LOCAL TAXES AND URBAN SPATIAL DEVELOPMENT

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B.A., The University of British Columbia, 1976

A THESIS SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF ARTS

in
THE FACULTY OF GRADUATE STUDIES
School of Community and Regional Planning

We accept this thesis as conforming
to the required standard

THE UNIVERSITY OF BRITISH COLUMBIA
April 1982

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ABSTRACT

Policy makers have tended to ignore the connection between local fiscal policy and urban development, in spite of the fact that taxation influences development and is entirely under the control of the public sector. Through a review of the literature, this thesis provides a theoretical analysis of the effects on spatial patterns of development of the existing property tax and of a number of alternative taxes.

It is concluded that the existing property tax contributes to urban sprawl by distorting the market in two ways. The portion of the tax levied on improvements depresses investment in repairs and construction. A shift to a tax solely on land or location values should increase the intensity of land use. Because the property tax is not directly related to the benefits and costs of supplying services, especially those that are density and distance related, private locational decisions are made without regard for public expenditures. Marginal cost pricing, through multi-part tariffs and specific project betterment levies, for financing extensions of services to new development on the urban periphery, would produce more compact forms of expansion.

Several forms of taxes particularly applicable to the urban periphery have the potential to increase control over new development. Betterment levies, in the form of land
value increment and progressive development value taxes, induce earlier development. Of the various preferential taxes for agricultural and open space lands, use value assessment with a flat rate tax penalty, independent of development value and levied upon change of use, is the most effective in delaying development.

A tax system incorporating these alternatives to the property tax has the potential to increase the intensity of land use in developed areas, to promote infill within scattered development, and to reduce the premature conversion of peripheral land. These tax reforms combined with traditional planning controls offer greater consistency between fiscal and planning policies.
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CHAPTER I

INTRODUCTION

This thesis examines the relationship between alternative forms of local taxes and the spatial development of urban areas. Although taxation is one of the variables affecting the allocation of land by the property market, the effects of taxation on urban growth have been neglected by planners and little attempt has been made by policy makers to coordinate taxation policy in a positive manner with plans for urban development. The purpose of this thesis is to suggest a possible framework for integrating fiscal and planning policies.

More specifically, the first objective of this analysis is to determine how the existing property tax affects the market's spatial distribution of urban land. The second objective is to examine the spatial effects of a change from this tax to forms which are economically neutral to the operations of the property market. The final objective is to assess the effects on urban development of other forms of local taxes which produce nonneutral effects and to consider their function in a taxation system designed to complement planning goals. The analysis is based on a review of the literature.

Traditional forms of land use controls, among them zoning, subdivision controls, development permits and building
codes, have largely been restrictive measures operating against the powerful market mechanisms which allocate land in urbanized areas. The land market and planning efforts directed towards the promotion of sound urban growth have been described as competitive forces (Neutze, 1973, p. 1). Often there are strong market incentives to circumvent planning restrictions which produce unintended results. However, the philosophy of planning in the North American context is based on the premise that the function of planning is not to replace the market as a determinant of land use, but merely to guide the outcome toward more socially desirable ends. Through the coordination of taxation policy and planning objectives, the planning function can be strengthened by its connection to a factor which is an integral part of market operations.

Historically, local governments perceived their mandates simply as providers of basic municipal services associated with property (Plunkett, 1976). The property tax, which originally supplied almost all local government revenues, was therefore seen as the most appropriate means of matching responsibilities with funds. However, as cities became more highly urbanized, the scope of municipal responsibilities broadened and the revenues for meeting these new responsibilities came increasingly from higher levels of government, mostly in the form of provincial grants. Today local governments and the planning function that has evolved along
with them are concerned with many issues that collectively make up the "quality of urban life."

These issues have resulted in increased demands from municipalities for revenue sharing and for access to new revenue sources from senior levels of government to supplement the local property tax. Many of these issues - the revitalization of the commercial core, rehabilitation of neighborhoods, development of transportation networks, provision of recreational areas, preservation of agricultural land on the urban periphery - are related to the effects of taxation on patterns of spatial development. In view of the continuing, if diminished, importance of the property tax, it would seem preferable that a more economically rational use of this local source of revenues be explored before further demands for revenue are initiated.

The use of fiscal instruments to promote planning objectives is a relatively new and untried notion; the use of planning measures to achieve fiscal objectives is a common strategy used by competing municipalities with a short term perspective based on self interest. Zoning is sometimes used as a means of attracting urban uses which are highly productive of revenues and of excluding less desirable uses. Zoning for low residential densities is also used to control population growth and to reduce the associated costs of providing services. These and other similar measures (Engelbert, 1969, p. 107-109) can be manipulated to the
advantage of individual municipalities without regard for the social and economic stability of the urban area as a whole. The subversion of planning to fiscal policy can be avoided through explicit and constructive attempts to exploit the relationship to the benefit of the entire metropolitan area.

**URBAN SPRAWL**

The phenomenon known as urban sprawl has been singled out as one of the foremost urban planning problems (Archer, 1971). In spite of the considerable attention devoted to it in the literature, it has eluded precise definition. In purely descriptive terms, sprawl is simply the process of urbanization of the periphery, but the term has come to refer to all forms of spatial development that represent, in some way, a suboptimal allocation of land from a societal point of view. In this section, the types, criticisms and causes of urban sprawl will be more closely examined, in order to define the problem and provide the terms of reference for the ensuing chapters.

Three main forms of sprawl have been identified (McKee and Smith, 1972, p. 182; Bahl, 1977, p. 248). The first is low density, continuous development on the urban periphery of primarily residential dwellings on lots large relative to those found nearer the urban core. The second form of sprawl is ribbon development extending radially from the core along
major transportation routes. The third form is discontinuous or leapfrog development occurring in separate, possibly compact parcels separated from more heavily urbanized areas by undeveloped land. Some combination of all three forms of sprawl may be evident in a single urban area.

There are a number of problems with describing the physical aspects of sprawl. For one, its dynamic nature is understated, if not ignored in these necessarily static descriptions. Harvey and Clark (1965) argue that sprawl merely represents an intermediate stage in the process of urban growth. An early period of scattered development may result in future infill or compaction. The long term result may be no different in density than that produced by more orderly, sequential development. These implications will be discussed more fully later in this section. In addition, static descriptions emphasize the effects of sprawl on the periphery although an important factor may be underdevelopment of the urban core itself, in the form of land withheld from its highest potentially productive use.

CRITICISMS OF SPRAWL

Sprawl has been criticized for accelerating conversion of agricultural and open space lands on the periphery to urban use (Gloudemans, 1974). The leapfrog form in particular has been blamed for increased demands on public revenues for
extensions of public utilities and services to prematurely developing areas. Lower density and scattered developments have been found to be more expensive to service in some cases than more compact land uses (Bahl and McGuire, 1977). Radial sprawl is a form often cited for its unbalanced mix or incompatibility of residential, commercial, and industrial land uses (McKee and Smith, 1972). Public and private transportation costs and associated energy consumption have risen more rapidly as a result of sprawl. Furthermore, these effects are likely to become even more serious as urban populations, settling at increasingly lower densities, cause progressively higher rates of land absorption for urban uses (Gloudemans, 1974, p. 3).

The outcome of all these effects is a pattern of development that is frequently judged to be economically inefficient relative to more compact forms of spatial expansion. The costs of sprawl have been studied extensively by various researchers and have been found to be significant (Real Estate Research Corporation, 1974). Essentially, then, urban sprawl may be considered a result of the land market's failure to assign the full social costs of sprawled development. It is this economic aspect of the problem that the following chapters explore.

Before the relationship of local taxes to urban sprawl is discussed, it is important to note that there are some advantages to sprawl. Lessinger (1962) argues that scattered
developments are beneficial in the long run because they allow for flexibility, providing vacant land for future infill in response to new forms of demand and changes in technology.

The opposite of sprawl, compaction, reduces the potential for urban adaptation and reconstruction because of the costs of demolishing obsolete structures and the economic riskiness of individual efforts to rehabilitate single units in large neighborhoods of deteriorating structures. Although Lessinger's comments are an important contribution to the compaction-scatteration debate, he understates the importance of the short run incremental social costs imposed by scattered development. These costs may well overshadow the private costs of land assembly and demolition of existing buildings as the optimal pattern of land use changes. Lessinger also does not discuss the impact of scatteration on commercial and industrial land uses. It is likely that decentralization of these functions has a debilitating effect on the economic vitality of the urban core. Finally, Lessinger's concept raises the question of how planning would proceed - how much land should be reserved and where should it be located - for scattered development plans incorporating future uncertainty.

Because of these problems, it appears that neither extreme of compaction or scatteration is entirely advantageous. Some balance between these extremes is likely desirable, but
because the discipline of planning lacks the requisite degree of foresight, a practical definition of the appropriate social balance cannot be determined with any assurance. Without this foresight into the long run merits of scatteration and considering the substantial immediate costs of sprawl, this analysis proceeds on the assumption that the reduction of urban sprawl is a desirable planning objective.

CAUSES OF SPRAWL

There are a large number of causes of urban sprawl, involving private actions within the property market and public sector actions affecting the market. An initial factor influencing spatial development may be the nature of the physical topography. Some areas are uneconomic for development because of the expense of construction on difficult terrain, and are skipped over in favor of more amenable sites. The pattern and history of landownership - a large number of owners with different motives for holding land - results in a supply of land for urban uses offered for sale in discrete, as opposed to continuous parcels (Harvey and Clark, 1965, p. 6). Developers frequently require large sections of land for subdivision and must match their demand with the available supply. Independent speculative evaluations of risk and of the likelihood of future profit result in discontinuous patterns of development (Bahl, 1968, p. 199). Consumer preferences, in particular the popularity of single
family residences, complete the supply and demand relationships which promote sprawl.

Public sector contributions to sprawl include decisions on the location of transportation routes and on the availability of public transportation, which produce location alternatives by making the central city accessible from the periphery. The extension of public services to peripheral subdivisions has also increased the desirability of suburban locations. Differences in planning regulations between metropolitan and suburban jurisdictions make some areas more favorable than others for immediate development. Prospects for changes in zoning by-laws create uncertainty in the land market which increases the contribution of speculation to sprawl (Clawson, 1962, p. 97). Inadequate planning, resulting from rapid growth or the absence of jurisdictional responsibility for planning may also be responsible for sprawl.

Public policies supporting home ownership encourage demand primarily for single family residences, thus promoting low density land uses. These subsidies are offered in the form of income or property tax benefits. They include exemption from income tax of imputed rent from owner-occupied homes and of income saved for the purpose of purchasing homes (e.g. the Registered Home Ownership Savings Plan). Home owner grants or income tax credits applied to property taxes are also subsidies favoring home ownership. Finally, the local property tax, through its economically nonneutral
effect on land allocation, also contributes to sprawl.

Because there are many determinants of sprawl, any changes to local taxes can have only a limited impact as a solution to the problem. However, many of the causes outlined above are essential elements in the operation of the land market and the patterns of development they produce may more closely approximate a socially optimal balance between sprawl and compaction. Other factors, including the property tax, are distortions within the realm of public control. As will be seen, the property tax is also interrelated with other elements contributing to sprawl. Their combined effects may be quite important from the planning perspective.

THE IMPACT OF PROPERTY TAXES ON URBAN DEVELOPMENT

Decisions on the location of development are based on the relationship between the anticipated profitability of the type of development, on the costs of land acquisition and on any costs assigned for services which bring the land into urban productivity. If the land has already been assembled, the opportunity costs of land in different uses must be considered. Local taxes are also a factor affecting development decisions. Any form of local tax, including the existing property tax on land and improvements, which is not proportional to land values or which is not a payment for services received, will therefore distort locational choices.
The property tax affects the investment decisions of all participants in the urban land market. Although the primary motives for owning land differ, land in a developing urban area is an asset which increases in value over time. It is this ripening effect which forces all landowners to make decisions on the length of time land is held in its present use, the optimal time of conversion to a new use and the types of investment in improvements which will maximize the profits from ownership. The original owner is frequently not the developer who makes the actual decision on the type of investment most profitable to undertake, but the expected returns from the optimal development of a location are reflected in the market value of the land. Speculation in land values is defined as "occurring if the land is withheld from the market for economic reasons by a rational (a profit maximizing) individual" (Bahl, 1968, p. 199).

More specifically, the main variables affecting investment decisions are: returns from the land in its present use; returns from possible new uses (net of income tax); costs of conversion, including demolition of existing structures; the interest rate; and the property tax rate. A more complete examination of these variables is undertaken in Chapter V, but it is possible here to determine the approximate magnitude of the effects. The property tax rate is a small proportion (1-2%) of market value and can be expected to have only a limited effect on speculative decisions (Bahl, 1968). Only
where decisions are economically marginal will the tax determine the locational choices that affect spatial development. These marginal cases include decisions in which the owner is nearly indifferent between developing and not developing, or developing in one location or another because the net returns are barely sufficient to be economically desirable. Not only the small proportion of total value represented by the property tax, but the even smaller difference between the tax burdens of two locations also reduces the impact of the tax on locational decisions. In cases in which decisions on the density of development or investment in improvements permits choices on the basis of incremental additions to investment, the property tax will be a determining factor. Despite the expected small magnitude of effect, however, the distortions produced in the market by the property tax may be very important because of their impact on allocational efficiency through their failure to assign appropriate social costs.

**SCOPE OF ANALYSIS**

There are a number of assumptions and limitations on the scope of the analysis to be undertaken. Although other forms of taxation may have an impact on urban spatial development, the sole concern here is with local taxes. In addition to the property tax, the general term, local taxes, refers to other
property-related charges and fees including development cost charges, service charges, and other similar revenue forms. The discussion is specifically concerned with urban areas that have reached a stage in their development in which problems associated with sprawl are evident. However, the analysis is generally applicable to the somewhat different problems of growth in rural areas and to urban development in developing countries, from which there has emerged a considerable interest in innovative forms of local taxation as a guide to spatial growth (Magon and Maton, 1977; Grimes, 1977).

Although the process of implementing tax reforms is beyond the scope of this analysis, the taxes reviewed are examples which have been implemented in some form here and in other countries. Experience with these forms of taxes has generally suggested that they are feasible alternatives.

Tax reforms related to the administration of the property tax are also not discussed although they too may be relevant to spatial development. Among these issues are uniformity of assessment at market value and related effects of inter-area tax disparities. This analysis also does not address questions concerning the absolute level of taxation and the degree of impact on investment in improvements. It is assumed that the property tax will retain its current role as a major source of municipal revenues.
CHAPTER II

THE PROPERTY TAX - ECONOMIC NONNEUTRALITY AND INVESTMENT

This chapter investigates the impact of the property tax on investment incentives which affect spatial patterns of land allocation. In relationship to the problem of sprawl, this discussion focuses on the issue of the intensity of land use in the developed sections of urban areas. The analysis of the effect of the property tax on investment decisions demonstrates one form of the tax's economic nonneutrality in the distribution of resources. This critique of the property tax provides the basis for the discussion, in Chapter III, of a form of tax which complies with the standard of economic neutrality.

