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FISCAL ZONING IN
CANADIAN CITIES

by

© Raymond Boyce, B.Comm., M.A., M.U.P.

A thesis submitted to the Faculty of
Graduate Studies and Research in partial fulfilment
of the requirements for the degree of
Doctor of Philosophy

Department of Economics

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ABSTRACT

This dissertation examines the fiscal motives which induce communities to employ restrictive land use controls. The objectives of the paper are to determine whether or not fiscal zoning is an empirically relevant phenomenon in Canadian cities and, more specifically, whether changes in the fiscal circumstances of communities, due to higher level government grants and reorganization of local government structures along metropolitan lines, are likely to influence zoning policies.

Our inquiry into this subject is prompted by serious conceptual problems with, and lack of strong statistical support for, the traditional rationale for zoning, namely, the control of externalities arising from the proximate development of 'incompatible' land uses. Canadian cities provide an interesting context within which to examine the issue of fiscal zoning, for they have experienced important changes in fiscal circumstances which, according to the fiscal rationale for zoning, would be expected to influence their zoning behaviour.

Our analysis is conducted in two stages. First we present a basic model of fiscal zoning and then modifications to that model which consider the implications for zoning of provincial grants and metropolitan government.

In the second stage of our analysis we test empirically hypotheses derived from our fiscal zoning model.

Our empirical results for the Toronto-Centred Region provide strong evidence of a fiscal motive for zoning. We find that the less dependent a community is on property taxes as a revenue source, the greater is the variety of development which has occurred there. Similarly, we find that the greater the percentage of local revenues which is transferred to upper tier (metropolitan) governments in order to finance public service provision at those levels, the more varied is the community's development pattern. In other words, the less important is the local fiscal impact of new development the less restrictive is the community's zoning behaviour.

Our results for Vancouver and Montreal are less significant than those for Toronto. Several explanations for these results are offered.

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INTRODUCTION

The rationale for municipal zoning controls has been the subject of considerable analysis in recent years. Emphasis on the prevention of negative externalities arising from the proximate development of dissimilar land uses, 'externalities zoning', has diminished and greater attention is being paid to the fiscal implications for communities of controlling their development, 'fiscal zoning'.

Closer analysis of zoning in general and fiscal zoning in particular has been prompted by the observation in recent decades of highly exclusionary zoning practises in suburban municipalities in the United States. These practises have been noted in the popular press and have been the subject of numerous court cases.¹

It is believed by many observers² that the suburbs of major metropolitan areas need to be 'opened up' and that substantial benefits to society will result from doing so. Several adverse effects of the current situation are often cited in support of reform measures. Exclusionary zoning is seen as preventing central city lower-income groups from having access to increasingly suburbanized jobs; it is viewed as a means of promoting racial and class segregation; it

'bottles up' the poor in the central cities and contributes to central city decay; and, it causes distortions in consumption patterns, especially of housing.³

In support of the view that suburban development has been characterized by highly exclusionary zoning, it is noted that in the New York area as of 1960 nearly half the vacant land in the twenty-two county region was zoned for single-family housing on lot sizes of one acre or more.⁴ However, it is also true that 41.3 percent of the housing units constructed in New Jersey between 1960 and 1969 were in multifamily structures.⁵ Furthermore, over the period 1962-1970, 52 percent of all multifamily starts in sixty-three large standard metropolitan statistical areas (SMSAs) in the United States were located in suburban communities; in some cases, the suburban share exceeded 80 percent.⁶ Based on these construction figures, it would appear that initial zoning restrictions may not be an accurate guide to the future development pattern of a community. Such zoning may be substantially modified during the course of development in order to accommodate a variety of changed circumstances. Consequently, suburban communities may not be the exclusive

residential enclaves they are often thought to be. It is noteworthy that the Packs⁷ found little evidence of suburban socio-economic stratification in Pennsylvania metropolitan areas.

