LAND VALUE TAXATION: SOME EFFECTS ON LAND SPECULATION
AND THE BURDEN OF MUNICIPAL TAXATION

by

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ABSTRACT

Throughout economic history, since the time of the Physiocrats, the idea of taxing land has been discussed, receiving both enthusiastic approval and vehement condemnation. While it has been held up as everything from a cure for unemployment and inflation to "a guarantor of perpetual industrial and international peace," the property of the tax with which this thesis is concerned is its propensity to intensify the use of land.

Recently, this property has resulted in the tax's reception of a considerable amount of attention from politicians, planners and citizens who feel that a substantial portion of the high cost of land (and thus housing) and the sprawl-type development in the Vancouver area is the result of the withholding of land from the market by land speculators. The effect of increasing the tax on land is to increase the costs, thus reducing the profitability of holding land in the expectation of selling at a profit in the future, so causing more land to be developed and ultimately, resulting in an increase in the supply and a reduction in the price of housing. It is the purpose of this thesis to examine the potential of a policy of increasing the tax on land to a level necessary to accomplish this goal in the Vancouver area.

The development of a simple land valuation model from the roots of classical rent theory permitted a
demonstration (in theory) of the holding cost and capitalization effects of the tax. However, the realization that the effects of taxing land in a theoretical world may differ considerably from the results of taxing land in "the real world", made necessary the model's extension to take into account the characteristics of and the forces acting upon the three main participants in the land conversion process; the consumer of housing, the residential developer and the pre-development landowner.

By making explicit the difference in the landowner's and developer's valuation of land, it was possible to construct a framework, which when provided with values for two variables, the rate of land value appreciation and the capitalization interest rate of the speculator, is able to determine the rate at which land must be taxed to force it into production.

An important factor to be kept in mind when changing the base of the property tax (land and improvements to land alone) or raising the rate of taxation on one part of the base is the shift in the burden of taxation among different properties or different types of properties that may occur as a result of the differences in the distribution of assessment between land and improvements among different properties. It was found that substantial shifts in the burden of taxation resulted from a shift to land value taxation and that the total burden increased drastically
when land was taxed at a rate necessary to remove the profitability of land speculation.

If the costs of this shift in burden are sufficient to block the implementation of this policy, it is necessary to look for alternative means of accomplishing the stated goals. The selection of alternative policies will depend on the assumed cause of the problems (shortage of housing and sprawl). If speculative activity is still seen to be the cause of housing shortages and urban sprawl, other policy devices with less costly side effects may be adapted to reduce the quantity of speculation. If land speculation is not the major obstacle to sufficient quantities of housing and orderly urban development, alternative public policies that influence other market factors or participants must be adapted.
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CHAPTER I

INTRODUCTION

Two issues that have received a great deal of discussion in the past and continue to cause concern in the present are (1) the shortage of housing and (2) the "sprawled pattern of land use", which often occur in urban areas experiencing rapid growth. Vancouver has not escaped this experience.

1.1 The Shortage of Housing

Anyone currently residing in the Vancouver area cannot help but be aware of the shortage of accommodation. Soaring rents and dwindling vacancy rates are evidence of the housing industry's inability to meet the demands of a large influx of migrants. One explanation that has been offered for the paucity and high price of housing is that there is a shortage of land for residential development in Vancouver. It is easy to understand why some people might come to that conclusion in view of the small percentage of the total land area upon which it is possible to build houses. However, not all those concerned with the housing problem agree.

In the Report of the Residential Living Policy Committee to the Greater Vancouver Regional District, it
is stated that

One of the great fallacies is that the Region has run out of available land for housing. Nothing could be further from the truth. There is a shortage of serviced land.¹

The report says that there is an estimated 30,000 to 60,000 acres of undeveloped land designated for urban residential use. These projections exclude all areas designated for other uses, e.g., industrial, commercial, parkland, greenbelt, utilities and railways etc.²

It goes on to say:

Using the lower figure (30,000) acres, and assuming a density of only six dwelling units per acre, there is sufficient, (largely unserviced) designated land to meet the single family dwelling needs of the Region for 30 years, plus projected apartment land needs for 30 years with land to spare.³

A more recent study done by the G.V.R.D., indicates that there is about 57,000 acres of already designated urban areas, which would be sufficient to accommodate (at existing densities) all expected growth for the next 18 years.⁴

No matter which of these estimates represents the true availability of land for residential use, it appears that the question is not one of availability, but of putting the existing resource to use.

Why, then, isn't this land being built upon? One reason might be that rapid increases in land prices that have accompanied the accelerating growth of the area have encouraged landowners to hold on to land in anticipation of even larger price increases in the future.
1.2 Urban Sprawl

While there has been little argument over the fact that there is a housing shortage that needs to be corrected, the issue of what form of urban development is desirable has sparked considerable debate in modern urban society. In the interest of keeping an open mind, the next section will discuss briefly, some of the arguments that have been used to condemn and to support sprawl-type development. While no conclusions will be reached here, it is hoped that this discussion will show the range of opinion that has been voiced on this subject.

Before beginning the discussion, it is necessary to establish just what is meant by sprawl. The word sprawl has been used to describe a variety of land-use patterns. While all represent patterns of development that feature an over-all density, that is less than that found in mature compact segments of the city, the differences between these land use patterns that bear the label sprawl are important in the formation of policy to deal with sprawl.

Harvey and Clark\(^5\) suggest that there are basically three patterns of urban development that have fallen, at one time or another, under the classification of urban sprawl. These are, "low density continuous sprawl" which "is merely the gluttonous use of land in opposition to a value judgement about a higher density which would have been more appropriate", "ribbon development" composed of narrow bands of (frequently
quite intensive) development, usually along transportation corridors and "leap-frog sprawl" which is the settlement of discontinuous, although possibly compact patches of urban land-use.

It will be seen in future discussions that the "sprawl" with which this paper concerns itself is the third type of sprawl, in which the house builder is forced to leap over land which he cannot use for one reason or another.

This is the same type of sprawl that has evoked strong criticism from popular and academic writers. Clawson lists some of the most frequently heard criticisms. 6

1. A sprawled or discontinuous development is more costly and less efficient than a more compact one, each of the same density, within settled areas. Many costs depend on maximum distance or maximum area. If these were reduced, costs would be lower per capita or per family served.
2. Sprawl is unaesthetic and unattractive.
3. Sprawl is wasteful of land, since intervening lands are typically not used for any purpose.
4. Land speculation is unproductive, absorbing capital, manpower and entrepreneurial skills without commensurate public gain. It destroys or impairs economic calculations that ideally lead to maximum general welfare.

Since the opponents of sprawl have probably been more numerous and perhaps more vocal than the supporters, an elaboration on Clawson's points will not be made here. Instead, the less frequently heard opposing arguments will be presented.

It is difficult to argue with the first point, that servicing costs are not greater in sprawled areas than in compact areas. However, the servicing costs are not the
only costs associated with a particular pattern of urbanization.

An evaluation of the second argument against sprawl listed by Clawson, that it is unaesthetic or unattractive is difficult due to the subjective nature of a decision concerning what is or is not attractive. If the concern is for the commuter who must pass these open areas of land on his daily trip to the core, there is reason to suspect the opposite, that the commuter does not find these open spaces offensive, but rather more attractive than a continuous vista of houses, factories and shops.

The argument that sprawl is a wasteful pattern of land-use is based on the observation that vacant land amid built-up areas is rarely seen to have any economic activity going on upon it. One reason given to explain why the former use of the land, usually farming, is not continued is that the planning horizon has been shortened by uncertainty. The reason that farmers do not invest in capital improvements that would yield long-run returns, is that such investments could delay the sale of the land by the time it takes to liquidate the capital investment in the land. Thus the farmer or speculator, because of uncertainty feels that the chances of a profitable deal are enhanced by the absence of encumbering investments on the land. Taken from a public viewpoint, if the society desires to have a supply of land that is available for quick conversion to
urban use it is probably necessary to forego the income that could be gained from the land while it is in "storage".

Another argument made for the value of storing vacant land for future use is made by Lessinger:  

The gradual filling-in of communities--provides flexibility in urban development. A quick filling-in-compaction, as exemplified in the year 2000 plan (National Capital Region, U.S.A.)--loads the community with the fashions of today, the obsolescences of tomorrow. It reduces the amount and interspersal of uncommitted space; vacant or containing removable (relatively old structures). This chokes off the possibilities for adaptive reconstruction, essential in our world of furious but unforeseeable change and produces long-run inefficiencies, unwarranted blight and segregation of the poor. A city which incorporates channels and increases scatteration encourages efficient adaptation to change. It also offers a supply of housing in which residential mixing of poor and middle class is feasible and large scale segregation is not feasible.

The two main arguments for sprawl that emerge from this statement are:

1. the property of sprawl to enable successful, efficient adaptation to change,
2. the encouragement of "social mix" in housing.

If these two goals are desirable and are indeed encouraged by discontinuous urban growth, it would appear that sprawl, at least on these two counts, confers social benefits rather than costs.

It seems that the most important argument for the sprawl-type development is the flexibility it provides for future development. The opponents of sprawl argue that a
high price is paid for this flexibility because of the high infrastructure costs incurred in the servicing of this type of urban development and the production lost on the land while it is in storage. It is unlikely that the opponents of sprawl would argue that flexibility for adaptation is an undesirable quality. What they would question, however, is the efficiency of the present practice of allowing the decisions of individual landowners to determine the quantity and location of land held in "storage" to provide the flexibility needed to accommodate future urban growth. These critics see real costs in allowing "speculators" to determine which land will be developed, when.

As the shortage of housing and the sprawl of cities have related to the effects of land speculation, it will be useful to discuss its nature and effects.

1.3 Land Speculation

Speculation in land is much the same as speculation in any other commodity. The basic means of making a profit is to buy the commodity in a market where the price is low and sell in a market where the price is high. Differences in the price of a commodity from one market to another usually occur if the markets are separated by space or time. In order for the speculator to make a profit, the price differential between the two markets must be large enough to cover the costs of transporting the good either through space or time and to leave a residual for profit. Thus, the
profitability of speculation depends on the price differential and the transportation costs (for spatially separated markets) or holding costs (for temporally separated markets). Speculation will occur when the price differential minus the holding or transportation costs provides a return greater than or equal to the return available to the speculator in other investments. If the price differential is too low or the costs of transportation or holding are too high, the speculator will earn a return lower than the return available in other investments and so, if economically rational, will not speculate in land.

1.31 Effects of Land Speculation

Hamilton summarizes the effects of the speculator:

By buying commodities in one period for release in a future period, speculators cause (1) a withdrawal of present supply, (2) a temporary increase in present price, (3) an increase in amount stored, (4) an increase in future supply, and (5) a reduction in future price—the end result being a relative stabilization of price and consumption over time.

Thus, despite the speculator's poor reputation he performs the valuable role of moving the economy toward pareto optimality by helping to equate differences in utilities or prices for a commodity between markets (separated by either space or time). If speculators are performing a service to society, why have they been so maligned?

In addition to land speculation's association with the two evils discussed earlier in this chapter, Hamilton
finds a substantial amount of the criticism stems from the widespread assumption that the urban land market lacks competitiveness. This, he says results from two assumptions:

1. the assumption of a fixed supply of land and a disregard for the influence of demand in the determination of market prices.

2. the tendency to confuse speculators with those landowners who may have some degree of monopoly control over portions of supply.11

1.32 Elasticity of the Supply of Land

Hamilton says that, while strictly speaking the supply of land is relatively fixed, (land rarely being created or destroyed) the amount of land available for development at any point in time is elastic and does respond to increases in demand with an increase in the quantity supplied. If demand were not elastic, the only response to an increase in the demand for land would be an increase in the price of land.

Such is obviously not the case, particularly with land on the urban fringe.12

Hamilton goes on to state that in situations where the supply of land is divided among a large number of owners, this elasticity "produces conditions of supply that are considerably more competitive than many would expect".13

1.33 Monopoly Interest

The second condition necessary for a competitive land market is the absence of any landowner with monopoly power. Only through the competition among numerous small
landowners will prices reflect the true preferences of society.

While Hamilton, in his study of the British Columbia land market found no evidence of the presence of monopolistic interests, there is evidence to suggest that, in other Canadian cities, large percentages of the total quantity of land available for urbanization is in the hands of relatively few landowners. The existence of monopolistic interests in the land market means that, to a certain extent, land is supplied at the time, place and location determined by these landowners.

Further arguments are raised against land speculation on the basis of the morality of permitting the speculator to profit at public expense.

While both the questions of monopolistic interests in the land market and the equity of the income distribution fostered by present institutional arrangements, are important questions to be answered, they will not be discussed further here.

1.4 The Land Value Tax

Thus far, this study has shown how the shortage of housing and sprawl-type development have been linked to land speculation. Politicians, planners and citizens concerned with the two problems, have felt the solution to both to lie in the reduction of speculative activity in the land market. The brief discussion of land speculation showed the speculator
to be a businessman who, like most others, is concerned with the profitability of his enterprise. One of the costs of all business ventures, is the cost of taxation. "House and Home" says:

Ours is a tax-activated, tax accelerated, tax dominated economy. Every business decision must be checked and rechecked against its tax consequences. 17

The G.V.R.D. report also looks to taxation as a means of guiding private investment decisions toward social goals.

There should be a fundamental change in the method of apportioning real property taxes... A gradual reduction of the taxes from improvements to the land would have an effect on vacant undeveloped land. 18

The prospect of using land-value taxation to help push vacant urban land on to the market is further developed in a paper done for the G.V.R.D. by Hans Blumenfeld. Speaking of a tax on site values, Blumenfeld says:

This would strongly deter speculators from buying land and put increased pressure on them to sell, resulting in an increased supply of land at lower prices, for building. It would eliminate, or at least very much weaken the pressure for "leap-frogging" or scatteration. Finally it would greatly reduce both the cost and difficulties for public land assembly. 19

Gaffney, in two remarks in two separate articles, suggests that property taxes have strong influences on urban land-use and may cause unwanted effects if their mechanisms are not properly understood.
Real estate taxes cannot absolutely compel some land uses nor absolutely forbid others, as can zoning or building codes; but they provide powerful economic incentives which are operative constantly over long periods of time and in the long run may be as effective as absolute prohibitions or mandates.\textsuperscript{20}

... others have supported land underassessment to relieve the pressure to develop suburban land—without, I believe, adequately considering that unused land lies among used parcels and disrupts symbiotic interactions which are the heart of public land planning and the essence of urban civilization.\textsuperscript{21}

While no attempt will be made to evaluate the effects of the property tax on "the essence of urban civilization" as it exists through the "symbiotic interactions" of parcels of land, it is the purpose of this thesis to evaluate the effectiveness of a land value tax in ameliorating the two problems, (housing shortage and sprawl) through the reduction of speculation in the urban land market.

1.5 Thesis Overview

Having stated the problems with which this thesis seeks to deal, (the determination of the effectiveness of a land value tax in increasing the supply of housing and reducing urban sprawl by reducing speculative activity in the land market), the remainder of the thesis will be concerned with establishing the relationship between land value taxation and the level of speculative activity in the land market and the relationship between the incidence of land
speculation and the incidence of the two problems (the housing shortage and urban sprawl).

Since the suggestion of the use of a land value tax to accomplish these and other objectives has been made at various times in the past, the first part of Chapter II will be devoted to a review of the theory of taxing land values as put forward by economists and non-economists throughout history.

In the second part of Chapter II, the effects of the tax (in theory) on the landowner, will be examined.

The motivation for the third chapter is the realization that the land conversion process or housing production process (whichever way it is viewed) is a complex process, whose outcome (amount and location of housing produced) is determined by the decisions of many participants with differing characteristics. Once this is realized, the land value tax becomes one of many policy devices that may be used to modify the outcome of the land conversion process. With this in mind, a simple three participant land conversion model consisting of the predevelopment landowner, the residential developer and the consumer of housing is presented and used to show the effects of a number of participant characteristics and contextual factors on participant decisions and thus on the quantity and location of housing produced.
In Chapter IV, the theoretical effects of the tax will be re-examined in light of the new knowledge of the "real world" gained in Chapter III. So far, throughout the discussion of the effects of the tax, the concern has been focused on the primary effects of the tax on the speculator. The tax also will be shown to have secondary effects which vary in magnitude with the rate at which land is taxed. In order to measure the magnitudes of some of these secondary effects (shifts in the burden of taxation among uses), a simple model will be developed to show the magnitudes of the tax rate necessary to influence speculator decisions.

The purpose of Chapter V is (1) to use the model to determine the rate of land value taxation which is necessary to accomplish the goals set out for it, and (2) to determine the effects on the distribution of tax burden among land uses of raising the tax rate to the necessary level.

The purpose of Chapter VI is to make a final evaluation of the effectiveness of the tax in reducing sprawl and the housing shortage in light of the information gained on (1) the relationship of the tax to land speculation (the level of the tax needed to reduce land speculation), (2) the importance of land speculation to the larger problems of the shortage of housing and the sprawl of cities, and (3) the secondary effects of shifting tax burdens that result from the use of land value taxation to accomplish the specified goals.
Chapter I - Notes and References


2 Ibid., p. 9.

3 Ibid., p. 9.

4 Thompson, Berwick and Pratt, Infill, a policy study done for the Greater Vancouver Regional District, December 1973, p. 2.