CONTRAST BETWEEN THE SUPPLY OF LAND AND THE SUPPLY OF IMPROVEMENTS

Economic theorists have generally argued that, for analytical purposes, the base on which the property tax is levied can be separated into two components - land and improvements. Although there are some conceptual difficulties in distinguishing the value of a site from that of its improvements, current assessment practices demonstrate the practical validity of this distinction. For the purpose of
this analysis, improvements are defined as all additions to a particular parcel of land brought about by private efforts to bring land into productive use.

Together, land and improvements supply the three basic characteristics of real property - location, space and quality. The value of a location is determined by features unique to land, including scenic potential and suitability for construction, by the aggregate level of private improvements and by public actions such as the provision of infrastructure and creation of amenities. The most important determinant of location value over much of the urban landscape is accessibility to economic activities - to commercial functions and places of work provided in the central business district of the urban core. Here aggregate private and public investment in improvements are the highest. As Becker (1969, p. 16) has described it, "In a larger sense, it is the presence of an urban population and its many activities that endows urban land with locational or site value."

Two elements can be distinguished in the supply of improvements - space and the quality of the architectural environment. The potential for useable space is provided by the existence of land. The actual space, horizontal and vertical, is provided by the nature of the improvements. The amount of space supplied by improvements can be measured either in terms of the number of units (e.g. residential) created or the amount of space per unit. This latter attribute
of space and all other characteristics which create architectural variations among real property are a part of the quality of the environment supplied by improvements. Both space and quality of improvements will be referred to hereafter as the quantity of improvements.

The essential economic distinction between taxing land and taxing improvements lies in the nature of supply. Land, as a finite resource, is in fixed supply. In contrast, improvements of a potentially infinite range are possible.

Although in an absolute sense the supply of land is fixed, from an urban perspective the availability of land appears to be constrained only by jurisdictional boundaries. However, urban land uses are not the only possible or desirable uses of land. Other uses land may be put to include agriculture, forestry and mining. It may be desirable to leave land in its natural state for recreational purposes or to preserve it as a watershed. Sometimes it is desirable simply for aesthetic reasons to preserve unimproved land as open space in urban areas. Within urban areas, commercial, industrial and residential sectors also compete for access to land. All of these competing uses for land make it a scarce resource in relatively fixed supply compared with improvements.

In economic terms, land is a factor of production which is said to be in inelastic supply. Elasticity of supply is defined as the percentage change in quantity supplied in response to the percentage change in price. Because in the
absolute sense the supply of land is fixed, it is said to be in perfectly inelastic supply. In an urban context where more land can be acquired (although only at the expense of another use), land for a particular use is in limited and inelastic, but less than perfectly inelastic supply. Differences in the time horizon for urban development reflect the degree to which land for urban purposes is in limited supply.

In the short run, an increase in demand resulting from population growth or expansion of economic activity will result only in a higher price for land. Institutional and technological barriers to conversion of land from undeveloped to urban use prevent an immediate supply response commensurate with demand. In the intermediate run, as some of these barriers are overcome, land will be made available for urban use and the supply will become more elastic - the higher price resulting from increased demand will induce an increase in the supply of land. Land will be converted to urban uses and densities in already developed areas will be increased. In the long run, however, an increase in demand and increase in the price offered for more land will elicit a smaller and smaller supply response because there will be less remaining land that can be shifted from its existing use to an urban use. The costs of transportation, natural physical barriers and restrictions on conversion of agricultural and open space lands are examples of factors constraining the
conversion of more land. This long run position describes highly developed urban areas in which a large proportion of the land is already committed, by way of buildings and infrastructure, to certain urban uses and densities until replacements are necessary. Although more land for development can still be acquired by out-bidding agricultural and open space land uses, the further conversion to urban use may exceed the socially optimal balance between different uses. Thus over time the supply of land for a particular urban area grows more inelastic (Becker, 1969, p. 18-19).

In order to contrast the supply of land with the supply of improvements, consider the potential for development of a single parcel of land in an urban area. The owner's ability to change the location value of this parcel is extremely limited because this value is largely externally created. If the parcel is very large (for example land assembled in order to build a shopping center), it is capable of creating some location value, but only rarely affecting to a major extent the total pattern of location values in an urban area. The amount of horizontal space also cannot be altered. Ignoring zoning regulations and building codes for the moment, a change in the quantity of improvements is well within the ability of the owner. A small, single family residence may be built, or a medium density apartment, or a multi-storey office tower. The quality of construction may vary from the barest degree of improvement essential to a structure to the
most technologically advanced forms of construction and quality of materials. There is a great range in the possible types of improvements and the supply is therefore highly elastic. It is not perfectly elastic because of institutional controls (i.e. zoning and building codes), technological limitations and tastes. However, in relative terms the supply of land is considered inelastic and the supply of improvements elastic.

**ECONOMIC EFFECTS OF TAXATION**

The following is a simplified description of the economic effects which result from taxing each component of the property base. For the purpose of clarity, it is assumed that the supply of land is perfectly inelastic and the supply of improvements perfectly elastic. It is also assumed that demand and supply decisions are rational in economic terms and that all other factors, including average costs of builders, funds available, interest rates and other taxes remain unchanged.

In response to the introduction of a tax on improvements, landowners will be motivated to reevaluate their investments and reduce the supply of improvements. Because improvements have a finite useful life, they require economic stimuli for maintenance and eventual replacement. In the short run the effect on supply will be minimal, but in the long run, a tax
on improvements will cause a reduction of investment in repairs and replacement until the new equilibrium is reached at the point where the marginal costs of the landowners are equal to their marginal revenues net of all taxes. This reduction in the supply of improvements, assuming demand has remained constant, has resulted in a shifting of the tax burden from the owners of the improvements to the consumers of their services. The owners regain their previous level of return on investment and the consumers now pay the same for a lesser quantity of improvements. In the case of rental housing, the tax has been shifted from landlords to tenants. Commercial enterprises shift the tax to consumers in the form of higher prices for goods and services (Bails, 1973, p. 286). For owner-occupied housing, a tax on improvements decreases the value of the properties, which reduces the returns received by builders, who lower their investments and restrict supply. As demand begins to exceed supply, prices of existing houses are bid upwards by housing consumers. There is no essential difference in these economic effects between owner-occupied and rental housing or commercial enterprises. In each case the tax is passed on to the consumer. In the case of owner-occupied housing, the consumer is also the owner.

If a tax solely on the land or location value is imposed, it cannot be shifted forward in the long run because the supply cannot be reduced. Assuming that landlords are
motivated by economic factors in a competitive market, are aware of the opportunity costs of their capital (i.e., the benefits which would be obtained from investing capital in alternative uses), and are not prevented from acting by institutional barriers (e.g. rent controls), the price they charge for the real estate will be determined by what the market can bear. Rather than being shifted, the tax will fall on the landowner's economic rent. Economic rent is a pure surplus which, in the case of land, may be defined as the price consumers are willing to pay for the exclusive use of a location (Bails, 1973, p. 285). Economic rent is a direct result of the demand for a factor in fixed supply. The tax on land will be capitalized in the form of lower property values. Capitalization is the phenomenon by which the market value of property reflects the stream of future benefits and costs. Thus, the expectation of succeeding years of tax payments will result in the property values dropping by an amount equal to the present value of expected future annual tax payments.

The effect on the development of a site of the removal of the improvements component of the property tax has been demonstrated by Becker (1969, p. 28-29). In Figure 1, curve A represents the potential average returns and curve M the marginal net return to the site. The two factors affecting the rate of investment in improvements (at level of investment H) are the rate of return on investment in improvements (GC), reflecting the opportunity cost of capital, and the tax on the
FIGURE 1
TAXATION OF IMPROVEMENTS AND THE EFFECT
ON INVESTMENT IN IMPROVEMENTS

FIGURE 2
EFFECTS ON QUANTITY AND PRICE OF THE REMOVAL
OF THE TAX ON IMPROVEMENTS
value of improvements (GQ). Where the sum of these two rates intersects the net marginal rate of return (R), the most profitable level of investment in improvements is found (CH). Area CSTH represents the annual gross value of the site and improvements, of which GQRD represents the tax on improvements and CGDH represents the net return on investment in improvements.

Removal of the tax on improvements (area GQRD) increases the optimal level of investment in improvements to CJ, for which the interest rate equals the marginal net rate of return. The annual value of the site rises to GPLF, some portion or all of which is the tax on site value. Because the component of the tax on land value is independent of marginal net returns, the amount of investment in improvements will not be affected by the size of the tax.

On an aggregate level, the removal of the tax on improvements shifts the supply curve for improvements forward (Figure 2). The quantity of improvements increases from Q to Q', the market price declines from P to P'.

A NOTE ON THE DEMAND FOR LAND AND IMPROVEMENTS

In order to determine the full extent of the effects of each component of the property tax on the allocation of investment, the elasticity of the demand curves should be examined. However, little attention has been devoted to the
price elasticities of the demand for land and improvements and there are conflicting results from the various empirical studies which have been undertaken (Heilbrun, 1966, p. 40-41). Because of the highly inelastic nature of the supply curve for land, the importance of the demand curve in terms of economic effects is reduced. This will be demonstrated more fully in the following section.

Demand for improvements includes demand for the number of units for a particular use and for quality, including space per unit. The demand for the number of units is likely to be inelastic because, at any given time, a finite number of units, especially for residential purposes, will be required (Heilbrun, 1966, p. 39-42). Virtually no one will be willing to pay less for a decrease. The elasticity of demand for quality is less certain. An inelastic demand is generally the result of a lack of close substitutes. In the case of demand for improvements, assuming there are enough units available, the demand for quality can be substituted to some degree by location, a factor supplied by land. Without further empirical information on the relative importance of these two factors, it can only be assumed that the aggregate demand for improvements is neither highly elastic, because of the demand for units of space, nor highly inelastic because of the existence of location as a substitute.
INCIDENCE

The concept of tax incidence, or who bears the burden of the tax, brings together the elements of supply and demand and demonstrates the extent to which the tax on improvements is economically nonneutral. In the following discussion, the importance of the assumptions about elasticity is clarified. Figure 3 shows graphically the effect of a tax under various conditions of supply and demand elasticity from the viewpoints of owner and consumer.

The first case (a) considered represents the conventional view of the effect of the property tax under conditions of perfect inelasticity in the supply of land. The impact of the tax from the owner's point of view is effectively a drop in demand. For the same quantity supplied, the owner receives a lower return. There is no effect on the consumer (or tenant), who pays the same price for the same amount supplied. The elasticity of the demand curve for land has no impact on this result. If the supply of land is less than perfectly inelastic, a small portion of the tax will be borne by the consumer.

Case (b) represents the effect expected if the supply and demand for improvements is moderately elastic (between unitary and perfect elasticity). To the owner, the effect of a tax is again the same as a reduction in demand. The total amount paid by the consumer after the tax is represented by area
FIGURE 3
INCIDENCE

a. Perfectly Inelastic Supply - Owner bears tax

b. Elastic Supply/Elastic Demand - Owner and consumer bear tax

c. Elastic Supply/Inelastic Demand - Both bear tax, but consumer bears proportionately more than in case (b)
agdh, of which the owner receives aech. The amount of the tax is represented by egdc. The price per unit of improvements received by the owner has decreased from f to e. The price paid by the consumer has increased from f to g. The consumer pays the portion of the tax fgdj and the owner, efjc. From the viewpoint of the buyer, the tax has effectively shifted the supply curve from S to S', with the same results (point d is at the same level).

Case (c) represents moderately elastic supply and inelastic demand for improvements. The general effect is identical to case (b), but area fgdj, the amount of the tax paid by the consumer, is proportionately larger than in case (b). Therefore, the less elastic the demand curve for improvements becomes, the more of the tax will be borne by the consumer.

In general, the more the tax burden can be shifted forward from owner to consumer, the more distortion is created in the market allocation of resources. As this discussion of incidence has demonstrated, greater distortion is produced by a tax on improvements and the result, where shifting occurs, is a reduction in the quantity of improvements.

INCIDENCE AND THE EMPIRICAL EVIDENCE

To this simplified discussion of incidence may be added other considerations that increase the complexity of a
theoretical analysis of the real estate market in an urban area. In reference to the supply of improvements, Grieson (1974) has noted that because of technological limitations in construction, an increase in building height causes an increase in the marginal costs of construction per storey. Arnott and MacKinnon (1976), using Grieson's model, conclude that the burden of the improvement component of the property tax is still mainly passed on to tenants in the long run. The importance of the assumptions regarding the elasticity of demand for improvements has been thoroughly reviewed by Simon (1943) in a critique of the debate between Pierson and Edgeworth concerning the differences in demand for land at the city center and on the periphery. A problem with their analysis, as Simon points out, is that the two types of land are not simply two aspects of a single commodity, but are more properly viewed as competing commodities. He assumes, as in this discussion, that the demand functions are similar (Simon's case 3 and 4) and concludes that the tax on improvements will be shifted, if demand is not highly inelastic, only in part on to the tenant (or consumer).

Orr's empirical analysis (1968) of the Boston area led him to conclude that because the supply of capital in housing is not perfectly elastic and because demand is likely to be elastic in the case of numerous taxing jurisdictions due to competition among comparable sites, the tax on improvements is not shifted from owners to renters. It should be noted
that where there are fewer small taxing jurisdictions in an urban area, less competition reduces the elasticity of demand for improvements in any one jurisdiction and (according to the analysis in the previous section) the tax will be shifted on to tenants. Black's study of the City of Boston (1974) excluded the surrounding metropolitan areas in Orr's analysis. Black found less than complete shifting forward of the property tax and concluded that the demand for improvements (rental housing in this case) is less elastic in the city than in the urban area as a whole. This result again is similar to cases (b) and (c) in which both consumer and owner (or landlord and tenant) share the burden of the improvement portion of the tax.

**CAPITALIZATION**

As has been stated previously, if a tax is not shifted forward, it must be capitalized. The improvements portion not shifted to the tenant or consumer is capitalized into a lower value for improvements, thus acting as a disincentive to owners to invest in improvements. The total amount of the tax on land will be capitalized into lower site values. It is frequently maintained that a tax solely on land values will have the aggregate effect of reducing land values and promoting development. But as Becker (1969, p. 30) has argued, removing the tax on improvements and compensating
in the aggregate by a tax on land will make it more profitable to improve, increasing the demand for land. The final result is indeterminate, but may be an increase in aggregate land value.

There have been a number of attempts to determine the extent of the capitalization effect (Netzer, 1966; Oates, 1969), but the results are often contradictory (Wales and Wiens, 1974; Smith, 1970). Although it would seem to be a simple problem of determining whether a more highly taxed building would sell for a lower price, it is difficult to make comparisons holding all other characteristics, such as location and quality, constant. Public services, which are likely to increase the value of a location, also vary throughout urban and suburban areas. The relationship between the provision of services and property taxes is a subject reserved for consideration in Chapter IV.

