the first Constitutional provision was established for collecting a tax on income—the Sixteenth Amendment. This amendment was one of the first attempts to collect taxes on intangible wealth. However, the only governments to make substantial use of it were the federal and a few state governments. Therefore, the local government was left almost completely dependent on tangible property as a tax base. The reliance of local government upon the property tax has not changed significantly during the last century, although a few cities have initiated an earnings tax in the last decade.

A recent report by the United States Department of Agriculture (USDA) states that in 1964 real property taxes provided 41 percent of all local government revenue and 87 percent of all local tax revenue in the United States.¹¹ The findings of this report will have great significance for local governments when their clientele start to change from a rural to an urban one. At that time property valuation will increase. Simultaneously, more and better services will be needed which usually increases the rate of the property tax because of the static nature of the tax base.

An analysis of taxes levied on farm real estate located in Standard Metropolitan Statistical Areas (SMSA's)¹² indicated that in 1963, taxes per acre aver-

⁸Jesse Burkhead, *State and Local Taxes for Public Education* (Syracuse: University Press, 1963), p. 105.

⁹Dick Netzer, *The Economics of the Property Tax*, (Washington: The Brookings Institute, 1965), p. 189.

¹⁰Jensen, *op. cit.*, p. 26.

¹¹United States Department of Agriculture, Economic Research Service, *Farm Real Estate Taxes: Recent Trends and Developments*. RET-5 (Washington: Government Printing Office, 1965), p. 3.

¹²An SMSA is a county or a group of contiguous counties which contains at least one city of 50,000 inhabitants or more or "twin cities" with a combined population of at least 50,000. In addition to the county, or counties, containing such a city, or cities, contiguous counties are included in an SMSA if, among other things, they are essentially metropolitan in character and are socially and economically integrated with the central city.

aged more than 2½ times the taxes on farms in counties adjacent to SMSA's. Also, they were more than five times as high as in rural counties—those some distance from metropolitan centers. The USDA estimated that about one-fourth of the total farm property taxes paid in 1963 originated in metropolitan areas.¹³

The above suggests that rural farmland is required to shoulder much of the burden of increased government costs as an area becomes urbanized. The few facilities available must be expanded greatly as the population density increases. Also during this phase of community development, government costs are disproportionately high since many capital facilities are being built. In this early phase of urban development, farm property is still a major component of the tax base. Thus, a small community may well be engulfed by suburban development within a year or two and find itself paying for a full range of urban public services out of taxes collected from an agricultural tax base.

PRINCIPLES OF TAXATION

Several criteria have been established to evaluate alternative types of taxation. These criteria are: the ability to pay the tax, the ease of administering it, its regressiveness or progressiveness, the incidence of the tax, the tax as a means of control, benefits received from the tax, and dependability of the tax as a source of income. These seven criteria will be applied to the property tax on the rural-urban fringe. Those that seem to be especially significant in the rural-urban fringe will be studied in detail.

Ability to Pay the Tax

Like all other taxes, property taxes must be paid from current, past, or future income. As late as a century ago, most of the wealth of the country was held in the form of tangible goods. But even then many property owners were "land poor" and their incomes were such that they often forfeited their properties because of their inability to pay the taxes levied on them.

With the changes of the past century, this relationship between property ownership and the ability to pay has become less correlated. Most large personal incomes are now associated with salaries, fees, and dividends rather than with direct income from real property. The rationale that possession of property is the best objective measure of ability to pay has long since been undermined by the changing nature of the economy, the narrowing of the general property tax itself, and the wide variations in rates and coverages among jurisdictions in large urban areas.¹⁴

Unlike other forces that cause farmland to rise in price, urban expansion ordinarily does not increase agricultural income. Nor is the farmer usually able to

¹³United States Department of Agriculture, Economic Research Service, *Farm Real Estate Taxes: Recent Trends and Developments*. RET-4 (Washington: Government Printing Office, 1964), p. 3.

¹⁴Netzer, *op. cit.*, p. 214.

borrow on the speculative value of his land to meet taxes based on this value.¹⁵ The poor correlation between property taxes and current income from property is most vividly portrayed on the fringe of cities where land is in the process of transfer from agricultural to urban land uses.¹⁶

Thus the criteria of ability to pay indicate there are unique problems in the rural-urban fringe. First, the increase in the price of land becomes translated into higher assessments. Second, the increased need for public services becomes translated into higher tax rates. Both factors contribute to a rapidly increasing property tax. While this is occurring, the ability to pay usually remains unchanged or decreases. Frequently, farm property owners are reluctant to make capital improvements on the land for fear it soon will be forced from agriculture. Thus, the realized income from the property frequently does not improve. Since these criteria suggest unique problems in the rural-urban fringe, it will be studied later in more detail.

Ease of Administration

This is one of the leading arguments favoring the property tax. As soon as property is assessed and the rate is determined, the tax is levied against its owner. The fixed and continuing nature of the real property tax practically guarantees the collection of the tax once it is levied. Since property taxes have the first claim on land, the owner must forfeit his property rights if the taxes are not paid in a specified period of time. Therefore, property taxes ordinarily are paid on time. Consequently, the total revenue collected from this source is usually high relative to the cost of administering it. The ease of administration of the tax seems to be similar throughout Missouri; and while there does not appear to be unique administrative problems in the rural-urban fringe, the methods in the state may not be as up-to-date as they should be.

Regressivity

A tax is said to be regressive with respect to income when the tax rate decreases as income increases. Sometimes a tax is considered to be regressive when the effective tax rate decreases as the size of taxed holdings increases. Rate structures are also often classified as progressive, proportional, or regressive. The tax is proportional if the rate is unaffected by income or size of base, progressive if the rate increases with increases in income or base, and regressive if the rate decreases with increases in income or size of base.

Real property taxes are formally proportional in that the rate is independent of income and base size. However, if farm property taxes are correlated with size of business they tend to be regressive in impact. Because relative property valuation seems to decrease as the size of base increases, property taxes also tend to be regressive with respect to base size. Property tax assessments tend to be regres-

¹⁵Frederick D. Stocker, "Taxing Farmland in the Urban Fringe," *The Journal of Farm Economics* (December, 1963), p. 1133.

¹⁶Harold Groves, *Financing Government* (New York: Holt, Rinehart and Winston, 1964), p. 63.

sive in the United States, the North Central Region¹⁷ and Missouri.¹⁸ Consequently, the real property tax in the rural-urban fringe, as in other agricultural areas, is regressive. According to Frederick D. Stocker, property in the rural-urban fringe "having a low value per acre is commonly over-assessed relative to land of higher value."¹⁹ Stocker observes that the tendency to assess properties having small total values at higher rates than more valuable properties is common in fringe areas. The combination of these two influences operates to place the heaviest tax burdens on the properties that are least able to bear them, that is, the small properties with a low value per acre.²⁰

Incidence

The incidence of a tax refers to the persons or things that bear the actual tax burden. In certain instances portions of the real property tax may be shifted so that someone other than the property owner actually bears the tax. The question is who actually bears the tax?

Barlowe says, "According to the 'pure' theory of tax incidence, a property tax on bare land is nonshiftable while a tax on land improvements can usually be shifted over time even though it may appear nonshiftable at particular moments in time."²¹ Groves agrees and says that shifting is not likely to occur on land, except in the form of tax capitalization, since the supply of land is relatively fixed.²² Netzer also concedes the above and concludes that the property tax rests on the owner of the assets.²³ In light of the above, there seems to be no reason to assume that the incidence of the property tax would vary in the rural-urban fringe.

Control

The real property tax can be used as an indirect measure to discourage or prohibit certain types of land use, to promote soil conservation goals, and to foster the more intensive use of land resources. The effectiveness of the tax in achieving these goals has varied considerably.

Groves states, "Taxation itself is a social control, and no tax or fiscal policy can be judged apart from all of its consequences whether they are classed as fiscal or non-fiscal."²⁴ Commons also agrees with this philosophy because he says,

¹⁷The North Central Region includes Illinois, Indiana, Iowa, Kansas, Kentucky, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

¹⁸William H. Heneberry and Raleigh Barlowe, *Assessment of Farm Real Estate for Property Taxes in the North Central States. Station Special Bulletin 439*, North Central Regional Publication 130, (East Lansing: Michigan State University, 1962). The study concludes, "In general there was a tendency to assess low-priced properties at higher proportions of sale or appraised value than high-priced ones." p. 3.

¹⁹Frederick D. Stocker, "How Taxes Affect the Land and Farmers," *1958 Yearbook of Agriculture* (Washington: Government Printing Office, 1958), p. 248.

²⁰*Ibid.*

²¹Raleigh Barlowe, *Land Resource Economics* (Englewood Cliffs: Prentice-Hall, Inc., 1958), p. 541.

²²Groves, *op. cit.*, p. 152.

²³Netzer, *op. cit.*, p. 40.

²⁴Groves, *op. cit.*, p. 42.

"Even when not consciously intended to be regulative, taxes nevertheless regulate, for they . . . determine the directions in which people may become wealthy by determining directions in which they may not become wealthy."²⁵

Property taxation on the rural-urban fringe is considered to be regulative, even if not intentional. Higher taxes can pressure land into more intensive use, but if the demand does not exist for these uses, taxes can have an injurious effect in fostering the waste that comes with premature development and tax delinquency.

Stocker says, "There is good reason to believe that heavy taxes on farmland influence farmers to sell their land prematurely to speculators or developers with possible adverse effects on both land tenure and land use."²⁶

The control criteria seems to suggest unique problems in the rural-urban fringe. Near cities much agricultural land that might have remained in agricultural use until ripe for urban occupancy has been taken out of production. Therefore, the control criteria will be examined in more detail later.

Benefits Received

Legally, taxes can be imposed only for public purposes, but whether the benefits are always equal to the sacrifice of the payment of the taxes levied is questionable. The benefit principle is invoked, as are other arguments, to justify or condemn a tax. Barlowe says, "Property taxes are often more closely associated with benefits received than with ability to pay. This is particularly true when a high proportion of the collected tax is used to provide protective services and community facilities which enhance property values."²⁷

Burkhead contends:

If a justification of the tax is needed other than on the grounds of revenue availability, it must be in some crude terms of benefits received. Local expenditures, by and large, and on the average must either make the property more valuable by an amount roughly equal to the capitalized value of the annual tax payments, or the property-owners must derive benefits from governmental services approximately equal in value to the tax payments. The possibilities of ascertaining the relationship of tax costs to benefits from government expenditures are most limited, since this requires not only studies of incidence by areas, but, in addition, the allocation of benefits by area and by economic groups within areas.²⁸

Netzer is more cautious when he suggests:

. . . Although in some taxing jurisdictions property tax liabilities may closely parallel use of some public services, there are widespread

²⁵Commons, *op. cit.*, p. 820.

²⁶Frederick D. Stocker, "Urban Encroachment in Relation to Farm Taxes," *Journal of Soil and Water Conservation*, Vol. 19 (May-June, 1964), p. 96.

²⁷Barlowe, *op. cit.*, p. 559.

²⁸Burkhead, *op. cit.*, p. 32.

geographic differences in this regard. In general, the existing American property tax does not appear to measure up well as a user charge for any important public service.²⁹

As the area becomes urbanized, the additional benefits received from their higher property taxes are usually not requested by farmers in the rural-urban fringe. A small community may well be engulfed by suburban development within a year or two and find itself paying for a full range of urban public services out of taxes collected from a predominately rural tax base. The only consolation the farmer receives is that the land he holds is appreciating in value, probably more rapidly than is reflected in his assessment. Since the benefits received seem less associated with costs on the rural-urban fringe than in other areas, these criteria will be studied in more detail.