With reference to the Canadian case, a 1977 report⁸ noted that while Metropolitan Toronto satisfied approximately 50 percent of its low-income housing needs, the regional municipalities adjacent to it met only 8 percent of the identified need in those areas. These data suggest the presence of exclusionary zoning in the Toronto area.

Our examination in this dissertation of the fiscal motive for zoning in a Canadian context is prompted in part by this possibility of restrictive zoning controls in the Toronto area. On the other hand, municipalities in the Toronto area have experienced in recent decades significant changes in their fiscal circumstances due to increasing levels of provincial grants and the restructuring of local government, most notably along metropolitan lines. As analyzed in subsequent chapters, we expect such reforms to reduce municipal incentives to zone fiscally. Thus it is our purpose in this dissertation to determine if fiscal zoning is indeed an empirically

relevant phenomenon in a Canadian context and, more specifically, to examine the effects of provincial grants and metropolitan forms of government on municipal incentives to zone fiscally.

History of Zoning

In order to gain insight into the subject of fiscal zoning, we need to examine more closely the phenomenon of zoning itself. In the United States zoning has a long history, dating from New York City's comprehensive bylaw of 1916. In 1926 the constitutionality of zoning was upheld by the U.S. Supreme Court in the landmark case of Village of Euclid v. Ambler Realty Co., in which zoning was accepted as a legitimate exercise of the police power of the state.

The history of zoning in Canada is not as well-documented as in the American case. There does not appear to be any landmark case upholding the constitutionality of zoning in Canada. It seems that zoning has simply been accepted as a legitimate function of local government. In any case, it does not appear to be a wholly recent phenomenon in the country. Nader⁹ cites the example of Tuxedo, Manitoba (a suburb of Winnipeg prior to that city's reorganization in 1972) which had highly restrictive

controls residential lot frontages and floor areas following its incorporation in 1913. Goldberg and Horwood note that Canadian land use controls began at the turn of the century "with minimal building regulations governing frontage and set backs, along with some discretionary power to regulate use."¹⁰ In 1921 'districting' was implemented in Ontario and in 1927 zoning bylaws were introduced in Vancouver. "In general, most provinces adopted land use controls similar to the U.S. model, with significant innovations being brought into law after 1950."¹¹

Externalities Rationale for Zoning

A general presumption exists that the primary purpose of zoning is the prevention of negative externalities arising from the proximate development of 'incompatible' land uses. Were such land use conflicts permitted, the property values of higher-order uses (generally considered to be low-density residential) would be decreased by the presence of lower-order uses (generally considered to be industrial, commercial and apartment residential).

However, there is empirical evidence that conflicting land uses do not result in the reductions

in property values that they are alleged to. Studies by Crecine, Davis and Jackson¹² and by Rueter¹³ found this to be the case for Pittsburgh, while Maser, Riker and Rosett¹⁴ found little evidence of negative externalities in Monroe County, New York. Grether and Mieszkowski¹⁵ found that nonresidential land uses had no systematic effect on house values in New Haven, Connecticut.

Several explanations can be offered for these results. One that comes most readily to mind is that zoning has effectively controlled the location of externality-producing land uses so that adverse price effects from lower-order uses are minimized. Mills¹⁶ suggests that with all the resources devoted to zoning in the past fifty years it would be surprising if some of the most offensive land uses had not been kept out of residential areas. In the case of the Pittsburgh studies, though, it should be noted that most of the observed nonresidential uses, which were found to have no adverse effects on property values, were in place prior to the adoption of zoning ordinances in that city. Therefore, zoning cannot be considered responsible for the absence of externalities in Pittsburgh. A similar argument applies to 'nonconforming uses' in other study areas;

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there is little evidence to indicate that such 'offensive' uses reduce nearby property values.