NONNEUTRALITY

The property tax has been found to be economically nonneutral to the allocation of urban resources. In the short run, to the extent that the supply of improvements can be restricted, only part of the tax can be shifted forward onto consumers. The remainder is capitalized into a lower value for improvements. In the long run, when the supply of improvements is more elastic, a further reduction in supply
results in higher portions of the tax being shifted to consumers. Under conditions of perfect elasticity in the supply of improvements, all of the tax is eventually shifted forward and no capitalization occurs. Consumers, whether tenant or owner-occupiers, pay a higher price for improvements and the supply is lower than if there were no tax on improvements. The more elastic the demand curve for improvements, the more supply will have to be restricted in order to shift the tax. In the case of land, long run inelasticity of supply results in virtually full capitalization rather than shifting.

In spatial terms, the improvements component of the property tax theoretically discourages intensive land use, both in the form of higher densities and more complete use of land in urban areas. As a result of its nonneutrality, the property tax contributes to incentives for the speculative holding of vacant or underdeveloped land in the urban core. In effect, it penalizes the landowners who improve their sites and so contribute to location values in favor of those that allow their properties to deteriorate or remain in a less than optimal state of development. Although the magnitude of the effect is not likely to be large, the property tax in its present form works in the opposite direction to planning objectives involving the reduction of urban sprawl.
CHAPTER III

LAND VALUE TAXATION

The differences in economic effects between taxing land and improvements support the concept of a tax based solely on land values. Most of the existing literature on local taxation and the patterns of urban growth has concentrated on the contrast between a tax levied on land and improvements and a tax exclusively on site value. Variously referred to as the land, site or location value tax, it has been the subject of much considered debate (and occasional mere speculative whimsy) dating back in modern economic history to Henry George, an advocate of single tax reform (George, 1879). Through a review of these debates, this chapter examines land as a tax base and the effects of a shift from the property tax to a land value tax on urban development.

LAND AS A TAX BASE

The neutrality of the tax on land values to the allocation of resources, in particular to investment in improvements, has been investigated in Chapter II. Because of the unique nature of each site in terms of access to urban amenities, the taxation of economic rent through the tax on land values represents the appropriation of a portion of the externally
generated benefits which create location value.

In order to define these benefits more precisely, it is necessary to distinguish between improvements to land and improvements on land. In the urban context, the former includes such services as land clearing or levelling and installation of drainage, sewerage and water supply facilities. The latter includes construction of buildings, parking facilities, etc. Although improvements on land are clearly determined by private incentives and cannot be taxed without distorting the allocation of resources, there is greater uncertainty about whether improvements to land should be taxed, especially because these tend to be publicly provided. Bails (1973, p. 285) argues that improvements to land should be taxed because they contribute to location values. Harriss (1970, p. 215-16) maintains that this form of improvement represents "capital investment no less than the structures rising above" and should be treated as buildings. Unless these improvements are also exempted from the land value tax, economic distortion will remain.

A resolution to this debate is suggested when these arguments are considered with respect to a vacant lot in the downtown core. Its value as an undeveloped parcel of land is not due simply to its location near other buildings and the economic activities prevalent in the core, but to the existence of urban infrastructure - streets, sidewalks, sewerage and water mains, etc. - even though it does not directly
benefit from it, because the infrastructure is a part of the economic rent derived from the uniqueness of a location. To the extent that value attributable to infrastructure represents past or sunk costs from publicly created benefits, it may be included in the land value tax base without distorting economic efficiency. The direct costs arising from improvements which bring a particular parcel of land into productive use are those which result from connection to the existing infrastructure, e.g. hookups to water mains, and should not be considered a part of the land value tax base. These, however, may be taxed on another basis considered in Chapter IV.

The land value tax reflects the highest and best economic use of the site - the most productive use regardless of how fully its present use in the form of improvements on land takes advantage of its location value. How land values can be determined for the purpose of tax assessment is a subject which cannot be examined in detail here (Holland, 1970). However, Browning (1963, p. 303-304) has reviewed the established methods for appraising land values.

Comparison of recent market sales for property with similar characteristics is the most frequently used method for determining assessments, although no two parcels are perfectly identical and sales information on all types of property is not always available. Where market data is unavailable, another practice is to assess site value as a certain percentage of total property value for neighborhoods.
of consistent structural type and age. Another method, used primarily to determine the value of undeveloped land on the urban periphery, involves estimates of the value of land in its current highest productive use, the costs of bringing the land into development and the cost of acquiring the land in its present state. The land residual method requires the calculation of imputed income to land on the basis of assumptions about building value, net income to property and the capitalization rate for the building. Net imputed income can then be capitalized for land to determine present land value.

In the following descriptive analysis, it is assumed that total revenues from the land value tax will match those presently collected by the property tax. The only changes will be the exemption of the improvements component and an increase in the rate of taxation on the land component according to the distribution of land values.

The revenue adequacy of this form of land value tax has been questioned, but because of difficulties in conducting empirical tests, the issue has not been resolved. Essentially the dispute is whether the land value tax would have to be set at such high rates that the economic rent of the land would be entirely removed. Heilbrun (1966, p. 234-245) has suggested that the economic rent would be destroyed and that therefore a theoretical maximum on land value revenues exists.
Stone (1975) has argued that the question must be considered through a dynamic approach in which the rates of increase in expenditures and of revenue growth are taken into account. However, as Netzer (1966, p. 212) has concluded, even if all expenditures cannot be financed by the land value tax, this factor does not detract from the economic desirability of exempting improvements, but merely raises the issue of finding another source of revenues to offset any deficits produced. The question of revenue adequacy is therefore considered in the context of a local tax system discussed in Chapter VI.

**TRANSITION TO A LAND VALUE TAX**

Most treatments of the land value tax have been limited to an overview of the general effects or have concentrated on specific types of areas. The purpose of this section is to bring together these arguments concerning the positive and negative impacts of the tax on the different sections of the city in order to assess the suitability of the land value tax in the planning context.

It is important to note that these effects will be evident only from the perspective of a change from the property tax to a tax on land values. As Nowlan (1976) has observed, the property tax is often criticized for its nonneutral effect by advocates of land value taxation who then assert that the
land value tax, rather than being neutral, will act as a stimulus to development. A shift to the land value tax removes the disincentive to invest in improvements created by the property tax. The changes in spatial patterns which result are merely caused by the removal of a market distortion.

A shift to a tax on land values will not affect the tax burden of all sites. For those sites which have made average use of their location earning potential, the land value tax will impose no greater a tax burden than the present property tax. Sites improved to greater than average will be "rewarded" by a drop in taxes. Only the sites in a less than average state of improvements for their location will pay more taxes. The tendency will be for older buildings to be replaced by newer structures and low density by higher density land uses (Netzer, 1962, p. 195-196). In the absence of zoning controls, or, more realistically, in transitional or mixed-use areas, multiple family housing would replace single family residential units and commercial sites would also become more intensively used.

If tax liability is not based, in the aggregate, on different classifications of land use, a shift in the burden between residential, commercial and industrial uses is probable. Differences in the results of empirical analyses suggest that the nature of the shift among land use classes varies with different urban areas (Rawson, 1961, p. 27; City of Vancouver, 1976, p. 40). Although commercial, and
to some extent, industrial sites tend to be located in central city areas where land values are the highest, the tax is likely a small and not significant portion of total costs (Pickard, 1966, p. 15). Less productive enterprises - small commercial operations and industrial sites with low productivity relative to the amount of land occupied - may be forced to relocate. It is probable that most firms will be able to absorb higher taxes and the general mix of commercial, industrial and residential land use in the city will not be altered.

However, the land value tax may prove detrimental to single family residential neighborhoods located near the core. Commercial enterprises and multiple unit residential dwellings, because of their greater capacity to absorb taxes, may drive out less productive single family residential land uses. In order to alleviate this possibility, the present practice of differential assessments according to land use should be preserved.

DEVELOPED SECTIONS OF URBAN AREAS

VACANT LAND AND UNDERDEVELOPED LAND IN THE URBAN CORE

In the urban core and surrounding developed areas there are often many parcels of land that are totally unimproved or that have a very small value of improvements relative to location value (e.g. parking lots). With the exception of
land unsuitable for development because of problems related to the natural topography, this vacant or nearly vacant land is withheld from development in anticipation of future speculative profits. Particularly in the urban core where land values are the highest, the introduction of a land value tax would result in the greatest increases in the tax burdens for owners of vacant land.

This major increase in the cost of withholding land from development would act as an incentive for speculators to make land available to developers at an earlier date than was previously optimal under the property tax (Becker, 1969, p. 27). Capitalization of the higher tax, as explained in Chapter II, would result in lower market values for vacant land, making it easier for developers to acquire (Clark, 1961, p. 80).

A frequent criticism of the land value tax is that it will increase the density of core development to an undesirable degree. Traffic congestion, the lack of open spaces, and other associated problems with the inner city environment would be aggravated by the development of vacant land and redevelopment of obsolete buildings at higher densities (Clark, 1961, p. 79). However, the potential for core development is not unlimited and congestion in itself is one of the factors encouraging decentralization of urban functions to suburban and other less prime areas. Decentralization for this reason represents both a desirable and efficient
allocation of resources determined in the market and by its nature, the land value tax will not eliminate this trend.

The land value tax will also not create a sharp and immediate rise in construction on vacant sites or in the density of redevelopment. In the core areas where the tax increase is the greatest, the anticipated profits are also the highest. The changes that would be induced by the land value tax would occur gradually and would allow planners sufficient time to assess the impact of proposals for development on neighboring areas. Also, vacant land in the inner city does not often provide desirable forms of open space. The provision of useable and aesthetically pleasing open space depends on planning rather than the haphazard allocation of vacant land.

A related criticism of the land value tax is that it weakens the positive role played by speculation in the urban development market. A vacant lot, if it were developed immediately to its highest present use, might produce less private profits and public benefits than if it were withheld from development, or minimally improved until some future time when a larger building demanded by an expanded market could be built (Nowlan, 1976, p. 16-17). Critics of the land value tax have termed this "premature development." The fallacy of this argument relates again to the nonneutral nature of the property tax in contrast to the neutrality of the land value tax. In an urban area in which the property
tax has been in effect, the market allocation of land already has been distorted. Despite demand for the kinds of uses valuable vacant and underdeveloped land in the urban core could be put to, it is allowed to be held at relatively low rates under the property tax. The neutral land value tax provides an incentive for putting the land to use under current market conditions and this does not constitute "premature development."

URBAN RENEWAL AND THE TRANSITION TO HIGHER INTENSITY LAND USE

Downward-transitional Areas

A phenomenon common to highly urbanized areas is the existence of tracts of deteriorating housing stock and blighted industrial zones, both frequently near the central core. Because of the proximity of these areas to the core, the potential for high land values exists, but the aggregate negative effects of minimal investment in improvements have kept land values depressed. In strictly economic terms, these areas represent an inefficient allocation of land as an urban resource.

Because the ratio of improvements to land values, despite the artificial depression of the latter, are low in comparison to a city-wide average, a move to land value taxation would result in an increase in taxes for the holders of these properties. The market in downward-transitional properties
is frequently composed of small-scale operators with short term, low volume profits to be gained (Peterson, 1972, p. 68). These investors operating at the margin and those who own and occupy housing in these areas would be hardest hit by increased taxes. The owners unable to offset the rise in tax payments through increased improvements and higher charges to consumers will be forced to sell, the capitalized value of the higher taxes resulting in a lower selling price. Purchasers of the presently economically unprofitable land will find that there are no penalties for improvements and will be encouraged to convert the properties to a higher level of intensity of use.

Although the discussion has focussed on residential areas, it is also applicable to blighted industrial and commercial areas. The renewal effect would be somewhat less because taxes are a less significant item of operating expenditures.

The redevelopment of blighted areas is dependent on the demand for central locations. Although much of the renewal witnessed currently in urban areas has been in the form of high cost, high density apartments and offices near recent redevelopment, market demand is probably not accurately reflected by this trend. If renewal were to take place on a larger scale, moderate income apartments, for which there is certain to be some demand, are a likely result. Because it represents the minimum possible redevelopment investment,
moderate income housing is a residual land use in the second stage of urban development in much the same way that single family homes are the best short term investment in the first stage of development (Neutze, 1969, p. 119).

To the extent that land value taxation would be effective in promoting urban renewal, the pattern of land values in the older areas of the central city would be expected to change (Netzer, 1962, p. 200). As previously blighted areas are added to the central business district through redevelopment, the supply of highly valued, centrally located land would increase. This increase in supply in the longer run would reduce pressures for higher density development in the core.

Although taxation theory (Turvey, 1957) and several empirical studies contrasting the effects of a shift from property to land value taxes have generally supported the expected direction of the effect, the magnitude remains unclear (Pollock and Shoup, 1977; Smith, 1970). In the specific case of downward-transitional urban areas, it would be expected that the effect would be stronger for redevelopment because of the greater importance of taxation as a fixed cost relative to total operating expenditures and to profits. However, there are several important factors that weaken the response of slum property to the taxation effect. Unlike vacant land, blighted neighborhoods are productive to their owners and may be profitably held out of optimal use
for longer periods (Grey, 1969, p. 91). Despite their suboptimal efficiency, slum neighborhoods perform the important economic function of providing housing for the low income population and slum landlords have a captive clientele.

As Clark (1961, p. 82) notes, the short term market for redeveloped slum properties is likely to be quite limited and it would be unrealistic to expect one property owner in the middle of a blighted neighborhood to improve without assurance that the rest of the surrounding properties will follow. There is a possible advantage to the acquisition of small holdings by large-scale developers. Assembly of large tracts of land reduces the risk of redevelopment because of known positive externalities. If urban renewal is a municipal policy, a more active role must be sought by planners and other tactics must be used to provide developers with a more certain climate for investment and to ensure the existence of a supply of alternative low income housing for those who would be displaced in the process.

**Stable Areas**

Another urban area in which taxes are likely to increase under a system of land value taxation is the predominantly single family residential sector immediately surrounding the city core. Generally this housing is of older stock, is owner-occupied and has low to moderate income occupants.
Unlike the downward-transitional slum areas, this area is relatively stable in its present condition (Peterson, 1972, p. 89-91). The level of maintenance and the rate of investment in improvements may be fairly low, but the housing quality is not quickly deteriorating. Critics have argued that a transition to land value as a tax base would impose an unjustifiable burden on these stable areas (Clark, 1961, p. 81). Certainly pressures for redevelopment to higher densities, frequently already in evidence, would increase on these areas because of their proximity to the urban core, and the familiar capitalization effect would result in lower land values for the owners of these properties.

To the extent that the demand for location exceeds demand for lower density and higher per unit space, pressures for redevelopment in these noncentral stable areas will be eased by the expected intensification of core land use. However, demand for single family residences is certain to persist, especially in these well located areas. Unlike the owners of vacant land and land in downward-transitional areas, the owner-occupiers of properties in stable areas are not long term speculators able to absorb an increase in holding costs resulting from higher taxes. Both the market for this type of land and the lesser resistance of these owners to an increase in taxes make it reasonable to expect a considerable redevelopment effect and some turnover in ownership of single family residences, particularly those with low income owners.
Despite the land value tax's economic efficiency which benefits the urban population as a whole, in this case through an increase in the number of residents able to enjoy a better location, the tax will have inequitable effects that may be quite significant. Land values that have been artificially depressed may take some time to reflect actual location values, thus easing the tax impact on low income owners, however, the equity problem seems to be inherent in the land value tax. It may be argued that the problems of low income groups are best considered outside the framework of the property tax system and should not be addressed at the direct expense of optimal urban development. In addition, it should be noted that although those affected in this case may be income poor, their very ownership of property of relatively high value implies that other options for housing choices - in peripheral areas or in multiple family units - remain open.