7 Ibid., p. 107.


10 Ibid., p. 5.

11 Ibid., p. 8.

12 Ibid., p. 8.

13 Ibid., p. 8.

14 Ibid., p. xii.


18 G.V.R.D., op. cit., p. 49.


CHAPTER II

LAND VALUE TAXATION

2.1 History of Land Value Taxation

Throughout economic history, since the time of the French Physiocrats, the idea of taxing land values or the rent from land has received considerable discussion. The range of opinion on the matter has been quite large. There have been those who have openly advocated the taxing of land values to achieve various socially desirable goals: Henry George (1879), Brown (1932), Rawson (1961) and Gaffney (1972). There was a group of classical economists who, interested in efficiency, were in favour of taxing land rent: Smith (1776), Mill (1872), Say (1830), Senior (1928), and Ricardo (1911). Another group qualified their support of the tax in one way or another: Anderson (1914), Simon (1959), Fisher (1954), Seligman (1913), the Hickes (1955), Heilbrun (1966), Jensen (1939) and Haig (1915, 1917). And another group was opposed to the idea of taxing land values for various reasons that will be made clear later: Cannan (1907), Edgeworth (1906), Darwin (1907), King (1921, 1924), Knight (1933), Ely (1922, 1930), Davenport (1917), Barlowe (1954), and Ratcliff (1950).\(^1\)
2.2 Advantages of the Land Value Tax

Among the advantages claimed for the exclusive taxation of the rent of land in lieu of all other taxes include, "the elimination of unemployment, the prevention of inflation," as well as its powers as a "guarantor of perpetual industrial and international peace."²

Leaving these miracles aside, it can be said that the advantages of the tax are two: (1) the recovery of the unearned increment and (2) the intensification of land-use.

2.2.1 Unearned Increment

One of the most prominent advocates of the tax on site value was Henry George, who, living in California during the late nineteenth century saw the effect of a large influx of population, rapid economic growth and surging land prices to be the concentration of wealth in the hands of the landowners who were reaping extraordinary profits by simply buying land and waiting. If they waited long enough, development, in the form of roads, sewers, and schools would eventually engulf their land thus raising its value as the value of these services became capitalized into the price of the land. To George, the sight of parasitic landowners becoming rich by the work of others was intolerable. His remedy for this inequity was to tax the value of the land so as to return the land speculator's "unearned increment"³ to its rightful owner: the public.
The tax on land values falls on those who receive from society a peculiar and valuable benefit and upon them in proportion to the benefit they receive. It is taking by the community for the use of the community, of the value that is the creation of the community.  

Browning puts it simply:

A tax on the value of land will restore to the community, some of the increase in value due to community improvements.

Support for George's proposition has continued into the present. According to Rawson:

. . . since land values are primarily a social value which rises where people cluster together for exchange and social intercourse, it is particularly suitable for taxation, since taxation itself is a social phenomenon, the need for which arises out of the same clustering of population.

Since the purpose of this thesis is to evaluate the efficiency of the land value tax in solving the problems of the housing shortage and urban sprawl and not its ability to promote an equitable distribution of resources, the paper will now turn to the second property of the tax, which relates more directly to the theme of this thesis, the tax's ability to intensify land use.

2.22 Intensification of Land Use

Much has been written about the difference in land-use, generated by the taxing of a building as opposed to the land upon which it is situated. Gaffney says:

Tax capital and you drive it away; tax land and you drive it into use.
Rawson outlines the basic theory behind this relationship between land taxation and land use:

As far as a property tax rests upon the site value of a property, it rests upon the potential earning power of the site, in direct proportion to it, and without consideration of whether the owner develops his property well or poorly. Because the tax takes a portion of the land's annual value, whether or not the land is used, it discourages, however mildly the speculation and "withholding" with which planners and developers are constantly faced.

This type of speculation, the holding of land out of its "highest and best use" manifests itself in two ways, which have been identified by the advocates of site-value taxation; the deterioration of buildings in the central city and discontinuous suburban growth (sprawl). It is argued that a property tax based on building values rather than on land values, both discourages investment in housing and allows landowners to keep land off the market in anticipation of the windfall gains resulting from increased land values caused by urban growth. These ills can be avoided by converting the tax on buildings and land, to a tax based solely on land. Rawson says:

The tax on land, through its tendency to lower land prices, lowers the real cost of housing. By providing a stimulant to the efficient use of land, it encourages rebuilding in central areas and it checks the practice of holding land in vacant or ill-used states.

As well, the benefits of land-value taxation have been presented as a boon to urban planners.
Despite the enthusiasm on the part of the advocates of the tax there has been no lack of criticism. Some of the major criticisms of the tax on land values will be discussed below.

2.3 Disadvantages of the Land Value Tax

The criticisms of the tax fall into three basic categories: (1) disputation of the desirability of the intensity of land use fostered by the tax, (2) claims that the tax is inequitable, and (3) claims that the tax is administratively infeasible.

2.3.1 Intensity of Land Use

The arguments against the tax on this basis are similar to those arguments presented earlier in the discussion of sprawl. These writers have emphasized the increased costs of intensive land use and the restriction of options for the future by premature development.

(a) Congestion. The costs of congestion can be seen in the increased travel time that occurs as populations become more and more dense (causing more and more traffic on streets that are limited in size). Critics concerned with the congesting propensities of the tax also point to the psychological costs of reduced open space and the biological and sociological consequences of crowded human living.
Other critics have felt that the tax may adversely influence the timing of development.

(b) Premature Development. By forcing landowners to put land into use as quickly as possible, to maximize short-run returns, a more permanent, long-run, land-use pattern may be precluded. If, for example, the construction of a more efficient high-rise building is prevented by the cost of removing a walk-up, whose construction was forced by the pressure of a site-value tax in a previous period, the result is a long-run misallocation of resources.

Others have pointed to the shifts in wealth that would occur with a switch to land-value taxation, that would make the tax inequitable.

2.32 Equity

It has been argued that to impose a tax on land in a later period of development would be inequitable to those people who have recently purchased land. While there probably has occurred large increments in value, quite possibly unearned increments, it is quite likely that the person presently holding land has enjoyed the benefit of a very small portion of this unearned increment or perhaps none of it at all. The imposition of a site-value tax could have the effect of relieving a present landowner of those resources which he had invested in land without regard for their
Still others have maintained that the tax is administratively infeasible.

2.33 Administration

Since the major effects of the tax are supposed to occur as a result of taxing land values as opposed to any other values (improvements), it is critical for the tax, to tax the value of the land, exclusive of the value of any buildings resting upon it. This means that the land must have a value independent of the value of a building on the site. Writers such as Ratcliff and Turvey do not believe that this is possible.

In a strict sense, land has no value as such nor do buildings, have an independent value. Each has value and utility only when usable for some human activity and to make it usable in the urban scene, land must have improvements, usually buildings and buildings must have land. It is never possible, therefore, to speak of the productivity of land without saying for what purpose in what use and thereby implying improvements of a certain nature. . . . Thus it is illogical to isolate structural or locational factors which affect productivity only in relation to building or only in relation to land. 13, 14

2.4 Summary - The Land Value Tax

Some of the most frequently occurring arguments for basing the real estate tax on the land value are:

1. It encourages building and rehabilitation.
2. It discourages land speculation.
3. It reduces urban sprawl.
4. It recovers the "unearned increment."
5. It reduces the cost of land.
The most commonly heard arguments against the tax are:

1. It fosters undesirable urban congestion.
2. It forces premature development.
3. It is inequitable.
4. It is administratively infeasible.

A careful examination of the list of advantages listed for the tax will reveal that there is one basic advantage, from which the others flow. That is the discouragement of land speculation. Since the discussion here, and in other sources often make references to the tax's effect on speculation through its effect on land values, it is useful, at this point, to diverge for a moment, and show how the value of land is determined.

2.5 Land Value

Basically, the value of land is the value of the economic rent that can be earned by the land. Since rent is an income flow that occurs both in the present and in the future and since present incomes are worth more than the prospect of future incomes, the value of future rents must be equated to the value of present incomes, if the investor is to make a decision about the allocation of present resources.

This brief discussion suggests that there are two steps in the determination of the value of land: (1) the determination of the present and future returns (net benefits) earnable on the land, and (2) the discounting of future returns to land in order to equate them to present values.
2.51 Economic Rent

Before discussing the determinants of economic rent, it is necessary at this point to distinguish between the meaning of rent as it is commonly used and economic rent. Rent as it is used to refer to a payment to a landlord by a tenant is a payment for services provided by the landlord. Included in the price of this "contract rent" are payments to the landlord to enable him to cover the costs of operating the building and to earn a return on the capital he has invested.

Economic rent, on the other hand, is the portion of contract rent paid that is above the amount required to bring the good into production.

Economic rent has been defined similarly by Barlowe as

the surplus of income above the minimum supply price it takes to bring a factor into production.\textsuperscript{16}

Gaffney provides another definition of rent that will be more useful in later discussions of the value of land and its relation to the economic rent of land:

Essentially rent is the net product of land after deducting non-land costs. It includes imputed service flows as well as cash flows, of course, with the former assuming primary importance today because it is exempt from income tax.\textsuperscript{17}

When the competitive economy is in equilibrium, the price of an object is the price of the inputs required for its production. Therefore, in equilibrium, there is no
"net product." However, not only is the market not always in equilibrium but not all land is of equal quality.

A certain piece of land may have qualities which enable it to produce more of a product from a given level of inputs than another piece of land. The difference in the level of production from a given level of inputs is the rent accruing to the more productive land.\(^{18}\)

Rent earned by land is a result of the differing characteristics of land. These characteristics can be products of Nature or of Man. In classical economic rent theory, these two sources of rent may be found respectively, in Ricardo's theory of rent from fertility and in von Thunen's theory of rent, from locational advantage.

(a) Ricardian Rent

Ricardo said that in a newly settled country, with an abundance of rich fertile land, a very small proportion of which is required to be cultivated for the support of the actual population\(^{19}\) only the most fertile land would go into production. (In Figure 2-1 this land is represented by A.) At this point in time, there would be no economic rent associated with the use of the land, because the price of the good produced would equal the costs of production (including labour and a fair return to capital). However as population increases and the demand for food goes up, there would be an increase in the demand for food (and thus its price), that would warrant the bringing into production, lands that are not quite as fertile
Figure 2-1 - Ricardian Rent

Figure 2-2 - Locational Rent
as the first land (lands on which equal quantities of labour and capital as applied on the most fertile land would produce a smaller output than on the most fertile land).

In Figure 2-1, equal amounts of labour capital are applied to all grades of land. The differences in sizes of the blocks represents the differences in the output of the different grades of land. It can be seen that when B is brought into production, the value of the extra ten units produced on A with the same labour-capital input represents an economic surplus (rent) that accrues to A as a result of its superior fertility compared to B. As population increases more and C lands are brought into production, an economic rent of 10 will accrue to B and 20 to A. When D lands are brought into production, an economic rent of 10 accrues to C, 20 to B and 30 to A. This example emphasizes the idea that economic rent is the difference in income that can be earned by one piece of land as compared to another and not simply the difference between total returns and the costs of utilization.

(b) Location Rent

In classical economic theory, a second determinant of rent, that of locational advantage, was developed by von Thunen. Because transportation technology was in a relatively primitive stage of development in von Thunen's days, the costs of transportation were important cost factors of agricultural production. Obviously, goods produced on land
further from the market would cost more to bring to market than those produced closer to the market.

Figure 2-2 illustrates the effects of location on economic rent. If it is assumed that all land is of equal fertility, it follows that equal amounts of labour-capital will produce an equal output. Thus no fertility rent will be earned by any land. However, with a market economy, a further cost of production is the cost of bringing the produce from the farm to the market. Because of the costs of transportation, land located nearest the market is comparatively more productive (less inputs per unit output) than lands located at a distance. Lands at the market earn a rent that is equal to the costs of bringing products from the most distant farm that actually brings produce to the market.

(c) Summary - Economic Rent

The following are the principal characteristics of economic rent:

1. Rent is the result of the use of different qualities of land in the production of a good.

2. The price of the good is equal to the costs of producing the good on the least productive land in use.

3. The rent earned by a piece of land is equal to the difference between the costs of producing the good on that piece of land and the price of the good as determined by the costs of producing it on the least productive land that actually produces the good.
As population increases, the demand for goods produced on the land increases, thus (assuming constant short-run supply) forcing prices for the good up. These increased prices mean that it is profitable to produce the good on previously uneconomical land. Rent on all land in production before this rise in demand increases.

2.52 Urban Land Rents

The determination of urban land rents, as put forward by Hurd, bears a close resemblance to the theory of agricultural location rents of von Thunen.

As a city grows, more remote and hence inferior land must be utilized and the difference in desirability between the two grades of land produces economic rent in locations of the first grade, but not those in the second. As land of still more remote and inferior grade comes into use, ground rent is forced still higher in land of the first grade, rises in land of the second grade but not in land of the third grade and so on. Any utility may compete for any location within the city and all land goes to the highest bidder.

... Since value depends on economic rent and rent on location and location on convenience and convenience on nearness, we may eliminate the intermediate steps and say that value depends on nearness.21

Without getting into the argument of why a particular site yields more utility,22 it will suffice here, to note that a site producing more utility than alternate sites will earn an economic rent. This rent will equal the excess utility yielded by the site in question over the utility of the marginal site.
2.53 Capitalization of Rent into Land Value

From the preceding section, it was learned that the fact that a site has the potential to earn a rent, means that its productive capacity is larger than that of an alternative site (the difference in productive capacity being equal to the rent). A producer looking for a site for his operation would pay a yearly premium to use the site up to the amount of the economic rent earned, yearly, by the site. If he were to purchase the site, he would, in effect be buying the right to receive a series of annual incomes. The present value of this right is the sum of these annual returns (rent) discounted to the present by the buyer's discount rate. The formula for determining this value is:

\[
PV = \frac{A_1}{(1+r)} + \frac{A_2}{(1+r)^2} + \ldots + \frac{A_n}{(1+r)^n}
\]

Where:  
- \(PV\) = Present value of site  
- \(A_n\) = Economic rent in period \(n\)  
- \(r\) = Capitalization interest rate^{23}

2.54 General Land-valuation Model^{24}

As mentioned before, the effect of the land-value tax to intensify the use of land, acts mainly by influencing the value of land as determined by different participants in the land market.

Since the land-value tax operates by affecting the valuation of land by individual participants, it is necessary
to expand the land value model (above) in order to account for differences in participant characteristics. The first step is to reformulate the A (rent) term of Equation 2-1.

A, the rent accruing to the site is equal to the income earned by the site minus the costs of keeping the site in use. Thus:

\[ A = b - c \]

Where

\( A = \text{economic rent} \)

\( b = \text{income earned on the land} \)

\( c = \text{costs of keeping the land in production} \)

Equation 2-1 becomes:

\[
PV = \frac{(b_1 - c_1)}{(1+r)} + \frac{(b_2 - c_2)}{(1+r)^2} + \ldots + \frac{(b_n - c_n)}{(1+r)^n}
\]

Which reduces under more convenient notation to:

\[
PV = \sum_{t=1}^{n} \frac{b_t - c_t}{(1+r)^t}
\]

Where:

\( PV = \text{present value of the site} \)

\( b_t = \text{income earned on site in period } t \)

\( c_t = \text{costs in period } t \)

\( r = \text{capitalization interest rate (opportunity cost of capital)} \)

\( n = \text{investment time horizon (time period of investment)} \)

From this general equation, it can be seen that the value of land is determined by the benefits earned from the land minus the costs of earning those benefits (both real
costs as represented by the "c" term of the equation but implicit opportunity costs, as represented by the "r" term of the equation).

2.6 Mechanics of the Tax on Land Values

Distinguishing between the incidence and effects of a tax, Silverman says,

In dealing with incidence we wish to know on whom the money burden of a tax directly or indirectly falls: to what extent the impost "stays put" and to what extent it is shifted. Is it possible, for example, for a business man to pass his income tax to his customers in the form of higher prices? . . . . But even more important, from the view of economic welfare, is the question of ultimate effects. Besides ascertaining so far as possible, who bears the money burden of a tax, we want to know what are the economic reactions to which it gives rise. The amount may be so oppressive or the manner so ill-conceived, that the taxpayer is discouraged from exercising his productive powers to the full. 25

Although, as Silverman points out, it is the effects of the tax which are most important, it can be seen that the determination of the incidence of the land-value tax is necessary for an assessment of its effects.

While not apparent from the general land value equation, it will become apparent in later sections that the effect of the tax will depend, to a large degree, on the characteristics of the "land valuer." As these characteristics vary from participant to participant, in the land market, it is necessary, in order to determine the effects of the tax, to establish upon which participant the tax is incident.
Secondly, as a move to a property tax, based solely on land values would mean the elimination of a tax on building values, it is also important in considering the incidence of the land-value tax, to consider the shift in incidence that occurs as a result of removing the tax on buildings.