Dependability as a Source of Income

Unlike many other taxes, revenue collected via the property tax need not fluctuate with changes in the business cycle. Tax collections can be as high during depression years as during periods of prosperity, except for a possible increase in the amount of tax delinquency. This reliability and uniformity of yield from the property tax is highly desirable as far as the local units of government are concerned. Burkhead says, "The tax responded well, when examined in terms of county aggregates, to increases in population and to increases in the proportion of the population of school age."³⁰ The dependability of the property tax throughout the United States, including rural-urban fringes, is one of its outstanding features. According to Groves, this is the foremost reason why the general property tax is tolerated. He says, "Finally, and above all, the property tax in many ways has provided a reliable source of revenue for local governments."³¹

The dependableness of the property tax is as pronounced in the rural-urban fringe as anywhere else in the state. This is due to the fact that local units of government in the area have the same control in determining the rate and the assessed valuation as the local governments in the rest of the state. Therefore, these criteria will not be given special consideration in this analysis.

PURPOSE OF THE STUDY

The problems faced in this inquiry concerned the extent of increased property taxation in the rural-urban fringe of Kansas City, Mo., and the relationship of the present level of taxation on rural property to the benefits received and to the change in control of the property.

Objectives

The objectives of this analysis were to determine:

²⁹Netzer, *op. cit.*, p. 59-60.

³⁰Burkhead, *op. cit.*, p. 70.

³¹Groves, *op. cit.*, p. 69.

- 1) if farmland is bearing a disproportionately large amount of the property tax on the rural-urban fringe over time;
- 2) if there is a disassociation of costs and benefits from the property tax over time as the area becomes urbanized;
- 3) if the present system of taxing property is the most efficient way of facilitating the transfer of land from agricultural to non-agricultural uses; and
- 4) if variation in the property tax per acre on the rural-urban fringe can be explained by a selected set of variables.

Hypotheses

The following hypotheses were used as guides in the analysis:

- 1) If the principle of ability to pay is fulfilled in the rural-urban fringe, then during the time the area is being transferred from agricultural to urban uses the amount of property tax should be related to the current income generated from the real property. Hypothesis 1 is: The taxation principle of ability to pay is not fulfilled in the Kansas City rural-urban fringe.
- 2) If the principle of benefits received is fulfilled in the rural-urban fringe, then as the property is transferred from rural to urban use, there should be an association of the costs incurred with the benefits derived from the property tax. Hypothesis 2 is: The taxation principle of benefits received is not fulfilled in the Kansas City rural-urban fringe.
- 3) If the principle of control is satisfied, then the tax should not force the property from its present use until a higher and better use exists. Hypothesis 3 is: The taxation principle of control is not satisfied in the Kansas City rural-urban fringe.
- 4) If the real property tax per acre varies among farms, then some of the following factors influence the level of property taxation:
 - size of farm
 - price per acre of a comparable farm
 - owner's estimate of the present price per acre of sample farm
 - miles from sample farm to Kansas City city limits
 - minutes driving time from sample farm to Kansas City city limits
 - number of years farm has been owned by present owner
 - age of barn on sample farm
 - age of house on sample farm
 - dollars of depreciation for improvements on sample farm
 - number of days of off-farm work per year for owner of sample farm
 - horizontal distance from the origin of an X and Y axis superimposed on the area
 - vertical distance from the origin of an X and Y axis superimposed on the area
 - population per square mile by county
 - number of school age children per square mile by county

- percent urbanization by zones within counties
- percent urbanization by counties
- gross income per acre for sample farm.

Hypothesis 4 is: The above factors do not influence the level of property tax variation among farms in the Kansas City rural-urban fringe.

ORGANIZATION OF THE STUDY

The plan of this report is to present a statement of the problem, the method used in analyzing it, the findings of the inquiry, and the implications of the findings. The report, consecutively, covers the conceptualization of the problem, the procedure followed in obtaining data to test hypotheses, a description of the sample farms, the analysis of the hypotheses, and the development of remedial measures growing out of the diagnostic phase of the analysis.

Source of Data and Method of Investigation

In order to test the above hypotheses certain information from farm-owners was required. Data were needed to determine the extent of the problem of increased property taxes, factors responsible for the problem, factors responsible for keeping the problem within present limits, and potential remedial measures which could be extended. In this section the area to be studied is described first; second, the method of obtaining the data is explained; and third, a brief description of the farms in the sample is presented.

STUDY AREA

This inquiry was limited to the West Central Missouri Extension District —Cass, Clay, Jackson, Johnson, Lafayette, Platte, and Ray counties. (See Figure 1.) These counties either contain part of Kansas City or adjoin counties which do. Consequently, the project was concerned with the Kansas City, Missouri rural-urban fringe. The inquiry was initiated because community leaders in the area felt Kansas City was exerting a substantial effect on the area.

All seven counties have become increasingly urbanized in the past decade. Perhaps the improvement of existing roads and the construction of interstate highways more than any other factors have accounted for much of the growth in the fringe counties. With the improvement in roads and highways the majority of the residents live within commuting distance of Kansas City. Most of the residents can drive to the city limits in one hour or less. The briefness of the trip to the central city by commuters from agriculturally-oriented counties has had a substantial effect on the counties. Not only have the counties experienced an increasing number of residential farms, but also the counties have become aware of

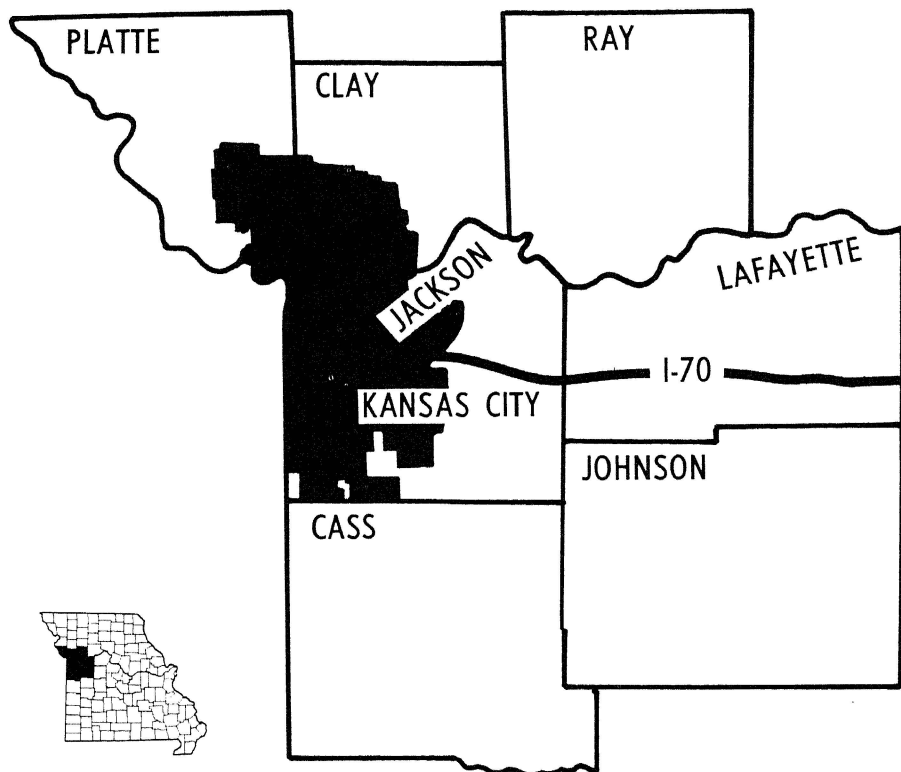


Fig. 1—Location of Missouri's west central Extension district.

an "urban sprawl," i.e., scattered and uneven expansion of residences and industries which by-passed many tracts of undeveloped land. This "urban sprawl" has caused high costs for public services because of duplication and over-extension of facilities. These problems have become more severe with the increased population, and probably will become more acute in the future with the predicted increase in population.³²

In the preceding decade, 1950 to 1960, the population of these seven counties experienced an increase of 22.14 percent. By 1960 the Census of Population reported 833,588 people lived in the area. A projection of this trend indicates this number will increase to 965,378 by 1970, or an increase of 131,790 people.

A county breakdown of population shows Jackson County had an increase of 100,000 people between 1950 and 1960, the highest absolute increase in the area. However, the total population for the six surrounding counties showed a

³²Population projections used throughout this report were provided by James Pinkerton, Research Center, University of Missouri, June 2, 1967.

Percent Change in Population

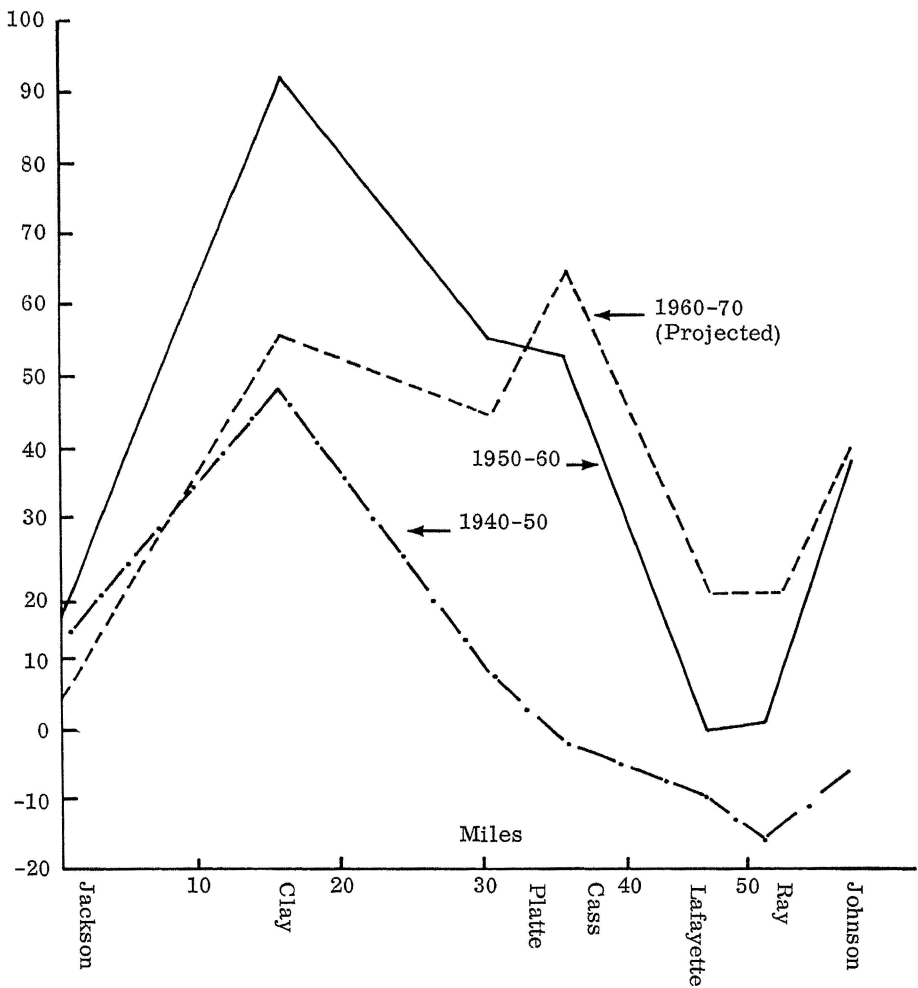


Fig. 2—Percentage change in population by counties as a function of miles from the Kansas City city limits for periods from 1940-70.

higher rate of increase. Figure 2 illustrates the percentage increase in population by counties as a function of miles from Kansas City for ten-year periods from 1940 to 1970. The distance was determined by finding the number of miles from the midpoints of each of the counties to the center of the Kansas City urbanized area in Jackson County. The graph illustrates that the metropolitan population is expanding from Jackson County into the adjoining counties. Jackson County had a 15.1 percent increase in population from 1950-60 while Clay, the closest county, had nearly a 100 percent increase in population during the same time. Platte and Cass, which are approximately 30 miles from the metropolitan center,

had slightly more than a 50 percent increase in population. Two of the three furthest counties—Lafayette and Ray—experienced practically no change during the decade while Johnson County had a modest increase. Although the population growth in the latter three counties was small during the 1950-60 period it was a reversal of the trend for many previous decades in which each county lost population. Furthermore, the projections for the 1960-70 period indicate that the most distant counties are increasing their growth rates faster than any other counties in the Kansas City metropolitan area. Undoubtedly this change reflects the growing interdependence of the distant counties with the metropolitan area.