REHABILITATION AND MAINTENANCE

The main focus of the discussion has been on the effect of the land value tax on redevelopment (or development in the case of vacant lots), but there are several alternatives requiring less investment in improvements which are likely to dominate in the short run. In response to the removal of the tax on improvements and at the lowest end of the scale
of capital outlay, repairs and replacement of worn structural features may be undertaken. Depending on demand conditions in the particular location, rehabilitation and remodelling may be more profitable options.

Rehabilitation and maintenance are less capital intensive and less risky that development or redevelopment. These alternatives are also incremental. They allow landowners to upgrade buildings at a pace easily measured against demand. These effects would therefore be more immediate in the generally somewhat unresponsive economic short run.

The removal of the tax on improvements thus increases the adaptability of the housing stock to changes in demand (Heilbrun, 1976, p. 76). In response to an increased demand from higher rent payers, the quality of buildings can be raised. When demand shifts to lower income renters, renovation can be undertaken to provide more units with less space per unit. In either situation, a land value tax removes a disincentive which causes a lag between change in demand and in supply response.

Heilbrun (1976, p. 71) has argued that the tax component on improvements has no effect on operating expenditures because property is assessed at market value and not on the services the owner provides to property. Although owner-provided services and normal repairs are not assessed for taxation purposes, an indirect effect exists. A poorly maintained building in need of physical repairs will have a
lower market value than one operating at the optimal level. Therefore a tax on improvements encourages lower maintenance. Removing the tax permits increased maintenance. Owners of under-maintained buildings who are forced to improve because of building regulations will no longer be penalized by higher taxes (Lai, 1972, p. 63).

Again, the increase in investment in improvements is not confined to rental properties, but will also occur in the case of owner-occupied buildings. Owners will improve, without penalty, in order to derive higher utility from increases in the quality of their structures. The resulting rise in property values allows the return to investment to be realized at the time of sale. Landlords receive a more immediate return, where demand permits, through higher rents.

Although a shift to the land value tax will also be an inducement to improve in downward-transitional areas, rental earnings and profits from sales are limited by the generally low incomes of renters and the lesser prospects for rehabilitation on a neighborhood scale. The owners of the cheapest forms of rental accommodation, because their low income renters are able to pay only for the minimum acceptable shelter requirements and cannot respond with higher rents for changes in quality, will probably not rehabilitate, but sell for land assembly and redevelopment.

With this important exception, the aggregate result of a transition to land value taxation should be better quality
rental housing at a lower price than was previously available. Because incentives would be the same for every landowner and assuming a reasonably competitive market for rental housing, any owner who failed to increase maintenance or rehabilitate to the optimum level, where marginal costs are equal to marginal rents, would lose their tenants to the owners of apartments who invested in improvements. In the immediate short run, the supply of the number of units of rental accommodation might be restricted and tenants forced to pay somewhat higher rents for the better quality housing. In the intermediate run, the stimulus described in the preceding sections for increased construction would allow demand to be matched by supply and rent levels would drop to the equilibrium point.

For owner-occupied housing in good locations, levels of maintenance and rehabilitation would probably also increase, especially as new owners appear. An increase in demand, particularly if due to higher net incomes, would likely result in higher levels of investment because of the popularity of the single family home as an investment choice. In upward-transitional areas - the older residential neighborhoods with high land values in which the process of regentrification has already begun - the rate of rehabilitation would increase under land value taxation.
URBAN SPRAWL AND SUBURBAN DEVELOPMENT

To the extent that the shift from the property tax to the land value tax results in the more intensive use of land in the developed urban area, peripheral growth would be reduced. The land value tax encourages a substitution of investment preferences for improvements rather than land. An important limiting factor is the extent to which location can be substituted for greater per unit space - whether the higher density environment of areas close to the urban core can divert demand from single family homes on large lots in more distant suburban locations. With the exception of Simon (1959), these cross-elasticities of demand have received little attention in the literature. It is possible only to suggest that the importance of space to the demand preferences of landowners on the periphery may make some residents indifferent to the option of greater proximity to the core.

Without empirical evidence it is difficult to generalize about the level of taxation on peripheral land resulting from a shift to the land value tax. If the improvement to land value ratio is less in the core than on the periphery, taxes on the latter will decline after the shift. Several empirical studies (Smith, 1970; Brodsky, 1972) have indicated that this would be the case. Although land values on the periphery are low, agricultural land has also a low improvement to land value ratio and the reverse effect is possible.
The issue of how taxation affects the development of urban fringe land is complex. On criticism of current property tax levels, Netzer (1962, p. 196) has noted,

The two principal accusations are wholly contradictory. On the one hand, it is asserted that increasing tax burdens on agricultural or wooded land as urbanization draws near makes it more difficult to reserve land for open space purposes. On the other hand, it is (more frequently) claimed that relatively light tax burdens on potentially developable land on the urban fringe encourages speculative holdings and produces leapfrogging or discontinuous development, with unpleasant esthetic effects and higher ultimate costs of development for the urban area as a whole.

The confusion stems from whether the land is being held by a farmer or by a speculator and the problem increases when the two roles are combined. The subject of taxation and the preservation of agricultural land is dealt with more fully in Chapter V. One relatively more certain effect of the land value tax requires attention here.

Frequently metropolitan areas contain tracts of agricultural land in the areas skipped over during development. Surrounded by residential subdivisions, these areas of high land and low improvement values would certainly be exposed to higher taxes. This increase in taxes, as in underimproved areas in the city, would encourage transition to higher intensity land uses because holding costs are increased (Rawson, 1961, p. 28). The smaller and less productive the tracts of agricultural land are, the more likely they would be redeveloped. Similarly, land value taxation would cause a loss of open space between areas of scattered development.
(Grey, 1969, p. 93-95). Because open space, unlike agricultural land, produces no private profits to offset taxes, an increase in taxes is more of an incentive to put it into productive use.

In the suburbs of the metropolitan area, the transition to the land value tax can be expected to encourage more compact development around regional subcores in the same manner that the tax increases the intensity of land use around the primary urban core. Compaction of both these types has the further beneficial effect of reducing pressures for development in the intervening area between the city and its suburbs. The spread of low density continuous sprawl, which absorbs agricultural and open space land, would be reduced. To some extent, the land value tax will offset the tendency in suburban communities to implement minimum lot size regulations and other measures (Moss, 1977, p. 424) that foster low density development for the purpose of maintaining low tax rates in relation to the level of public services provided.

However, these positive effects of the land value tax are dependent on planned efforts to guide the development of subcores so that they become functional centers of economic activity around which residential areas and transportation systems develop. Unless patterns of location values in the suburbs can be defined with respect to these subcores, suburban land values would be more strongly determined by
proximity to the urban core. The role of the land value tax in relationship to planning for more optimal forms of development is supportive, but not determinant.

SUMMARY OF SPATIAL EFFECTS

This chapter has provided an analysis of the advantages and problems of a shift from property to land value taxation for different types of areas within the metropolitan complex. In the developed portions of the city, a shift to the land value tax should theoretically decrease speculative withholding of vacant land and increase redevelopment of obsolete structures. However, the high profitability of speculation in vacant land, the demand for low income housing and the lack of incentives for individual owners to undertake renewal in blighted areas are factors which would be expected to reduce the benefits of the land value tax. In downward-transitional and stable residential areas in central locations, urban renewal, which creates more efficient use of location potential, has the negative effect of displacing low income landowners and renters. Particularly in upward-transitional areas, the removal of the tax on improvements stimulates maintenance and rehabilitation, the more incremental forms of urban renewal.

More intensive use of urban land reduces speculative pressures on peripheral areas and the extent of urban sprawl.
However, neither preservation of agricultural land nor conservation of open space would be ensured by a shift to the land value tax. Suburban subcores would tend to take on more compact forms of development. Especially in peripheral and suburban areas, land value taxation would have to be used in conjunction with other planning strategies to be effective in promoting desirable and efficient patterns of growth.

Positive effects result only from the perspective of a shift from the property tax to a land value tax. The tax merely represents the return of the market equilibrium to neutrality with respect to investment. As such the tax will not encourage "premature" development but will remove the barrier presented by the existing property tax to investment in improvements. From the point of view of urban planning, the land value tax is the optimal base on which to proceed. The stimulus for development, a nonneutral effect in a direction consistent with planning objectives, can be provided through market mechanisms in the form of other types of taxes to be discussed in Chapter V.
CHAPTER IV

ECONOMIC NEUTRALITY AND THE PROVISION OF SERVICES

In order for a local tax to be economically neutral to the allocation of land, it must be a charge commensurate with benefits received in the form of services at the level of the individual property owner. In this chapter, this second criterion for economic neutrality is used to evaluate the property tax, and the effects on urban spatial development of other types of local taxes based on neutrality are examined.

This discussion is generally applicable to all urban sector activities, but focuses primarily on residential locational choices. A considerable amount of literature has already been devoted to the more specific effects of taxes on location decisions within the commercial and industrial sectors. Also not considered here is distributional efficiency in allocating costs among urban activity groups. To the extent that local taxes are not collected in proportion to benefits received among residential, commercial and industrial sectors, distributional efficiency is reduced. In addition, as Netzer (1966, p. 67-68) has noted, the prevalent use of a large proportion of local taxes for expenditures on services to people (e.g. education), rather than on services to property has resulted in the net overall
shift in resources from "private physical investment to investment in human development." This has been justified by the belief that this shift produces net advantages of higher levels of economic growth and this assumption is not challenged here.

PROPERTY VALUES, SERVICES AND TAX CAPITALIZATION

One possible method of determining whether the property tax is equated with benefits received is through an examination of the capitalization effect. If the property tax burden on a site and its improvements were exactly offset by the benefits from services provided, the tax would impose no deadweight loss and there would be no market distortion (Hamilton, 1975, p. 13). For the homeowner, the net capitalization effect should leave property values undisturbed. For the landlord, the cost can be passed on to the tenant and the former's profit levels remain the same. The tenant's rent rises, but the benefits of additional services are theoretically sufficient to be translated into willingness to pay. The capitalization and shifting effects discussed in Chapter II would be removed. Even if the tax were to increase with the level of improvements, as long as the additional services provided were of equal value to the additional tax, the equilibrium situation would produce no net capitalization or shifting. However, the central
contention of Chapter II - nonneutrality with respect to improvements - would remain valid because an aggregate shift to investment in services over improvements is effected. Unlike land, the elasticity of supply of improvements will allow supply to be affected.

The extent of net capitalization of a tax on property values should be an indicator of the degree of divergence between the value of public services and the tax cost. However, there are a number of reasons why the benefits from services may not be fully reflected in increased property values.

Cities are often in the position of a monopoly supplier of services. Lacking the normal market feedback signalling demand responses to private suppliers, the municipality may simply be over or under supplying services. Administrative inefficiency may lead to overpriced services. Municipal governments are also in the position to compel the purchase of certain services to ensure positive public externalities. The levels of required services may exceed demand. This is a problem inherent in the supply of public goods because it is possible that private benefits, even in the aggregate, are not commensurate with the costs imposed by taxes. A final possibility is that some services do not affect the value of property. However, even services to people, as opposed to services to property, are likely to be reflected in location values and hence in property values. With all these
possibilities in mind, net capitalization can be taken as only a rough indicator of the relationship between benefits received from services and the taxes used to pay for them.

There is a lack of empirical evidence on intraurban differences between the level of taxes and expenditures on services as measured by capitalization. There is also little information on the relationship between the tax portion levied on improvements and the level of benefits received from services. Although such empirical studies would be valuable, particularly in addressing the issues important here, difficulties in disaggregating levels and quality of services along with tax levels for different areas of the city have apparently made this type of research impractical.

The literature on the relationship between local taxes, expenditures on services and residential property values has tended to focus on comparisons of different tax rates and different levels of services provided within the metropolitan region or among municipalities surrounding large urban centers. The reason has been that most of the research is directed at the adequacy of the Tiebout model to explain residential location decisions.

Tiebout (1956) first proposed the theory that different tax rates for different levels of services, among independent taxing jurisdictions, represent an efficient market effect. If the Tiebout model is applicable, it could be concluded that the property tax is roughly a payment for services
received among communities in spite of the lack of evidence on capitalization within an urban area. In the model, consumers of public services are able to choose the types and qualities of services and combinations of services capable of satisfying virtually all possible preferences. Because some public goods are extremely expensive to provide and require a large number of consumers to make them worthwhile to maintain, the Tiebout model has been applied to suburban communities which presumably are able to take advantage of these types of benefits available in the central city. Also, the expected heterogeneity of preferences for services among the large numbers of residents effectively excludes the central city from the applicability of the model.

In addition to a large number of communities, Tiebout has also assumed complete consumer mobility and accurate information and awareness of the tradeoffs between the benefits and costs of residing in each of the communities (Hirsch, 1977). Locational constraints, such as the presence of employment, are also assumed not to exist. In the Tiebout model, the U-shaped average cost curve for public services as a function of population implies that a lump sum tax is imposed to cover operating expenses and that residents bear the marginal costs of their presence in the community. The optimal point of operation is at the bottom of the curve. Before this point is reached, the community will attempt to attract new residents; after this point it will discourage
residents in order to lower the average costs of production of services. In the equilibrium solution, population is distributed optimally among all jurisdictions (Hyman, 1974).

The assumptions of the Tiebout model reduce its applicability to the real world, even to the suburban case it most closely approximates. In the absence of the kind of market balance governing the Tiebout model, it is also possible to find communities of high priced residential land where high levels of services are provided at relatively low tax rates because of high per capita assessments (Netzer, 1962, p. 192). Often cited is the use, in these communities, of large lot zoning to restrict the number of entrants with families requiring high levels of educational and recreational services. Because it is in the interest of suburban communities to exploit whatever locational advantages they possess and to try to attract residents less demanding on the public budget, the Tiebout effect is undermined.

In spite of its appeal as a means by which the present property tax system could achieve efficiency in the allocation of public services, the Tiebout version of suburban land use tends to be rather myopic. It is an outcome of primary benefit to high income residents since only they are able to afford the quality and level of services that presumably everyone would prefer if the option existed. It is in the nature of merit goods that are publicly provided that everyone should be provided with at least a minimum level,
yet the model offers no assurance that the minimum result is an acceptable one. The sacrifice of equity for efficiency may have particularly undesirable results if, for example, education is strictly rationed on the basis of ability to pay. Although it offers a greater range of alternatives for those who can afford to choose, the Tiebout effect would probably reduce if not restrict low income housing in the suburbs (White, 1965). Homogeneity within suburban communities is also not a phenomenon of universal appeal and much has been written previously about the problems associated with suburban ghettoization.

But perhaps the strongest argument against the Tiebout effect from the point of view of efficient land allocation is that it encourages consumption of land for housing and urban sprawl. The number of taxing jurisdictions necessary to satisfy the range of preferences would unquestionably need to be large and the need for some exclusionary mechanism such as minimum lot sizes or population quotas within each community (Hirsch, 1977) would expand suburban land consumption. The metropolitan area-wide negative externalities of loss of agricultural land and open space, and increased transportation costs have been disregarded.