2.61 Incidence of the Property Tax

Perhaps Simon summed up the problem faced here best when he said,

It is a curious fact that, although there has been common agreement among two generations of economists as to the fundamentals of tax incidence theory, no consensus has been reached with respect to the incidence of a tax on real property. 26

Of the list of determinants of the incidence of a tax given by Seligman in his "Doctrine of Incidence," the consideration of the following seems to hold the most promise for determining the incidence of the property tax: 27

(1) Is the tax on the margin or on a surplus?
(2) Is the market for the product monopolistic or competitive?
(3) Is the demand for the product elastic or inelastic?
(4) Is the supply of the product elastic or inelastic?
(5) Is there complete mobility of capital?

The classical economists divided the tax on property into two parts; the tax on land and the tax on buildings. Thus the real property tax was subject to two different laws: "the law of a tax on rent (land value) and the law of a tax on capital (building value)." 28
2.62 Incidence of the Tax on Land

Ricardo gives the classical view of the incidence of a tax on land as he says:

A tax on rent would affect rent only: it would fall wholly on landlords and could not be shifted because it would leave unaltered, the difference between produce obtained from the least productive land in cultivation and that from every other quality.24

Simply, the argument is that a tax on land rent will probably be regarded by the landlord as an added expense to be passed on to the tenant. The way he does this is by raising the contract rent of the property. However he will be unsuccessful in his attempt because land at the margin (land D in Figure 2-1) is not earning rent and therefore, is not subject to the tax. The tenant, if confronted with an increase in rent, would move to the marginal location where he could continue to pay his former contract rent. For this reason, it is argued that the tax comes directly from the landlord's pocket.30

2.63 Incidence of the Tax on Buildings

The tax on buildings is regarded by the classical economists to be a tax on capital. Smith (1776), Mill (1872), Ricardo (1911). The argument may be expressed in the following manner. Builders who make an investment in materials, labour and interest charges to construct a building and make further expenditures for maintenance, insurance and repairs to keep the building in operation, expect a certain
return. If they do not receive the return they want they simply will not invest in the construction of new buildings but will put their money into some other investment yielding a higher return. The effect of a tax on building values, which is a tax on the capitalized net returns earnable by the building, has the effect of reducing these returns. The owner of the building will try to pass this cost onto the users of the building by increasing the contract rent. If this increase is not paid, investment in buildings will diminish, and assuming that demand for buildings does not drop, prices for buildings will be bid up as supply becomes insufficient to meet demand. The new price will be large enough to provide the builder with the return he wants with enough left over to cover the amount of the tax.

One of the principle arguments against the idea of using site-value taxation has been the feeling by some economists that a return to a property consisting of land and buildings cannot be divided between that arising from the land and that arising from the building. Edgeworth (1897, 1906), Turvey (1957), Ratcliff (1950, 1964).

Edgeworth felt that the split could not be made, and stated that under conditions of inelastic demand, the burden of the tax on site-values would be borne, not by the landlord, but by the occupier of the building.\textsuperscript{31}

Turvey, holding that the value of site and building cannot be determined in isolation of each other and basing his analysis on the interest in property concludes:
... the substitution in part or in whole of a site-value rate for the present rate would redistribute the burden between properties, but not between owners of different interests in each property. The same people would be liable to pay rates in either case.32

2.64 Shifting of the Tax on Housing

Research into the characteristics of housing markets has found that the classical theory of building tax shifting does not always hold true. It has been suggested that the taxing of the housing industry may cause a shift of investment funds to untaxed sectors.33 The ultimate incidence of the tax is thought to depend on the (1) period considered, short or long run, (2) opportunities open to the landlord, (3) the tax rate, and (4) the rate of housing substitution in nearby areas (Barlev, 1973).34

Further analyses of the incidence of the tax on building values by Richman35 and Thorndike36 have shown that the incidence of the property tax varies under differing conditions of the elasticity of the demand for buildings.

2.65 Summary of the Incidence of the Tax

There has been considerable argument over the incidence of the real estate tax. It is generally felt that because the supply of land is fixed that the incidence of the tax on land falls on the landowner. Edgeworth has argued, however, that under conditions of inelastic demand, the tax on land would be shifted to the occupier of the land.
It has been thought that the burden of the tax on buildings is shifted to the occupier of the building. It has been argued however, that, at least in the short run, since supply of buildings is inelastic and the demand is elastic, that the tax on buildings is borne by the owner of the building.

2.7 The Economic Effects of the Tax on Land Values

Becker identifies four effects of converting the present real estate tax on the value of building and land to a tax based solely on the value of land, on the intensity of land-use. He says the following effects of such a change would tend to promote more intensive land-use: (1) the holding cost effect, (2) the capitalization effect, (3) the fixed cost effect, and (4) the unburdening effect. It is the purpose of this section, to briefly sketch the nature of these effects as presented by Becker. In subsequent sections, the effects of varying the assumptions upon which this theory is based, will be discussed.

2.7.1 Holding Cost Effect

From the general land value equation, it can be seen that the value of land varies as the difference in values of the net returns to land vary. As \( \sum_{t=1}^{n} (b_t - c_t) \) increases, so does land value. Thus as the costs, "\( c \)" of owning land go up or the benefits, "\( b \)" of owning land go down, the present value of the land goes down. It can be seen that the costs
become more important to the landowner as the benefits of the use of land decrease. The landowner, who suffers most from an increase in the costs of holding land is the holder of vacant land (no present returns). The holder of vacant land is speculating that the rise in value over the holding period will more than compensate for the costs of holding the land through the period. Since he is earning no tangible return from the land during the holding period against which an increase in holding costs may be offset, he will be particularly sensitive to an increase in holding costs.

One of the costs of holding land is the property tax. It has been argued that the present system of property taxation (based on the value of land and improvements) favours those property owners who have least in the way of improvements. It is argued that the rise in property tax rates on land that would be necessary to raise the same level of revenues from land values (when shifted from a base of property and land values) would increase the holding costs of vacant or underutilized land, thus reducing the speculator's incentive to hold the land, encouraging him to either develop the land or to sell the land to someone who will develop the land.

2.72 Capitalization Effect

The effect of these increased holding costs on the value of land is known as the capitalization effect. The yearly reduction in net returns to land that is caused by
an increased tax on land, reduced the present value of the land.

From the general land valuation equation, it was shown how

\[ PV = \sum_{t=1}^{n} \frac{b_t - c_t}{(1+r)^t} \]

An increase in the land value tax may be represented by

\[ PV = \sum_{t=1}^{n} \frac{b_t - (c_t + x_t)}{(1+r)^t} \]

Where \( x_t \) = increase in land value tax in period \( t \).

Thus the net returns, in each period, have decreased by the value of the increased tax. The mechanics of the capitalization effect on land values is given by Colin Clark.\(^\text{38}\)

Let

- \( r \) = interest rate
- \( x \) = the tax rate on the selling value of the land
- \( V \) = the selling value of the land
- \( E \) = full economic rent (including discounted value of expectations of future rises in rent)
- \( F \) = the full selling value of the land

Then

\[ F = \frac{E}{1} \]
\[ V = \frac{(E - xV)}{i} \]
\[ V = \frac{E}{(x+r)} \]
\[ E = V (x+r) \]
\[ \frac{V}{F} = \frac{r}{(r+x)} \]

Thus site-value taxation will lower the selling price of the land in the ratio \( \frac{r}{(r+x)} \).
2.73 Fixed Cost and Unburdening Effects

The third consequence, for the intensity of land-use of the conversion of the real estate tax on land and buildings to a tax on land values alone has been labelled by Becker as the "fixed cost effect." It is argued that the level of investment in buildings is affected by the tax on improvements of the present real estate tax. If the builder is to maximize profits, he must add units of building (e.g. more floors) until the marginal revenue earnable by those units equals the marginal cost of their construction. The effect of a tax on buildings is to increase the marginal costs of adding an extra unit (since the tax is tied to the value of the building which presumably rises with an increase in the number of units), thus making submarginal, a unit that before the tax was marginal. In this way, it is argued that the tax would reduce the amount of building.

The advantage of the site-value tax is that it is a fixed amount, dependant on the use of the site (highest and best). Since the portion of the marginal cost of each additional unit to the building is not increased by the tax on site-value (in fact, average tax per unit goes down with each additional unit) the tax does not restrict the size of buildings.

The "unburdening effect" is closely related to the fixed cost effect. By removing the burden of the property tax from the building and placing it on the value of the land, there will be a reduction of the tax liability of
owners of properties with high improvement/land ratios and an increased liability for those owners of properties with low improvement/land ratios. If the tax burden for two properties, similarly situated, one with a high value building, the other with a low-value building (or in the extreme case, no building at all), are equal, it is argued that there will be no disincentive to maintaining the high-value building in good condition or to increase the value of buildings on the low building value site.

The construction of higher quality and more spacious buildings will be encouraged because they will incur no more tax costs than, if buildings were shabby and cramped. Owners will remodel their buildings more freely, knowing that the fruit of their efforts will not be rewarded with an additional tax burden.40

2.74 Summary - The Economic Effects of the Land Tax

The four effects of a substitution of a tax based solely on land for a tax based on land and improvements as defined by Becker are (1) the capitalization effect, (2) the holding cost effect, (3) the fixed cost effect, and (4) the unburdening effect.

While the effects of untaxing buildings, contained in the fixed cost and unburdening effects, represent an important part of the argument for changing the base of the property tax from the value of land and improvements to the value of the land only, the effects that concern this study are the effects that most directly influence the land speculator (the holding cost effect and the capitalization effect).
It will be remembered from Chapter I, that the housing shortage and urban sprawl are thought to be caused by the withholding of land by speculators. It was shown how the holding cost effects makes speculation in land less profitable by increasing its cost. The less profitable it is to speculate in land values, the smaller the quantity of land that will be withheld from the housing developer and presumably, the less serious will be the housing shortage.

With the reduction of the profitability of speculation, there is less likelihood that developers will have to "leap" over land that is being held by developers, thus lessening the likelihood of urban sprawl.

So, it seems that by reducing the profitability of speculation, the land value tax has the ability to reduce the problems of a housing shortage and urban sprawl.
Chapter II - Notes and References


3Alfred Marshall, Principles of Economics, New York, Macmillan and Co., 1961, pp. 433-434. Marshall distinguishes between the "inherent" or original value of land, "which arises from its position, its extension, its yearly income of sunlight and heat and rain and air" and the "public value" which results from the actions of men. "For instance barren heath land may suddenly acquire a value from the growth of an industrial population near it, though its owners have left it untouched as it was made by nature." "A tax on the public value of land does not greatly diminish the inducements to cultivate the land highly nor to erect farm buildings on it. Such a tax therefore does not greatly diminish the supply of agricultural produce offered on the market, nor raise the price of produce; and it is not shifted away from the owners of the land."


8Rawson, (1961), op. cit., p. 11.

9Ibid., p. 11.

10Gaffney (op. cit. 1969), lists a series of benefits that he feels flow to the planning process from the use of the site-value tax.

1Gives planners a positive tool for influencing land-use (as opposed to present negative tools, zoning, building codes).
(2) Gives public investment leverage over private investment.
(3) Gives planners leverage over tax assessors.
(4) Enables synchronized expansion to provide for open space.
(5) Shortens the period between site renewals.
(6) Frees planners from the constraint of "French Equity."
(7) Leads to a demand for a greater variety of community facilities, because it gives people better access.


14 For the opposing view, see Ernest M. and Robert M. Fischer, Urban Real Estate, New York, Holt, 1954, pp. 54-57. Netzer considers both arguments and concludes that "To deny that there is a distinguishable site value for a specific improved site, independent of the nature of the actual improvements on it is to deny that there is any such thing as location rents—that is differential returns available from the use of one urban site rather than another in an environment in which every site is unique in some respect. Individual entrepreneurial decisions surely do not deny this." Netzer, op. cit., p. 199.

15 Browning, op. cit., p. 35.


18 Note that rent is defined as the differential and not as the difference between the total return and the cost of utilization in the following: "Each site tends to be put to the use whereby it will yield the maximum total return over the costs involved in utilizing it. These costs include among other things, such returns, in the form of profits as are necessary to attract business ability. The differential remaining which is due to the superiority of the profit-making opportunities afforded by one site as compared to another is rent, and is put into the hands of the landlords by the competition of the entrepreneurs for the best opportunities." Edward Chamberlin, The Theory of Monopolistic Competition, Cambridge, Harvard University Press, 1933, p. 203.


Ibid., p. 278.

David Ricardo, "Principles of Political Economics," Vol. 1, in *Works and Correspondence of David Ricardo*, P. Sraffa, ed., Cambridge, at the University Press, for the Royal Economic Society, 1951, p. 173. It seems that Ricardo foresaw the administrative problem of dividing the total return of a property, when land and property are owned by the same person. "A tax on rent as rent is constituted would discourage cultivation because it would be a tax on the profits of the landlord." p. 173. "There can be little doubt that if a tax were laid on rent, landlords would soon find a way to discriminate between that which is paid to them and for the use of the land and that which is paid for the use of the building and the improvements which are made by the landlord's stock." p. 174. If a tax were laid on rent
and no means of separating the remuneration now paid by the tenant to the landlord under the name of rent were adapted: the tax as far as it regarded the rent on building and other fixtures would never fall for any length of time on the landlord but on the consumer. p. 175.


34 Orr found that in the Boston area, the tax is borne by landlords because the short-term supply is inelastic and the demand is elastic. Larry L. Orr, "The Incidence of Differential Property Tax on Urban Housing," National Tax Journal, September 1968, pp. 253-262.


39 Becker, op. cit., p. 27.

40 Ibid., p. 28.
CHAPTER III

THE LAND CONVERSION PROCESS

3.1 Introduction

To this point in this study, it has been shown how: (1) the shortage of housing and sprawl-type urban development has been attributed by certain segments of society, to the process of speculation in the land market, (2) the logical response of those holding this belief is to attempt a reduction of these two problems by reducing the incidence of land speculation, and (3) one of the more frequently proposed methods of reducing speculation in land is to raise the tax on land.

Two important limitations make this approach to solving the problems of the housing shortage and urban sprawl inadequate. These are: (1) the failure to evaluate this policy device (land value tax) within the context of the larger process of land conversion, and (2) the failure to determine the nature of the second order effects of the tax.

It is the purpose of this chapter to attempt to demonstrate the restrictions imposed by the first limitation by illustrating the complexity of the land conversion process.
The land conversion process (or housing production process) is a complicated process which is the result of decisions made by a multitude of actors, including landowners, real estate agents, home-builders, home-buyers, financial institutions, politicians, planners and other non-elected officials.¹

The decisions made by each individual that affect the outcome of the entire process are a function of what Kaiser and Weiss² call "decision agent characteristics" (factors inherent in the decision-maker himself—income, liquidity, attitudes toward risk etc.), and "contextual factors" (factors external to the decision-maker—public policy, interest rates). The attempt to influence the amount and location of housing produced, by increasing the tax on land is an attempt to modify the entire process through the modification of one contextual factor influencing one participant in the process. Clearly the success of such a policy is dependent upon the importance of (1) the influence of the tax on landowner decisions relative to the effect of changes in other contextual factors, and (2) the influence of the decisions of the landowner on the outcome of the larger process relative to the influence of other decision-makers. If there are other contextual factors, which when modified, or other participants, who when influenced have a more important effect on the outcome of the process, it becomes necessary when evaluating the tax's ability to affect the
outcome of the process, to compare the benefits and costs of its use with the benefits and costs of other policies.

Rather than attempt to evaluate the effects on the process of the decisions of the large number of participants listed, the study, following the work done at the University of North Carolina, will try to understand the land conversion process by examining the behaviour of three key decision agents; the predevelopment landowner, the residential developer and the consumer of housing.

Restating the problem simply, as society's dissatisfaction with the quantity and location of housing produced, suggests that the pivotal participant in the process is the residential developer. It is he, who ultimately makes the decision as to how much and where, housing will be produced.

The motivating force behind all developer decisions will be assumed to be the making of a profit. The more profitable it is to develop land into housing, the more housing the developer will produce. The more profitable it is to develop site A than site B, the more likely the developer will be to develop site A.

In this discussion, it will be shown how the profitability of developing land in general and the profitability of developing particular pieces of land is influenced by (1) the effects of consumer demands for housing, (2) the effects of the supply of land offered by the landowners, and (3) the effects of contextual factors acting directly upon the developer.
3.2 The Demand for Residential Land

3.21 Derived Demand

One of the most important things to remember when discussing the demand for land is that it is a "derived demand." Boulding offers the following explanation of this concept in reference to the demand for labour.

In studying causes affecting the demand for labour, the first fact that springs to our notice is that the demand for labour is usually a derived demand. That is to say that people who buy labour do not generally buy it for its own sake. They buy it because, with its aid they can produce or acquire some further commodity for which there is a demand and which therefore can be sold. There is a demand for weavers because of the demand for cloth; there is a demand for automobile workers because there is a demand for automobiles. Likewise, there is a demand for the services of land because of a demand for things which land will grow . . .