The importance of the West Central Missouri Extension District as an agricultural producing region during the last 20 years has been examined in some detail in Perspective Paper Number 1, "Land Use and Tenure in West Central Missouri."³³ Therefore, this description of the study area will be limited to a summary of the major trends which have important implications not only for agriculture but also for agriculturally related industries in the area.

One of the most important trends in the area is the tendency toward less land in farms. However, if present trends continue, there is not likely to be much change in the acreage of cropland in the area. While average farm size has been increasing, the number of farms has been decreasing, especially close to Kansas City. This is expected to continue. The value of all farm products sold has been increasing. While the value of crops, livestock, livestock products and nursery products has been increasing, the value of dairy products sold in recent years has changed little. The amount of land devoted to corn and wheat is approximately unchanged and is likely to continue so with the passage of a four-year government program.³⁴ The trend toward lower acreages of oats and higher acreages of sorghum and soybeans can be expected to continue. Although the number of milk cows has decreased and can be expected to continue, the number of cattle and calves may be expected to increase slightly, barring major changes in marketing arrangements. Sheep numbers are declining; but the data are not conclusive with respect to trends in the number of hogs. Expenditures for purchased inputs have been increasing as indicated by the increased expenditures for feed, trucks, and tractors. These trends are expected to continue.

The above trends indicate that even though there have been significant changes in the nature of agriculture in the West Central Missouri Extension District, it can be expected to continue to be an important agricultural producing region in the next decade.

The median family income³⁵ in this area increased substantially with in-

³³Melvin G. Blase and Edwin D. Welliver, "Land Use and Tenure in West Central Missouri," Agricultural Economics Department paper, 1967-36, University of Missouri - Columbia, 1967.

³⁴United States Department of Agriculture, Economic Research Service, *Feed Situation* Fd.S-212 (Washington: Government Printing Office, February, 1966), p. 14.

³⁵Median income is the amount of income that separates the recipients into two equal groups, one with incomes above and the other with incomes below the median.

creases ranging from 39 percent to 88 percent. Table 1 shows the median income for the seven counties and the state.

Although the median income for the area is somewhat less than for the state, the area has experienced a faster increase during the past decade. If this trend continues as expected, the median income for the area will soon exceed the median income for the state. In summary, if the above trends continue, this area will be characterized in the future by (1) an increased absolute importance of both agriculture and industry, (2) an increased affluence of the population, and (3) an increase in the demand for public services.

METHOD OF INVESTIGATION

The sample survey method of obtaining data was used. A sample of farm operators and owners of tenant-operated farms in the West Central Extension District was interviewed in 1966 to obtain most of the data. The remaining data were obtained from public records and secondary sources.

Sampling Procedure

To secure data for the study a random sample of 28 segments was drawn.³⁶ The design was an area probability sample which excluded urban areas. The criterion adopted for deciding whether a farm should remain in the sample was the headquarters rule. If the major managerial decisions for operating the farm were made from the household in the segment, the entire farm unit was included in the sample. If the operator of the sample farm was an owner-operator, he was interviewed, but if he was a tenant the owner of the farm was located and interviewed. Consequently, with one exception, owners of land which qualified as a farm according to the United States Census definition³⁷ were interviewed. The exception was governed by the 25-mile rule used by the Census conducted by the U.S. government, i.e., only if the owner lived within 25 miles of the land owned was an interview obtained. Records obtained from 153 owners were used in the analysis.

Survey Questionnaire

The questionnaire was designed to provide information about the adjustments in land use that had been made by farm owners, with special attention to the influence of the property tax. The data requested were in five major categories: (1) general information about the farms such as size, type of tenure, etc.; (2) public service information concerning education, roads, public services and utilities, and welfare; (3) property transfer information such as price of land, and tax delinquency; (4) financial information about the farm including operating expenses, fixed expenses, gross income and net income; and (5) property tax data

³⁶The sample was drawn by the Statistical Laboratory at Iowa State University, Ames.

³⁷The census definition of a farm is one having 10 acres or more with \$50 of farm products sold per year or less than 10 acres with \$250 or more of farm products sold.

TABLE 1--MEDIAN FAMILY INCOME FOR THE WEST CENTRAL EXTENSION
DISTRICT BY COUNTY, 1949 TO 1959^a

County	Family Median Income		
	1959 Census (Dollars)	1949 Census (Dollars 1959)	Percentage Change
DISTRICT	\$5,067	\$3,083	64.35
Cass	4,613	2,588	78
Clay	6,606	4,158	59
Jackson	6,028	4,142	46
Johnson	3,907	2,147	67
Lafayette	4,066	2,927	39
Platte	5,898	3,145	88
Ray	4,352	2,476	76
STATE	\$5,127	\$3,240	58

^a Claude C. Haren and Robert B. Glasgow, Median Family Income and Related Data, By Counties (Washington: Government Printing Office, 1964), pp. 44-47.

including assessed valuation, levies by type and amount, and the total tax paid. Data were obtained for the years of 1965, 1960, and earlier years if available.

Data Processing

The schedules were edited and the data transferred to automatic data processing listing sheets. The data were punched on automatic data processing cards, and summarized to provide a description of the sample farms. Finally, they were utilized to test the hypotheses.

DESCRIPTION OF THE SAMPLE FARMS IN THE WEST CENTRAL EXTENSION DISTRICT

The general characteristics of the sample farms are set forth in the following order: farm size, farm tenure, location of tracts, type of farm, age of buildings, price per acre of land, miles and minutes to the Kansas City city limits, occupation of farm owners, and off-farm work. As reflected in these data, the number of sample farms increased each year from 1959. In 1965 there were 153 schedules completed with information obtained for that year on the farms sampled, while only 118 schedules had information for 1959. The difference was due to the turnover of the properties occurring during the period. Table 2 shows the number of farms on which information was obtained in the West Central Extension District from 1959 to 1965.

As mentioned previously, the headquarters rule was used in selecting farms for the sample. If there were more headquarters in one segment than in others, that segment had a larger number of observations. Lafayette County typifies an area with a large number of headquarters located in each segment. On the other hand, Jackson County, which has a higher percent of urban population than the other counties, had a small number of headquarters qualifying as farms in the sample. The number of observations in each county partially explains the percent breakdown of characteristics for the area. These characteristics will be examined in following subsections.

Farm Size

The size of farms was measured in two ways in this analysis. First, it was measured by the number of acres owned and second, by the number of acres operated. The average size of farm (acres owned) has remained almost constant since 1961 in the area (Table 3). Most of the small farms were reported in the more urban counties. The larger farms were reported in the three most rural counties—those the greatest distance from the central city. All three most rural counties had an increase in average farm size for the five-year period, 1961 to 1965.

The average size (acres owned) for the sampled farms is somewhat larger than the average for the state. The average size of farm (acres owned) for the state has increased from 176.7 acres in 1959 to 201.4 acres in 1965, while the average size of farm (acres owned) for the area has decreased from 249 acres in

TABLE 2--NUMBER OF FARMS OBSERVED BY COUNTY AND IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE, 1959 TO 1965

Years	Number of Farms in							
	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1959	7	11	17	40	2	18	23	118
1960	8	12	17	41	2	18	23	121
1961	11	12	19	41	7	18	24	132
1962	11	12	20	42	8	19	25	137
1963	12	13	20	43	9	19	25	141
1964	12	13	20	46	10	21	25	147
1965	13	13	20	49	10	23	25	153

TABLE 3--AVERAGE SIZE OF FARM (ACRES OWNED) BY COUNTY IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE FROM 1961 TO 1965

Years	Average Size of Farm in							
	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	168	205	410	181	44	152	370	238
1962	168	205	396	184	46	146	362	235
1963	167	193	400	187	50	155	376	236
1964	167	193	413	185	47	155	384	235
1965	164	193	433	184	47	155	392	236

TABLE 4--AVERAGE SIZE OF FARM (ACRES OPERATED) BY COUNTY IN THE WEST CENTRAL
EXTENSION DISTRICT SAMPLE FROM 1961 to 1965

Years	Average Acres Operated in							
	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	190	230	391	205	49	152	297	227
1962	190	222	403	204	51	161	300	228
1963	186	212	437	205	55	172	319	234
1964	186	231	940	200	51	152	305	273
1965	181	229	734	200	51	160	310	258

1959 to 236 acres in 1965. If the trends toward smaller farms in the area and larger farms for the state are projected, the average size farm for Missouri will exceed that of the area in the near future. The decreased size of farm in the rural-urban fringe is one consequence of urbanization influences.

Although the average size of farm (acres owned) has decreased slightly in the last five years, the average number of acres operated per farm operator for the sample has increased (Table 4). In 1961 the average number of acres operated per farm operator was 227 acres, and by 1965 this had increased to 258 acres—a 13.7 percent increase. This trend, to operate more acres in order to make the farming operation efficient, is occurring over the entire state; however, in this urbanized area more of the land probably is being rented because of its high purchase price.

Farm Tenure

The tenure of farm owners in the West Central Extension District sample is shown in Table 5. Approximately one-half of the operators were owners and approximately one-fourth were crop-share renters. The crop-share lease accounted for almost one-half of the tenant operated farms. The other leases were cash, cash-crop share, and livestock-share. The number of observations for each type of tenure may be seen in Table 5.

Location of Land Farmed

Table 6 shows farms that had tracts located a distance from the headquarters farm. For this sample of farms only 14.7 percent had tracts located away from the headquarters. Platte County is the leader with 76.0 percent of its farms having tracts located a distance from the farmstead. This suggests the Platte County farmers are probably feeling pronounced effects of urbanization. One of the effects of urbanization is that farm operators are required to travel a distance from the farmstead in order to obtain enough land for an economical farm unit.

Type of Farm

Beef, grain, and general are the most prevalent types of farms³⁸ in the West

TABLE 5--TENURE OF FARM OWNERS IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE, 1965

	Number	Percent
Owner-Operator	72	47.1
Cash	12	7.8
Cash-Crop Share	14	9.2
Crop Share	39	25.5
Livestock	2	1.8

³⁸The method used to determine types of farms was that over one-half of the net income must be produced by an enterprise to be considered that type of farm.

TABLE 6--FARMS THAT HAD TRACTS LOCATED A DISTANCE FROM THE HEADQUARTERS FARM IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE IN 1965

County	Number	Percent
Platte	4	76.0
Clay	3	25.0
Ray	6	30.0
Lafayette	1	2.1
Jackson	0	0.0
Cass	5	21.7
Johnson	3	12.0
District	22	14.7

Central Extension District sample. Only a small percent of the farms were hog or dairy farms. The results of this grouping of the sample farms are shown in Table 7. The area had an extensive type of farming with most of the farms in the sample being beef, grain, and general. Two counties had more than one-half of their farms classed in one type. Ray County had over one-half grain farms and Clay County had over one-half beef farms, according to the sample.

Age of Buildings

The average age of the buildings, in terms of the years of use remaining, is given in Table 8. The average age of the barn for the area was 42 years old with an expected 34 years of productive life remaining. The average age of the house was 49 years for the sample farms, with an expected 37 years of productive life remaining. The average age of other buildings was 27 years with an average expected remaining productive life of 34 years. Jackson County seemed to stand out as a county with the most new buildings.

Land Prices

The difficult nature of an owner estimating the price per acre for which his land would sell was recognized in this study. Therefore, the owner was first asked the price per acre of a comparable farm that had sold, and then his estimate of the present price per acre of his farm if the land were sold. The anticipated consequence was that the farm owner would estimate prices of land near market value. The results of the above procedure are shown in Table 9. The price per acre for comparable farms for the area averaged \$287 per acre, and the average estimated price by owners for their own farm was \$313 per acre.

The land price data by counties shows much variation. Jackson County had the highest land prices of the seven counties, with an average comparable price per acre of \$442 and an average estimated price of the owner's farm of \$592. As Jackson County and the rest of the area is becoming more urbanized, the demand for land is increasing and the price is being bid upward.