The externalities rationale for zoning also assumes a degree of homogeneity of tastes among consumers which in fact may not exist. If instead there is heterogeneity of tastes, the case for negative externalities is less certain, at least for lower order uses which are similar to the predominant land use of the community. Thus it is not clear that development of semi-detached single-family houses (lower order) will adversely affect the value of detached single-family houses (higher order). Bish and Nourse note that the preferences of individuals at the margin determine market results and not average preferences; consequently, "...if citizens' tastes differ, postulated relationships based on average or planner tastes are not likely to be validated by the observation of market results."¹⁷

A final explanation for the observed absence of adverse external effects can be found in land use theory. The proximity of non-residential uses to residential uses may well enhance property values if the non-residential uses in question have desirable attributes. This would be the case for convenience stores, shopping facilities, employment centers and

even for highways because of the accessibility they provide. Residential uses adjacent to such non-residential uses may well experience negative externalities and consequent reductions in property values, but these effects may be more than offset by the positive effects on the property values of nearby, but non-adjacent, residential uses. This possibility could account for the failure of studies to find empirical support for negative externalities. Under this interpretation, negative externalities are present but are so highly localized, i.e. they are 'next-door' phenomena, that they are difficult to isolate statistically. In support of this notion, it is worth mentioning a statistic which is often cited in the zoning literature; Tideman¹⁸ calculated that the probability of a resident (of a Chicago suburb) participating in a zoning hearing decreased by one-half for each 79 feet of distance between his residence and the site of the zoning issue.

Even if we allow for the existence of negative externalities, the important question still arises whether zoning is the most effective way to deal with them. An expanding literature on zoning suggests that it is not and that instead greater reliance should be

placed on restrictive covenants and nuisance law procedures.¹⁹ It is increasingly believed that a great many land use conflicts can and should be resolved through private negotiations between the affected parties as influenced where necessary by court determinations of property rights and compensation levels. These issues are beyond the scope of the present paper, but it is important to note once again that they seriously undermine the validity of the externalities argument as a rationale for zoning.

In this vein some further comments on Village of Euclid v. Ambler Realty are in order. In that case the zoning ordinance, allegedly designed to protect a residential area from industrial development of nearby vacant land, reduced the value of that land by over \$300,000 (75 percent).

Undoubtedly, that amount is far more than that required to install the finest landscaping along Euclid Avenue [the boundary of the vacant land which bordered on the existing residential area] or compensate nearby property owners for the losses caused by an industrial use. Allowing Ambler Realty to landscape or compensate would probably have been a more efficient solution to the external cost problem.²⁰

It is also important to point out that a passage from the trial transcript suggests that the motive behind Euclid's zoning may not have been the prevention

of externalities in the first place. The Euclid decision states in part that:

The plain truth is that the true object of the ordinance in question is to place all the property in an undeveloped area of 16 square miles in a strait-jacket. The purpose to be accomplished is really to regulate the mode of living of persons who may hereafter inhabit it. In the last analysis, the result to be accomplished is to classify the population and segregate them according to their income or situation in life.²¹

Mills comments that: "[This judge] clearly perceived that the real purpose of the zoning under litigation was blatant exclusion, rather than legitimate protection against nuisances. Yet he felt unable to rule on the real motivations for the law."²²

Similarly, Nader focuses on the necessity of controlling externalities when he discusses urban planning, but switches emphasis when he turns to a discussion of municipal finance, stating that "Land use planning often has as its primary objective municipal tax-base balance"²³ and that "Although there are other elements involved, suburban municipalities zone out low-income housing primarily for fiscal reasons."²⁴

If the primary motivation for zoning were found to be exclusion of certain groups rather than the

control of externalities, it would be necessary to consider why the real reason for zoning was not openly admitted. The most plausible explanation, of course, is that open exclusion of people on the basis of income or race or ethnic origin would be held unconstitutional; on the other hand, exclusion of 'incompatible' land uses with which these groups are closely identified, such as smaller and denser dwelling units and jobs in 'heavy' industry, would be considered legal under the police power of the state to protect the 'health, safety, convenience, and welfare' of its (current) residents.