Since the product of residential land is housing, the demand for residential land is derived from the demand for housing. Thus demands for residential land will vary with the demand for housing. But this is not the only influence on the demand for residential land. Since the demand for a home is not simply the demand for a building, but is also a demand for other home-related services; the space provided, the accessibility to other places and other amenities such as schools, parks, and municipal services, the demand for housing may also be regarded as a demand for a composite good. Since these services make variable demands on the land component of housing, shifts in preferences among
these housing services will cause shifts in the demand for land in the composite good.

For the purposes of this study, in order to be able to concentrate on the land component of the housing package, the services provided by housing will be divided into those derived from the space provided by land and those derived from all other services. The two components of housing will be labelled, respectively, land and shelter-accessibility.

3.22 Determinants of Demand

Most clearly, the demand for land will vary with the total amount of housing demanded. The more housing demanded, the more land demanded (other things held constant). In general, an increased demand for housing can result from an increase in the number of consumers demanding a constant amount of housing per consumer, a constant number of consumers demanding more housing per consumer, or an increased number of consumers each demanding more housing. Thus, a change in population or shifts in the demand curve for housing will change the demand for housing and thus for residential land.

The individual consumer of housing is also a consumer of other goods. According to indifference curve analysis, the consumer will maximize his satisfaction with the combination of housing and other goods at a point where the line of attainable combinations (budget line) is just tangent to the consumer's indifference curve between housing
and other goods. At this point,

\[ \text{MRS}_{OH} = \frac{P_o}{P_H} \]

Where

\( \text{MRS}_{OH} \) = Marginal Rate of Substitution of housing and all other consumer goods

\( P_o \) = price of other goods

\( P_H \) = price of housing

The consumer maximizes his utility by consuming quantities of housing and other goods in proportions such that,

\[ \frac{\text{MU}_H}{P_H} = \frac{\text{MU}_O}{P_o} \]

Where

\( \text{MU}_H \) = marginal utility of housing

\( \text{MU}_O \) = marginal utility of other goods

\( P_H \) = price of housing

\( P_o \) = price of other goods

Any change in contextual factors, or consumer characteristics that alters this relationship, by changing the marginal utility or price of either good to the consumer will result in a change in the proportion of the consumer's budget that is allocated to housing. This change in demand (other things remaining equal) will result in a change in the demand for residential land.

Secondly, it is important to remember that housing is a composite good consisting of two basic components (in this study) land, and shelter-accessibility. The consumer seeks a combination of these two composite goods, that maximizes his utility. In the same way that the consumer maximizes his satisfaction by consuming quantities of housing and
other goods, so he maximizes his satisfaction by consuming quantities of land shelter-accessibility such that

\[ \frac{\text{MU}_L}{P_L} = \frac{\text{MU}_{sa}}{P_{sa}} \]

Where

- \( \text{MU}_L \) = marginal utility of land
- \( \text{MU}_{sa} \) = marginal utility of shelter-accessibility
- \( P_L \) = price of land
- \( P_{sa} \) = price of shelter-accessibility

Any change in contextual factors or consumer characteristics which alters this relationship by changing the marginal utility or price of either component will result in a change in the proportion of the consumer's budget that is allocated to each component of housing. This change in the demand for housing components (other things remaining equal), will result in a change in the demand for residential land.

The following points may be drawn out of the preceding discussion:

1. The demand for land is derived from the demand for housing. Changes in the demand for housing will change the demand for land.

2. The demand for housing is determined by the consumer's marginal utility gained from housing and the price for housing compared to the marginal utility to the consumer of all other goods and the price of those goods. Changes in the marginal utility of consuming housing relative to the price of other goods, will change the demand for
housing and hence the demand for land.

(3) The demand for housing is composed of the consumer's demand for the services provided by the two components of housing, land and shelter-accessibility. Changes in the relative prices or marginal utilities to the consumer of these two components will change the demand for land.

The next section will list the changes in demand for land that occur as a result of changes in contextual factors and consumer characteristics that influence (1) the consumer's demand for housing, and (2) the consumer's demand for the components of housing.

3.23 The Demand for Housing

(a) **Number of Consumers**

Strictly speaking, the increase in demand for housing through population increases can be seen to be a result of net migration and increases in the difference between birth and death rates. While some housing studies talk about net household formation and age composition, these will be seen to be characteristics related to the utility of housing.

(b) **Utility of Housing**

Any change in societal attitudes that results in consumers valuing housing more than they did previously, will result in an increase in the demand for housing and land.
(i) **Net Household Formation**

Changes in tastes or preferences for housing that result in the formation of new households or the maintenance of existing households will cause an increase in the demand for housing and thus an increase in the demand for land. Such changes in tastes as demonstrated by the preferences of young people of moving out of the family home at an earlier age than did previous generations or the tendency of older people not to move back to their children's home has meant a net increase in the number of households demanding housing units and hence an increase in the demand for land.

(ii) **Income**

If the demand for housing is more income elastic than the demand for other goods, an increase in income will result in a larger increase in the demand for housing than for other goods. An example of the increase in housing demanded resulting from an increase in income is the increased rate of "undoubling" that occurs when incomes rise.  

Similarly if the utility of housing rises more with each additional unit of housing consumed, an increase in credit availability, through a reduction of interest rates, a reduction of down payment/loan ratio or a lengthening of the term of the loan that makes all goods easier to obtain, will mean an increase in the demand and consumption of housing as compared to other goods.
(c) **Price of Housing**

If the price of housing changes relative to the price for other consumer goods, the consumer, to maintain a constant level of satisfaction, in the absence of a change in preferences, must change the level of consumption of housing.

Special policies designed to make credit more available in the housing sector than in other final demand sectors, effectively lowers the price for housing relative to the price of other consumption goods. Thus to maintain his maximum level of satisfaction, the consumer will consume more housing and thus more land.\(^9\)

Policies of rent control or rent subsidy will reduce the price of housing compared to other consumption goods and encourage an increased demand for housing and land.

### 3.24 The Demand for The Components of Housing

As stated before, the second effect on the demand for land occurs as a result of changes in the relative utilities and prices of land and shelter-accessibility in the composite good of housing.

Any increase in the utility gained by a consumer from the services provided by the land portion of the composite good of housing that is not accompanied by a corresponding rise in the utility gained from the other services of housing will result in an increase in the consumer's demand for land. Important factors causing changes of this sort, are the age
composition of the population and life-style preferences.  

3.25 Summary - The Demand for Residential Land

The first step in understanding the outcome of the land conversion process (quantity and location of housing produced) was to show the impact of consumer demands for land. It was demonstrated how the consumer's demand for land (both in quantity and location) was derived from his demand for housing (both the total amount demanded and components demanded). In addition, some of the consumer's characteristics and some of the contextual factors influencing the quantity and composition of housing demanded were mentioned.

In spite of the importance of the magnitude and nature of the demand for housing, in determining the outcome of the land conversion process, it has been often underestimated and in some cases completely overlooked by those seeking to alter the outcome of the land conversion process through the use of a land value tax.

3.3 The Supply of Residential Land

It is necessary, when determining the profitability of developing housing in a particular amount or location to not only be aware of the demand for housing in that quantity or location but also of the costs of producing housing in that quantity or location.

Since the price for one key input of the housing production process, land, is determined by the value placed on land by the predevelopment landowner, an important part of
determining the profitability of developing particular quantities and locations of land, is the understanding of the land valuation process of the predevelopment landowner.
Part of the difficulty of this task lies in the scarcity of knowledge of his behaviour.

Of all the groups involved in the process of suburban growth, least is known about the landowners, speculators and dealers, and considering how little we know about some other groups, this is a strong statement. Such evidence as does exist suggests that members of this group, in addition to buying land from farmers or others who used it for production and selling it to developers, may buy and sell land among themselves.

3.31 Speculative Motive for Owning Land

In spite of the apparent diversity of this group, one thing that may be said with relative certainty is that the majority of these landowners are aware of the increasing value of their land, caused by the expansion of adjacent urban areas. Thus the land valuation equation 2-4 may be adjusted to make explicit, increasing capital value. Equation 2-4 becomes:

\[ PV = \sum_{t=1}^{n} \frac{b_t - c_t}{(1+r)^t} + \frac{K}{(1+r)^n} \]  

Where

- \( PV \) = present value of the land
- \( b_t \) = income earned on the land in period \( t \)
- \( c_t \) = costs of production in period \( t \)
- \( r \) = capitalization interest rate
- \( K \) = expected sale price for land period \( n \)
- \( n \) = investment time horizon
It can be seen from equation 3-1 that variations in the values for any of the variables among different landowners will result in variations in the value placed on the land by different landowners. Generally those influences which tend to (1) increase the net returns to the land during the holding period (either an increase in the income derived from the land or a decrease in the costs of production), (2) increase the price at which the landowner expects to sell the land in the future, or (3) decrease the capitalization interest rate, will increase the present value of the land to the landowner, thus increasing the price of the land to the developer and so decreasing the profitability of developing land.

As this study is concerned with vacant land that is being held off the market in anticipation of profits from future land value appreciation, the most important variables are (1) the expected sale price at the end of the investment period, (2) the landowner's discount rate, and (3) the costs of holding the land through the investment period.

3.32 Capitalization Interest Rate

The rate used to discount future returns to the present is a function of the landowner's time preferences for income, his opportunity costs of capital, and his evaluation of the risk involved in the investment.

(a) Income Time Preferences

The more the landowner values present income as
opposed to future income, the higher will be the rate by which he discounts the future incomes from the land. The higher the discount rate, the lower will be the landowner's estimation of the present value of his land and the more probable it is that the bid price of a developer will be sufficient to persuade him to sell his land.

(b) **Opportunity Costs**

In making explicit the rate at which he wishes to discount future earnings the investor must take into account the rate of return that might be expected from alternative investment opportunities open to him. He should discount future earnings on the proposed project by at least the rate of return that is available to him in his best alternative investment. The costs of foregone investment opportunities vary from investor to investor as investor characteristics such as income, liquidity, income tax bracket, etc., vary among investors.

A man with ample investment funds, perhaps faced with a high marginal tax rate and hence eager to secure capital gains on which a lower rate is paid (in Canada half the taxpayer's capital gains are added to his taxable income and taxed at his normal rate) could afford to speculate on land at interest rates perhaps no higher than 2%.

A farmer, short of capital and hence forced to ration his scarce capital among various potentially profitable farm enterprises or forced to borrow at 6% or more would necessarily use a much higher rate—perhaps 6, 8, or even 10%. A real estate developer perhaps, short of capital and eager to use his capital in enterprises where the turnover was rapid would be in a position similar to that of the farmer.12
(c) Risk

While attitudes toward risk may vary from investor to investor, most investors will prefer an investment guaranteeing a sure return to an investment in which the probability of the same return is less. In order to differentiate between two investments with differing probabilities yielding the same return, the investor may discount the more risky opportunity at a higher rate than the less risky investment (thus reducing its value relative to the more certain investment). The investor's attitude toward risk and thus the rate he uses to discount investment opportunities may vary among investors as the marginal utility of money varies among investors.

3.33 Cost of Holding Land

As this study is dealing with vacant land, the major cost in holding it through an investment period is the cost of the property tax. An increase in the property tax on land reduces the net return to land by the amount of the tax and thus reduces the present value of the land in the eyes of the landowner.

Variations in the effective rate of taxation on land occur as a result of variations in investor income tax rates.

In Canada, property taxes incurred in the production of an income are deductible from that income. Property taxes on undeveloped land are deductible if "the land is held in inventory of or used in connection with a business
or held primarily for the purpose of producing income of the taxpayer for the year. Taxes which are not deductible under these criteria can be used to increase the cost base of land which would reduce the taxable capital gain resulting from the sale of the land by the cost of the tax. Thus the cost of property taxation is less for those investors taxed at high marginal income tax rates than for those taxed at low marginal income tax rates.

3.3 Estimation of the Appreciation in Land Values

The land valuation model presented to this point in the discussion has made the real estate investor appear to be an "economic man," continually weighing his opportunities in holding land against the opportunities that open to him upon selling the land. Since land is a bulky investment, in which the investor usually ties up substantial quantities of his money, there is reason to expect that estimations of present value would be calculated religiously. Weiss had this to say of such estimations:

Land development is obviously, much more of an ad hoc process than we had previously supposed. The unsystematic manner in which developers approach the production of residential lots indicates that most of the decisions made at this stage in the development process are probably made on the basis of their own experience and a general awareness of "what's going on" in the local development industry rather than on the basis of what new techniques and ideas are available.
While Weiss and her associates were speaking specifically of developers, there is no reason to believe that landowners in the process would act any more "rationally."

If such subjective estimates are likely to yield less consistent answers to the question of the value of land than detailed feasibility studies, there is reason to suspect that values for land and thus prices for land will tend to vary as landowner characteristics vary.

Furthermore, an accurate estimation of the rate of land value appreciation involves an accurate forecasting of the demand for land. This in turn means that participants in the market must accurately forecast the demand for housing from the determinants of demand as presented at the beginning of this chapter. Such a task is by no means an easy one particularly for those with little or no experience in real estate investment problems.

Even if the demand for housing in a region can be accurately forecast by the landowner, other factors may influence the income potential of an individual location. While the pressure of demand may be uniform on land throughout a region, the infrastructure which make urban expansion possible will display unevenness both spatially and temporally. Since the costs of holding land (taxes and interest charges) continually eat away at expected profits, it is important for the land holder to know where and when public investment will occur.
Thus accuracy in forecasting the rate and path of urban growth will probably depend on (1) the information available to the investor, and (2) his ability to use it to estimate the correct value of the land.

3.35 Summary - Supply of Residential Land

The point that this section has tried to make, is that the price which the developer pays for land is determined, to a large extent by the investment characteristics of the landowner. Landowner characteristics such as income, liquidity, opportunity costs, time preferences for income, expectations, attitudes toward risk, as well as holding costs (land tax) have an effect on the value which the landowner places on the land. As these characteristics vary from landowner to landowner, so does the value placed on a given piece of land. Differences in landowner values for land and consumer values for land will have an effect on the amount of housing that is produced. Differences among landowner valuations for comparable parcels of land will affect the distribution of land developed.

3.4 The Developer

In the first two sections of the chapter it was shown how the demand for residential land is derived from the consumer's demand for housing and how the landowner responds to prices offered for his land to determine the supply of residential land that is offered at any one time.
Essentially the market for land is an exchange of resources between the consumer who desires to trade some portion of his wealth for land and the landowner who wishes to exchange part of his wealth in land for a more liquid asset.

However, the land that is to be exchanged, is not in the form which the consumer desires. As mentioned above the consumer typically demands a "housing package" of which land is only one component. Other components of the residential package include shelter and urban services. This is where the developer comes in. He uses his skills of combining land with other components to produce a product which is demanded by the consumer.

As mentioned at the outset of this chapter, the pivotal participant in this process of land conversion is the developer. His decisions concerning the profitability of developing land in general and the profitability of developing particular tracts of land is affected both indirectly by the influences of demand for and supply of land and directly by contextual factors acting upon him to modify his perception of the profitability of a proposed project.

3.41 *Indirect Effects on Developer Decisions*

The developer is typically a producer (in Vancouver) who is neither a monopolist or monopsonist and has the amount of land that he develops determined to a large degree by the quantity of land demanded by the consumer and the amount of land supplied by the landowners. Because of this, any
variations in the determinants of demand for the quantity or type of housing will cause changes in the quantity of land demanded. Similarly, changes in the factors which influence the landowner's valuation of land, thus the asking price for land will change the quantity of land supplied at any bid price. In general any factors which tend to increase the positive difference between the consumer's bid price for land and the landowner's asking price for land will increase the quantity of land that needs to be exchanged in a move toward "pareto optimality" and hence will increase the amount of production carried out by the developer.

The land developer's position as a middleman can be an advantage or a disadvantage to him. If market conditions and contextual factors combine to increase the positive difference between consumer valuations of land and landowner valuations of land, he gains an extra profit equal to the difference. If forces act to decrease this difference or to make it negative, the developer becomes hard pressed to find land upon which to carry out his operations.

Thus public policy which combines with market imperfections to increase the difference between landowner and housing consumer valuations of land (consumer has higher valuation) will increase the profitability of land development and thereby increase the amount of land developed. In the same way, policies that decrease this difference will be seen to decrease the amount of land that is developed.
(a) The Housing Production Function

In the first section of this chapter it was shown how the consumer forms his demand for the land and shelter/accessibility components of housing. The relationship between the consumer's demand function and the developer's production function will now be shown.

Just as the consumer maximized his utility in the combination of land shelter/accessibility by consuming quantities of each so as to equal their ratios of marginal utility to price, similarly, the developer maximizes his production per unit cost by equating the ratios of each factor's marginal physical product to price. So in the production of a residential package, he combines factors of production in the following manner:

\[ \frac{\text{MPP}_L}{P_L} = \frac{\text{MPP}_{SA}}{P_{SA}} \]

Where

- \( \text{MPP}_L \) = marginal physical product of land
- \( \text{MPP}_{SA} \) = marginal physical product of shelter-accessibility
- \( P_L \) = price of land
- \( P_{SA} \) = price of shelter-accessibility

The producer will adjust his combination of factors in the composite good in response to changes in the MPP or price of a factor.