TABLE 7--TYPE OF FARM EXPRESSED IN PERCENTAGES BY COUNTY AND IN
THE WEST CENTRAL EXTENSION DISTRICT
SAMPLE, 1965

Type	Type of Farm, Percentages				
	Beef	General	Grain	Hogs	Dairy
County					
Platte	27.3	27.3	45.4	----	---
Clay	53.8	30.8	----	15.4	---
Ray	25.0	----	55.0	15.0	5.0
Lafayette	26.5	38.8	14.3	18.4	2.0
Jackson	40.0	20.0	30.0	10.0	---
Cass	30.4	26.1	17.4	17.4	8.7
Johnson	24.0	36.0	24.0	8.0	8.0
District	29.9	28.5	23.9	13.9	4.0

TABLE 8--AGE AND YEARS OF USE REMAINING IN BUILDINGS BY COUNTY AND IN THE
WEST CENTRAL EXTENSION DISTRICT SAMPLE IN 1965

	Average Barn Age (in years)	Average Years Remaining	Average House Age (in years)	Average Years Remaining	Average Others Age (in years)	Average Years Remaining
Platte	33	21	53	22	33	29
Clay	28	29	37	52	32	17
Ray	39	24	45	33	32	22
Lafayette	44	38	54	37	26	39
Jackson	26	34	39	33	17	40
Cass	41	39	52	43	24	38
Johnson	54	35	49	38	29	42
District	42	34	49	37	27	35

TABLE 9--PRICE PER ACRE OF FARM MOST COMPARABLE TO SAMPLE FARM AND OF OWN FARM, ESTIMATED BY OWNER, BY COUNTY AND IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE, 1965

County	Comparable Farm	Owner's Farm
Platte	\$342	\$395
Clay	313	365
Ray	295	290
Lafayette	287	297
Jackson	442	592
Cass	308	296
Johnson	167	195
District	\$287	\$313

TABLE 10--AVERAGE MILES AND MINUTES TO KANSAS CITY CITY LIMITS FROM THE SAMPLE FARMS IN THE WEST CENTRAL EXTENSION DISTRICT IN 1965

County	Miles to Kansas City City Limits	Minutes to Kansas City City Limits
Platte	10	19
Clay	16	25
Ray	55	71
Lafayette	43	47
Jackson	15	25
Cass	26	32
Johnson	54	62

Other Characteristics of Sample Farms

Table 10 shows the average number of minutes of driving time and the average number of miles to Kansas City city limits from the sample farms. The largest number of minutes to the city limits is 71, which is still within commuting distance. The average commuting time is nine more minutes than the number of miles from the Kansas City city limits.

Occupations of the farm owners in the sample are shown in Table 11. Well over half of the farm owners were operating their own land, and nearly one-third of the owners were non-farmers, with the remaining owners retired. Again, Jackson County was atypical; approximately two-thirds of the sample owners being non-farmers.

TABLE 11--OCCUPATION OF FARM OWNERS BY COUNTY AND IN THE WEST
CENTRAL EXTENSION DISTRICT SAMPLE IN 1965

Occupation:	Percent Farm Operator	Percent Non-Farmer			Total	Percent Retired
		Percent Blue Collar	Percent White Collar	Percent Other		
<u>COUNTIES</u>						
Platte	53.8	7.7	7.7	-	15.4	30.8
Clay	38.5	15.4	30.8	-	46.2	15.4
Ray	50.0	-	15.0	10.0	25.0	25.0
Lafayette	51.0	20.4	2.0	8.6	30.6	18.4
Jackson	11.1	55.6	-	11.1	66.7	22.2
Cass	63.6	9.1	4.5	13.6	27.3	9.1
Johnson	66.7	4.2	-	16.6	20.8	12.5
District	52.0	14.0	6.6	9.6	30.0	18.0

On the sample farms approximately one-third of the owners were working off the farm. Those working off the farm lived an average of 28 miles from their jobs. This required an average of 34 minutes travel time. These owners worked approximately 45 weeks per year with average monthly earnings of \$591.³⁹

Relationship of the Real Property Tax to Ability to Pay, Benefits Received, and Control of Resource Use

In order to determine the magnitude of the problem under study, an effort was made to examine the increasing cost of real property taxes. First, the factors were examined which might explain the increase in property taxes. Second, the actual change in the real property tax cost was investigated to determine the extent of the increase. Third, the change in the benefits received from the tax was examined to determine the relationship of the change in the benefits to the change in tax cost. Fourth, the change in income to the real property was examined to determine if the property tax was taking an increasing amount of the income. Fifth, the effect of the increased property tax on the control of real property was examined.

FACTORS WHICH INFLUENCE AN INCREASING LEVEL OF PROPERTY TAX

There are many factors responsible for the present level of the property tax on the rural-urban fringe. Some of the frequently mentioned factors are inflation, land prices, quantity and quality of public services provided, and urban encroachment. Since all these factors tend to increase the monetary cost of property taxes on the rural-urban fringe, they will be discussed.

Inflation and Tax Trends

The term inflation is often used to describe a time of generally rising prices. As entrepreneurs and debtors, farmers are likely to gain from inflation, at least temporarily. Inflation frequently creates special problems in municipal finance where a spread between expenses and general property tax receipts can develop. In many cases property taxes are increasing monetarily, but when deflated to constant dollars they may be decreasing.

The USDA publishes index numbers of taxes per acre levied on farm real estate.⁴⁰ These index numbers for Missouri, the Corn Belt, and the United States are shown in Table 12. The index of farm real estate taxes per acre for Missouri advanced from 116 percent of the 1957-1959 average in 1960 to 143 percent in 1965. This increase for the state was approximately the same as for the average of

³⁹The monthly earnings include both the husband's and wife's off-farm earnings.

⁴⁰United States Department of Agriculture, Economic Research Service, *Farm Real Estate Taxes: Recent Trends and Developments*. RET 1-5 (Washington: Government Printing Office, 1961-66).

TABLE 12--TAXES LEVIED ON FARM REAL ESTATE: INDEX NUMBERS OF AMOUNT PER
ACRE, BY STATES AND REGIONS, SELECTED YEARS 1940 TO 1965
(1957 - 1959=100)^a

State and Region	Index Number, by Years								
	1940	1950	1955	1960	1961	1962	1963	1964	1965
Missouri	34	56	82	116	123	126	132	137	143
Corn Belt	32	61	82	113	118	125	129	136	142
United States	37	66	83	115	123	129	136	143	152

^a United States Department of Agriculture, Economic Research Service, Farm Real Estate Taxes, Recent Trends and Developments, Ret 1-5. (Washington: Government Printing Office, 1961-66).

the Corn Belt states—Ohio, Indiana, Illinois, Iowa and Missouri. However, the United States figure advanced to 152 from 115, which was an increase 10 index points more than for Missouri.

Land Market

As the area becomes urbanized the demand for land can be expected to increase since there is more competition for the land. This increased demand is translated frequently into higher prices for land close to the urban areas. Gaffney estimates that the radiation of price influences extend more than 50 miles from the center of some cities. He contends that these conditions raise land prices, create an artificial shortage of building lots, increase the dispersion of development areas, and raise the cost of providing needed public services.⁴¹

The Census of Agriculture reports the value of land and buildings per acre has increased approximately 63 percent for the sample area in the ten year period 1955 to 1965.⁴² Table 13 shows the value of land and buildings per acre by county and area for 1955, 1960 and 1965. The table also shows the percent increase in value of the real property for the past decade. Clearly, the value of land and buildings in the area has increased significantly.

The value of land has a substantial effect on the level of property taxes since the law requires that land be assessed at "its true value in money."⁴³ If this procedure were used, real property in Missouri should be assessed at 100 percent of market value. However, assessors commonly assess property at 30 percent of market value.⁴⁴ In a recent study, ratios of assessment as a percent of market value (determined by verified sales) were determined for 55 Missouri counties. The seven counties in the sample area had ratios as follows: Cass 22.2, Clay 28.1, Jackson 25.8, Johnson 20.9, Lafayette 27.4, Platte 24.0, and Ray 26.8. Thus, in actual practice the property is being assessed somewhat below 30 percent of its market value.

Quantity and Quality of Services

Since local governments depend primarily on property taxes for revenue, the amount of services provided by local governments depends largely upon the amount of property tax collected. As an area becomes more urbanized (1) more services tend to be required and (2) their quality exceeds those the rural area had before. The increased cost of these services usually is borne by rural property owners since most of the services are required either simultaneously with or in advance of urbanization. Since the populace which move to outlying areas usually

⁴¹Mason Gaffney, "Urban Expansion—Will It Ever Stop" 1958 *Yearbook of Agriculture*. (Washington: Government Printing Office, 1958), pp. 503-522.

⁴²United States Department of Agriculture, *Census of Agriculture: 1954 and 1964* (Washington: Government Printing Office, 1956 and 1967).

⁴³*Missouri Revised Statutes*, 1959, Section 137. 115.

⁴⁴Paul E. Junk, et al., *An Assessment Sales Ratio Study*, (Columbia: Research Center, University of Missouri, 1967), p. 3. These ratios were computed by averaging the ratios obtained from each of over 50 transactions for each county.

TABLE 13--VALUE OF LAND AND BUILDINGS PER ACRE FOR SELECTED
YEARS AND PERCENT INCREASE IN VALUE 1955 TO
1965 IN THE WEST CENTRAL
EXTENSION DISTRICT^a

County	1955	1960	1965	Percent Increase 1955-1965
Cass	\$106.69	\$151.91	\$211.07	97.87
Clay	192.89	278.22	299.81	55.43
Jackson	277.96	322.64	454.00	63.33
Johnson	71.52	108.04	137.65	92.46
Lafayette	138.10	178.14	115.58	56.82
Platte	176.43	196.67	237.92	34.85
Ray	102.01	147.53	185.05	81.40
District	<u>\$152.22</u>	<u>\$197.59</u>	<u>\$248.82</u>	<u>63.46</u>

^a United States Department of Agriculture, Census of Agriculture: 1954, 1959, and 1964.

own less property than the farm owners, they are more concerned with the amount of services provided than the rate of taxation.

The quantity and quality of services which an area receives is, at best, very difficult to measure.⁴⁵ In this inquiry no attempt was made to determine the benefits of services received from the property tax in dollar terms. The main emphasis was on the changing amount and quality of the benefits in relation to the change in the property tax.

Urban Encroachment

Urban encroachment is one of the main factors which many believe to be responsible for the increase in property taxes. The preceding two factors—land market and quantity and quality of services—are influenced considerably by urban encroachment. However, urban encroachment is influenced by attitudes of the new inhabitants, social structure, community participation and other sociological factors.⁴⁶ Urban encroachment may change the mix in the population to such an extent that the majority becomes favorable to increase local government involvement in the welfare of the community.

Although urban encroachment is extremely difficult to measure, some simple indicators such as people per square mile and percent urbanization can be used. The development of adequate indexes of urban encroachment would provide a much needed input for more detailed analysis.

CHANGES IN THE COST OF THE REAL PROPERTY TAX

The real property tax per acre experienced a steady and continuous increase in the rural-urban fringe of Kansas City, Missouri between 1961 and 1965. As stated earlier, taxes per acre levied on farms in Standard Metropolitan Statistical Areas (SMSA) averaged more than two and one-half times the taxes on farms in counties immediately adjacent to SMSA's, and more than five times as high as in rural counties—those at some distance from metropolitan centers. The USDA estimated that about one-fourth of the total farm real estate levies in 1963 originated in metropolitan areas. The results of this inquiry seem to be consistent with the above findings. The property tax per acre has increased 42 percent in the past five years for the farms sampled in this study, while for Missouri the increase has been only 17.4 percent. The study area had an increase of \$0.74 per acre while the state only had an average increase of \$0.19 per acre.⁴⁷

The real property tax per acre is the product of assessed valuation and levy

⁴⁵Werner Z. Hirsch, Elbert Z. Hirsch and Morton J. Marcus, *Spillover of Public Education Costs and Benefits*. (Los Angeles: Institute of Government and Public Affairs, 1964). This study attempted to measure the cost and benefits of public education in the St. Louis metropolitan region. It is one of the few studies of this kind that has been undertaken.

⁴⁶Stocker, *op. cit.*, pp. 95-97.