Fiscal Motive for Zoning

The above considerations suggest that the prevention of externalities may not be the major motivating force behind municipal zoning practises. The alternative rationale offered in the literature focuses on the fiscal circumstances of the community and views zoning as a means by which these may be improved. 'Fiscal zoning' may be defined as the intentional employment of land use controls to promote the improvement of the community's fiscal position, in the sense of minimizing the tax price associated with a given level of public services, or alternatively,

maximizing the level of services at a given tax rate. As such, this strategy differs significantly from an externalities approach to zoning, which seeks to preserve current property values through the exclusion of incompatible land uses. This latter strategy focuses on the potential externality effects of development on nearby properties, in contrast to the fiscal zoning strategy which considers the tax/expenditure effects of development on the entire community.

Of course, the presence of an externality, which lowers the property values of proximate housing, will have an indirect effect on the community's fiscal position because the tax rate will now be applied to lower-valued property in the neighborhood of the externality. However, the overall effect on the fiscal position of the community arising from this localized effect is likely to be of only minor importance.

In a somewhat different vein, however, Fischel asserts that

...any technical externality could be offset by some fiscal expenditure, thus making it a fiscal externality. The effects of a factory might be offset by appropriate construction of barriers, planting of trees, rebuilding roads, etc., all financed by the public sector. Avoidance of such expenditures by zoning is just as surely fiscal zoning as avoidance of...

additional school expenditures is. The distinction may be an attempt to distinguish between technical and pecuniary externalities, but it should be clear from the preceding discussion that "fiscal zoning" may apply to either.²⁵

While Fischel's statement is technically correct, it fails to distinguish between direct and indirect effects on public expenditures and taxes arising from development. The important issue of the degree of fiscal impact is involved here. Furthermore, while Fischel's 'avoidance expenditures' could conceivably be quite substantial, it is not obvious how they would be objectively determined, since they would be largely influenced by neighbors' perceptions of harm suffered. Nor would the city necessarily be obliged to protect all injured parties from such perceived nuisances. Although externality-reducing expenditures are not unheard of, extensive compensation of this nature is not a generally accepted function of local government. In the traditional fiscal zoning case, on the other hand, it is rightly assumed that the city is obliged to extend the given level of community service to all newcomers. Fischel's opinion is the only example of this view found in the literature. In contrast, the separation of 'externalities' and 'fiscal' motives is found frequently.

Examination of the fiscal motive for zoning has special relevance for the reform of exclusionary zoning practises. Metropolitan forms of government, higher levels of state and federal aid to municipalities, and assumption of local service provision and financing by higher level governments have all been advocated as means by which local land use development can become more inclusionary. These reforms will only be effective, however, to the extent that local communities do in fact practise fiscal zoning. In addition, the role of these reforms in alleviating fiscal pressures on local governments will depend on how they are structured and implemented.

It should be stated at the outset that the term 'zoning' will be used in this paper not just in the traditional narrow sense of land use allocation, but rather in the more general sense of all land use restrictions at a community's disposal. It encompasses zoning per se, the granting of variances and exemptions, subdivision controls, subdivision approval, installation of infrastructure, conversion of structures to other (higher intensity) uses, 'dedication of land' requirements and building codes. Our primary concern here is to analyze the fiscal implications of land use controls as a whole, rather than one single type of

control, important as that may be.

It is also necessary to discuss briefly the scope of fiscal zoning. In a narrow sense fiscal zoning refers to the control of community development based on the public sector cost-revenue implications of alternative housing types. This approach has generally led to the conclusion that large-lot single-family housing is fiscally superior to other types. However, a number of important considerations, such as differences in community tax bases and tax rates, variations in public expenditures, and especially education expenditures, across housing types, the scale of development and the capacity of infrastructure are often ignored in this approach.

The traditional assumption of the universal fiscal superiority of large-lot single-family housing, irrespective of community fiscal circumstances, is neither valid nor does it allow a fruitful examination of the fiscal zoning process. In the model we develop below, a variety of factors are considered which illuminate the complexity of the fiscal zoning process and the inadequacy of the traditional fiscal zoning conclusion regarding single-family housing. One of the interesting conclusions of the model is that while fiscal zoning in the case of wealthy communities has

highly exclusionary implications, the fiscal interests of progressively less wealthy communities are consistent with increasingly inclusionary development.