If the consumer's marginal utility of land rises in relation to the other component of housing, the marginal physical product of a unit of land in the developer's
production has risen. In an attempt to provide the product demanded by the consumer and to equate the MPP/price ratio of the two components the developer increases the proportion of land in the residential package. Since the consumer's marginal utility of land has risen he will be willing to pay an increased price for the land. If the landowner's supply price of the land remains the same as before, the developer earns a profit at the expense of the landowner in addition to the normal return expected for his services.

At the other end of the process, if the influences on the landowner are such that he lowers his valuation of land and thus his asking price for land, the developer can offer the same proportion of land in his residential package at a lower cost or increase the proportion of land at no additional cost. If the consumer is unable to recognize this reduction in costs, the developer is able to earn an extra profit again.

Similarly, reductions in the utility gained by the consumer through the consumption of land or increases in the landowner's asking price for land that combine with market imperfections to reduce the developer's profit will decrease the amount of land developed.

Thus in the absence of an instantaneously adjusting market, fluctuations in participant valuations of land can have either positive or negative effects on the profitability of the development of land and thus on the amount of land that is developed.
If the developer, in reality, operates in a competitive market, the increased profitability that results from higher consumer valuations for land combined with lower landowner valuations of land would quickly disappear as developers undercut each other's prices in an attempt to secure a larger share of the market.

However, if policies and market imperfections work in the opposite direction, that is, to reduce the difference between consumer and landowner valuations of land, the adjustment made by developers will be to reduce the amount of development, to search for other areas in which to operate, or to pull out of the land development industry altogether.

(b) Locational Effects

Market imperfections not only influence the amount of land that is developed but also influence the spatial distribution of the land that is developed.

The consumer's preferences between land and shelter-accessibility dictate the price which he is willing to pay for each component. The developer in his selection of a location for his next development is aware of the utility gained by the consumer from the land component of the package and thus how much he should pay for that input. If the landowner's price is too high, the developer will shop around until he finds a piece of land that will satisfy the consumer's needs and his own profit requirements. This appears to be one of the reasons for urban sprawl. Landowners
holding land adjacent to the urban area, whose price is higher than that which the developer feels the consumer is willing to pay, will be passed over by the developer in favour of cheaper land further from the city. If the landowner overestimates the price he believes the consumer is willing to pay for accessibility or if he fails to adjust his prices to decreases in the price of accessibility brought about by improvements in transportation facilities or changes in urban structure, his land will remain overpriced and undeveloped and thus result in the "sprawl" or "scatteration" of cities of which so many authors have written.

3.42 Direct Influences on Developer Decisions

Not only do the influences of demand for and supply of land have effects on developer decisions, but there exists a number of factors which act directly on the developer to modify his development decisions of quantity and location.

As with the indirect influences on developer behaviour, direct influences will be seen to affect the amount and location of development by affecting the profitability of development.

There are basically two types of variables which directly influence the developer; those associated with the financing of the development and those associated with the risk of the development.

The importance of financing to the developer is pointed out by Clawson, Maisel, and Goldberg.
Residential builders and developers in the suburbs, like redevelopers in the central city, have relied primarily on borrowed capital.\textsuperscript{16}

All phases of the construction process tend to be equity poor. The great majority of firms in the industry are compelled to stretch their capital to the utmost. Typically, the leverage in the industry is large. In theory—lending contracts for construction oblige the builder to furnish equity to 20% of the finished value. In practice by careful timing and judicious scheduling of work and bills, contractors can cut their equity requirements by more than half. . . . A builder who finances all his own work has of necessity a very low capital turnover rate. Conversely, the higher his borrowing, the more work he can perform and the greater the potential profits. Most builders attempt to maximize turnover.\textsuperscript{17}

Goldberg, ranking the importance of various financing arrangements found

that loan-to-value ratio is by far the most important, reinforcing the intuitive stress on leverage. The rate of interest, is next in importance, while the remaining factors are essentially undifferentiable.\textsuperscript{18}

While the developer's attitudes toward the risk of an investment may vary from developer to developer, some developers being more prepared to take the chance of losing heavily for the possibility of making a killing, generally, other things being equal the investor will prefer a sure thing to one that is uncertain. Moreover in light of the previous discussion in which the developer was seen to be heavily dependent on obtaining credit for his operations, from financial institutions, given the conservative nature of these institutions, it appears that no matter what the
entrepreneur's personal attitudes toward risk are, he will be forced to behave conservatively if he is to obtain funds from these financial institutions.

Most lenders have been primarily concerned with the "financial soundness" of projects, but the factors they use in measuring such financial soundness are likely to be conservative.¹⁹

Thus any factor that tends to improve the probability of a successful venture will be looked upon as a factor that increases the yield of the investment making development more profitable and thereby increasing the amount of development occurring.

(a) Financial Factors

(i) Cost of Capital

If a real estate investment is evaluated in terms of the cash flow that it generates there are two basic sources to be considered: (1) the cash flow that occurs over the term of ownership, and (2) the net proceeds from the liquidation of the investment.²⁰ For a typical residential development in which the developer sells the lots or houses on completion of his work, the cash flow during the term of the investment will be negative, leaving the entire value of the investment to be gained from the liquidation of the investment at the end of the investment period.

If the yield is defined as the net return (selling price of the investment minus the cost of development) divided by the total costs of development, the higher the interest
rate the higher are the annual payments for the use of money borrowed, hence the lower the net return, the lower the yield per dollar invested, the less attractive the investment in the development of land becomes and the less land development that occurs.

(ii) **Availability of Capital**

In the typical real estate investment there are usually two investors, the equity investor and the mortgage lender. The equity investor (or property owner), characteristically, when making a real estate investment goes to the money market to borrow as much money as he can at the best terms, supplying the balance of the capital required from his own pocket (equity funds).

Since it is the rate of return to the investor's own funds about which he is most concerned, the equity investor tries to gain maximum advantage from the situation known as "leverage" or the ratio of borrowed funds to equity funds. The investor benefits from any difference in the rate of return on the project and the rate at which he borrows funds.

It seems then that influences which tend to increase the availability or decreases the cost of financing will be seen to increase the profitability of development and so increase the amount of development. Any influence that tends to decrease the availability of capital or increase its cost will be seen to decrease the profitability of
land development and therefore decrease the amount of development occurring.

3.43 Risk of Development

There are many factors acting on the developer to influence the probability that he will earn a return on the money invested that will make a particular development worthwhile. Kaiser and Weiss divide these effects into the effects on marketability and the effects on the costs of development. Influences, especially those of public agencies can significantly change the revenues anticipated from the proposed developments. Public investments in transportation that increase the accessibility of a proposed development will increase its marketability. Changes in the zoning of the development area or surrounding area can determine the appropriateness of a proposed development (thus its marketability). While Kaiser and Weiss maintain that effects on the marketability of particular development weigh more heavily in the decision calculus of the developer (because the costs of development are usually more predictable than market conditions) they do not neglect the cost side of the equation.

Despite the greater importance of estimated marketability effects of site characteristics in our study area, the developer cannot afford to concentrate on marketability at any cost.23

To illustrate their point they offer the example of Greensboro, which controlled developers most by a policy
which influenced development costs.

Whether policies act upon the cost of development or the marketability of a development is secondary (in this discussion) to the recognition that these factors can have an effect on profitability of a given development. The less certain a developer is about the outcome of such factors, the less certain he will be of the expected return of the development. One way in which an investor might deal with uncertainty is to charge himself a premium that serves to equate the value of a sure development with the value of an uncertain one. Generally, the larger the risk, the larger the premium he must charge. The larger the risk premium the smaller the expected return of the prospective development. The lower the expected return of a development, the less likely it is to occur. Thus any factor which tends to increase the risk associated with the earning of a return from land development will serve to decrease the profitability of land development occurring. Any factors which decrease the risk of earning a given profit from land development will increase its profitability and so the amount of development occurring.

The uncertainty associated with the profitability of land development resulting from the uncertainty of public policy will act to decrease the amount of development over an entire region if the uncertainty of public policy is uniformly uncertain. However in a multi-jurisdictional
region, uncertainty associated with any particular location is due to the uncertainty of the policy of the jurisdiction in which that location lies. If the uncertainty of public policy varies from jurisdiction to jurisdiction, it is probable that development will occur in jurisdictions in which the developers are most able to predict the return they can expect on their investment.

In this way uncertainty, when combined with political fragmentation may act to not only influence the quantity of development but also the location of development.

Evidence that developers are concerned with the certainty of these influences on their anticipated returns is supplied by Goldberg. He found that developers were extremely sensitive to the influences of zoning and the access to municipal services. It appears that developers were not willing to purchase land on the chance that the zoning or servicing necessary for their development might occur. When asked of the importance of "proper zoning" in the consideration of the decision to develop, 61.3% of the developers interviewed, responded that it was "essential" while an additional 25.8% felt it was "very important."

When asked the same question of the importance of access to trunk sewers, 48.4% responded that it was essential while 41.1% felt it was very important. Thus over 87% of the respondents felt that zoning was essential or very important and close to 90% felt that access to sewers was essential or very important to the decision to develop.
3.44 Summary - The Developer

The purpose of this section was to show the outcome of the land conversion process as determined by the housing production quantity and locational decisions of the developer is influenced by (1) the indirect effects of the demand for and supply of land for housing, and (2) by a number of "contextual" factors acting directly upon the developer to modify his perception of the profitability of the development of land general and of the profitability of developing particular parcels of land.

It was shown how market imperfections that cause differences in consumer and landowner valuations for land affect the profitability of developing land.

Finally, some of the contextual factors which were seen to directly influence the developer's opinion of the profitability of development, included the cost and availability of capital and public policy (e.g. zoning, servicing).

3.5 Summary - Land Conversion Process

In view of the number of decision-makers and factors affecting decisions, which have an impact on the quantity and distribution of land developed for housing, it is difficult to understand why so much emphasis has been given to one factor (tax on land) affecting one variable (holding costs of land) of one participant (the landowner) in the land conversion process.
An over-reliance on this one factor means not only the neglect of other factors influencing other landowner decision variables, but more critically, the overlooking of the important influences of consumer demands, and factors acting directly on the developer to modify his decisions in regard to the quantity and location of his operations.

Only after the benefits and costs of a range of policies designed to (1) reduce demand for housing (e.g. restrict population growth), (2) encourage development by increasing the profitability of development, (e.g. increasing the amount of serviced land) or (3) modify landowner behaviour (e.g. increasing information about urban land markets to landowners) are compared to the benefits and costs of using a land value tax to reach the desired goals, can a definitive answer be given to the question of which policy or combination of policies is the most efficient means of reducing the problems of the housing shortage and urban sprawl.

Hopefully this chapter, by describing some of the relationships in the process has served to suggest some of the areas in which policy may be implemented, should the primary effects of the land value tax be found to be in-effectual or its secondary effects too burdensome, to make its use worthwhile.
Chapter III - Notes and References


2For a review of research conducted under this program see Edward J. Kaiser and Shirley Weiss, "Decision Agent Models of the Residential Development Process - A Review of Recent Research," Traffic Quarterly (23) 1969, pp. 597-630.


6Ibid., p. 30.

7Ibid., p. 31.

8Ibid., p. 61.

9Ibid., p. 32.

10Ibid., p. 30.


22 Kaiser and Weiss, 1970, p. 34.


24 Goldberg, *op. cit.*, p. 86.
CHAPTER IV

THE LAND VALUE TAX - RE-EXAMINED

4.1 Introduction

In Chapter I, the problems with which this thesis is concerned were presented. In Chapter II, the effects and mechanics of the effects of a land value tax on these problems were presented with the aid of a simple land valuation model. In Chapter III, the simple model was expanded to take into account the variables that affect the valuation of land in a situation closer to the one that exists in the real world. The purpose of Chapter IV, is to use the knowledge gained in Chapter III to re-evaluate the effects of the tax discussed in Chapter II on the problems stated in Chapter I.

Before going on to discuss the relationships among speculation, land taxation and urban sprawl or the high costs of land it will be useful here to expand the land valuation model to make explicit the effect of the tax on the land speculator.

In both problems (urban sprawl and the shortage of housing) speculation or the holding of land for a higher price, means that the residential developer is not able to acquire the input (land) for his production process at the price he needs to make the profit he requires to make an
investment in the development of residential land seem attractive. His reaction to the speculator's demand for a higher price for land will depend to a large degree on the demand elasticity for the final good. If demand is elastic, he will be unable to pass all of the increased costs of land on to the consumer. This results in a decrease in the supply of houses offered by the developer. If the demand for housing is price inelastic the developer will be able to meet the landowner's price for land by simply raising the price of the final product. In the third situation, if the consumer is willing to increase his transportation expenses in lieu of paying a higher price for a better location, the reaction of the developer will be to bypass the well-situated high-priced land in favour of developing less well-situated lower priced land.

Thus if the speculator's asking price for the land is more than the developer is willing to bid, there are three possible supply responses by the developer that depend ultimately on the demand characteristics for housing and the components of housing: (1) supply less housing at the same price, (2) the same amount of housing at a higher price, or (3) change the location of the houses supplied (sprawl). Since it is the difference between the developer's bid price and the speculator's asking price that causes these adverse effects (less housing, higher priced housing, or sprawl), it will be useful to examine the means by which each evaluates land.
4.2 The Pure Development Model

Since the evidence shows that developers do not typically speculate in land (Chapter III) but value land solely for its worth as a factor of production, it is possible to adjust the general land valuation equation:

\[ PV = \sum_{t=1}^{n} \frac{b_t - c_t}{(1+r)^t} + \frac{K}{(1+r)^n} \]

to reflect this singlemindedness:

\[ PDV = \sum_{t=1}^{n} \frac{b_t - c_t}{(1+r)^t} \]

PDV = pure development value
\( b_t = \) returns to development in period \( t \)
\( c_t = \) the cost of development in period \( t \)
\( r = \) capitalization interest rate
\( n = \) time period of investment

4.3 The Pure Speculative Model

Just as it is possible to assume a single minded developer with no regard for the rise in land values over the investment period, it can be assumed that the speculator has no intention of developing the land and so invests only to capture the rise in land values. To show this motivation for holding land the general equation becomes:

\[ PSV = \frac{K}{(1+r)^n} - \sum_{t=1}^{n} \frac{c_t}{(1+r)^t} \]
PSV = Pure Speculative Value
K = expected bid price in year n for land
c_t = costs of holding land in year t

The pure speculative model may be reformulated again, to make explicit the components of the speculator's value for the land:

\[ PSV = PDV + \sum_{t=1}^{n} \frac{k_t - c_t}{(1+r)^t} \]  

4-3

k_t = increase in land value in year t

This equation simply shows that the speculator bases his estimation of the future value of the land on the price which he has been offered in the present and the net increase in land values that occurs between the present and the time of the anticipated sale.

It can be seen, that as long as the increase in land values is greater than the costs of holding the land, the value of the land to the speculator will be greater than the value of the land to the developer. As long as PSV is greater than PDV, the developer responses listed above, may be expected to occur.

However, should the rate of increase in land values decrease or the costs of holding land rise such that:

\[ \sum_{t=1}^{n} k_t - c_t = 0 \]  

4-4

it can be seen that the present speculative value will equal
present development value and thus the developer will not display the adverse reactions listed above (decreasing the supply of housing, increasing price or providing scattered discontinuous development).

For the speculator to have a higher value for the land than the developer, the yearly rate of land value appreciation must be greater than the yearly costs of holding the land. If the rate of appreciation is equal to the holding costs, the value of the land is equal to the development value. If the rate of appreciation is less than the rate of holding costs, the speculative value will become less than the development value.

\[
PSV = [1+(m-h)] \ PDV \quad 4-5
\]

\[m = \text{annual percentage increase in land values}\]
\[h = \text{annual holding costs as a \% of land value}\]

Since the two major holding costs to the speculator are (1) opportunity cost of capital invested in the land, and (2) the tax on the land, the equation may be reformulated to make explicit these costs

\[
PSV = (1+[m-(r+x)]) \ PDV \quad 4-6
\]

\[m = \text{annual rate of land value appreciation (\%)}\]
\[r = \text{speculator's capitalization interest rate}\]
\[x = \text{land value tax rate (\% of market value)}\]

IF \[m-(r+x)] > 0 \ then \ PSV > PDV

IF \[m-(r+x)] = 0 \ then \ PSV = PDV

IF \[m-(r+x)] < 0 \ then \ PSV < PDV
If it is accepted that housing shortages and urban sprawl are the result of higher speculative values for land, any policy that (1) decreases the rate of land value appreciation, (2) increases speculator opportunity costs, or (3) increases speculator tax costs will meliorate the problems by decreasing the difference between the two values for land. Those proponents of an increased site value tax see the solution to lie in the implementation of the third alternative. It is now necessary to re-examine the effects of this policy on the two problems, (1) shortage of housing and (2) the "suboptimal" distribution of urban development (urban sprawl).