⁴⁷United States Department of Agriculture, Economic Research Service, *Farm Real Estate Taxes: Recent Trends and Developments*. RET-2-6 (Washington: Government Printing Office, 1962-1966). Estimates of average taxes per acre for the district and for individual counties made from the sample were unweighted with respect to farm size.

per \$100 of valuation. Therefore, one should examine both of these components to determine the property tax trend on the rural-urban fringe.

Assessed Valuation

Assessed valuation of real property is determined by the county assessor. The property is usually assessed at approximately 30 percent of market value. In this study the real property was found to have been assessed at somewhat below 30 percent. This was consistent with the findings of the previously mentioned studies.

The assessed valuation for property in this study increased by 28 percent in the five year period. In 1961 the assessed valuation per acre was \$49.95 and by 1965 it had increased to \$58.74. Table 14 shows the assessed valuation obtained in this study by counties and averages for the district. There is wide variation by county, with Jackson County having the highest average assessed valuation. However, the average assessed valuation for Jackson County is much lower for the sample farms in this study than that given by the State Tax Commission. Most of the other assessed valuation statistics are comparable, with a small amount of variation. The classification of assessed valuation according to State Tax Commission allows much more land to be considered farmland than the more restrictive definition used by the Agricultural Census and in this analysis. The assessed valuation by the State Tax Commission is set forth in Table 15.

Property Tax Levy

The second component of the property tax per acre, levy per \$100 of valuation, has also increased in the past five years. The levies per \$100 of valuation for the sample farms are presented in Table 16. The average levy for the area has increased \$0.212 per \$100 valuation. This is a 10.4 percent increase in five years. No data are compiled and released on total levies per \$100 of valuation by counties for Missouri; therefore, no direct comparisons can be made with county census figures.

Property Tax Cost

The product of the two factors discussed above gives the real property tax per acre. The property tax per acre had an increase of \$0.74 in the sample, which was a 42 percent increase in five years, as mentioned earlier. The property tax per acre for the sample farms is set forth in Table 17.

The average real property tax per acre is somewhat less for the state than for this area. In 1961 the state average was \$1.15, and each year thereafter it had a \$0.03 and \$0.06 increase so that by 1965 it was \$1.34. Comparisons of the state averages with area averages show that taxes in the area have been relatively high. Therefore, there is some evidence for property owners' feeling that the property tax is at a high level in the area. On the other hand, the average property tax for the Corn Belt states—Ohio, Indiana, Illinois, Iowa and Missouri—was \$2.70 in 1961 and increased to \$3.70 by 1965, which is much higher than the average property tax on the sample farms.

TABLE 14--AVERAGE ASSESSED VALUATION PER ACRE BY COUNTY AND IN THE WEST CENTRAL
EXTENSION DISTRICT SAMPLE, 1961 TO 1965

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$68.26	\$67.71	\$44.68	\$44.79	\$ 79.52	\$ 39.85	\$25.72	\$45.95
1962	62.73	65.71	47.33	43.26	69.83	106.87	24.84	53.30
1963	58.91	75.08	47.58	44.20	68.58	110.78	24.73	55.21
1964	58.91	79.38	45.35	42.74	149.45	102.95	24.40	59.65
1965	59.69	77.50	43.46	42.05	151.20	99.81	24.14	58.74

TABLE 15--AVERAGE ASSESSED VALUATION PER ACRE BY COUNTY AND IN THE WEST CENTRAL
EXTENSION DISTRICT SAMPLE, 1961 TO 1965^a

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$62.27	\$77.14	\$34.65	\$42.21	\$474.81	\$40.18	\$28.34	\$108.51
1962	57.25	75.63	35.22	42.98	379.68	44.81	28.46	94.86
1963	57.71	76.00	35.90	43.35	545.46	41.91	28.47	118.40
1964	57.86	76.47	36.62	43.90	597.99	45.76	28.02	126.65
1965	58.21	77.69	37.60	43.96	849.96	46.37	28.39	163.13

^aMissouri State Tax Commission Reports, 1961 to 19

TABLE 16--AVERAGE LEVIES PER HUNDRED DOLLARS OF ASSESSED VALUATION BY COUNTIES
AND IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE, 1961 TO 1965

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$4.252	\$5.835	\$4.197	\$3.397	\$4.781	\$4.560	\$3.399	\$4.039
1962	4.570	5.260	4.343	3.460	4.720	4.399	3.758	4.098
1963	4.635	6.001	4.340	3.869	4.718	4.373	3.722	4.295
1964	4.344	5.395	4.313	3.769	4.424	4.381	3.386	4.105
1965	4.495	5.506	4.678	3.822	4.653	4.655	3.366	4.251

TABLE 17--AVERAGE PROPERTY TAX PER ACRE BY COUNTY AND IN THE WEST CENTRAL
EXTENSION DISTRICT SAMPLE, 1961 TO 1965

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$2.55	\$2.30	\$2.04	\$1.51	\$4.86	\$1.48	\$.86	\$1.73
1962	2.67	2.28	2.31	1.74	4.02	4.07	.96	2.20
1963	3.01	2.27	2.25	1.74	3.94	3.86	.93	2.21
1964	2.67	2.86	2.28	1.80	5.18	3.60	.93	2.32
1965	2.94	3.11	2.32	1.91	6.09	3.64	.94	2.47

To determine the real increase in property taxes to the farm owners, the figures were deflated. The index chosen to deflate the data was the Consumer Price Index⁴⁸ since the index is representative of changes in the purchasing power of the dollar. When the real property tax per acre was deflated, an increase of \$0.60 per acre over the five year period was obtained instead of \$0.74. Although real property taxes per acre are increasing, they have not increased as fast when deflated to constant dollar terms. When deflated, they are increasing at 6.94 per cent per year.

The cost of operating a farm business is influenced by the cost of the property tax. In order to determine how the property tax compared with purchased inputs, a comparison of the change in property taxes per acre with the change in the Index of Prices Paid by Farmers for Production Commodities⁴⁹ was made. During the five year period 1961 to 1965 an increase of 0.75 percent per year was found in prices paid by farmers. This clearly shows that the cost of property taxes to the farm business has increased faster than the cost of purchase items.

CHANGES IN BENEFITS RECEIVED FROM THE REAL PROPERTY TAX

The difficult nature of measuring benefits to the public, and, specifically, to the property owners from taxation levied against real property makes an exact analysis almost impossible. Only a few studies have related real property taxes to benefits received by real property owners. One of the first attempts was made by O. H. Brownlee of the University of Minnesota. He stated the difficult nature of measuring benefits as follows:

Finally, only a very crude estimate of the distribution of the benefits of public services can be obtained. If such services are not sold, their valuation is somewhat arbitrary. . . Even if their total value were known, their allocations among persons would not be completely known. . . Because notions with respect to certain crucial facts are frequently vague, it is important to note how difference in such notions affect the various estimates. . .⁵⁰

A Wisconsin tax study committee stated:

When comparing farm property taxes with levies on property in the other two business categories, recognition ought to be given to the likelihood that farmers are probably less able to shift their taxes than are merchants and manufacturers. Consideration should also be accorded the fact that they generally enjoy a lower level of services from local government than do those connected with city-centered business enterprise.⁵¹

⁴⁸United States Department of Commerce, *Statistical Abstract of the United States: 1966*, 87 Ed. (Washington: Government Printing Office, 1966), p. 356.

⁴⁹*Ibid.*, p. 632.

⁵⁰O. H. Brownlee, *Estimated Distribution of Minnesota Taxes and Public Expenditures Benefits* (Minneapolis: The University of Minnesota Press, 1960), p. 6.

⁵¹University of Wisconsin Tax Study Committee, *Wisconsin's State and Local Tax Burden* (Madison: University of Wisconsin, 1959), pp. 128, 131.

The statements above are considered in this analysis of costs and benefits of the property tax to owners of farm property; however, the scope of this report is limited to the owners of farmland. Consequently, no comparison is made with owners of other types of property.

The farm owner's real property tax pays for many local government functions. One of the most important levies against real property is for education. The next highest levy is for roads and highways, and the other levies vary considerably from one taxing jurisdiction to another.

This section on benefits received by the sample farm owners will examine (1) the quantity and quality of education, (2) the quality of the highways, (3) the welfare programs and (4) other public services. No effort will be made to make monetary comparisons. All that will be made is an examination to determine if the benefits received have increased and some indication as to the extent of any change.

Education

The school tax is the largest levy against real property. For the farms sampled by this study the school tax was 70.65 percent of the total levy in 1965. The average school levy was \$3.223 per \$100 valuation in 1965, an increase of \$0.46 from 1961. This represents an increase of 16.6 percent over the past five years.

The total number of children from the sample farms who were in primary and secondary schools increased from 85 in 1961 to 123 in 1965. This is an increase of 44.7 percent. However, the largest increase was in the number of high school students—a 57.14 percent increase—while the number of grade school children increased only 38.59 percent. The average number of children being sent to grade and high school from each farm is shown in Figure 3. In 1959

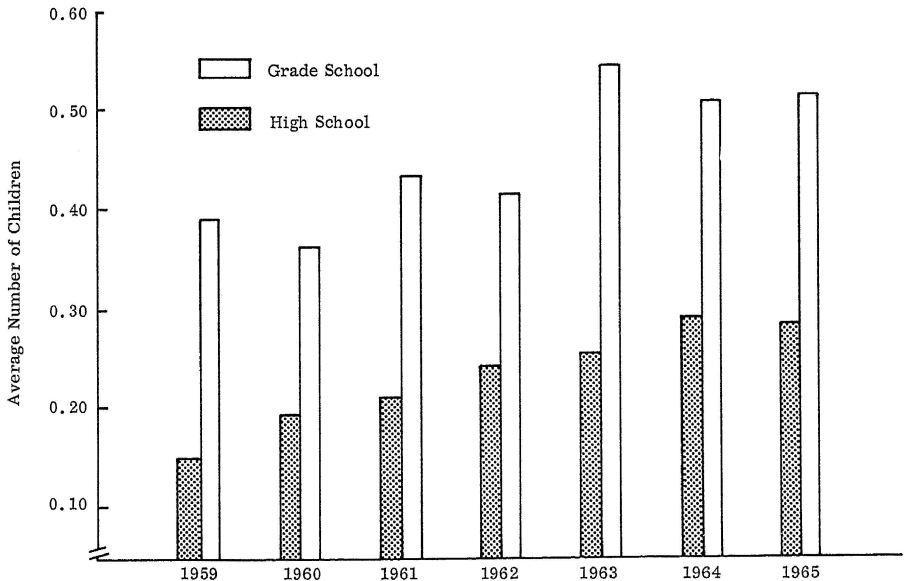


Fig. 3—Average number of children sent to school from each farm in the west central Extension district sample, 1959-65.



Fig. 4—Percent of grade schools by rating in the west central Extension district, 1959-65.

there was almost four-tenths of a child per farm in grade school and by 1965 there was over five-tenths of a child per farm in grade school. The number of children per sample farm in high school for the same period almost doubled from fifteen hundredths to almost three tenths. Thus, the number of children attending school from these farms did increase.

When the sample farm owners were asked about the change in the quality of school service since 1959, 55.3 percent said it was "greatly improved," 28.2 percent said "improved some," 9.2 percent said "same," 5.0 percent said "not quite as good," 2.0 percent said "much worse." Thus, more than 80 percent of the farm owners sampled replied that there had been some improvement in the educational facilities servicing their farms.

That the quality of the education in the area has increased is evidenced by the change in ratings for grade schools and high schools attended by children from the sampled farms. Figure 4 shows the percent of grade schools by rating for 1959 and 1965. In 1959 approximately two-thirds of the grade schools had an "A" rating, the poorest rating. Approximately one-fifth had "AAA" rating, the best rating possible, and the other 13 percent had an "AA" rating. By 1965 the "A" rated grade schools had decreased by almost one-half; the "AA" rated grade schools had almost doubled, and the "AAA" had also experienced a substantial increase. The increase of the better quality grade schools, and the decrease of poorer quality grade schools substantiate the hypothesis that the quality of educational services has increased in the area.