'Public Goods' Zoning

Another complexity involved in a more broadly defined fiscal zoning process is the quality and quantity of public services provided in the community. Two strands of thought are of importance here.)

The first is the notion of 'public goods' zoning, as discussed by Mills and Oates.²⁶ They point out that the output of public services is a function not only of budgetary inputs but also of 'environmental' characteristics of the community concerned. A given level of education or of public safety may be influenced more by the socioeconomic circumstances of the community's residents than by direct financial expenditures on these services. Zoning can play an important part in regulating the 'type' of community that develops. The authors note that "These policy variables may dwarf in importance local fiscal variables for purposes of determining output levels of some local services."²⁷ The problem of separating this 'public goods' motive from the budgetary fiscal motive remains, however.

Large-lot single-family zoning is consistent with either motive.²⁸

In this vein, it is worth noting Babcock's statement that:

The resident of suburbia is concerned not with what but with whom (emphasis in original). His overriding motivation is less economic than it is social. His wife spends more at the hairdresser in a month than the proposed apartment house will add to her husband's tax bill in a year. What worries both spouses is that the apartment development is a symbol of everything they fled in the city. When they protest that a change in dwelling type will cause a decline in the value of their property, their economic conclusion is based upon a social judgment."²⁹

Hamilton³⁰ takes issue, however, with Babcock's intimation that the fiscal implications of alternative developments are trivial in nature. He uses the example of a community with \$40,000 homes, a 2.5 percent effective tax rate and a \$1,000 tax burden per household, which doubles the tax base per family by means of a fiscal zoning policy. At a discount rate of 10 percent, the present value to a household of the \$500 reduction in taxes that results would be \$5,000. Consequently, Hamilton concludes that "...households and zoning boards are playing for big stakes when they attempt to manipulate tax bases."³¹ The potential importance of fiscal considerations, of

course, does not preclude a socioeconomic motive as well for controlling community development.

Demand for Public Goods

Local zoning practises may also be affected by the political influence new residents are expected to have on the level of public services. Lower-income groups would be zoned out not only because of their adverse fiscal consequences for the local budget, but also because they might vote for a different tax/expenditure package than that enjoyed by the current population. Fiscal surpluses derived from the admission of high-value housing into the community may be offset by the higher level of expenditures which voters will now support (assuming a positive elasticity of demand for public expenditures with respect to average house value and assuming a median voter model for determining public goods expenditures). Straszheim³² suggests that at either end of the income distribution, this elasticity will likely be less than 1. In poor communities the admission of slightly wealthier (less poor) residents would not be expected to lead to large increases in public service expenditures. In wealthy neighborhoods the demand for higher service levels by

wealthier residents would be partially channelled into the private goods sector.

The potential influence of new entrants to the community on public expenditure votes suggests an additional fiscal reason for restrictive zoning. It is worth noting, though, that zoning would still tend to be biased in favor of the higher-income groups because of the fiscal surpluses they provide.³³

Approaches to Community Formation

It is also important to discuss the basic issue of whether zoning is an intervention into the operation of the market system or whether it is simply a validation of market forces. According to established land use theory,³⁴ the free market will lead to a sorting out of land uses within an urban area. Based on land use theory alone, one would expect a high degree of separation among socio-economic classes with resulting differences among communities in income levels, housing values, etc. The relevance of fiscal zoning (and of externalities zoning) in this context is suspect.

Alonso briefly discusses zoning, but attaches little importance to it: he states that "...usually zoning regulations and the free-market result coincide,

so that the regulations do not bind. In fact, zoning boards often follow, though sometimes reluctantly, the dictates of the market, and even try to anticipate them, both in framing the regulations and in granting exemptions and variances."³⁵ If this is the case, then one can legitimately ask what the purpose of zoning is. Alonso does not discuss the motives behind municipal zoning practises, other than to note the view that "...the zoning authority is opposing the market forces in the short run only to serve them more perfectly in the long run, by holding land to 'maturity' before allowing it to be developed."³⁶ No mention is made of either fiscal zoning or externalities zoning, or any other kind of zoning for that matter.