4.4 Effects on Sprawl - Re-examined

In previous discussions, it was stated that one of the causes of sprawl is the inability of developers to purchase land adjacent to the urbanized area because of the difference in the price that they are willing to pay and the asking price of the speculator. It was shown how the speculative value of land could be made to equal the development value by increasing the tax on the land held out of production. This would lower the speculator's asking price for the land to a price that the developer is able to pay. Thus land nearest the city, held out of production before the imposition of the tax would be developed after the imposition of the tax.

There is one problem with this reasoning, however. It will be remembered that the developer chose the more
distant land because of a differential in the price of adjacent land and distant land. An increase in the tax on land applied uniformly upon all land within the region would certainly lower the costs of adjacent land (ceteris paribus) but so would it lower the cost of the distant land. Thus the differential in price that was responsible for the sprawl in the pre-tax period is preserved to work its evil in the after-tax period if the tax is applied to all land values at the same rate. In the absence of differential assessment or tax rates that would tax adjacent land more heavily than distant land, the tax would achieve its desired effect only if the entire speculative value were taxed away. In areas of rapid growth, the increase in the tax necessary to accomplish this task might be high. It will be seen later that there are real constraints to the amount which the tax may be raised. If it happens that the tax raising runs hard into a constraint before it reaches the level needed to remove the speculative value from land, it will be necessary to employ other methods to remove the "excess" price differential between land adjacent to the urbanized areas and that land further from the city core.

4.5 Effects on the Housing Shortage - Re-examined

As mentioned earlier, one reason given for the shortage of housing was the high cost of land (due to speculative activity in the land market) to the developer.
It was shown in Chapter II how the imposition of land value tax lowers the price of land in the ratio of \(\frac{r}{r+x}\). Thus increases in the rate at which land is taxed will reduce the cost of land. Reductions in the cost of land, under competitive market conditions, result in reductions in the price for housing and increases in the amount of housing produced.

However there is more to the simple reduction than the equation shows. Holland\(^1\) illustrates some additional considerations in the following example

... let the discount rate be 5 percent and let there be a piece of land that promises $1,000 a year (appreciation or net rent). The land will sell for $20,000 and the annual interest cost will be $1,000. Next impose a site value tax that comes to 20 percent of the annual yield. The land will now sell for $16,000. The annual interest charge will be $800 and the annual tax payment $200; together they will be precisely equal to the annual interest cost before the tax. The running costs of development will not have changed.

... Thus the running cost of land for development purposes is converted by the site value tax from an interest charge to a smaller interest outlay plus a tax payment which together are just equal to the interest charge in the absence of the tax.

... And if this is the case capitalization of the tax and the consequent decline in the selling price of land do not encourage development.

Thus from this example, it can be seen that while the price for land has gone down, the total costs of development have remained constant. The only change has been a shift in the destination of the payment from the private
sector to the public sector as a result of the decrease in interest payments accompanied by a corresponding increase in tax payments.

However even this example does not give the full story of the effect of the land value tax on land values and development, since it holds true only under the restrictive assumption of the existence of a world in which unlimited capital is freely available at the same cost to all who desire it. While the total costs of development are not reduced by the increase in the tax, the "capital cost" of the land has been reduced. The tax may be seen as a perpetual loan to the owner of the land.\(^2\)

This "loan" is of most value to those who have the most difficult time obtaining credit or have to pay the highest price for it. It is worth least to those investors with ample supplies of low cost capital. Thus land subject to this tax and thus subject to this loan would increase in value, more for the capital poor than for the capital rich.

Typically it is the developer who has difficulty obtaining the capital he requires and who pays dearly for that which he can scrape up, while it is the speculator who is usually endowed with large quantities of capital for which the opportunity costs are low. Thus the effect of a tax on land is to narrow the gap between the value placed on land by the speculator and the value placed on the land by the developer. The effect of this narrowing, is to reduce
the incidence of problems discussed at the outset of this chapter.

In addition to the effect which the tax has on those "rational speculators" who respond in a predictable manner to changes in the present worth of their land, Gaffney argues that the tax awakens those landowners who have been sitting on land without paying much attention to its worth. The shock of a drastically increased tax provides the nudge, needed to encourage these landowners to evaluate the worth of their land and act in a manner similar to the rational speculator.

In practice, they (land value taxes) even tend to accelerate renewal by arousing sleeping landowners, bypassing credit rationing, substituting a visible explicit cost for an invisible implicit one, reducing the liquidity of slow landowners, compelling a more rational attitude toward heirloom land and in general needling landowners to do what their self interest would seem to have dictated anyway.3

4.6 The Tax Rate Needed to Lower the Price of Land

Earlier, it was demonstrated that speculative land value equalled the development land value when the rate of land value appreciation equalled land holding costs, which consist of the opportunity cost of the capital invested in the land and annual taxes on the land. In areas of high growth, an increase in speculative values can be counter-balanced by either an increase in the tax rate or capitalization rate such that:

\[ m-(r+x) = 0 \]
If the policy is to stabilize land prices at the development value by increasing the tax on land it is important to know (1) the annual rate of land value appreciation and (2) the capitalization rate of the speculator. If for example the price of a piece of land has been increasing at a rate of 20% per year (and that pace of appreciation is expected to continue) and the speculator has a capitalization rate of 8%, the value of the land needed to stabilize prices can be found by substituting these values into the equation:

\[ m - (r + x) = 0 \]
\[ 20 - (8 + x) = 0 \]

\[ x = 12 \]

Thus when the rate of value appreciation is 20% and the speculator's opportunity costs are 8%, the rate at which land must be taxed to reduce the speculative value of land to the development value is 12%.

4.61 Speculator Income Tax Rate

A twist to the formulation occurs when the income tax situation of the speculator is taken into account. Since property taxes on vacant land are often deductible from income tax liabilities, the existence of a progressive income tax makes the cost of the property tax dependent on the income of the speculator. For example, this means that a 2% land value tax to a person in the 50% tax bracket is equivalent to a 1% tax to a person with no taxable income. The variation
in effect among taxpayers with differing marginal income tax rates is shown below.

Table I

Effective Property Tax Rates for Various Income Marginal Tax Rates

<table>
<thead>
<tr>
<th>Marginal Income Tax Rate - %</th>
<th>Holding Cost for a Land Value Tax 2 per cent</th>
<th>Holding Cost for a Land Value Tax 4 per cent</th>
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<tr>
<td>50</td>
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<td>0</td>
<td>2.00</td>
<td>4.00</td>
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To return to the previous example, it can be seen that if the taxpayer were in the 50% income tax bracket, a land value tax of double the twelve per cent would be necessary to reduce the value by the same amount. Thus an important factor in determining the rate of land value taxation that will reduce the speculative value to the development value is the marginal income tax rate of the speculator.

In Table II, the effects of the three variables acting to determine the rate at which a municipal government would have to tax land to remove the speculative value of land are summarized. It can be seen that increases in the rate of land value appreciation or speculator income tax rates, has the effect of raising the rate at which land must be taxed to remove the speculative value. The rise in the speculator's discount rate reduces the rate at which land must be taxed to reduce the speculative value to the development value. What is particularly striking is the high rate
<table>
<thead>
<tr>
<th>Rate of Annual Holding Appreciation Costs to Stabilize Prices</th>
<th>Speculator's Discount Rate</th>
<th>Speculator's Effective Rate of Land Value Tax</th>
<th>Income Tax Rate</th>
<th>Nominal Land Value Tax Rate</th>
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at which land must be taxed to reduce the speculative value to the development value.

4.7 The Equity Constraint

The large increases in the tax rate applied to land necessary to induce high income, low opportunity cost speculators to sell their land to developers involve substantial shifts in the burden of the property tax. A shift from the present system of property taxation which taxes both buildings and land would increase tax burdens of those taxpayers owning property with relatively low improvement/land ratios. Specifically, the shift to land value taxation at a rate which would maintain the pre-tax level of revenue, would decrease the tax payable by those owning property with a total value/land value ratio greater than the average ratio for all properties in the taxing jurisdiction, increase the tax payable by those owning property with a total value/land value ratio lower than the average ratio and leave unchanged the tax payable by those owning property with a total value/land value ratio equal to the average ratio in the taxing jurisdiction.

The shifts in property tax burdens that occur when the base of the property tax is shifted from land and improvements to only land and that occur as land value taxes are increased to a level necessary to stabilize land prices at their present level will be the subject of investigation in the next chapter.
4.8 Summary

A re-examination of the effects of the land value tax in reducing the problems of the housing shortage and urban sprawl revealed some of the simplifying assumptions made when the effects of the tax were first discussed.

Once the importance of the differential in land prices rather than absolute land prices to the incidence of urban sprawl, was made clear, it was possible to re-evaluate the tax's ability to reduce sprawl by lowering land prices. It was seen that a land tax would have to be applied differentially to remove the differential in the profitability of developing one piece of land as opposed to another (and thus reduce sprawl).

In addition to illuminating some of the factors influencing the effectiveness of a policy to reduce the shortage of housing by increasing the rate of land value taxation, the chapter presented a simple model designed to show the rate at which a land value tax would have to be levied to reduce the speculative motive for holding land and so increase the profitability of producing housing (thus easing the housing shortage).

Finally, a secondary effect associated with the increasing of the land value tax was introduced (shifting of the burden of taxation).
Chapter IV - Notes and References


2Ibid., pp. 278-280.


CHAPTER V

THE EFFECTS ON THE DISTRIBUTION OF THE BURDEN
OF MUNICIPAL TAXATION OF TAXING LAND AT THE RATE
NECESSARY TO REMOVE THE SPECULATIVE VALUE OF LAND

5.1 Introduction

In Chapter IV, the culprit responsible for the ills of urban sprawl and the shortage of housing was assumed to be the land speculator. It was shown how the high price for land demanded by the speculator, due to his expectations of future land value appreciation evokes three responses from the developer; (1) less housing produced, (2) higher priced housing, and (3) urban sprawl. Further, a simple speculative land value model was developed. In this model the speculative value depended on three variables; (1) the rate of land value appreciation, (2) the speculator's discount rate, and (3) the rate of land value taxation. It was shown that as long as the rate of land value appreciation is greater than the combined opportunity and tax costs, the speculative value will remain above the development value, preventing land from being developed. Thus by increasing the tax on land so that holding costs become equal to the rate of land value appreciation, the speculative value for land is reduced to the development value of land and the adverse effects of land speculation are avoided.
The purposes of this chapter are twofold. The first is to estimate the magnitude of a land value tax that is required to reduce the speculative value for land to the development value. To accomplish this, it will be necessary, as equation 4-6 suggests, to determine the rate of land value appreciation and the speculator's discount rate.

The second purpose of this chapter is to examine the shifts in tax burden which occur when a land value tax is levied at a rate necessary to remove the speculative motive for holding land. The area of analysis for this study is the City of Vancouver.

5.2 The Tax Rate Needed to Remove The Speculative Value of Land

5.21 Rate of Land Value Appreciation in the City of Vancouver

The Vancouver area has undergone extremely rapid growth in the past decade and especially rapid growth in the past few years. This growth, largely due to heavy immigration has placed onerous demands on the available land resource. This has resulted in a rapid increase in the price of all land but particularly in the price of serviced land.

(a) Methodology

In an attempt to establish the rate of land value appreciation, it was first proposed to draw a sample from the 2150 vacant lots in the City of Vancouver whose rate of appreciation would be representative of the rate occurring
throughout the City in a specified time period. The requirements of this methodology included (1) a substantial number of vacant lots that had changed hands at least once (preferably more often) during the time period, (2) sales which were transacted between sellers who were adequately aware of demand prices and buyers who were adequately aware of bid prices, and (3) sales that were made at "arms length." A search through the files of the Greater Vancouver Real Estate Board for this sample was frustrated on all counts. Sales of vacant land were few in number and multiple sales of the same parcel were even fewer. Large price changes over extremely short periods of time and the presence of sales from companies to individuals or vice versa of the same name led the researcher to suspect that the third condition necessary for a valid sample would not be met either.

When the impossibility of obtaining an adequate sample from which to estimate the rate of land value appreciation became apparent, an alternative method was adapted. This method made use of the Greater Vancouver Real Estate Board's statistical records for vacant lot prices. Each year The Board publishes the prices for lots in selected areas of the City of Vancouver and the Greater Vancouver Regional District. A lower and an upper price for lots in each area are given for each year. An average price for lots for each year in each area was obtained by taking the average of the two representative prices listed for each year.
The average price was used so as to avoid the bias of using either the upper or lower end of the price range. Prices used in the analysis, therefore are probably substantially higher than the price that could be obtained for some lots and substantially lower than the price for which other lots could be sold. In view of the high rate of appreciation in the last year, the prices listed for 1973, on the whole will probably seem substantially lower than experience might suggest.

Average lot prices were calculated from 1967 to 1973. The year 1967 was chosen because areas listed in the records remained nearly the same from that period to the present. Thus problems of area redefinition were avoided. From the average lot prices calculated, the yearly land value appreciation rate was calculated for each area of the city listed. An average appreciation rate for each area was then obtained by taking the average of the yearly appreciation rates. An average appreciation rate for the City of Vancouver as a whole was obtained by taking the average of the average rates of appreciation for all areas of the city which had sales listed in all seven years.

The results of this analysis are presented in Table III. The trend over the seven years was one of substantial appreciation in the early parts of the period followed by a period of little or no appreciation around 1970, followed in turn by the present period, characterized by spectacular
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leaps in land values of from 36.4% in Kerrisdale to 82.5% in Champlain Heights. Average yearly rates of appreciation over the seven year period ranged from 17.5% in the Point Grey-Dunbar area to 23.9% in the Grandview area. The average for the City over the period was 21.4% per year.

A similar trend of high appreciation, low or zero appreciation followed by rapidly accelerating rates of land value appreciation was found when the same analysis was made of areas throughout the Greater Vancouver Regional District. Since these areas have, on the whole experienced higher growth rates than the City of Vancouver, it is not surprising that land value appreciation rates have also been higher, ranging from 21.3% per year in West Vancouver to 28.1% per year in Delta (north). The average yearly increase over the seven year period (24.1% per year) turned out to be slightly higher than the average increase for the City of Vancouver.

(b) The Selection of an Appropriate Rate of Land Value Appreciation

The selection of a single rate of land value appreciation is extremely difficult and is made more difficult by the rapid rise in prices in the last year. Are these price increases representative of true economic conditions and so indicate the probable rate of future appreciation? Or are they the result of overly inflated expectations similar to the ones that occurred before the sudden drop in rates of land value appreciation that occurred in
1970? The Real Estate Board seems to feel that these price increases will continue into the future. If the Board is correct in its assumption, the appropriate rate of appreciation to use in the calculation might be 50% per year or more. However, since the outcome of the complete analysis will be jeopardized more by an overestimated rate than by an underestimated rate, it was arbitrarily decided to select a rate of appreciation close to the average rate found to have occurred over the past seven years. That rate is 23% per year.

5.22 The Speculator's Discount Rate

The selection of a discount rate that could be considered representative of the cost of capital to a large heterogeneous group of landowners known collectively as speculators is an even more difficult task than the determination of an appropriate rate of land value appreciation. As pointed out in Chapter III, the cost of capital varies from investor to investor as a function of each's income, liquidity, and income time preference, and alternative investment opportunities.

Typically, the literature has regarded the speculator as an investor with low opportunity costs due to the high rate at which his income is taxed. Clawson in 1962, speaks of speculators with discount rates as low as 2%. In a study done for the G.V.R.D. by Thompson, Berwick and Pratt (an urban planning consulting firm) a model developed to
investigate the possibility of putting vacant land into use, assumed capital to be available to developers at rates of 8% to 9½%. If it is true that developers are typically capital scarce and pay more for capital than speculators, it would seem that a speculator discount rate less than that of the developer would not be inappropriate. However since the argument suffers from an underestimation of the discount rate more than from an overestimation, a conservative rate of 10% was chosen as the speculator capitalization interest rate.

5.23 Rate of Taxation Needed to Reduce the Speculative Value of Land to the Development Value

Having established values for the annual rate of land value appreciation and the speculator's capitalization interest rate, it is now possible to determine the rate at which land must be taxed to decrease the present speculative value to the present development value.

It will be remembered that this occurs when the annual rate of land value appreciation is equal to the annual costs of holding the land. This occurs when

\[ m - (r+x) = 0 \]

Thus when \( m = 23\% \) and \( r = 10\% \) the rate at which land must be taxed to reduce the speculative value of land to the development value is 13%. However, from an earlier discussion it will be recalled that the marginal income tax rate of the speculator has an important influence on the
effective cost of any nominal rate of taxation. If the speculator is assumed to be in a 50% marginal income tax rate bracket, the nominal rate of the land value tax will have to be 26%, or double, to have the same effect.