The percent of high schools by ratings for 1959 and 1965 is shown in Figure 5. The high schools are rated the same way as the grade schools and Figure 5 shows approximately the same results as Figure 4. These figures contribute evidence to confirm the hypothesis that the quality of educational services is definitely increasing in the area.

Highways

The road levy takes one of the largest portions of the total levy against real

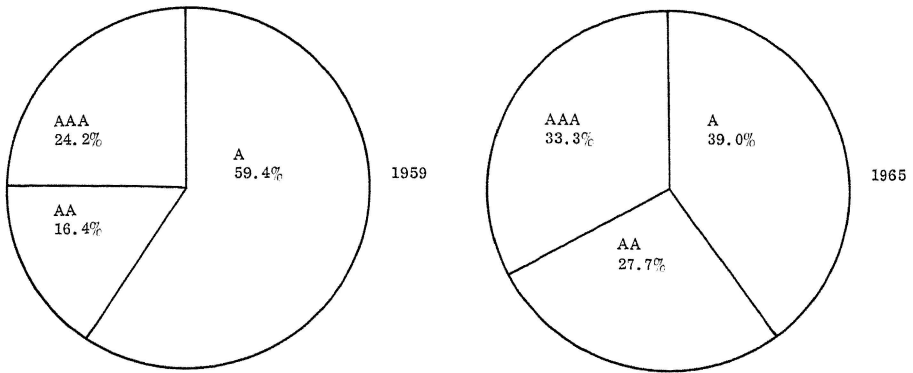


Fig. 5—Percent of high schools by rating in the west central Extension district, 1959-65.

property. The average road levy for the area in 1965 was 12.05 percent of the total levy. Thus, the highway and education levy accounted for 82.7 percent of the total levy against real property. During the past five years, 1961 to 1965, the road levy has increased by 10.7 percent, and presently stands at \$0.514 per \$100 of valuation. Jackson County has dispensed with the road levy for the areas in which the sample farms were located. However, it has the highest county levy in the area.

When the sample farm owners were asked about the change in the quality of the road servicing their farmsteads since 1959, 20 percent said "the roads were improved;" 36.6 percent said "the roads were improved some;" 39.3 percent said "the roads were not quite as good;" and 1.4 percent said "the roads were much worse than in 1959." Thus, over one-half of the sample farm owners felt the quality of the roads servicing their farmsteads had improved noticeably.

Data concerning the type of road servicing the farmstead by five year intervals were obtained also. Table 18 contains this information. Dirt roads were eliminated, except for one; the number of rocked roads increased slightly, and the number of asphalt roads almost tripled in number, while the number of cement roads decreased slightly. Consequently, the quality of roads has increased for the area. This conclusion gives further evidence supporting the hypothesis that the benefits received have increased.

TABLE 18--CHANGES IN TYPE OF ROAD FOR THE WEST CENTRAL EXTENSION DISTRICT SAMPLE FROM 1949 TO 1964

Year	Number of Roads			
	Dirt	Rock	Asphalt	Cement
1949	41	75	9	14
1954	13	101	17	14
1959	3	106	25	12
1964	1	100	36	11

Welfare Program

Of the farm owners who had any opinion about the welfare program, 5 percent thought it had improved greatly, 43.3 percent thought it had improved some, 31.7 percent thought it was the same, 16.7 percent thought it was not quite as good, and 3.3 percent thought it was much worse than it was in 1959. However, 60.5 percent of the total number asked had no opinion. Thus, one could conclude that those who were knowledgeable about the welfare program believed it had improved.

Other Public Services

The county levy accounts for a large proportion of the total levy that remains after the education and road levies have been deducted. In fact, the education, road, and county levies accounted for 95.5 percent of the total levy against the real property of the sample farms in 1965. The average county levy was \$0.46 per \$100 of valuation in 1961 and had increased 17.4 percent in five years to \$0.54 per \$100 of valuation by 1965. The county levy provides for a variety of public services and utilities which usually have no special levy.

When farm owners in the sample were asked about the change in the quantity and quality of other public services since 1959, 6.0 percent said "they had greatly improved;" and 32.2 percent said "they were the same." Again, more than one-half thought there had been some improvement in services they were receiving in 1965 as compared to 1959.

The sample farm owners also were asked the public service or utility that they thought had increased the most. Most of the property owners felt that fire protection and library service experienced the largest improvements. (Table 19)

TABLE 19--PUBLIC SERVICES AND UTILITIES THAT CHANGED FROM
1959 TO 1965 IN THE WEST CENTRAL EXTENSION
DISTRICT SAMPLE

Service	Percent of Sample with Increased Service
Fire Protection	28.8
Library	20.0
Johnson Grass Control	6.4
Water Line	6.4
Parks	8.0
Other	8.0
None	22.4

Summary of Changes in Benefits Received by the Property Owners

A summary of the opinion questions about education, roads, public services and utilities, and welfare is presented in Table 20. If the different categories for

TABLE 20--CHANGES IN PUBLIC SERVICES RECEIVED BY PROPERTY OWNERS IN THE WEST CENTRAL
EXTENSION DISTRICT SAMPLE FROM 1959 TO 1965

Service	Percent Reporting					
	Greatly Improved	Improved Some	Same	Not Quite as Good	Much Worse	Do Not Know
School Service	55.3%	28.2%	9.2%	5.0%	2.0%	0.0%
Road Service	20.0	36.6	39.3	1.4	2.1	---
Utilities & Public Service	6.0	57.0	32.3	---	---	4.6
Welfare	2.0	17.1	12.5	6.6	1.3	60.5

each question could be averaged together, the following results would be obtained: (1) 20 percent thought all the changes in services had greatly improved, (2) 34 percent thought they had improved some, and (3) 25 percent thought they had remained the same from 1959 to 1965. Thus, there is evidence to reject the hypothesis that the benefits received due to the property tax had not increased from 1959 to 1965.

CHANGES IN INCOME TO THE PROPERTY TAXED

The ability to pay the property tax also was analyzed in this inquiry. The gross income and net income of the sample farms were obtained since ordinarily the taxes must be paid from the current income. The income figures were taken from Internal Revenue Service Form 1040, Schedule F.

The use of IRS income tax returns has some inherent limitations, but the necessity of obtaining income information for preceding years required the use of recorded yearly data. Stocker and Ellickson⁵² report that there is usually a substantial difference in net income from agriculture reported by the IRS and the amount estimated by the USDA. They attribute much of the difference in net income to overstatement of farm operating expenses by farm owners when filing their income tax. However, they state, "It does seem clear that reporting of gross farm income today is substantially complete, whatever the situation may have been two decades ago."⁵³ Therefore, in this analysis gross income will be used as the primary indication of capacity to pay taxes.

The average gross income per farm is given in Table 21. During the five year period, 1961 to 1965, the average gross income per farm has increased by approximately \$1,000. However, there is much variation by year and county. Jackson County had a very low average gross income per farm, while Clay and Ray Counties both had rather high gross income per farm statistics for the five year period 1961 to 1965.

The gross income per acre also increased during the five year period. Table 22 shows the gross income per acre. During this period the gross income per acre increased by 15.8 percent.

The net income per farm per year also has shown an increase. It was slightly less than \$1,000 for the entire sample. However, some of the county averages were negative. The average net income per farm is shown in Table 23.

The average net income per acre for the area has increased by 30.3 percent in the five-year period. Again there is much variation by county; however, the overall trend for the area is upward. Because of the earlier evidence that IRS net income is inferior to gross income as a measure of ability to pay, net income is not used further in the analysis. However, the average net income per acre is shown in Table 24.

⁵²Frederick D. Stocker and John C. Ellickson, "How Fully Do Farmers Report Their Incomes?" *National Tax Journal*, Vol. XII, June 1959, pp. 116-126.

⁵³*Ibid.*, p. 126.

TABLE 21--AVERAGE GROSS INCOME PER FARM BY COUNTY AND IN THE WEST CENTRAL
EXTENSION DISTRICT SAMPLE 1961 TO 1965

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$8,960	\$18,292	\$13,107	\$ 9,088	\$ 731	\$5,751	\$11,445	\$10,419
1962	8,103	6,059	14,738	9,064	806	7,076	10,605	9,300
1963	8,341	5,198	13,910	9,544	1,136	5,757	11,616	9,187
1964	5,805	6,287	17,204	9,669	1,377	6,940	9,117	9,393
1965	8,404	16,170	17,753	11,530	1,393	6,865	10,194	11,305

TABLE 22--AVERAGE GROSS INCOME PER ACRE BY COUNTY AND IN THE WEST CENTRAL
EXTENSION DISTRICT SAMPLE, 1961 TO 1965

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$58.21	\$63.87	\$ 61.32	\$48.03	\$14.60	\$34.39	\$39.09	\$49.55
1962	52.00	25.96	102.81	48.38	18.60	42.01	49.99	53.33
1963	53.53	20.82	87.21	47.84	18.51	41.10	50.49	50.58
1964	37.64	22.17	103.49	46.13	34.66	39.27	38.28	49.66
1965	53.38	62.94	104.45	55.05	34.35	37.42	40.16	57.42

m

TABLE 23--AVERAGE NET INCOME PER FARM BY COUNTY AND IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE, 1961 TO 1965

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$3,964	\$ -183	\$2,752	\$1,917	\$-614	\$402	\$2,814	\$1,838
1962	3,316	-287	2,737	2,380	-291	563	2,457	1,938
1963	3,999	-1,024	6,254	1,557	-268	689	2,875	2,459
1964	3,129	-391	5,840	1,677	-243	121	1,479	2,047
1965	2,908	164	7,689	2,221	0	923	1,758	2,705

TABLE 24--AVERAGE NET INCOME PER ACRE BY COUNTY AND IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE, 1961 TO 1965

Year	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	\$29.04	\$-3.16	\$20.22	\$10.33	\$-34.30	\$.58	\$ 7.33	\$ 9.31
1962	23.72	-3.81	15.77	10.66	-17.34	1.53	7.69	8.26
1963	27.74	-7.81	49.87	4.85	-12.70	1.72	13.33	16.33
1964	22.44	-5.20	56.66	5.53	- 8.98	.40	4.08	12.68
1965	20.64	-1.67	72.51	8.50	- 6.15	-37.33	5.14	12.13

TABLE 25--PROPERTY TAX AS A PERCENT OF GROSS INCOME PER FARM PER COUNTY AND IN THE WEST CENTRAL EXTENSION DISTRICT SAMPLE, 1961 TO 1965

Year	Tax as a Percent of Gross Income by Counties							
	Platte	Clay	Ray	Lafayette	Jackson	Cass	Johnson	District
1961	6.3%	14.0%	9.3%	5.5%	38.5%	7.6%	3.4%	8.77%
1962	7.2	15.4	7.5	5.4	24.9	6.6	4.5	8.18
1963	9.9	15.3	6.6	6.8	19.0	8.7	3.2	8.38
1964	17.4	43.9	6.4	7.7	20.1	6.2	4.9	11.80
1965	17.8	21.0	8.3	9.9	23.8	7.5	4.2	11.30

The property tax per acre as a percent of the gross income per acre gives one of the best indications of ability to pay the tax. Further, it shows how the ability to pay the property tax has changed over time. For all the sample farms, the property tax was taking 8.77 percent of the gross per acre income in 1961 and five years later the property tax was taking 11.30 percent of the gross income. Thus, in the five-year period the property tax, as a percent of gross income, has increased by 28.8 percent. One of the most noticeable percentages is Jackson County where the property tax was taking almost one-fourth of the gross income in 1965. Table 25 shows the data discussed above.

The evidence presented in this discussion substantiates the hypothesis that the tax on real property in the area is taking an increasing amount of the income from the property.

CHANGES IN CONTROL OF PROPERTY DUE TO THE INCREASED PROPERTY TAX

Theoretically, if the real property tax becomes too high relative to income the tax becomes delinquent. Therefore, the property owners were asked if the property tax had ever been delinquent. Only 2 percent of the property owners sampled reported that the taxes on their property had been delinquent since 1949.