Yet another result of the model's assumptions is that the uncompensated use of central city services by suburban residents is overlooked. The relationship of the Tiebout effect in the suburbs to the city has generally been ignored
in the literature. An important exception is Hamilton's (1975) estimate of the extent to which central city residential consumption is depressed relative to the suburbs, because in neither jurisdiction do taxes resemble an accurate price for services received.

Empirical studies examining the Tiebout effect within metropolitan regions have provided some evidence on the correlation of property taxes and levels of services. Oates' (1969) cross-sectional study of 53 moderate size New Jersey communities in the New York metropolitan region concluded that property values were negatively related to the property tax rate and positively related to public services, represented by school expenditures per pupil. A modified version of Oates' model tested in the San Francisco/Oakland/San Jose metropolitan region again revealed the expected relationship between taxes, expenditures and housing values, although the model was found to be sensitive to factors differentiating urban areas (Pollakowski, 1973). As Gustley (1976) has pointed out, Oates' mono-centered region may have been the cause of results not applicable to the poly-centered Pollakowski study. The results of Orr's (1968) study of the rental housing market in communities in the Boston metropolitan area showed no evidence that residential rents were affected by taxes and expenditures. Heinberg and Oates' (1972) critique of the Orr model's specification led to a reformulation, this time reversing the results, but with a less
than 50% shifting (Orr, 1972). Black's (1974) use of Orr's model for the Boston area also found the forward shifting of the property tax to renters to be less than complete, implying some degree of net capitalization. From this brief review of the main results of empirical studies, it is evident that the relationship between taxes, expenditures and property values demonstrates a tenuous equation of taxes to the value of services, even at aggregate municipal levels.

THE BENEFIT PRINCIPLE AND MARGINAL COST PRICING

Economic neutrality in the provision of services is derived from the benefit principle of taxation. In analogy to private transactions in the market, public services should be priced according to benefits received. More specifically, the tax for a particular service should be set, not to recover the unknown total benefits received by each taxpayer, but at a rate such that the marginal tax equals the marginal benefits received from the last unit of the service provided (Bird, 1976, p. 11). From the taxpayer's point of view, this arrangement would be fundamentally equitable. However, it is not economically efficient because it implies that services should be supplied regardless of the costs. Because of eventual diminishing marginal utilities, the benefit principle implies that consumers should be charged less as more of the service is provided despite the fact that marginal costs may
be increasing.

As Figure 4 demonstrates, the tax should be set where the marginal costs of supplying the services are equated with the marginal benefits. At this point the welfare of the community is maximized. If the service is priced at less or more than \( P \), resources will be inefficiently allocated to the production of this service (Bird, 1976, p. 33).

However, the very nature of a public or quasi-public good prevents the exact equation of marginal costs and benefits. Wicksell (1896) and Lindahl (1919) have argued that an equitable distribution of public resources is more important than efficiency. Although more precise distinctions between public and private goods will be provided later, it is evident that the positive benefits to the community as a whole of certain services cannot be evaluated in any exact way by the marginal benefits to individuals. Samuelson (1954) has suggested that because of externalities among taxing jurisdictions, it is impossible to determine, at the level of one jurisdiction, an optimal level for the provision of pure public goods or services.

Even if the benefit principle and marginal cost pricing theory are not achievable in any real system of taxation, a closer approximation of marginal costs to benefits remains a desirable objective. As Bird (1976) concluded from his study of public pricing, the importance of beneficiary charges is not so much as a method for rationing limited
FIGURE 4
EFFICIENT PRICING OF PUBLIC SERVICES

FIGURE 5
MARGINAL COST DEFICIT
public resources, but as a signal to governments of the public's evaluation of the worth of services. Without this kind of signal on which the private market operates, services will almost certainly be inefficiently provided.

The property tax does not represent a marginal cost price for services, but it is not as distributionally inefficient as average cost pricing, in which total costs are borne equally by all beneficiaries regardless of individual benefits received and costs imposed. The property tax appears to fall somewhere between the extremes of average and marginal cost pricing because property values have some relationship to the value of services provided (Downing, 1973, p. 631). Property taxes per unit of residential space tend to increase as densities decline and the costs of some services, as will be discussed more specifically later, also increase with lower densities (Hyman, 1977, p. 241). However, where special assessments are levied on services provided in addition to the property tax, average rather than marginal cost pricing is frequently implemented because the former is simpler to administer. The succeeding analysis contrasts average with marginal cost pricing in order to make the differences between the two mechanisms clear not only in the case of these special assessments, but also because the property tax does not represent a marginal cost assessment for services.
FIXED VERSUS VARIABLE COSTS

Marginal cost pricing is best applied to the financing of operating expenditures - the variable or incremental costs that occur once a system has been put into production. To the degree that an expansion in production can be carried out in small units of capital outlay, the fixed cost component can also be incorporated into the marginal cost pricing formula. But a significant amount of public expenditures on services are, at least initially, indivisible and create a fixed cost independent of the volume of services produced and consumed. If there are increasing returns to scale in production, in the long run, average costs, which reflect recovery of total costs, will be higher than marginal costs (Milliman, 1972, p. 34).

If marginal cost pricing is in effect, a deficit in financing will occur. Figure 5 (Paul, 1972, p. 83) illustrates this situation, assuming increasing returns to scale. The output \( Q_1 \) produced would be, under marginal cost pricing, at the intersection of the marginal cost and demand curves. Total revenues would be represented by the area \( abcQ_1 \), but the full costs, represented by the average cost curve, would be \( aP_1dQ_1 \). The gap between revenues and expenditures would be area \( bP_1dc \). In the opposite case of decreasing returns to scale, revenue surpluses would be created. Both the financing of the deficit for a service from the general tax base and the reallocation of a surplus to
other public expenditures are inequitable solutions because those who have imposed the costs will be subsidized by the entire municipality. Because the primary focus of marginal cost pricing is on additional units of production, it is most appropriate to the short run incremental costs which tend to be termed "variable" costs even though an element of fixed costs may be involved (Vickery, 1972, p. 55). Not only initial costs, but future expansions requiring large lump-sum investments are difficult to deal with in the marginal cost pricing framework.

SPATIAL EFFECTS

Downing (1977) has made one of the few attempts to apply the theory of user charges to urban spatial development. His analysis examines the relationship between location incentives for two adjacent communities. In Figure 6, A and B represent sites of production of a service within two communities. For a fixed level of output serving a given number of residents, \( AA^1 \) represents the level of the long run marginal cost of production. \( A^1D_A \) represents the distribution cost function. Assuming costs increase linearly with distance, the level of distribution costs is lowest at site A. Because community B is smaller than A, its long run marginal costs (\( BB^1 \)) are higher. \( B^1D_B \) represents its distribution cost function. Point Z, where the two cost functions overlap, represents the most efficient market size for each community. Under
FIGURE 6
LOCATIONAL CHOICE AND MARGINAL COST PRICING

FIGURE 7
LOCATIONAL CHOICE AND AVERAGE COST PRICING
marginal cost pricing, as long as there are decreasing costs of production, migration of residents from B to A because services are cheaper will produce no inefficient effects, since AA will merely decrease and BB increase. If constant or increasing costs of production are the case, this will be reflected in the price for services and eventually efficient market size will become set.

In contrast, average cost pricing creates subsidization of peripheral areas by centrally-located residents. In Figure 7, using the same notation, an average cost charge (AA) is now levied. The costs of distribution are now shared equally by the whole community and the result can be compared to the previous marginal cost charge (AD) situation. Residents located between A and X subsidize those between X and Z. Because both receive the same level of service, Downing has noted that there is more incentive to locate beyond X and pressure to extend services to Z. Perhaps more accurately, there is no penalty for those who choose to reside in peripheral areas where the actual costs of the service are higher.

PUBLIC, PRIVATE AND MERIT GOODS - THE SCOPE OF MARGINAL COST PRICING

The main characteristics of a pure public good are that individuals cannot be excluded from the consumption of it and that one person's consumption does not interfere with
another's. In contrast, private goods can be rationed through prices so that only those willing to pay will receive the benefits. A merit good has been defined as "a private good that has been endowed with the public interest" (Milliman, 1972, p. 40). In other words, it is possible to ration the good or service, but because of certain positive externalities derived by the community from individual consumption, it is deemed in the public interest to ensure that everyone consumes at least some minimum amount. Other reasons that an essentially private good may be publicly supplied are economies of scale and the necessity of certain supply (Downing, 1977, p. 443). All these reasons are based on the acknowledgement of some type of externality. It seems generally agreed that deficits from the provision of these quasi-public goods or services should be financed by a subsidy from the general tax base. The resulting redistribution of income has been justified on the basis of equity (Mushkin, 1972, p. 11).

In the case of true public goods, marginal cost pricing has no relevance because the marginal cost imposed by an additional consumer is zero (Milliman, 1972, p. 40). But some publicly provided services with private characteristics are amenable to marginal cost pricing. A service provided primarily on the grounds of efficiency can be rationed on a more or less strict marginal cost basis. Where the externalities are large, marginal cost pricing has less
applicability. In some cases it may still be possible to relax marginal cost rules by adjusting charges to account for these externalities (Downing, 1977, p. 443). Because the zero-price option results in over-production and over-consumption, even for some goods with more public characteristics some loose form of marginal cost pricing is desirable (Bird, 1976, p. 347).

In general, the applicability of marginal cost pricing is dependent on whether the benefits are divisible - where preferences can be revealed and the ability to exclude exists. Some element of voluntary purchase must be evident, although this must be balanced by the consideration that some level of purchase may need to be compelled in order to eliminate the incentive to buy less than is socially desirable. Particularly good cases for marginal cost pricing are where extra public services are in demand and where people are willing to pay for different qualities of service (Mushkin, 1972, p. 22-23).

Although it is frequently argued that the scope of marginal cost pricing of public goods and services is much broader than current practices would indicate, the concern here is specifically with those services that have density and distance dependent costs. Failure to assign appropriate costs in these instances will allow locational decisions to be made without consideration for higher actual costs borne by the entire taxing jurisdiction. Downing and Gustley (1977) have reviewed previous studies and conducted their
own research on the relationship of density and distance to the costs of supplying various services. They concluded that the costs of water supply, storm drainage, sanitary sewers and solid waste disposal and collection are density dependent. Distance related costs, in order of extremes in differentials, were water supply, sanitary sewers and storm drainage. In both cases the differentials for capital costs were higher than for operating costs. Downing (1977), Vickery (1963), Kafoglis (1969) and Plunkett (1976) have maintained that these services are among those with a considerable similarity to private goods which makes them amenable to marginal cost pricing. The use of service charges and special assessments for these services is already fairly prevalent, but in most cases there remains room for greater use of marginal cost pricing. Downing (1977) and Mushkin (1972) have suggested more specifically how charges can be set and have dealt with the special problems of each of these services.

ADMINISTRATIVE COSTS AND IMPACT ON SPRAWL

There are two major issues relevant to this discussion that have not yet been raised. The first is the difficulty of implementing a user charge system corresponding more closely with marginal cost pricing. An important administrative problem that could prohibit marginal cost pricing,
even on a less strict theoretical basis, is the high cost of collecting the information needed to assign more appropriate charges. Effective pricing also requires periodic reassessment to avoid obsolete price structures. For services which are already partly provided on a user-pay basis the problem is not a serious obstacle. Even for other services, the initial increased administrative costs may well be justified by later savings in expenditures where the cost of providing these services prove to have been too low (Bird, 1976). In addition, the external benefits to the municipality from more effective planning and tax coordination may heavily outweigh the disadvantages.

The second issue is whether marginal cost pricing acts as a constraint to urban sprawl. A user charge, unlike a tax, which is a compulsory payment due as long as resident status is kept, allows the consumer of services some freedom to adjust consumption, perhaps to the point that the price paid is low enough to make a locational choice acceptable at a considerable distance from the city (Mushkin, 1972, p. 437). Basic services such as those mentioned previously are to some extent compelled or essential purchases which must be supplied at a minimum level. Marginal cost pricing for these services imposes some unavoidable costs. But to the degree that residents will be willing to pay higher charges associated with peripheral locations or are able to adjust consumption, marginal cost pricing will not reduce sprawl (Downing, 1977,
The objective of marginal cost pricing is simply to ensure that residents pay more of the social costs of their locational choices. Indirectly, it is a disincentive to sprawl because it forces consumers to evaluate preferences for location and services.

Within these limitations, there are several ways in which marginal cost pricing will affect development. Newly developing areas around the city's periphery will be forced to pay the full price for extensions of services. Among suburban areas, competition will be a factor in determining prices and the density/distance related charges will be of some effect in creating suburban cores. Between the city and suburb, however, intergovernmental bargaining over transfer payments is necessary where spillover effects result when economies of scale fail to correspond with political jurisdictions.

Bahl and McGuire (1977), have considered the question of effectiveness of taxes from the viewpoints of homeowner, speculator and developer. Where full incremental costs are recovered with charges variable by distance as opposed to lump sum charges, homeowners are likely to choose more central locations. Speculators holding undeveloped land requiring no services will not be influenced by marginal cost pricing, but by the property tax. Developers do consider the availability of services, but this is but one factor among a large number that influence their decisions. However,
neither speculator nor developer will benefit if their clients, the prospective homeowners, are not willing to pay the service costs for more remote locations.

ALTERNATIVES

The Land Value Tax

A number of writers (Vickery, 1972, p. 63; Roberts, 1977, p. 47; Bails, 1973, p. 387-288; Milliman, 1972, p. 44) have suggested that the land value tax is an appropriate means of recovering expenditures on services. They argue that publicly provided services are a large contributor to land values and, as noted in Chapter II, land value taxation is not a deterrent to development.

However, land values provide only a rough measure of public services. Other factors comprising externally generated benefits - proximity to place of work, shopping, recreational and cultural facilities and aggregate private benefits with a public character (the general level of improvements) - also have an influence on land values. It should also be noted that the areas of the highest land values are usually areas of compact development within the urban core that may be less expensive to service. Peripheral urban and suburban areas requiring extensions of services may be the most expensive to service. The important distinction here is between the sunk costs of the general provision of
infrastructure and operating costs. In consistency with the definitions provided at the beginning of Chapter III, only the former costs may be recovered through the land value tax. The latter costs represent improvements to land which should preferably be recovered through user charges. Land value taxation seems an appropriate means of recovering costs for services only where marginal costs and benefits are virtually impossible to determine. The planning of new services or extensions of services to the periphery and suburbs where those costs can be assigned on an individual or zonal basis permits a stricter adherence to marginal cost principles.

Multi-Part Tariffs

A more appropriate alternative for these areas is the multi-part tariff, designed to recover distance or density related costs and the marginal costs of consumption. A number of versions have been proposed. The tariff may be as simple as a fixed charge for connection plus an incremental charge for the amount used (Bird, 1976, p. 40). Downing (1973, p. 637) suggests, as an example for sewer services, a frontage charge for pipes to cover collection costs, a connection fee and a flat rate to cover any other operating costs. Frontage charges, which discriminate by size of premises, are for residential consumers a more equitable
means of assessment since they act in favor of smaller sites more likely to be occupied by lower income groups (Vickery, 1972, p. 62). Bird (1976) has also suggested a consumer price based on the marginal costs of consumption, a connection fee and a special assessment on distribution charges.