Another approach to the formation of residential communities focuses on the public goods sector. Charles Tiebout³⁷ developed for the local public goods sector a market analogue to the private goods sector in which consumers shop among communities for local public goods/tax packages. They maximize their utility by 'voting with their feet'. The efficiency properties of such a mechanism are seen to arise from the matching of consumer preferences for public goods (and the associated taxes) with supplies available in different communities. The problems of public goods provision at the national level,

principally the incentive not to reveal one's true preferences and thereby avoid the payment of taxes to finance the public good, can be avoided in the case of local public goods provision.

Once property taxes are introduced into the model, however, the system becomes unstable because of the incentive provided to lower-income groups (actually, any group that consumes less than the average value of housing in the community) to locate in communities with high levels of public services and low tax rates (wealthy communities) and thereby derive a fiscal transfer from existing residents. Such immigration by the poor provides an incentive for the higher income groups to avoid transferring fiscal benefits to the poor by moving to other, high-income communities. The result is an unstable system of 'musical suburbs' in which the poor continually follow the rich in order to acquire fiscal transfers from them. This problem would be avoided, of course, if in lieu of a property tax, a head tax were imposed on all community residents. However, with a property tax system in effect, local land use restrictions which take inter-income group transfers into consideration provide a means whereby the stability of the Tiebout migration mechanism can be restored and its efficiency

characteristics realized.³⁸ In this approach to community development, (fiscal) zoning plays an important role, in contrast to its more questionable function in the context of the land use theory approach.

Fiscal Zoning Literature

There are only a few empirical studies of fiscal zoning and these do not arrive at any consensus as to whether or not it is a relevant phenomenon. Hamilton, Mills and Puryear³⁹ regressed the Gini coefficient of family income for five suburban census tracts in each of nineteen SMSAs in the United States on a variety of nonfiscal and fiscal variables. They found that their key fiscal variable, compensatory aid to school districts, significantly reduced the degree of community income segregation as measured by the Gini coefficient and by implication the restrictiveness of community zoning practises. Flat-aid grants (i.e. a fixed amount per capita) had an insignificant effect upon income segregation. Since such grants are not strongly related to local tax effort, their influence on segregation was not expected to be very large. Their effects would be greater, of course, in cases where flat aid grants were so large that local tax effort was hardly required.

Branfman, Cohen and Trubek⁴⁰ constructed an 'education equalization formula' which assigned to state aid systems values ranging from one, for strict flat grants to education, to ten, for full equalization grants. This aid variable was found to have no statistically significant impact on their index of income clustering in thirty SMSAs in the United States. The coefficient of the aid variable even turned out to be positive rather than negative, as predicted (the higher the level of the aid variable, the more equalizing the type of aid received and hence the lower the expected level of income segregation).

It is interesting to note, however, that another explanatory variable used by Branfman et al., zoning fragmentation, turned out to be positively and strongly related to the clustering index, and indeed was their most important explanatory variable. The greater the number of zoning authorities in a metropolitan area, the more clustering that occurred. This result is consistent with the a priori prediction that a large number of small districts is better able to reflect the interests of different residents than is a small number of very large districts. Hamilton⁴¹ has

pointed out, however, that one can interpret the number of zoning authorities as a fiscal variable, as Hamilton et al. did in their analysis in which they used the number of suburban school districts in each SMSA as a fiscal variable. Hamilton states: "My conjecture is that the fiscal incentive is being represented in both cases, partially because I do not see how a large number of zoning authorities would lead to more income clustering for non-fiscal reasons than would a small number of authorities."⁴² Hamilton also cites evidence that the percent of school expenditures financed by the state explains about 35 percent of the variation among states in the average size of school districts. He concludes from this that a high level of state aid reduces the incentive to form a fragmented system of local governments, so that the number of school districts (or zoning authorities in the study by Branfman et al.) in a metropolitan area can justifiably be considered a fiscal variable.