(a) Present Rate of Taxation

At the present time in the City of Vancouver, there are two assessment rolls, the general roll, against which a 15.6 mill tax rate is applied to yield the general purpose revenue and the school and hospital roll against which a mill rate of 30.8 is applied to yield school revenues and against which a .8 mill rate is applied to yield hospital revenues. The total taxes paid by owners of vacant land within the city is $1,608,062. The total rate at which vacant land is being taxes may be obtained by dividing this amount by the assessed value (equal to market value for general purpose tax) of the vacant land. The annual tax rate by this calculation represents .0285 of the market value of the land or 2.85% of the value of the land. Therefore to remove the speculative value of the land the tax rate would have to be raised by over 400% to affect a speculator who does not pay any income taxes and by over 900% to affect a speculator whose income is taxed at a marginal rate of 50%.

(b) The Shift to Land Value Taxation

A first step in raising the tax on land is to change the base of taxation from land and improvements to land alone. Losing the revenues obtainable from taxing
improvements means that the tax rate on the remaining land assessment must be increased, if the pre-shift level of revenue is to be maintained. The mill rate which would yield revenues from land equal to the revenues now obtained by taxing land and improvements may be found by dividing the total tax revenues ($104,050,128) by the total land assessment ($1,843,747,021) (from the general purpose roll). The new mill rate of 56.4 is equivalent to 5.64% of the market value of the land. It can be seen that merely shifting the base of the real estate tax to land is not enough to remove the speculative value of land. The tax rate still must be substantially increased (from 5.64% to 13.00% or 26.00%, depending on the income tax assumption).

5.3 The Shift in the Burden of Taxation With a Shift to Land Value Taxation

In Chapter IV, it was shown that properties with low improvement to land ratios or total value/land value ratios lower than the average total value/land value ratio for all properties in the taxing jurisdiction would bear increased tax bills if revenues formerly earned by a tax on improvements and land were to be earned from a tax solely on the value of land. These relationships are summarized for the City of Vancouver in Table V.\textsuperscript{5}

If land and improvements were taxed at their full value, the average total value/land value ratio is 2.17/1. This means that all those classes of land-use with total value/land value ratios of less than 2.17 will experience
<table>
<thead>
<tr>
<th>Property Class</th>
<th>Land Assessment</th>
<th>Improvement Assessment</th>
<th>Total Assessment</th>
<th>Improvements as % of Land Value</th>
<th>Total Value/Land Value Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Vacant</strong></td>
<td>56,290,388</td>
<td>--</td>
<td>56,290,388</td>
<td>--</td>
<td>1/1</td>
</tr>
<tr>
<td><strong>Residential</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Family</td>
<td>967,604,029</td>
<td>706,368,421</td>
<td>1,673,972,450</td>
<td>73.00</td>
<td>1.73/1</td>
</tr>
<tr>
<td>Duplex &amp; Equiv.</td>
<td>54,256,867</td>
<td>49,075,267</td>
<td>103,332,134</td>
<td>90.45</td>
<td>1.90/1</td>
</tr>
<tr>
<td>Conversions</td>
<td>50,430,478</td>
<td>38,661,967</td>
<td>89,092,445</td>
<td>76.66</td>
<td>1.76/1</td>
</tr>
<tr>
<td>Combined with</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>21,109,960</td>
<td>46,369,920</td>
<td>67,479,880</td>
<td>219.66</td>
<td>3.18/1</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>2,188,350</td>
<td>81,245</td>
<td>2,269,603</td>
<td>3.71</td>
<td>1.03/1</td>
</tr>
<tr>
<td><strong>Residential Total</strong></td>
<td>1,095,589,692</td>
<td>840,556,820</td>
<td>1,936,146,512</td>
<td>76.72</td>
<td>1.76/1</td>
</tr>
<tr>
<td><strong>Apartments</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>159,587,742</td>
<td>423,778,945</td>
<td>583,366,687</td>
<td>265.55</td>
<td>3.65/1</td>
</tr>
<tr>
<td><strong>Business</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>382,211,773</td>
<td>605,966,827</td>
<td>988,178,600</td>
<td>158.54</td>
<td>2.58/1</td>
</tr>
<tr>
<td>Industrial</td>
<td>150,067,426</td>
<td>291,755,726</td>
<td>441,823,152</td>
<td>194.42</td>
<td>2.94/1</td>
</tr>
<tr>
<td><strong>Business Total</strong></td>
<td>532,279,199</td>
<td>897,722,553</td>
<td>1,430,001,752</td>
<td>168.66</td>
<td>2.68/1</td>
</tr>
<tr>
<td><strong>Total Taxable</strong></td>
<td>1,843,747,021</td>
<td>2,162,058,318</td>
<td>4,005,805,339</td>
<td>117.26</td>
<td>2.17/1</td>
</tr>
</tbody>
</table>
increased tax burdens with a shift to the land value tax. All residential classes of land-use excepting the category "combined with commercial" would be expected to pay more taxes if the base of taxation were shifted from land and improvements to land alone. Those land-uses whose total value/land value ratios are above 2.17 (commercial, industrial and apartments) would be expected to pay less tax after the shift to land value taxation.

Taking the mill rate, 56.4, which yields revenues equal to the total tax revenues for the city (including general purpose, school and hospital, and excluding local improvements and water rates) when applied to the total assessed land value (general purposes) and applying it to the land assessment values of each individual property class (thus giving the tax payable by each class under the land value tax) and comparing this value to the amount of taxes payable by each property class under the existing system, an idea is gained of the shifts in burden that occur when a tax, previously raised from land and improvements is raised solely from land values.

As was expected (from the calculation of the ratios) those properties with total value/land value ratios lower than the average ratio faced increased tax bills after the shift. As expected, vacant land with the lowest total value/land value ratio, suffered most from the shift to land value taxation.
Perhaps the most significant finding (while obvious from the data presented in Table V) is the refutation of a generally held belief that a shift from a tax on land and improvements to a tax on land alone will shift the burden of property taxation from residential land uses to commercial and industrial land uses. In the City of Vancouver, at least, the shift is largely in the opposite direction. While apartments and dwellings "combined with commercial" would pay less tax under the shift, all other forms of residential dwellings would pay more. Perhaps most significant is the 27.6% increase in taxes which would be paid by the largest group of property taxpayers, the single family home owners (41.1% of all property taxes paid in the City of Vancouver in 1973 were paid by this group) (see Table VI).

5.31 The Effect of the Shift on the Single Family Home

The average single family home (found by dividing total taxes incidence to single family residences by the number of single family properties) in the City of Vancouver in 1973 is one whose land is assessed at $13,131 and whose improvements are assessed at $9,586 (total taxable value is $20,320). Total annual taxes payable by this "average" homeowner (including general, hospital, and school taxes, excluding local improvements and other charges) are $581 ($381, if the homeowner is eligible for the $200 provincial homeownership grant). Under a system of taxation in which revenues
# TABLE VI

The Shift in Property Tax Burdens in the City of Vancouver Following a Shift in the Base of Taxation from Land and Improvements to Land Alone

<table>
<thead>
<tr>
<th>Property Class</th>
<th>Pre-Shift Tax Payable</th>
<th>Land Assessment (General Purposes)</th>
<th>After Shift Tax Payable</th>
<th>$ Change in Tax Burden</th>
<th>% Change in Tax Burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacant</td>
<td>1,608,062</td>
<td>56,290,388</td>
<td>3,174,777</td>
<td>1,566,715</td>
<td>+97.4</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Family</td>
<td>42,755,875</td>
<td>967,604,029</td>
<td>54,572,867</td>
<td>11,816,992</td>
<td>+27.6</td>
</tr>
<tr>
<td>Duplex &amp; Equiv.</td>
<td>2,596,542</td>
<td>54,256,867</td>
<td>3,068,087</td>
<td>471,545</td>
<td>+18.7</td>
</tr>
<tr>
<td>Conversions</td>
<td>2,251,202</td>
<td>50,430,478</td>
<td>2,844,278</td>
<td>593,076</td>
<td>+26.3</td>
</tr>
<tr>
<td>Combined with Commercial</td>
<td>1,595,618</td>
<td>21,109,960</td>
<td>1,190,601</td>
<td>-405,017</td>
<td>-25.0</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>64,229</td>
<td>2,188,358</td>
<td>123,423</td>
<td>59,194</td>
<td>+27.6</td>
</tr>
<tr>
<td>Residential Total</td>
<td>49,269,466</td>
<td>1,095,589,692</td>
<td>61,791,258</td>
<td>-12,521,792</td>
<td>+25.4</td>
</tr>
<tr>
<td>Apartments Total</td>
<td>13,632,721</td>
<td>159,587,742</td>
<td>9,000,748</td>
<td>-4,631,197</td>
<td>-33.9</td>
</tr>
<tr>
<td>Business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>25,160,562</td>
<td>382,211,713</td>
<td>21,556,740</td>
<td>-3,603,822</td>
<td>-14.3</td>
</tr>
<tr>
<td>Industrial</td>
<td>11,809,655</td>
<td>150,067,426</td>
<td>8,463,802</td>
<td>-3,345,853</td>
<td>-28.3</td>
</tr>
<tr>
<td>Business Total</td>
<td>39,539,128</td>
<td>532,279,199</td>
<td>30,020,546</td>
<td>-9,518,582</td>
<td>-24.1</td>
</tr>
<tr>
<td>Total Payable</td>
<td>104,050,128</td>
<td>1,843,747,021</td>
<td>103,987,331</td>
<td>62,797</td>
<td>.06</td>
</tr>
</tbody>
</table>

1Column does not balance because taxes on machinery and utilities have been omitted.

2Rounding error.
formerly obtained from the taxation of land and improvement values, are raised by taxing land alone at 56.4 mills (the rate necessary to generate the 1973 City of Vancouver revenues) the average taxpayer would be liable to pay $740, an increase of $159 annually. It can be seen from this example that a shift to land value taxation has a significant effect on a large, powerful group of taxpayers; the single family homeowners. The importance of this effect is magnified when (returning to the central theme) it is realized that the 56.4 mill rate that produced these substantial shifts in burden are only \( \frac{1}{3} \) to \( \frac{1}{4} \) (depending on the marginal income tax rate assumed for the speculator) of the land value tax rate needed to reduce the present speculative value of the land to the present development value.

5.4 Shifts in Tax Burden When Land is Taxed At a Rate Necessary to Reduce Speculative Land Value to Development Land Value

In order to show the shifts in burden which occur when land is taxed at a rate necessary to reduce the speculative value of land to the development value, a mill rate of 130 (13% of land value) (assuming no taxable income for the speculator) and at 260 mills (assuming a 50% marginal income rate for the speculator) was applied to the assessed values for land in each land use class. The results of this analysis appear in Table VII.

It can be seen from Table VII that even at the low marginal income tax rate assumption, large increases in tax
TABLE VII

The Shift in Property Tax Burdens in the City of Vancouver Following a Shift from the Present Tax Base and Mill Rate To a Land Tax Base and a Mill Rate Sufficient to Reduce the Speculative Value of Land to the Development Value of Land

<table>
<thead>
<tr>
<th>Property Class</th>
<th>Pre-Shift Tax Payable</th>
<th>After Shift Tax Payable (@ 130 Mills)</th>
<th>% Change in Tax Burden</th>
<th>After Shift Tax Payable (@ 260 Mills)</th>
<th>% Change in Tax Burden</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vacant</td>
<td>1,608,062</td>
<td>7,317,775</td>
<td>+355</td>
<td>14,635,500</td>
<td>+810</td>
</tr>
<tr>
<td>Residential</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single Family</td>
<td>42,755,542</td>
<td>125,788,523</td>
<td>+194</td>
<td>251,577,047</td>
<td>+488</td>
</tr>
<tr>
<td>Duplex &amp; Equiv.</td>
<td>2,596,542</td>
<td>7,053,392</td>
<td>+171</td>
<td>14,106,785</td>
<td>+438</td>
</tr>
<tr>
<td>Conversions</td>
<td>2,251,202</td>
<td>6,555,962</td>
<td>+191</td>
<td>13,111,924</td>
<td>+482</td>
</tr>
<tr>
<td>Combined with Commercial</td>
<td>1,595,618</td>
<td>2,744,294</td>
<td>+72</td>
<td>5,488,588</td>
<td>+243</td>
</tr>
<tr>
<td>Miscellaneous</td>
<td>64,229</td>
<td>284,486</td>
<td>+342</td>
<td>568,972</td>
<td>+785</td>
</tr>
<tr>
<td>Residential Total</td>
<td>49,269,466</td>
<td>142,426,659</td>
<td>+189</td>
<td>284,853,319</td>
<td>+477</td>
</tr>
<tr>
<td>Apartments Total</td>
<td>13,632,721</td>
<td>20,746,406</td>
<td>+52</td>
<td>41,492,812</td>
<td>+204</td>
</tr>
<tr>
<td>Business</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial</td>
<td>25,160,562</td>
<td>49,687,530</td>
<td>+97</td>
<td>99,375,060</td>
<td>+294</td>
</tr>
<tr>
<td>Industrial</td>
<td>11,809,655</td>
<td>19,508,295</td>
<td>+65</td>
<td>39,017,530</td>
<td>+230</td>
</tr>
<tr>
<td>Business Total</td>
<td>39,539,128</td>
<td>69,196,295</td>
<td>+75</td>
<td>138,392,591</td>
<td>+250</td>
</tr>
<tr>
<td>Total Payable</td>
<td>104,050,128</td>
<td>239,687,112</td>
<td>+130</td>
<td>479,374,224</td>
<td>+360</td>
</tr>
</tbody>
</table>
burdens occur for all classes of property, with vacant land experiencing the largest increases in taxes and commercial and industrial properties suffering least. (It should also be noted that total city revenues have more than doubled under the 130 mill tax rate and more than quadrupled under the 260 mill tax rate.)

5.41 The Effect on the Average Single Family Home

The average single family home was again hit hard by the increase. The same home discussed before with land assessed at $13,131 that paid total taxes of $581 under the existing system would pay taxes of $1,707 (per year) when its land is taxed at 130 mills (the rate needed to reduce the present speculative value for land to the present development value) (assuming zero taxable income for speculators). The rate necessary when the speculator's income is taxed at a marginal rate of 40% (260 mills) increases the tax payable by this average home from $581 (under existing taxing arrangements) to $3,414 (assuming no home ownership grant).

5.5 Summary - Shifts in Burdens of Municipal Taxation

The purpose of this chapter was to examine the consequences of attempting to lower the price of land (from the speculative value to the development value by raising the tax on land values). Since an effective rise in the rate of taxation of land is accomplished by shifting the base of the land and improvements to land alone (when revenues are held
constant) this change was the first step. Since this shift did not raise the tax rate on land sufficiently to reduce its price from the speculative value to the development value, the tax was then raised to a level which would accomplish this price change under two different assumed marginal income tax rates for the speculator.

The effect of the shift from the tax on improvements and land to land alone was to redistribute the burden of the property tax, increasing the burden on vacant and residential land while decreasing the burden on apartment, commercial and industrial land. As the tax was raised to the level necessary to remove the speculative value of land, large increases in the tax payable by all land-use classifications occurred.

The upshot of this discussion is that even if increasing the tax on land does decrease land prices by removing the speculative return to holding land, it must be realized that this goal is not accomplished without substantial increases and shifts in the burden of municipal taxation.

5.6 Limitations of the Analysis

The principle limitations of the conclusions reached from the preceding analysis, occur when an attempt is made to apply the findings to cities other than Vancouver.

From the model, it can be seen that the change in the rate of land value taxation (thus the shift in the burden of the tax) needed to effect the changes in land
valuation, depend on the rate of land value appreciation, the present tax and the speculator's discount rate.

Cities experiencing lower rates of land value appreciation, or already taxing land at higher rates than Vancouver, will require smaller increases in the rate of land value taxation needed to achieve a similar effect (to Vancouver) on speculators.

In addition, the structure of the city, that is the proportion of land use in each category, may have an influence on the shifts in the burden that occur with an increase in the rates at which land is taxed. However, while it might be said that Vancouver as a central city is not representative of "average" city structure, evidence shows that a similar shift in burden of taxation may be expected to occur in suburban areas.

Probably the most serious limitation, is the selection of a single speculator discount rate. As noted in Chapter III, little is known about the diverse group of landowners collectively known as speculators. Without further knowledge of the characteristics of these individuals or of the group as a whole, it is impossible to determine with assurance, the actual number of speculators which would be influenced enough by any given increase in the rate of land value taxation, to put their land onto the market.

Relatedly, it must be said that the selection of the single rate of taxation increase, relegates the effect
to an "all or nothing" proposition. With a range of rates and knowledge of speculators, it might be possible to predict the amount of land that would come onto the market under variable tax rate increases.
Chapter V - Notes and References

1 All statistics relating to land values were obtained from issues of *Real Estate Trends*, published annually by the Greater Vancouver Real Estate Board.


4 All statistics relating to assessments, rates of taxation and municipal revenues were obtained from a report published by the Department of Finance, of the City of Vancouver.

5 Since improvements are only taxed at 75% of their assessed value the relevant ratio of which to speak when considering the shift in burden is the total taxable value/land value ratio.


6.1 Introduction

In this thesis, it has been shown how the levying of an increased land value tax can help to solve the problem of a housing shortage and urban sprawl, by decreasing the profitability and thus the incidence of land speculation. Some of the questions that have arisen during the course of this study are:

(1) Are the goals (e.g. reduction of the shortage of housing and urban sprawl) which the tax will be used to achieve, worthwhile goals for society to pursue?