The multi-part tariff offers an opportunity to recover both "fixed" and "variable" costs. The former can be assessed on a flat rate basis for those types of costs for which it is difficult to get consumers to reveal their preferences and the latter on costs for which levels of consumption or location preferences can be adjusted. It is thus a solution to the dilemma of determining optimal levels of operation for public goods posed by Samuelson (1954). It is also a means for incorporating long run "fixed" costs and extensions of services into the marginal cost pricing framework rather than having to rely on general revenues to fund specific service deficits.

Ideal for these purposes would be a flat rate for all consumers to cover any remaining initial capital cost deficit; a connection fee, a distribution fee and an expansion capital cost fee for new consumers; and a consumption fee based on the marginal costs imposed by individual consumers. The first component and part of the second of this proposed tariff would recover the "fixed" costs and costs of expansion to make this a case of long run marginal cost pricing. The third component represents short run marginal cost pricing
closer to the theoretical ideal. The second component
is a distance dependent variable that is a disincentive to
locate in areas requiring new services. Since the capital
costs for expansion of services is even more significant than
operating expenditures for distance differentials (Downing
and Gustley, 1977), this tariff would have a more significant
effect on locational choices. The developer would presumably
bear the connection fee, the homeowner the distribution
fee in addition to the first and third parts of the tariff.
Because the supply of new development is probably quite
elastic, the developer would likely be able to pass his share
on to the homeowner. The assignment of the expansion capital
cost fee could be worked out between developer and pros-
pective homeowner, ensuring that the impact of location choice
outside serviced areas is fully realized by the consumer.

Multi-part tariffs are a compromise between strict
marginal cost pricing and administrative costs. Formulas
like the one suggested above may still be expensive to
administer. However, the benefits in the form of more
effective pricing, which signals preferences to the
municipality at the same time as restricting demand on the
basis of willingness to pay, and the impact on locational
choice which works in coordination with other policies
to reduce urban sprawl may well be worth the additional costs.
Project Financing Levies

Although betterment levies are discussed more fully in Chapter V, betterment levies for specific projects enlarges the scope of taxation on the basis of the benefit principle and is economically neutral if applied to new development. Decisions to undertake projects at public expense are often the stimulus for new development. Expansion of the transportation network, extensions of all physical infrastructural services and construction of substations are examples of the kind of public projects that increase the desirability of certain locations. A charge which recovers all or some portion of the private benefits of these projects, which tend to be undertaken in order to bring peripheral land into urban use, will be neutral and will assign social costs of development in a more optimal manner. An important qualification in the application of this form of betterment levy is that beneficiaries and benefits must be fairly easy to identify. New development on the periphery generally provides such a basis for assessment.

Maçon and Mañon (1975, p. 19-25) have described the process of assigning levies. Determination of the benefit area, quantification of aggregate benefits and calculation of individual benefits with corresponding levy often require simplification to reduce administrative costs. Aggregate benefits may be calculated by sampling property value
increases, which are extrapolated on this basis for the entire area. Increases in property values are the most desirable proxy for benefits received because they include the immediate and the future stream of benefits in capitalized form. If this information is not readily available, total project costs are prorated according to differential benefits among the recipients. Some type of benefit-cost analysis should be conducted in order to determine whether the project should be undertaken.

Specific project financing is a more sophisticated form of the more common development cost charge or special assessment. Unlike marginal cost pricing, it is a one time assessment for initial physical improvements. Because the costs of some public works projects are heavily concentrated on the initial investment in construction with relatively minor future expenditures required for maintenance - the type of project not amenable to forms of marginal cost pricing - a betterment levy may be more appropriate. It may also provide a better basis for recovery of the "fixed" cost component of investment in services where marginal cost pricing is applicable in recovering operating costs.
ECONOMIC NONNEUTRALITY AND TAXATION
ON THE URBAN PERIPHERY

Economic neutrality provides the basis for reforming taxation with the objective of removing distortions in the property market which contribute to urban sprawl, but it is not a means of increasing control over urban growth patterns. It may be desirable to supplement the tax system with taxes that are economically nonneutral to the development process in a manner consistent with planning objectives. This chapter explores two groups of taxes with which there has been some practical experience and which come closest to a merger between local fiscal policy and objectives for urban development. Neither of these tax groups has been designed specifically to increase control over land use intensity. However, their primary objectives - recovery of benefits conferred by public actions, in the case of betterment levies and improvement of equity, with respect to preferential tax treatment of agricultural and open space land - are closely related to the issue of urban sprawl. Their effects on the premature development of peripheral urban land therefore warrant investigation.
Before discussing these groups of taxes, the nature of a tax with the potential to reduce sprawl on the periphery must be examined. Sprawl results from premature development of urban fringe land despite the existence of more centrally located land which is a suitable locational substitute except for differences in the price of acquisition. A tax which increases the length of time peripheral land is withheld from development alters the balance of decisions to develop in favor of more centrally located land. It does so by reducing the profitability from development of peripheral relative to more central locations. The relative significance of the property tax to other factors determining decisions on the timing of development has been reviewed in Chapter I. At issue here is the direction rather than the magnitude of the effect. The following analysis has been derived from Shoup's (1970) study of the optimal timing of urban development.

The economically optimal time to develop urban land may be expressed as:

\[ T_O = f[r, a, V(T), A] \]

where:

- \( T_O \) = the optimal time of development,
- \( r \) = the interest rate,
- \( a \) = the tax rate on the property in its present use,
- \( V(T) \) = the development value at any time \( T \), and
A(t, T_o) = any earnings from the land in its present use.

A major assumption here is that land will be developed only for its highest and best economic use. This is reflected in the term V(T), which may also be described as the present value at some time T of net returns from the developed property if development occurs at T. It is implicitly acknowledged that over time the most profitable type of development changes in response to demand as urbanization increases. In addition to earnings in present use, term A also includes the cost of any temporary improvements that may be made to increase the profitability of withholding land from major redevelopment. It is assumed that the best type of temporary improvement in terms of profit maximization is carried out and the future costs of demolishing improvements to make way for development are also included in this calculation.

The property tax rate and the interest rate reduce present and future profits from holding the land for gains upon development. A decrease in the property tax, holding all other factors constant, will increase the profitability of withholding land from development, thus lengthening the time before development occurs. Figure 8 illustrates the effect of a decrease in property taxes on the timing of development. In this graph, P(t) represents the present value at some time t of the returns from interim use, net of the property tax, plus the present value of the development value at the
FIGURE 8
TAX REDUCTION AND THE TIMING OF DEVELOPMENT

\[ V(T) = \text{development value at some time } T \]
\[ P(t) = \text{market value at time } t \]
\[ P^*(t) = \text{market value at time } t \text{ if the tax is reduced} \]
\[ T_o = \text{optimal development time at the present tax rate} \]
\[ T_o^* = \text{optimal development time at a reduced tax rate} \]
optimal time. Because $P(t)$ reflects all factors which determine the value of the land, it is equal to the market value of the land at time $t$. The point at which the $P(t)$ and $V(T)$ curves intersect determines the optimal time of development, $T_0$. A reduction in the property tax is capitalized into the market value of the land and the $P^*(t)$ curve is shifted upwards, delaying development.

Shoup (1970) has described this relationship mathematically. Although he later includes interim returns in his equations, they are omitted at this stage in order to make the effect of the tax clear. The equation to be maximized is:

$$P(t,T) = V(T)e^{-r(T-t)} - \int_t^T aP(i,T)e^{-r(i-t)}\,di$$  \hspace{1cm} (1)

(Shoup, 1970, p. 38). The market value at time $t$ for a given development time $T$ is dependent upon the present value of the development value at $T$ minus the present value of the tax before development. Differentiation and simplification yield:

$$\frac{V'(T)}{V(T)} = r + a$$  \hspace{1cm} (2)

(p. 39). This result indicates that development occurs when the rate of increase in development value equals the sum of the interest and tax rates. Land will be withheld from development for as long as the rate of increase in development value exceeds the holding costs, which include the interest and tax rates, offset by any returns from present use. Lowering the tax rate allows land to be held profitably
when the rate of increase in development value falls to a lower level, thus postponing development.

The effect of the property tax levied prior to development has been demonstrated, but the case of a tax levied at the time of development, possibly after the tax has been kept at low levels, has yet to be investigated. Expanding on Shoup's analysis, a term $D(T)$, representing a tax levied at the time of development, can be introduced in equation (1).

\[ P(t, T) = [V(T) - D(T)] e^{-r(T-t)} - \int_t^T aP(i, T) e^{-r(i-t)} \, di. \]  

The optimal time of development is then given by

\[ \frac{\partial P(t, T)}{\partial T} = -r[V(T) - D(T)] e^{-r(T-t)} + [V'(T) - D'(T)] e^{-r(T-t)} - aP(T, T) e^{-r(T-t)} - \int_t^T aP(i, T) e^{-r(i-t)} \, di = 0. \]  

Simplification yields:

\[ -r[V(T) - D(T)] + [V'(T) - D'(T)] - a[V(T) - D(T)] = 0, \]  

and

\[ \frac{V'(T) - D'(T)}{V(T) - D(T)} = r + a. \]  

This reveals that the larger the value of $D'(T)$, or the faster the rate at which the tax increases over time, (e.g. to reflect higher development values, the earlier will be the optimal time of development. The larger the value of $D(T)$, or the greater the size of the tax at the time of development, the later will be the optimal time of development.

From this general mathematical form two more specific types of taxes levied at the time of development can be
examined. A fixed or flat rate tax levied on development means that \( D'(T) = 0 \), and equation (6) becomes:

\[
\frac{V'(T)}{V(T) - D(T)} = r + a.
\]

The higher \( D(T) \) or the development tax is, the longer development will be postponed. This effect is greater than in the general case where \( D'(T) > 0 \). In the case of a tax proportional to development value, \( D(T) = cV(T) \), where \( c \) is some constant, \( 0 < c < 1 \). Substituting into equation (6) yields:

\[
\frac{V'(T) - cV'(T)}{V(T) - cV(T)} = r + a.
\]

Therefore,

\[
\frac{V'(T)}{V(T)} = r + a,
\]

the same result that Shoup derived in equation (2). The proportional tax on development value has no effect on the optimal timing of development. Development will occur at the same time as if no tax were levied. This result is not intuitively obvious, but its general explanation lies in the observation that, because both increments in development value and the market value of the land are decreased proportionately with the tax, the net rate of appreciation of the land withheld for further development is not affected and according to equation (2), the optimal time of development is unchanged. This general analysis is applied in the following sections to two major groups of taxes having potential to influence land use patterns on the urban periphery.
Several forms of betterment levies have been used to recapture benefits conferred by public actions. Although none has been applied exclusively to the urban periphery, these levies may be particularly relevant here in view of the often great pressures for development which create expectations for windfall gains through speculation.

There are two justifications for the application of betterment levies to conversion of the urban fringe. The first and more frequently cited argument is that the windfall gains from increases in development potential accruing to speculators on these lands are made possible not just by private actions but by public actions like the granting of development permission and by "general community influences such as the growth of urban populations" (Grimes, 1977, p. 360). These gains are often referred to as "unearned increments". This viewpoint has been challenged by those who have stressed that speculation plays an important role in the operation of the property market and the distinction between a normal and a windfall gain is difficult to define.

A second rationale for such a levy is that the actions of many private operators may create negative social externalities through urban sprawl. In economic terms, the social discount rate for future benefits is lower than that of private developers, resulting in greater than optimal investment in
development with short term benefits and lower than optimal investment in agricultural and open space land uses which offer long term benefits (Ladd, 1978, p. 4). In the case of agricultural and open space lands, value is inadequately reflected by the market mechanism. Taxation of speculative gains in this context is perhaps best justified as recovery of costs imposed by negative externalities in the process of creating private benefits.

The kind of betterment levies designed for the recapture of unearned increments may be divided into two groups on the basis of the assessment method. Land value increment taxes may be assessed periodically on increases in land value or may be levied at the time the increment occurs, through sale. In order to be fully effective, the land value increment tax should be collected whether or not the speculative gains are realized. However, problems with determining unrealized gains have made taxation on the basis of sale a more common practice. In this form, the tax resembles a transfer tax or tax on speculative gains from land sales (Grimes, 1975). The difference between land value increment taxes and transfer taxes tends to be one of degree. The land value increment tax is generally designed to recover all speculative gains. Because increasing increments in land value reflect not only "unearned increments" due to windfall gains but also normal speculative returns, the tax is usually levied at less than 100% of the difference between the value
of the land at the time the tax is put into effect and the value at the time of sale.

The second type of betterment levy, the development value tax, comes into effect either at the time development permission is given or when development actually occurs. The relationship between land value increment and development value taxes is very close since land value increases reflect development potential. Land value increment taxes based on sales may be, in effect, the same as development value taxes because the motive for sale is often to change land use in order to realize development potential. Attaching the tax to the grant of development permission provides a clear signal of the means by which private betterment has been conveyed. The problem becomes one of determining the value of development permission. The British betterment levy is a practical example of how this was attempted through a combination of land value increment and development value taxes. It was levied on the increment between prior use value and value accorded by development permission (Harriss, 1972, p. 568).

In spite of the arguments favoring the return of speculative gains to public revenues, taxation that removes a significant proportion of these gains is likely to be strongly opposed, especially if devised for specific areas, on the basis of equity. Such a drastic change in the rules on which the property market operates creates a need for a remedy by way of the counterpart to betterment - compensation.
In the case of the British experiment with the betterment levy, compensation was awarded by means of the compulsory purchase of development rights (Archer, 1971). Development plans, which decreased the market value of some areas like open space land on the periphery and increased the market value of other areas through zoning and public improvements, provided the basis for compensation and betterment. Where development rights were frozen, the government compensated owners for the reduction in the market value of their lands. When development permission was granted for these lands, the owners purchased back their rights through the development value tax.

The British approach to the betterment issue, an innovative combination of tax policy with planning objectives, has proven to be highly controversial (Harriss, 1972). Among the major problems were the difficulty in assigning amounts of compensation and betterment and determining the types of planning permission which would qualify for betterment. The effect of the levy on the timing of development and the incidence of the tax have been the subject of considerable and unresolved debate (Rose, 1972; Neutze, 1974; Foster and Glaister, 1975; Rose, 1976). However, land value increment and development value taxes may prove feasible without compensation on the basis of recovery of public externalities if they are assessed on some lesser proportion of land value increases or development gains.
ANALYSIS OF THE EFFECT OF BETTERMENT LEVIES ON THE TIMING OF DEVELOPMENT

The case of a tax levied on the increment in land value between present market value and value at the time of development will first be examined. Maintaining the notation used in the first section, a simple form of this special tax, disregarding the general property tax and any returns from the land in its present use, may be expressed as:

\[ P(t,T) = V(T)e^{-r(T-t)} - b[P(T,T) - P(t,T)]e^{-r(T-t)}, \]  

where \( b \) = the rate at which the incremental tax is levied at the time of development. Because \( P(T,T) = V(T) \), simplification yields:

\[ P(t,T) = \frac{(1-b)V(T)e^{-r(T-t)}}{1-be^{-r(T-t)}}. \]  

In order to maximize, \( \frac{\partial P(t,T)}{\partial T} = \)

\[ \left[1-be^{-r(T-t)} \right] (1-b) \left[ V'(T)e^{-r(T-t)} - rV(T)e^{-r(T-t)} \right] \]

\[ - \left[ (1-b)V(T)e^{-r(T-t)} \right] be^{-r(T-t)} \]

\[ 1-be^{-r(T-t)} \]

\[ = 0. \]  

With the result:

\[ \frac{V'(T)}{V(T)} = \frac{r}{1-be^{-r(T-t)}}. \]  

Therefore, the higher \( b \), or the rate of the incremental tax on land values, the earlier development will occur. This result is consistent with the results of the earlier analysis.
because if \( b = 0 \), or no special tax is applied, the equation reverts to the form of equation (2) if the general property tax is ignored.