Also, the present owners were asked why the previous owner had sold the property. Only seven-tenths of a percent said that taxes were responsible. The main reasons were (1) to settle estates, (2) the profit motive, and (3) for retirement reasons. However, when the property owners were asked why they bought the land, over one-third reported they owned it for a capital gain, i.e., as an investment. This expected capital gain is an indication that the owners are expecting an appreciation in land prices due to urbanization.

The hypothesis that the present property tax is so high that it is forcing land out of agriculture prematurely would be rejected tentatively from the evidence obtained in this inquiry. However, this hypothesis should be explored more fully with additional data.

Determinants of the Real Property Tax per Acre on the Sample Farms

The observed property tax per acre varied substantially with socio-economic characteristics of the sampled farms. One of the primary objectives of the analysis was to detect significant cause and effect relationships among these variables. A variety of statistical techniques were used to determine which casual factors explained the variation in real property taxes per acre, rather than the observed variation having been due to chance. The 95 percent level of probability was accepted as the level of statistical significance.

HYPOTHESIZED VARIABLES USED IN THE ANALYSIS

As states in hypothesis four, certain factors were selected to explain the variation in the property tax per acre. All of the factors were considered; however, only the variables which explained the most variation were used in the final regression analysis.

In this section the variables are defined, and the logic for using each variable in the analysis is given.

Size of farm—Farm size was measured in total number of acres owned. For the farms sampled in this analysis, the range in number of acres owned was from 17 to 2,147. The size of farm was used as a variable in the analysis because of the regressive nature of the property tax. In a study conducted on the St. Louis, Missouri rural-urban fringe,⁵⁴ the size of the farm was a good predictor of the property tax per acre.

Price of a comparable farm—The farm owner was asked the price per acre of a comparable farm since the comparable price was expected to be a good estimation of farm prices in the area. Also in pretesting the questionnaire, the farm owners were very reluctant "to price their land" unless they were first asked a comparative question about the land market. The range in comparable prices per acre was from \$85 in the extreme rural area to \$800 per acre near the central city. The comparable price per acre was expected to help predict the tax per acre since the assessed value per acre should be a function of land prices.

Owner's estimate of the present price per acre of sample farm—This estimate by the owner was obtained after the owner was asked about a comparable farm price per acre. The owner's estimate was used in the analysis since this might approximate the assessed value more than the price of a comparable farm. The range of the owner's estimate was somewhat greater than for comparable farms, with a range of \$85 to \$900 per acre.

Miles from sample farm to Kansas City city limits—The property tax per acre was expected to be a function of the distance from the sample farm to Kansas City. Therefore, the number of miles from the sample farm to the city limits was ascertained. The range in miles from the Kansas City city limits was zero to seventy-five.

Minutes driving time from sample farm to Kansas City city limits—With the increasing congestion of traffic on highways, even though they have been improved in recent years, the minutes of driving time was thought to be a good measure of distance to the Kansas City city limits. The range in minutes of driving time was from zero to ninety-five.

Number of years farm had been owned by present owner—The length of time the present owner had owned his farm was measured in number of years owned.

⁵⁴Fredrick Charles Dopson and Frank Miller, *Effects of Urban Expansion on Ownership, Use and Taxation of Agricultural Land*, University of Missouri Research Bulletin 907 (Columbia: University of Missouri, April, 1966), p. 15.

This measure was used since some evidence suggests that assessors raise the assessed value only a few dollars or not at all each year prior to the sale of the land.⁵⁵ The range for length of ownership was from one to sixty-five years.

Age of barn on sample farm—The assessment of real property includes permanent buildings as well as land. The age of the barn was used as a measure of the quality of the improvements on the sample farm. Since some of the counties had a rural orientation, the quality of the barn was thought to be a possible influence on the assessment made. Ages of the barns on the sample farms varied from one to 105 years.

Age of house on sample farm—The house is also part of the real property assessed for taxation. As in the previous measure age was expected to give some indication of the quality of the improvements. The expectation that age of barn and age of house would be approximately the same was not found to be true in this study. However, the range for house age was found to be approximately the same as barn age. The range in age was from one year to 115 years.

Dollars of depreciation for improvements on sample farm—This measure also was expected to give some indication of the quality of improvements as well as the amount of improvement. A larger figure could indicate several buildings were being depreciated. The depreciation data for the sample farms were obtained from IRS Form 1040, Schedule F. Some of the sample farms reported no depreciation and other farms reported several thousand dollars of depreciation.

Number of days of off-farm work per year by sample farm owner—The amount of off-farm work was used as a variable in this analysis. An assessor, who is rural oriented would be expected to assess an owner who operates his farm full time at a lower rate than a farm owner who supplements his income by working elsewhere, i.e., off the farm.

Horizontal distance from the X and Y coordinates superimposed on the area—A locational factor seemed to be needed since urbanization usually moves at an accelerated rate in a specific direction. The best way to introduce a locational factor was considered in detail. Finally, X and Y axes were superimposed on the area with the origin approximately where Interstate Highway 70 crosses the Missouri-Kansas state line. The horizontal axis gives the distance east and west of the Y axis. The distance was measured in miles from the sample farms.

Vertical distance from the X and Y coordinates superimposed on the area—This variable is similar to the one immediately above, except it measures the distance north and south of the X axis.

Population per square mile by counties—The population per square mile measured the density of the population in the county. Population density was expected to influence the amount of the tax levy because a densely populated area usually requires more services. This measure was entered on a county basis since some of the levies were determined by the counties. The number of people per

⁵⁵State of Missouri ex rel. William V. Kahler, appellant v. State Tax Commission of the State of Missouri, respondent, No. 50,822, Supreme Court of Missouri, Division Number One. April Session, 1965.

square mile ranged from 1014 in Jackson County to as few as 28 in Ray, one of the most rural counties.

Number of school age children per square mile by counties—The number of school age children per square mile was expected to be a good measure of the demand for educational services since the school levy exceeded the other levies against real property. The number of school age children ranged from 239 to 7 per square mile by counties.

Percent urbanization by zones within counties—The percent of the population that was urban also was expected to be a good indication of tax rate. This measure was one of the few available by zones. A better relationship was expected in the analysis with data specified by zones. The zones used in this analysis had from zero to seventy-two percent urbanization.

Percent urbanization by counties—This is the same type of measure as the immediately preceding one except this is by counties. The county measure was included since some zones had zero percent urbanization. The reason for a zero percent urbanization was that a town of 2,500 had to be in the area before it was considered urban. Since much of the expansion of population in the rural-urban fringe was by "urban sprawl," the definition of urbanization was felt to be too limiting by zones. The counties had from 21 to 99 percent urbanization.

Gross income per acre for sample farms—The gross income per acre was expected to give some indication of the productive ability of the property. Since the productive ability of the land is one of the factors which influences the price of land, it was also expected to be an indication of the assessed valuation of the property. The gross income per acre had a large range with the high of \$367 per acre and a low of zero dollars per acre.

STATISTICAL MODELS UTILIZED IN THE ANALYSIS

Initially, an analysis of variance was performed to determine if the property tax per acre varied by a significant difference among counties. The results showed that the counties had significantly different means at the 95 percent level of probability. Since the variation among counties was significant, the location variables of X and Y were introduced in the manner explained in the preceding section.

Multi-variable regression was used to determine if variation in the property tax per acre for the farms sampled could be explained by a selected set of variables. In the multi-variable regression equation, property tax per acre was used as the dependent variable, while the 17 variables defined in the preceding section were used as independent variables. These variables were all included in the equation initially. However, due to the lack of significance between the dependent variable and several of the independent variables, an equation was evolved that included only five of the independent variables. It explained more of the variation in per acre real property taxes than any other model used and, therefore, was accepted as the final equation.

The independent variables used in the final model presented here were size

of farm, price per acre of a comparable farm, age of house on the sample farm (in logarithms), vertical distance from the origin of an X and Y axis superimposed on the area, and population per square mile by counties. The coefficient of multiple determination, R^2 , from this multiple regression analysis was .5280. The F test to determine the variation explained by regression was greater than zero yielded $F = 47.47/1.62 = 29.32^{**}$.⁵⁶ Consequently, with the appropriate degrees of freedom, the variation explained by regression was significant at the 95 percent level of probability or above. Also, the five independent variables given above had simple regression coefficients statistically significant at the 95 percent level of probability when "t" tests were performed on them.

The final regression equation which had significant regression coefficients was as follows: $Y = 1.3989 - 0.006X_1^* + 0.0055X_2^{**} + 0.2472X_3^* - 0.0139X_4^{**} + 0.0026X_5^{**}$ where,

Y = property tax per acre

X_1 = size of farm

X_2 = price per acre of a comparable farm

X_3 = age of the house on the sample farm (in logarithms)

X_4 = vertical distance in miles from the origin of an X and Y axis superimposed on the area, and

X_5 = population per square mile by counties.

Since all five of the regression coefficients are significant at the 95 level of significance, the implication of each variable for the property tax per acre will be discussed separately in the following section.

IMPLICATIONS OF THE STATISTICAL ANALYSES

Each of the five independent variables which had statistically significant sample regression coefficients had an effect on the property tax per acre. As the size of the farm increased, property tax per acre tended to decrease. As the price per acre of a comparable farm increased, the property tax per acre increased. As the age (in logarithms) of the house on the sample farm increased, the property tax per acre increased. As the vertical distance in miles from the origin of X and Y axis superimposed on the area increased, the property tax decreased. And as the population per square mile by counties increased, the property tax per acre increased.

Size of Farm

As anticipated, the tax was regressive for the sample farms. Thus, the natu

⁵⁶The 99 percent of probability is indicated by ** and the 95 percent level by *.

of the tax in the West Central Extension District is much like the tax on farmland elsewhere in the United States.

The regressive nature of the property tax substantiates the hypothesis that large tracts of property tend to be assessed at a lower rate per acre than smaller tracts of property. This finding suggests some improvement could be made in assessment practices of real property.

Price Per Acre of a Comparable Farm

The owner's estimate of the present price per acre of his own land bore a significant, positive relationship to assessed value per acre. However, the price per acre of a comparable farm yielded a more significant relationship. The explanation could be that the assessor was conservative in his valuations, and thus, these values more closely coincided with the estimated price per acre of a comparable farm, an estimate generally lower than the owner's estimated value per acre of his own land.

Age of the House on the Sample Farm

The increased age of houses was not anticipated to affect the property tax in an upward direction. The original hypothesis was that the newer the house, the higher the assessed valuation. Contrary to this belief, the property tax per acre increased with increased age of the house. After careful consideration of the effect of the age of the house on property tax per acre, an alternative hypothesis was suggested. Older houses usually were much larger and more impressive than newer ones, and many older houses have been substantially improved.

The Sample Farm's Vertical Distance in Miles From the X and Y Coordinates Superimposed on the Area

This variable was expected to interact with the horizontal distance from the Y axis (X variable). However, the horizontal distance from the Y axis was not significant. The significance of the vertical distance from the X axis (Y variable), which is parallel to Interstate Highway 70, means that the tax per acre tends to act in an inverse direction. The comparison of the X variable and the Y variable does imply that Interstate Highway 70 had a significant impact on property taxation in the area.

Population per Square Mile by Counties

As the population per square mile increased, the property tax per acre increased. This was expected. The relationship implies that as the population increases in each county an increase in property tax per acre can be anticipated.

Summary of Significant Variables

In summary, the above variables were significant, but they accounted for only 52.8 percent of the variation in the property tax per acre. Therefore, the predictive value of these variables is limited. This suggests the possibility that there may be other significant predictors, perhaps of a non-economic nature, which were not considered in this study.

IMPLICATIONS AND ALTERNATIVE REMEDIAL MEASURES

Implications for Policy Makers

The analysis shows the property tax per acre has definitely increased for the sample farms in the area. Second, the property tax per acre is increasing at a faster rate than the gross income per acre. This results in the property tax absorbing more of the gross income each year. Thus, the makers of public policy are faced with at least four questions. These are: (1) Does the public want the property tax related to ability to pay? (2) Is there a limit to the amount of income the property tax is expected to absorb? (3) If there is a limit, how can it be implemented? (4) Should an implementation of a limit provide for such as open spaces, agriculture, planned development, etc.? If these questions are faced squarely, the property taxation system probably would be improved considerably.