(2) Are the problems (the housing shortage and urban sprawl) the result of land speculation?

(3) If the answer to question two is "yes," is an increased land value tax the most effective means of accomplishing the goals?

(4) If the answer to question two is "no," what alternative policies may be used to accomplish these goals?

It is the purpose of this chapter to examine the worth of the land value tax by attempting to answer these four questions for the two policy issues (urban sprawl and the housing shortage).
6.2 Unearned Increment

However, before getting into that discussion it is necessary to digress, for a moment, to say a few words about a property of the land value tax, which although mentioned at the outset of the thesis, was not part of the mainstream discussion. The issue is the unearned increment of land values and the tax's property for recovering this increment for the public coffers.

The unearned increment has been a contentious issue, at least since the time of Henry George. It has caused considerable debate, especially in times of rapid urban growth when land prices are rising most quickly. There can be little doubt that during such periods, land prices do rise quickly and so make possible capital gains by those who hold land through the period. The question of whether the increment is unearned or not is a more difficult one to answer.

A capital gain is made by a landowner whose property suddenly leaps in value with the announcement of the construction of a new road which makes his land more accessible and so more desirable as a location for a new suburb, and is, in all likelihood, an unearned increment. The landowner has not made any investment to earn this increment. His only action was to be in the right place at the right time.

However problems arise when increments occur that are not due to public expenditures but due to private investments. Taking the same landowner, for example: Would not
the increment in property value be unearned if the value of his land rose in response to the announcement of a new shopping centre planned near his land? Would he be forced to compensate the member of the public (the shopping centre developer) most responsible for the increase in the value of his property? Whatever the answer may be, the point is that questions of the determination of what is or what is not an unearned income and if an increment is unearned by the property holder, who did earn it? are difficult questions to answer in a world in which the level of interdependence means that practically every economic action confers some external economy or diseconomy.

The second point which has been made before in this thesis, is that while taxing the value of the land of a landowner will most certainly recover the unearned increment for the public, there is no guarantee that the increment was earned by the landowner paying the tax. This particularly is true if the tax is implemented at a later stage in a city's development or if it is implemented immediately following the purchase of the land by the landowner.

A further problem occurs if differences in motives of owning land have bearing on the designation of an increment as earned or unearned. Is the profit earned by a sharp speculator on an acre of vacant suburban land, the same sort of unearned increment as the paper profit earned by the owner of a house who has no intention of "cashing in" but merely is interested in living in his own home?
Finally, the designation of the gain made by the speculator (as mentioned before), is only unearned if society values the service provided by the speculator, less than the amount which the speculator earns from the provision of this service. As stated before, the value of speculation in a product or resource is the stabilization of its price through the equation of societal preferences through time. These are difficult services to which to attach a value.

As noted in Chapter I, the existence of a monopolistic market structure may be a critical factor in determining whether the speculator's profit is earned or unearned. If a single landowner or group of landowners does have control over the market, there is reason to believe that speculative returns may be greater than the service provided. This has implications for the choice of the means by which to recover the unearned increment. From Chapter II it will be remembered that a tax on a monopolist will tend to be shifted forward to the user of the product. Thus, a land value tax on a monopolistic landowner may, in reality, be passed directly on to the ultimate user of the land (consumer of housing).

The preceding discussion has, hopefully, outlined some of the problems of defining and recovering the unearned increment. While it is difficult to come to any conclusions on the normative issue of recovery of the unearned increment,
it is easier to make an evaluation of the effectiveness of the tax in accomplishing the goal.

There are two problems in addition to the problem of taxing the monopolist, in using this method of recovering the unearned increment. First, since the tax is levied on the assessed value of the property there is no way it can distinguish between the hard cash increment earned by the land dealer and the paper profit of the homeowner. Secondly, land is not the only commodity which is capable of earning a capital gain, or unearned increment for its owner. Capital gains occur whenever there is a rent or quasi-rent associated with the use of a resource or product (this occurs frequently with other resources or durable goods). Therefore, to tax capital gains earned from land while not taxing those gained from other goods seems to be inconsistent.

A policy device for recovering the unearned increment, that avoids these pitfalls is the capital gains tax. The tax on capital gains has the advantage of being non-discriminatory (neutral in effects among incomes gained from different types of capital gains). While a distortion may be created between incomes earned as a result of capital gains and income earned in other ways, it would not single out the gains made through increases in land values for special treatment.

Secondly, through the use of the capital gains tax to recover unearned increment, it is possible to separate the
paper profits from the cash profits. Since the tax is levied only at the time of sale, it does not force a homeowner to sell his house in order to be able to pay the tax.

6.3 The Housing Shortage

There are few people in the Vancouver area who are not aware of the extreme shortage of housing. Zero vacancy rates, and rapidly rising rents and property values are evidence of a demand for housing that has overwhelmed the supply capacity of the housing industry. Therefore the normative question of whether or not to increase the supply of housing may probably be answered without much disagreement: Yes, something should be done about the shortage of housing.

6.3.1 Effects of Tax

Since the tax's main effect is to reduce the speculative value of land, the effectiveness of the tax in reducing the housing shortage depends upon what proportion of the housing shortage is due to the hoarding of land by speculators and on the effectiveness of the tax in pushing this land onto the market. An increase in the importance of the role of land speculation in creating the housing shortage or an increase in the effectiveness of a tax on land value in eliminating speculation will increase the effectiveness of the tax in reducing the shortage of housing.

It will be remembered from Chapter III, that the amount of housing produced is determined by the decisions of
numerous participants in the land conversion process (of which the speculator is one), who are influenced by a variety of factors (of which taxation is one). Thus if the amount of housing produced is influenced more by market participants other than the speculator or these participants are affected more by factors other than property taxation, it is likely that policies other than an increased land value tax will have a greater effect on the reduction of housing shortage.

6.32 Causes of the Shortage

There can be little doubt that part of the shortage of housing is due to the increased demand for housing that has occurred in Vancouver as a result of heavy in-migration, rising incomes, and increases in net household formation, and age characteristics of the population.\(^1\) To compound problems, changes in financial conditions have enabled more people to purchase more housing.

The drop in mortgage rates in 1971, combined with a general surplus of funds, significantly increased the buying power of the average family.\(^2\)

It seems then, that as long as migrants continue to arrive in Vancouver, and incomes (either conventional, increases in wages and salaries or effective through changes in the cost or availability of capital) continue to rise and as long as life-style preferences encourage increases in net household formation, it may be expected that demands for housing will continue to rise in the future.
If public policy is unable or unwilling to decrease demands for housing by instituting policies that would decrease the number of migrants coming into the area, decrease incomes or tamper with the tastes and preferences of housing consumers, the only alternative is to implement policies which will increase the quantity of housing supplied.

In Chapter III it was shown that the quantity of housing supplied by builders and developers is closely related to the profitability of producing housing. It was shown how decreases in the cost of capital or increases in the availability of capital, affect the quantity of building that is carried out. Goldberg's study found developers not only to be sensitive to financial conditions but also to a variety of factors influenced by public policy. These included zoning regulations and the availability of servicing. Goldberg went on to mention the importance of time lags from project conception to completion that are caused by increased public intervention into the development process. Since developers usually have high opportunity costs of capital, these delays reduce the profitability of development and are most likely to reduce the amount of housing produced.

Another factor, influencing the amount of housing that is produced is the municipality's attitude toward increased growth. It seems that the existing populations are hesitant to see their communities grow any larger than they
are at the present. This reluctance may be attributed to
the realization on the part of these municipalities that
increases in population mean increases in municipal costs
for the provision of the additional hard and soft services
necessary to serve these increases in population. It has
been argued by developers that no-growth policies are being
implemented by methods (charging of high impost charges)
which act to discourage residential development by reducing
the profitability of producing housing. (Because of the
seemingly inelastic demand for housing, these policies more
likely result in an increase in the cost of housing, as the
developer passes the increased cost on to the consumer of
housing.)

6.33 Policy Alternatives

It seems then, that if the above mentioned factors
are indeed obstacles to the production of adequate quantities
of housing, the implementation of the following policies may
help to increase the supply of housing.

(1) Planning to ensure that adequate land is
zoned for residential demands.

(2) Increasing expenditures on infrastructure
investment to make available more serviced
land for residential development.

(3) Streamlining the municipal approval processes
to avoid costly delays that reduce the amount
of housing being produced.

(4) Establishing cooperation among municipalities
to determine the appropriate shares of re-
gional growth so as to minimize the incidence
of individual attempts to halt growth by
instituting policies which act to reduce the
amount of housing supplied by developers.
(5) Establishing programs to ensure adequate capital is available to developers producing houses.

6.4 Urban Sprawl

The arguments as to the appropriate pattern of land use were briefly presented in Chapter I. The most commonly heard arguments against the "scatteration" type development were listed as (1) the high costs of servicing this type of development, and (2) the waste of resources that occurs while the land is in storage. The strongest arguments for this spatial pattern of development are that it (1) provides needed open space, and (2) provides flexibility of adaptation to future change. It is difficult in the space available to make an adequate assessment of the advantages and disadvantages of this type of development. However, the argument of providing flexibility for change has a strong appeal (to this author) and probably merits more intensive study.

When considering this problem, an important question becomes, whether or not there exist patterns of development that provide a similar degree of flexibility and open space (as scatteration) without the high servicing costs of this pattern of development. It seems probable that some of the costs of such types of development could be reduced by promoting a degree of infilling which would not substantially reduce the possibilities for adaptation in the future, and which under careful development controls would provide
adequate amounts of open space.

How effective a land value tax would be in fostering the development of these "leapt-over" areas depends on the degree to which this pattern of development is due to the influences of land speculation and how effective the tax is in encouraging speculators to sell their land to developers.

6.41 Causes of Sprawl

As the quantity of housing produced can be related to the profitability of producing housing, so can the spatial distribution of land developed, be related to the profitability of developing individual parcels of land. Developers, seeking to maximize profits, will tend to develop those lands which offer the probability of the highest profit. While the asking price of the speculator, which the tax is designed to lower, is an important factor in the determination of the profitability of developing a particular parcel of land, it is only one of many factors.

(a) Dead Lands

A certain proportion of the potential infill land in any municipality remains undeveloped for a variety of physical or institutional reasons, that decrease the profitability of developing the lands. These factors may include small or irregular shaped lots, tax delinquencies, clouded titles or obsolete subdivision designs. A study done for the Greater Vancouver Regional District found 45\% of a small sample of potential infill sites to have small or irregular
shaped lots. Developers will pass over these "dead lands" to develop other more profitable lands.

(b) Public Policy

As public policies can have an influence on the total profitability of developing land so public policies are responsible for differences in the profitability of developing different parcels of land.

An obvious example is the case where the municipality in which the urban core is situated, fails to provide adequate amounts of residentially zoned land for expansion. Developers are forced to jump land designated for other purposes to a municipality further from the core to secure land with the proper zoning.

Second only to proper zoning in location factors deemed necessary for profitable development by developers (as shown by Goldberg's study) is the availability of serviced land. Areas of developable residential land will be skipped over by developers if access to trunk sewers or water lines is not available.

As noted earlier in the discussion of the total amount of land that is developed, an anti-growth policy which manifests itself in such profit reducing devices as high impost charges may encourage developers to skip over lands in these municipalities in search of more profitable opportunities, perhaps further from the core.
If consumers of housing are also consumers of transportation facilities and seek to minimize total costs of housing and transportation, increases in transportation investment which decrease travel times from more distant areas and so reduce the total costs of living at a distant location relative to the costs of living in a position nearer to the urban core, will tend to increase the desirability of more distant locations (assuming that this accessibility is not completely capitalized into the price of the more distant land). This means that distant locations are more profitable to be developed by the developer. Thus discontinuous development is encouraged.

It is necessary, not only to consider the effects of municipal policy but also the effects of the policies of higher level governments. If for example, land prices near the core cause housing prices to exceed maximum limits for government guaranteed mortgages (C.M.H.C. $25,000 limit) consumers will tend to locate further from the core where land prices are less in order to secure the advantages of a government guaranteed loan.

(c) Independent Decision-Makers

Perhaps as important in determining the differences in the profitability of developing one parcel of land relative to another as the physical and public policy influences, is the heterogeneity of the owners of the vacant land. As discussed in Chapter III, the value placed on a piece of land
thus the price asked for by the landowner is a function of a variety of factors including the landowner's motivation for holding land, his opportunity costs of capital, his income time preferences, his income, his liquidity and his expectation of future rates of land value appreciation. Differences in these characteristics that are responsible for land valuations of some landowners being higher than developer valuations have a significant influence on which land becomes developed.

6.42 Policy Alternatives

If it is accepted that the reason for sprawl is that the profitability of developing more distant land is higher than the profitability of developing land which is closer to the core, then it seems that policies designed to increase the profitability of passed over land or decrease the profitability of more distant land will promote a non-sprawl type development. Policies other than increasing the tax on land values which would tend to remove this differential include:

(1) The use of municipal expropriation powers to assemble small or irregular shaped lots into usable development tracts.

(2) The rezoning of potential infill land for the use for which there is the greatest demand.

(3) The provision of adequate municipal services to potential infill sites.

(4) The adjustment of sprawl inducing policies of higher levels of government.
The provision of information systems to decrease differences in land valuations among landowners.

6.5 Land Value Taxation and Speculation

In the preceding two sections of this chapter, it was argued that, while speculation in land is a possible cause for both the problem of the housing shortage and urban sprawl, there are other factors that may be responsible for both of these problems. Policies to correct both problems were suggested to deal with the different causes of the two problems.

If, however, in the end, the problems specified are still seen to be caused by speculation in land and the benefits of this speculation are seen to be outweighed by the costs of the problems it creates, the remaining question to be asked of the land value tax is: Is the land value tax the most efficient means by which to decrease the speculation in land?

In Chapter V, the costs of applying a tax to all land at the rate necessary to remove the speculative value of land were shown to be high. One means of discouraging speculation in land which already has been mentioned is to increase the rate at which capital gains are taxed.

However, the capital gains tax like the general land value tax and all general taxes will probably induce secondary effects which may be undesirable (e.g. reduction of the incentive to invest in all sectors of the economy).
6.51 **Tax on Vacant Land**

If society is concerned with a specific problem, it makes sense to deal with it in a specific manner with a policy device which is able to hit hard at the problem while causing a minimum of adverse side-effects. If the problem is defined to be the withholding of vacant land from the housing production process, why not implement a policy specifically designed to influence the holders of vacant land? Instead of implementing a general land value tax increase which, if levied at the rate necessary to affect the landowners, causes substantial shifts in the burden of municipal taxation, why not (if taxation is the policy vehicle to be used) increase the tax on vacant land only. While there may be difficulties in defining what actually is vacant land and other problems in designating lands which are most suitable for development, this type of policy would have a far greater impact on landowners with fewer adverse side-effects than a general land-value tax.

6.6 **Conclusions - Directions for Further Research**

As the research for this thesis progressed, it became clear to the researcher that the original question of the usefulness of the land value tax as a policy device to ease the housing shortage and reduce the incidence of urban sprawl of large cities was merely the tip of a planning iceberg which when uncovered, was seen to be based on a myriad of conflicting beliefs and assumptions.
Not only was disagreement found to exist with regard to the effectiveness of the tax in achieving the two goals, but disagreement was also seen to occur even over the desirability of one of the goals itself.

Given that the reduction of sprawl and the increasing of the supply of housing are desirable societal goals, further disagreement occurred over the nature of the cause of these two problems. Much of this disagreement can be traced directly to the failure to fully comprehend the nature of the land conversion process. As mentioned before, in order to evaluate the effectiveness of the tax it is necessary to know:

1. the importance to the final outcome of the land conversion process (quantity and location of housing produced) of the decisions of the speculator, relative to the importance of the decisions of other participants.

2. the importance of the effect of the tax, relative to the effects of other government policies affecting either the speculator or other participants.

3. the secondary effects of various policies designed to influence the outcome of the process.

To answer these questions it is necessary to examine more closely, the decision-making processes of the participants involved in the land conversion process. Specific studies that might be initiated include:

1. A study to determine the magnitude and nature of the demand for housing.

2. A study to determine the capacity of the housing industry to meet this demand.
(3) A study to determine the effects of various public policies (e.g., providing more serviced land) on the amount of housing supplied by developers.

(4) A study to determine the nature of the speculator in the market. Who are the landowners? What are their characteristics? Are there monopolistic landowners in the market?

(5) A study to determine the secondary effects induced by the various public policy devices designed to modify the outcome of the housing production process.

Finally a question which has not been directly addressed in this study is: Should municipal taxation, whose original purpose was to raise revenue for municipal services, be used to perform a planning role which may be better filled by other methods?
Chapter VI - Notes and References

3 M.A. Goldberg, op. cit., p. 88.
4 Ibid.
5 Vancouver Sun, Monday March 4, 1974, "Municipal Levies Hike Home Costs."
6 Goldberg, op. cit., p. 89.
8 Thompson, Berwick and Pratt, op. cit., p. 20.
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