Both a tax levied on the increment in value between existing use value and development value and a land value increment tax, whether collected periodically or at the time of sale, can be expected to have similar effects. The increments in either case increase more than proportionately with total development value (Figure 9). At time \( T_2 \) the increment on which the land value increment tax is based is proportionately greater compared to development value at time \( T_1 \). The effect for a tax based on the increment between use value and development value is similar.

The taxes are of the form: \( D(T) = d[V(T) - k] \) (14) where \( 1 > d > 0 \) and \( k > 0 \), and \( k \) does not vary with \( T \). "\( k \)" represents either existing use value or present market value. Then,

\[
D'(T) = dV'(T)
\]

(15)

and substitution into equation (6) yields:

\[
\frac{V'(T) - D'(T)}{V(T) - D(T)} = r + a,
\]

(16)

which reduces to:

\[
\frac{V'(T)}{V(T) + \frac{dk}{1-d}} = r + a.
\]

(17)

Since \( \frac{dk}{1-d} > 0 \); \( \frac{V'(T)}{V(T) + \frac{dk}{1-d}} > V'(T) \).

This result indicates that either form of betterment tax will
FIGURE 9
LAND VALUE INCREMENT TAXES
AND THE TIMING OF DEVELOPMENT

\[ V(T) = \text{development value at time } T \]
\[ P(T) = \text{market value at time } T \]
\[ I = \text{increment} \]
cause development to occur sooner.

A tax with a rate based on full development value, whether calculated on the potential value accorded by development permission or actual value at the time of development, has already been examined in the first section (equations 8 and 9). It is a form of proportional development value tax which will have no effect on the optimal time of development. If a progressive tax is levied, i.e. one that increases more than proportionately with development value, again it would be expected that development would occur earlier.

The three main forms of betterment levy considered either result in earlier development or have no effect on the time of development. This indicates that recovery of speculative windfalls produced by the pressures of growing urban populations and public investment in new infrastructure is a fiscal policy consistent with planning objectives only in areas where new development is desirable. The taxes which reduce optimal development times may be useful in producing infill on the periphery and therefore in preventing leapfrog forms of urban sprawl.

PREFERENTIAL FORMS OF TAXES

This second major group of taxes is more closely related to land use, specifically for the preservation of agricultural land and open space. However, these preferential tax forms
have evolved from perceptions of inequity in the tax system, and it is to this primary concern that the desirability of these taxes is still often addressed. With the growing concern over loss of agricultural land and open space on the urban periphery, a more specific intent to retain land in these uses has emerged. Forms of preferential taxes will be treated in this discussion in the order of this progression in tax policy to a more broadly based frame of reference.

A problem common to all preferential tax forms is determining eligibility. In some cases, location within agricultural or open space reserves brings automatic or mandatory participation in specific tax programs, while in others participation depends on voluntary application. A variety of standards has been devised on which to base eligibility, largely in order to discriminate between farmer and speculator. Agricultural use criteria may include any combination of the following: proportion of income derived from agriculture, minimum gross income from agriculture, length of prior agricultural use, minimum acreage, productivity, cultivation practices, and family ownership (Atkinson, 1977, p. 199; Gloudemans, 1974, p. 22; Hady, 1974, p. 4-5). Open space land desired for preservation is more difficult to define and legislation has tended to be even more specific. Types of open space which may be covered by preferential taxes include land considered valuable for resource conservation, recreation, ecological interest, or for the purpose
of containing concentrations of urban development. The use of zoning as a basis for eligibility has become more common because of problems that have arisen from weaknesses in legislative definitions of open space. Generally the applicability of preferential taxes to agricultural and open space land requires little distinction and the following discussion refers to both as agricultural land.

CLASSIFIED PREFERENTIAL TAXES AND ASSESSMENT AT USE VALUE

Classified preferential taxes and current use value assessments for agricultural land have in common the objective of reducing tax levels relative to those that would be in effect under market value assessment. The tax reduction is offered for as long as agricultural land is retained in its current use and assessments revert to market value thereafter.

Preferential taxes based on agricultural classification are analytically no different from differential assessments on residential, commercial and industrial classes of land use. They are founded on the rationale that earning power should be considered in determining the amount of taxes to be paid for different types of property. Classified preferential taxes for agriculture are generally assessed at a lower proportion of market value than for urban types of land use. Unlike use value assessments, classified taxes reflect the potential highest and best use of the land as represented by
market value. Because use value assessment ignores all alternatives other than current use, agricultural land under pressure for development is more favorably treated in comparison to the classified property tax alternative.

Determining agricultural use value is an obstacle for this form of preferential tax because the traditional market value approach, based on sales, is inapplicable. Although no single, undisputed standard has been defined, a number of methods have been developed and implemented. The income capitalization approach is based on a calculation of the present and future stream of the tenant's rent or the owner's net income (Gloudemans, 1974, p. 15). In addition to the usual difficulties in determining the rate of capitalization, this approach is complicated by problems with extrapolating farm income over time and accounting for variations in managerial abilities. Sales prices for comparable land transferred for continued agricultural use are also a basis for use value assessment (Hady, 1974, p. 5). However, data may be limited and it may be difficult to find truly comparable land on which there has been a recent sales transaction. In addition, even agricultural land sold for agricultural use will have built into the sales price the capitalization of possible future changes in use to higher productivity. A third approach to determining use value is to assign to an advisory committee the task of preparing guidelines on values based on soil classifications, and adjusted according to
other factors including prior yields, location and drainage (Gloudemans, 1974, p. 16).

As is evident from the analytical introduction to this chapter, classified proferential taxes and use value assessments are simply tax reductions, which have the effect of delaying development. However, in cases where the difference between use value and market value is substantial, neither of these taxes will have a significant effect on development timing (Atkinson, 1977, p. 202). In marginal cases where market value is only slightly higher than use value, the tax break is more likely to persuade owners to continue agricultural use. It has been argued that use value assessment is an inefficient method of encouraging preservation because all agricultural landowners will benefit, but there may be only a small response in supply (Ladd, 1978, p. 5). In addition, these taxes will increase administrative costs at the same time as reducing the property tax base.

Even the original equity-based arguments for use value assessments have been challenged. Although market value assessments do not reflect income derived from use, ability to pay is not wholly dependent on income. Land ownership represents collateral for borrowing to meet taxes (Ladd, 1978, p. 3). Because of the increased complexity introduced by any type of exemption based on considerations of equity, it is frequently maintained that direct subsidies are a more suitable approach to this problem.
Deferred Taxes

Preferential treatment has also been extended to agricultural areas through deferred taxation. A change in use brought about by some form of redevelopment causes preferential use value assessment to revert to assessment at market value, including a tax "penalty" for conversion. Earlier forms of deferred taxation required the assessor to record both a use and market value assessment on a yearly basis. Upon a change in use, either some portion of deferred market value taxes or deferred taxes for a certain time prior to conversion became due. A more recent variant has replaced the deferred tax with a penalty upon conversion based on some portion of market value directly determined by sale or by reappraisal upon development (Hady, 1975, p. 2). The intent of this latter tax remains the same as the former, but the assessment process is simplified.

Deferred taxes are an attempt to recover municipal revenues lost from use value assessment. In some cases interest is charged on the taxes deferred, but rarely are there requirements that allow the full tax costs of preferential treatment to be recovered. A problem inherent in deferred taxes is that the rollback period must have some time limit or land retained in agricultural use for long periods in spite of market pressures for development will be taxed more heavily relative to land held speculatively for only a short time before change of use.
A part of the rationale behind deferred taxes is that a tax "penalty" at the time of transition to a new use will tend to delay development (Hady and Sibold, 1974, p. 15; Gloudemans, 1974, p. 40). However, a true deferred tax which recovers the entire rollback is merely a loan from the government which alleviates the farmer's cash flow problem. It is not a tax penalty at the time of development and will therefore have no effect on the timing of development relative to the baseline case of market value assessment while the land is being farmed. A deferred tax with a limit on the rollback period for which taxes may be charged is, in effect, a tax reduction and, as demonstrated in the first section of this chapter (equation 2), will theoretically lengthen the time land is held from development. Because the total final tax burden is greater than for simple use value assessment, deferred taxes will cause land to be developed somewhat more rapidly than the use value tax. A deferred tax for which the recovery is levied on some proportion of market value at the time of sale is a type of proportional development value tax because market values reflect development potential. The tax will have no further effect on the timing of development than the prior delaying effect of use value assessment.

Contracts and Restrictive Agreements

A more recent hybrid of deferred taxation, the contract or restrictive agreement, is an attempt to secure a commitment
from farm owners that the land will be held in its present use for a determinate period of time. On entering into a contract, the farm owner is granted some type of tax concession for the duration of the period. The tax concession may be in the form of a use value assessment (Hansen and Schwartz, 1975, p. 242), an income tax credit on property taxes (Hady, 1975, p. 2), or a payment of some portion of assessed market value in compensation for property tax liabilities (Barlowe et al., 1973, p. 207). Contracts are often renewed automatically, but termination may be made either by the government or the owner. Several years notice is required, after which the land reverts to market value assessment and often with a deferred tax payment and interest, or a gradual reduction in tax compensation where payments are made by the government. A tax penalty based on assessed value is also often imposed upon violation of the contract or upon cancellation of the contract by the farmer and change in land use. Because eligibility for contracts is determined by the government, the process is closely controlled by planning authorities, who base their decisions on development plans.

Where use value assessments and rollback payments are involved, the contracts add a degree more stability to land use patterns and offer more discriminatory control to governments than do the deferred taxes discussed earlier. Income tax credits on property taxes and payments to offset property taxes are generally considered to be a form of purchase of
development rights for the contract period. When the contract is terminated, in effect the owner buys back the development rights attached to the land.

Contracts and restrictive agreements with provisions similar to those for deferred taxes will have the same economic effects and need not be repeated here. A few new variants warrant further attention. Assessment at use value with gradual increase upon notice to terminate and no penalty on conversion can be expected to have a marginal effect in delaying development. Both payments in compensation for property taxes and income tax credits are forms of governmental loans which have no effect on optimal development time. A penalty not dependent on development value, e.g., on the assessed land value at the time the contract was initially entered into, will delay development timing. This is a form of fixed tax upon change of land use, which has been examined in the analytical section (equation 7).

The most effective combination of preferential taxes for delaying development is apparently assessment at use value combined with a fixed or flat rate penalty at the time of conversion. Whether or not a contract is in place is irrelevant to the decision to retain use or develop. This type of tax would be easier to administer, once the penalty is determined, than the more cumbersome contracts considered here. Unfortunately it is not an option offered by any known legislation.
CONCLUSIONS

A summary of the effects of taxes reviewed in this chapter is provided in Table I. A number of the taxes have some potential to control land use development on the urban periphery, but this potential has not been fully exploited. Although these taxes are primarily justifiable on the basis of other objectives, there are advantages to be gained in linking them to development plans in order to provide more coherent expressions of public policy. Betterment levies of the forms considered here are best applied to fringe areas considered suitable for new development and to produce infill between leapfrog developments.

Preferential taxes for agricultural or open space land are more effective if the land is in agricultural or ecological reserves, where a tax subsidy is offered to compensate for suspension of development rights. Although strict control over land placed in reserves is warranted, the existence of a tax penalty on conversion may be an additional disincentive against attempts to remove land from reserves, especially in areas close to urban development. A number of studies (Gloudemans, 1974, p. 38-41; Hady and Sibold, 1974, p. 10-11; Conklin, 1975, p. 9-11) have made it clear that application for preferential assessment on a voluntary basis will reduce farm land conversion generally only in semi-rural areas. It is also necessary to coordinate tax policy with development
plans, in order to prevent the possibility of leapfrog patterns of sprawl with little regard for agricultural or open space potential which may result from a random application of preferential taxes.
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The foregoing analysis of local tax alternatives was undertaken to address the three research objectives identified in Chapter I. A review of the results of this analysis and the implications for urban spatial development suggests a framework for a tax system sensitive to both fiscal and planning policies.

The first objective was to determine the consequences for spatial development of the most prevalent form of local tax - the property tax assessed on the value of land and improvements. Two economically nonneutral effects which distort the market allocation of land in a manner counterproductive to urban development result from the existing property tax. First, the depression of investment in improvements leads to a reduction in the intensity of urban land use. Second, because the property tax is not proportional to the benefits individual property owners receive in the form of public services and facilities, these goods are inefficiently allocated. The spatial effects of the latter distortion are most evident in the failure to assign appropriate social costs of development on the urban periphery, a factor which
contributes to patterns of sprawl.

The standard of economic neutrality provides the basis for two forms of local taxes. In response to the second objective, the nature of changes in spatial development expected from a shift to these taxes has been examined. The land value tax, by removing disincentives for investment in improvements, increases the intensity of land use and counteracts urban sprawl by delaying peripheral development through the encouragement of more efficient exploitation of underdeveloped core areas. Marginal cost pricing and betterment financing for public projects are most feasible in administrative terms to charge beneficiaries for the extension of infrastructure to new development on the urban periphery. This more economically efficient allocation of public costs works toward reducing premature development.

The third objective of this analysis was to examine the spatial effects of other taxes applicable to metropolitan areas which produce economically nonneutral effects, in order to determine their potential to act as positive guides for development. Betterment levies in the form of land value increment and progressive development value taxes reduce the speculative time horizon and promote earlier development. Of the preferential types of taxes, use value assessments and deferred taxes, particularly when attached to flat rate tax penalties upon change in use, are the most effective in delaying optimal development times. These taxes support
policies directed toward the preservation of agricultural and open space land uses.

Although none of the tax alternatives considered here can be expected, in isolation, to have a major impact on urban development, a tax system combining them is likely to contribute significantly to more optimal patterns of urban growth. Such a system of taxes, incorporating a number of approaches to the problem, would provide an important array of fiscal measures capable of acting as a constraint to sprawl. The objective of optimal growth would be supported by the coordination of this tax system with development plans which have determined the most economically efficient spatial stages of urban expansion, consistent with planned future investment in public facilities, and have identified the areas to be preserved for open space and agriculture.