Many of the answers to these questions can only be effected at the state level. With the failure to reject hypothesis one, i.e., adherence to ability to pay principle, another alternative of taxing property should be considered if adherence to this principle is desired. Of the different alternatives being used for taxing property on the rural-urban fringe (presented below), the deferred taxation policy seems to have the most advantages. This alternative makes it possible for the property owner who uses his land for agricultural uses to have his land assessed at its value in agricultural use. Then when the market value is realized, i.e., when the land is sold, the difference between the tax at market value and the tax at the deferred rate is paid. This system of taxation would conform to the principle of ability to pay.

Some of the answers to the questions above can also be answered at the local level. Planning is necessary to determine the use for which the land should be zoned. Such determinations can complement the deferred taxation system. In order to do this efficiently, a comprehensive plan must be established first.

The data in this analysis show extreme variation in property tax on farms located close to each other. This implies that perhaps some education and/or revised procedures are needed.

ALTERNATIVE METHODS OF DEALING WITH THE TAX PROBLEM IN THE RURAL URBAN FRINGE

Innovations in taxation methods designed for the rural-urban fringe which other governmental units are using were evaluated for the study area.⁵⁷ A discussion of these potential remedial measures follows.

Unrestrained Expansion

As an area becomes urbanized and the property tax accelerates upward, property is forced into more intensive use. Usually, the area affected by urbanization

⁵⁷Unpublished material presented by Prof. Frank Miller at the University of Missouri Short Courses in the spring of 1967 was drawn upon heavily in this section.

extends many miles and much of it is not ready for use that is more intensive than agriculture. Even though much of the land is not ready for intensive development, many pocket developments will occur where the land can be bought at a relatively cheap price.

Pocket developments because of unrestrained expansion have few advantages. First, the land can be sold to the highest bidder. Second, there are no restrictions on the use of the land. Finally, business, industries, and residences can be located anywhere.

However, these advantages may be outweighed by disadvantages. The primary disadvantages of unrestrained expansion are (1) scatteration and urban sprawl which cause unduly high expenditures for public services, (2) land that can be developed at lowest private cost for a given use is developed first; therefore, usually an intermingling of residences, businesses, and industries results, (3) no order of architecture is developed so that the overall appearance is very unappealing, (4) the road and street layout usually is inefficient and dangerous, and (5) air and water pollution commonly occur. Since the population density is increasing in many rural-urban fringe areas, e.g., the Kansas City fringe, many of these disadvantages are becoming serious. Therefore, increasing attempts are being made to improve this undesirable situation through some of the following methods.

Public Purchase of Land

The public purchase of land that is in process of transfer from agricultural to urban use has been made in Europe rather successfully. There are several advantages of this approach. First, the area can be developed according to a plan. Thus, provision can be made for the development in an orderly fashion for residential areas, business districts, industrial parks, and recreational facilities. Second, provisions can be made for waste disposal so that water and air pollution can be kept at a minimum. Third, transportation facilities can be tailored to specific needs such as heavy traffic, limited access for high speed traffic, and "matched" intersections with overpasses. Fourth, the surplus of income over development costs can be returned to the public treasury.

Even with some of the outstanding advantages of this plan, it is almost impracticable because of its political unacceptability. The procedure would depart from the American tradition of unrestrained private enterprise and might be considered socialistic. Although this plan has worked rather well in some European countries, its usefulness in the United States would be limited for the above reasons at this point in time.

Purchase of Development Rights

The purchase of development rights by a public authority or citizens group has some of the advantages of public purchase of land and would be less costly than that alternative since the land is not purchased. The advantages of it are that the owners of agricultural and forest land would retain the right to control

the land in its existing use with the owner's equity being the capitalized earnings' value of the land in agricultural uses. Taxes would be paid on this equity. In addition, profits of the project could be returned to the public treasury, if done by a public authority. Finally, the development could be systematic as in purchase of the land.

This plan also has some aspects which could be considered as disadvantages by many. The development rights would be expensive. Second, disagreements would arise between the equity holders as to when a tract of land should be transferred from agriculture and forestry to urban uses. And last, if carried out by public authority, the planning and development process would change from a private decision to a political one. Thus, the above procedure has met with only limited acceptance. Only three states—Alabama, Connecticut, and Maryland—have adopted some form of this plan.⁵⁸

Preferential Assessment

The preferential assessment of land, as long as it remains in agricultural and forestry uses, has been instituted in several states. With this plan, assessments can be based on the capitalized earnings value of the land in agricultural uses. Consequently, taxes can be associated with current earnings, and the pressure to subdivide prematurely is relieved. In addition, subdivision can proceed in an orderly manner.

However, in order to implement this proposal, a substantial revision of assessment laws and regulations would be required. Also, under this system the owners of agricultural and forest land may be encouraged to speculate because of the low rate of property taxes. These owners are only required to pay present taxes based on the value determined by capitalizing the returns to the land when in agricultural uses. With this system, when the owner sells his land, he can sell it for the full market value. Thus, the owner does not pay his share of taxes when he reaps the windfall profits from a change in land use, and the public has no recourse.

Because of this fault, a slightly revised procedure has been established which will be discussed in the following section.

Deferred Taxation

Deferred taxation uses preferential assessment; but it also requires keeping a record of the market value assessment. When the property is sold, the difference between the tax at market value and the tax at the deferred rate is paid. As a result of the preferential assessment, the current tax would be based on income from the land in agricultural and forestry uses. The taxes deferred during the period of these uses would be collected when the land shifted into urban use. This transition period between rural and urban use should be at the time when the greatest need for services exists. Likewise, it would be when the amount of

⁵⁸The Council of State Governments, *Farm Land Assessment Practices in the United States* (Chicago: Council of State Governments, 1967), p. 7.

tax revenue collected would increase significantly since the land would move out of agricultural use. Thus, the landowner would pay his full share of the tax, but the part based on appreciation in land prices would not become due until realized, i.e., the property is sold for urban uses.

The deferred taxation plan, like the preferential assessment plan which was discussed earlier, would mean assessment laws and procedures would have to be changed. Also, the county assessor would need to keep two types of records. The first record would consist of the assessed valuation and the amount of tax—both based on the earnings from agricultural land. The second record would consist of the assessed value and the amount of tax based on the market value of the land. Furthermore, the period of time for which the deferred taxes are payable could be limited. Finally, the payment of a low rate of interest on the deferred taxes could be required. Presently, three states—Hawaii, New Jersey, and Oregon—have some form of deferred taxation.⁵⁹

If the preservation of open space and elimination of urban sprawl is desired, the deferred tax plan could be integrated into a broad plan of area development and land use control through zoning. Deferral of taxes alone will not accomplish these objectives.

SUMMARY

The increase in population in the rural-urban fringe of cities, such as Kansas City and St. Louis, has had an impact on their local governments. These governmental units are required to provide more public services, in terms of quality and quantity, as population density increases. These services are provided by public institutions which have a rural orientation. The transition of these institutions from a rural to an urban orientation frequently is very difficult. Therefore, taxation of real property was investigated to determine the effects of urbanization upon this public institution.

Four questions of special interest to society in its appraisal of rural-urban fringe property taxation served as guides in the investigation. These questions were: (1) Was the amount of property taxes related to the current income generated from the real property? (2) Was there an association of the costs incurred with the benefits derived from the property tax? (3) Was the present system of taxing property the most efficient way of facilitating the transfer of land from agricultural to non-agricultural uses? and (4) Could the variation of the real property tax be explained by selected socio-economic variables?

The average property tax per acre for the sample farms in the West Central Extension District was \$2.47. The average tax per acre for the area is definitely higher than it is for the entire state. Thus, property owners on the rural-urban fringe were justified in feeling their property taxes were at a high rate.

⁵⁹*Ibid.*, p. 6.

The public services that are usually amalgamated as "benefits" of the real property tax increased between 1959 and 1965. The benefit which showed the greatest increase was education. Over 80 percent of the 153 landowners interviewed thought that some improvement had been made in their educational system since 1959. The quality of education in the area increased as evidenced by the change in ratings for grade schools and high schools attended by children from the sample farms. Another benefit showing improvement was the highway system. More than 50 percent of the farm owners thought some improvement had been made in their highways since 1959. Further evidence of increased quality of highways was an increase in the amount of rock roads and a tripling of asphalt roads. Other public services also increased but somewhat less than education and highway systems.

Although the income of the property taxed had increased, the income itself did not increase as fast as the property tax increased. Consequently, the property tax absorbed more of the gross income each year from 1961 to 1965.

The control of the property did not appear to change because of increased property taxes. Only 2 percent of the sample property owners reported that taxes on their property had been delinquent since 1949. Only seven-tenths of 1 percent of the sample farm owners said that the property tax was responsible for sale of the property.

Five variables accounted for approximately 53 percent of the variation in property tax per acre on the sample farms. These were (1) size of farm, (2) price per acre of a comparable farm, (3) age of house on sample farm, (4) vertical distance from the origin of an X and Y axis superimposed on the area, and (5) population per square mile by county.

The increase in the property tax per acre because of urbanization has begun to affect the land owners in the area. An examination of hypothesis one, which states: "The taxation principle of ability to pay is not fulfilled in the Kansas City rural-urban fringe," fails to be rejected, according to this analysis. Since the evidence in this inquiry shows that the property tax per acre is increasing at a faster rate than the gross income per acre, the consequence is that the property tax is absorbing a larger percent of the gross income each year. In fact, for the sample farms in Jackson County, the property tax per acre was absorbing almost one-fourth of the gross income per acre in 1965. However, land price appreciation was probably greater here than in the other six counties. The present system of property taxation does not provide for a disassociation of increased taxes with increases in land prices, prior to the sale of the property. This suggests some change needs to be made in the system of property taxation if the principle of ability to pay is accepted as a goal of public policy.

The services that are usually associated as benefits of the real property tax have increased. Consequently, hypothesis two: "The taxation principle of benefits received is not fulfilled in the rural-urban fringe," would tentatively be rejected, since the services, i.e., benefits received from the property tax, have definitely in-

creased for the area. However, the fact that the services should increase each year with a minimum increase in taxes, i.e., the need for efficiency in local government, should be kept in mind when considering the acceptance of this hypothesis. The nature of benefits received from the property tax makes the measurement of benefits very difficult. Nevertheless, there is clear evidence that the benefits received by the property owners increased concomitantly with rising taxes. While the extent of the association cannot be determined exactly, the two trends were clearly associated. This hypothesis has much economic relevance and should be considered in much more detail in future analyses.

The control of the property did not appear to change because of increased property taxes. Thus, hypothesis three: "The taxation principle of control is not satisfied in the Kansas City rural-urban fringe" would be tentatively rejected. With the rejection of this hypothesis, one could conclude that the property tax per acre has not reached a high enough level to make undue hardships on the land owners, or if the tax has reached this level, the owners are compensating for this increase by more off-farm work.

Finally, the variation in the property tax per acre on the rural-urban fringe was partially explained by a selected set of variables. Thus, hypothesis four: "The seventeen factors hypothesized do not influence the level of property tax variation among farms in the Kansas City rural-urban fringe," would be rejected. However, future analyses should attempt to explain more of the variation in property taxes than was possible here. In order to do so interdisciplinary research with analysts such as political scientists may be necessary. The inability to fit a regression model which could predict more than approximately one-half of the variation in the property tax per acre, implies there may be "little rhyme or reason" to the present method of property taxation. This implication of property taxes has been suggested by others. For example:

It has been said that the general property tax has only two faults. First, it is wrong in theory and second it does not work in practice. Others have said that administrative defects of the tax somewhat compensate for its conceptual shortcoming. These people believe that if the tax worked the way it were supposed to, it would be quite unbearable.⁶⁰

This quotation is appropriate to this analysis. This implies that either (1) some important variables were overlooked or (2) the property tax per acre is a result of something in addition to socio-economic variables.

⁶⁰Groves, *op. cit.*, p. 57.

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