INTERNAL CONSISTENCY OF FISCAL OBJECTIVES IN A SYSTEM OF TAXES

Possible components of a general system of taxes integrating economic efficiency with planning objectives have been evaluated individually. An overview from the metropolitan perspective suggests how these components might be practically combined in accordance with development plans. It also provides a means of assessing consistency of application among cases of similar merit and of preventing duplication
of fiscal objectives.

The first step toward a basic reform of the local tax system involves a return to the standard of economic neutrality. This standard allows for the recovery of publicly conferred benefits without distorting private incentives. The fiscal objective of the land value tax is to recapture economic rents from location values created by the growth of urban populations and natural features inherent in land. The fiscal objective of marginal cost pricing is to ensure that the allocation of public expenditures on services is conducted in a more efficient manner.

In order for the taxes to be economically neutral, both the land value tax and marginal cost pricing would have to be in effect over the entire metropolitan area. However, the problems inherent in calculating marginal costs for developed urban areas tend to limit the extent of their practical applicability. Within developed urban areas, marginal cost pricing should be used, wherever possible, to recover costs related to connection of new buildings to the physical infrastructure and to the volume of services consumed. As defined in Chapter III, these services are an example of the improvements to land not covered by the land value tax. Where marginal cost pricing is not administratively feasible, average costs must be assigned. In newly developing areas on the urban periphery, marginal cost pricing has a greater scope. Multi-part tariffs and specific project betterment
financing, which recover both the fixed and variable costs, can often be implemented.

In contrast to developed urban areas, there are few benefits of existing urban infrastructure reflected in location values on the periphery. If other taxes are imposed to directly recover the costs of new infrastructure, the existence of the infrastructure will have no effect on location values. Therefore the land value tax and marginal cost pricing do not lead to double taxation as the fiscal objectives of both taxes are complementary rather than competitive.

The land value increment and development value tax variants of the betterment taxation form were discussed in Chapter V in terms of their effects on new peripheral development. Because grants of planning permission convey benefits not only on the periphery but also in developed urban areas, a case could be made for the uniform application of these levies. However, the grant of planning permission on the periphery, usually in the form of changes in zoning from nonurban to urban uses, confers particularly significant private benefits because of higher speculative risks. In contrast, the development climate of urbanized areas is relatively more certain. Also, expansion on the periphery is more directly connected to sprawled development. For these reasons, betterment levies may be selectively applied in accordance with development plans for peripheral expansion
where future social costs of sprawl can, to some extent, still be prevented and present costs recovered. In developed urban areas, it is likely to be more desirable to allow the market to determine the timing and allocation of land, particularly if the land value tax is implemented.

The objective of these forms of betterment levies conflicts neither with the land value tax nor with pricing for services. A betterment levy reduces the present or market value of the land and therefore the amount of the land value tax is also decreased. The recovery of the costs of servicing, both fixed and variable, is separate from a tax on grants of planning permission.

Although the general objective of land value increment and development value taxes is the same, it is possible that they may both be used within a tax system without conflict. Land value increment taxes may be applied where development permission has already been given, but where no development is occurring. These taxes, where the increment is assessed periodically, will promote earlier development where infill is desired in leapfrog forms of sprawl. Progressive development value taxes can be tied to the grant of planning permission to promote earlier development according to development plans.

Development value taxes might actually be a cause of leapfrog development unless they are applied to all land on the urban periphery, with the exception of areas subject to
preferential taxation. A graduated system of levies according to planned sequences of development would be effective in controlling growth. In areas nearer the core in which early development is more desirable, the levy could be set initially at a small proportion of development value but over time could increase more than proportionately to reduce the optimal time of development. In more remote areas where it is desirable that development be postponed, the levy could be set at a higher proportion of current development value, but would decline proportionately over time. A graduated levy is consistent with the theoretical principles explored in Chapter V.

The fiscal objective of preferential taxation for agricultural and open space land is to equalize the difference between the market's short term estimation of the value of development for urban use and the longer run social estimation of the value of the land in its existing use. Although these taxes have been discussed primarily in terms of peripheral development, consistency demands that they be applied to all agricultural and open space areas that merit preservation throughout the entire metropolitan region. Especially within the developed areas and on the immediate periphery, preferential taxes counteract the effects of the land value tax. Rather than a conflict of fiscal objectives, this represents a deliberate attempt to offset the market's failure to reflect the social costs of urban absorption of these areas.
This suggested system of taxes is potentially the most effective combination, in terms of reducing sprawl, of the taxes which have been analyzed here. Tax reform need not include all of the alternatives outlined above in order to achieve the integration of fiscal and planning objectives. The most appropriate combination of taxes for specific metropolitan areas is dependent on a range of practical considerations, including political acceptability, legal constraints, administrative capacity, sophistication of development planning and the degree to which sprawl is perceived to be a problem. These factors cannot be examined in detail here. In the following section, an important theoretical constraint to tax reform is considered.

CONSISTENCY WITH FISCAL STANDARDS

There are only two principles of general validity that explicitly restrict the role of local taxes within the proper jurisdictional authority - all revenues should be used for a public purpose and the taxes should not discriminate against particular persons or property (Engelbert, 1969, p. 105). None of the taxes considered here need be eliminated on the basis of these principles. However, there are a number of other standards against which a proposed tax is likely to be judged. Failure of a tax to meet one of these standards should not eliminate it from consideration but it
must be seriously questioned if the conflicts are numerous or individually of particular importance. A review of these fiscal standards indicates the relative feasibility of the taxes under discussion in comparison with the existing property tax.

1. Adequacy as a revenue base

The land value tax, if the total revenue is fixed in accordance with expenditures, and individual taxes distributed proportionately with assessed market values is potentially as adequate a source of revenues as the current property tax on land and improvements. The only necessary change is an increase in the rate of assessment on land. If these new rates prove to be high enough to remove the full economic rent of land, other taxes in the system could be used to supplement revenues and the contribution of the land value tax can be reduced. Marginal cost pricing for peripheral areas and average cost pricing for the developed core are unlikely to produce adequate revenues by themselves because some publicly supplied services cannot feasibly be priced on this basis. If the use of marginal cost pricing is fully exploited, more revenues can be collected than are now captured by existing devices such as development cost charges. Betterment levies applied according to plans for development on the periphery are also supplemental taxes. Preferential taxes, to the degree that they act as subsidies, reduce the tax base. Forms of deferred taxes recovering foregone
revenues at the time of development to a higher use are preferable.

2. Benefits received

The land value tax is a form of payment for location values created by public and collective private efforts. Marginal cost pricing is based on the benefit principle. Together, these taxes are more consistent with payments for benefits received than is the property tax. Although it has been argued that the level of investment in improvements has some correspondence with expenditures on services (Clark, 1961, p. 82), the property tax is greatly inferior to these two combined alternatives. Betterment levies, also based on the benefit principle, are consistent with this standard. Preferential taxes are justified on the basis of social rather than private benefits.

3. Ability to pay/liquidity

Because the level of investment in improvements has some correlation with ability to pay, it has been suggested that the property tax is superior to the land value tax (Clark, 1961, p. 82). However, land is an asset and the land value tax is levied in proportion to its value as an asset. The real problem is not one of ability to pay, but of liquidity. The goal of increasing the intensity of land use necessitates putting land in valuable locations into productive use. The liquidity problem is an unavoidable aspect of this trade-off between public and private interests. Because marginal cost
pricing permits a locational choice, ability to pay is not a significant issue. The forms of betterment levies which come into effect upon development to a higher use are better equated with ability to pay than land value increment taxes which again may create problems of liquidity. Preferential taxes have been designed specifically to meet the problems of ability to pay and liquidity.

4. Legitimacy of expectations

A major factor limiting the extent of tax reforms is a reluctance to alter the rules affecting the operation of the property market, under which expectations have been legitimately developed (Vickery, 1970, p. 25). The land value tax and forms of betterment levies are likely to have the most severe impact on these expectations because they involve more radical forms of changes. The impact can be mitigated considerably by a gradual shift to land value taxation (Cord, 1970). Advance notice by way of development plans for the areas to which betterment levies will be applied would also ease the impact of these changes, although it would provide little assistance in areas where development has already begun.

However, the legitimacy of some expectations developed under the existing property tax should be examined closely. It could be questioned whether it is a legitimate expectation that speculative risks should be rewarded by windfall gains from changes in zoning, that services should be supplied
regardless of costs to particular locations, or that private improvements which upgrade neighborhoods should be penalized by taxes. The reforms suggested in this discussion provide a more justifiable basis for local taxes than does the current property tax.

5. Administrative feasibility and costs

The preceding chapters have described the administrative problems of each of the taxes and, in general, the successful implementation of these taxes suggests that they are feasible alternatives. However, administrative costs will be increased and the benefits of reform should be analyzed, empirically where possible, for particular urban areas.

6. Equal treatment of equals

According to this standard, taxpayers in similar circumstances should be liable for the same taxes and assessments (McMath Commission, 1976, p. 86). It is difficult to define the circumstances which are relevant, however. Those who view the property tax as a vestigial tax on wealth will define similar circumstances to include location value and the level of investment in improvements. From the perspective of land use planning, the relevant circumstance is solely location value. Because many assessment appeals are based on the argument that taxes are higher than those generally prevailing in the neighborhood, it is likely that taxpayers also consider location to be more relevant. Taxes based on marginal cost pricing have also been justified on the basis of
location as the relevant condition.

Although betterment levies are not entirely objectionable to this standard if location is the determining condition, grants of planning permission in developed areas in which betterment levies are not applied may be seen as cases of unequal treatment. Preferential taxes, even if assessed on a locational basis, are primarily a concession to groups having lower income or wealth, but are consistent with the standard because they apply to all land in a particular use.

7. Uniformity of application and equity

There has been considerable debate on the importance of this standard, based on the premise that uniformity produces less distortion in incidence (Netzer, 1976, p. 224). The property tax and the land value tax are the only alternatives which theoretically satisfy this criterion. In practice, classification according to use, assessment differentials and all forms of tax relief circumvent uniformity generally in order to alleviate equity problems directly. The tax system reforms considered in this discussion introduce a relatively greater degree of nonuniformity not generally justified on the basis of equity, but with the purpose of increasing local control over land use.

THE EFFECT OF TAX REFORM ON URBAN SPRAWL

The greatest impact of tax reform will be on preventing
further sprawl by affecting locational choices. In the introductory chapter, the three main physical forms of sprawl were described. In this section, the role of integrated fiscal and planning policy in reducing the effects of existing types of sprawl will be examined.

Of the various causes of low density continuous development, generally the most important is consumer preference for single family residences. Within the scope of local taxation, the best alternatives for reducing sprawl are marginal cost pricing, to allocate expenditures on services, and a shift to the land value tax, to promote infill where this is still possible. Although increased density tends to reduce the incremental costs of supplying some services to additional residential units, more compact forms of low density development are also more cost-effective than sprawled continuous development (Real Estate Research Corporation, 1974). Planned development of urban facilities and extension of services and utilities combined with greater use of marginal cost pricing are necessary to reduce the future extent of this form of sprawl.

Leapfrog development results from differences in speculative evaluations of risk and from varying motives for owning land. Although betterment levies and the land value tax, to the extent that these skipped over areas have high location values, can affect speculative decisions on holding land from development, increased certainty of development
potential may be more effective. The existence and enforcement of development plans combined with appropriate local taxes will act to reduce these speculative holdings (Clawson, 1962).

Arterial sprawl is possibly the most difficult form to attempt to remedy through local taxes. In this case, the original concentric pattern of land values has been distorted along transportation arteries and location values previously determined by physical proximity to the urban core are now determined by temporal proximity. The objective of planning is frequently directed toward concentrating development in nodes along the arteries or in suburban regional centers at the termini of the main arteries. Where new centers are established, land value taxation can promote compact development, betterment levies can reduce the time land is withheld and preferential taxes can help preserve the areas most valuable in their present use. Again, extensions of services can be financed by marginal cost pricing.

JURISDICTION FOR REFORM AND THE METROPOLITAN REGION

The discussion has treated the metropolitan area as a single jurisdiction in which a comprehensive tax policy could be formulated. In Canada, the actual jurisdiction for reform lies not with local governments, but with the provinces, which have been assigned powers over municipal institutions
and "generally all matters of a merely local or private nature" under the Constitution Act, 1982 (Section 92, (16)). The provincial government would have to consider the suitability of these taxes for semi-rural and rural areas to ensure reasonable terms of general applicability, in addition to the metropolitan regions which have been the sole concern of this analysis.

A more significant problem is that metropolitan regions are not unified jurisdictions, but are often composed of a number of political entities. Agreement on regional planning objectives and fiscal policy are important to the effective operation of this system of taxes. Differences in the types of taxes applicable and in tax rates among local governments could create negative impacts on regional land use patterns. In order to ensure uniformity of tax objectives and to mediate where conflicts of local interest arise, it may be necessary to assign these responsibilities to a regional level of government.

However, disputes among municipalities over matters affecting local interest have impaired the abilities of regional districts, metropolitan councils, counties and the like to contribute to coherent land use development. Although this subject cannot be dealt with here in the detail it requires, it is possible that greater regional government access to some portion of municipal revenues for these purposes, supplemented by increased provincial aid, would
strengthen the regional planning function. This more active role for regional governments (or greater provincial involvement in intermunicipal affairs) might include compensatory fiscal transfers in order to maintain adequate revenue bases in those municipalities for which immediate economic expansion is not desirable in the long term interests of the region.

RECOMMENDATIONS FOR FURTHER STUDY AND CONCLUDING COMMENTS

This thesis has reviewed a number of options for local taxation which are frequently recommended as incentives for more socially optimal forms of urban development, but which have not been analyzed systematically within the context of economic efficiency and aggregate effect on spatial patterns of growth. More effective variations on these alternatives have been suggested, but there may be other forms of taxes more closely combining planning and fiscal objectives which deserve further exploration. The focus of this analysis has been on urban sprawl and metropolitan development, but planning problems of small communities and rural areas may also benefit from a closer alliance with fiscal policy, not necessarily using the tax forms considered here.

Before implementation of reforms is undertaken, empirical research should be applied to specific metropolitan areas to estimate the magnitude of the impact on landowner behavior and incentives to alter investment decisions. The length of time
necessary to achieve changes in development patterns through a series of induced alterations in patterns of land value would also aid in the evaluation of the effectiveness of tax reform. From the perspective of equity, it would also be desirable to estimate the extent of burdens imposed on different classes of landowners. Finally, the increase in administrative costs of implementation would need to be known to determine the feasibility of reform.

This analysis concludes that there exists considerable scope for local tax reform with the objective of promoting more optimal patterns of urban development. A central contention of this thesis is that economic inefficiency in the allocation of resources contributes to urban sprawl. However, tax reforms are only one approach to the complex problem of urban sprawl. Other measures will be necessary to control patterns of development. Important among these measures are traditional forms of planning controls which, when combined with tax reforms, will be more effective in reducing the extent of sprawl and will contribute to greater efficiency.

Although there has been a general reluctance to initiate substantive reforms of local taxes, despite well documented criticisms of the property tax, the growing concern of local governments over questions of urban development and financing of public projects should prompt reevaluations of fiscal policies. Until attempts are made to integrate fiscal and planning objectives, local fiscal policies will be
inconsistent and counterproductive to the development of metropolitan areas.
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