Windsor⁴³ has recently suggested, however, that in states where a high percentage of education expenditures is financed by the state government, a smaller number of school districts could be explained

equally well by the very presence of a state government which had assumed a major role in the provision of education and which, as part of that role, had effected a consolidation of school boards. Under this interpretation, the presence of fewer school districts would not reflect the diminished fiscal incentives of local communities to establish more numerous districts, but simply an attempt by the state to provide greater educational uniformity. Thus the extent to which the number of school districts (or zoning authorities) can be considered a fiscal variable is not clear. It is an issue which has yet to be resolved.⁴⁴

Another study of the fiscal zoning issue deserves consideration as well. It adopted a method of analysis radically different from that of Hamilton et al. and Branfman et al. James and Windsor⁴⁵ conducted an empirical study of zoning in New Jersey, the most heavily urbanized state in the United States (567 municipalities) and one in which the state government does little (as of 1976 at least) to provide or finance public services. They suggested that "If local communities in New Jersey don't practice fiscal zoning, such zoning can't be expected to prevail in many other places."⁴⁶

The authors calculated a zoning efficiency index

for each of 175 municipalities based upon the fiscal benefits each would expect to derive from development according to its current zoning plan and the benefits to be derived from alternative development strategies.⁴⁷ They concluded that "Fiscal interests appear to have exerted a slight influence on zoning ordinances but are not accurately reflected in the ordinances of most municipalities."⁴⁸

Despite the fact that the authors found little evidence of fiscal zoning by communities, it is noteworthy that the overall zoning pattern of New Jersey municipalities was quite consistent with their fiscal zoning hypothesis. Thus, of 555,000 vacant acres zoned for single-family residential use in the 175 municipalities included in the study, 420,000 acres were zoned for minimum lot sizes of one acre. The authors indicated that the 'fiscal ideal' would have required about 422,000 vacant acres to be zoned for one-acre minimum lots.

In addition to their restricted use of the zoning efficiency index and the interpretation of the index values,⁴⁹ there are other problems with James and Windsor's analysis which merit comment. The most important of these is their use of zoning maps to measure the restrictiveness of land use controls.

Communities have many means at their disposal to control growth so that it is difficult to base conclusions on simply one aspect of control, important though that may be.

Furthermore, James and Windsor only analyzed residential development that could take place under existing zoning regulations. They did not take into consideration zoning amendments which could occur as development progressed. They also did not consider that the development permitted by the zoning might never occur because of a lack of demand for such housing during the time period envisaged under the zoning plan. Indeed, communities may zone for uses which are unlikely to be developed in order to control expansion with its attendant costs. Thus, the possibility of communities 'overzoning' for some land uses as a means of limiting development should be noted.⁵⁰ This may even involve zoning for land uses which are more fiscally disadvantageous than others but for which there is little demand.⁵¹ James and Windsor assumed that the demand for any type of zoned land use would exist and that development would automatically ensue. While James and Windsor's analysis is interesting for its very direct approach to determining the presence of fiscal zoning, it has many

shortcomings which seriously compromise its conclusions.

Dissertation Outline

The importance of fiscal considerations in the community development process, and the role of land use controls in realizing community fiscal objectives, require further study. In the dissertation we will synthesize arguments relevant to fiscal zoning which have been mentioned in the literature and noted above and, in particular, present a model which incorporates those fiscal factors that influence a community's zoning behavior. Through extensions of the model we will examine the changes to be expected in zoning behavior as the fiscal circumstances of the community are altered. The effects of government grants on fiscal zoning will be considered, as will the role of government reorganization along metropolitan lines.

In Chapter 1 we discuss considerations of importance to our study of fiscal zoning. These include cost and revenue implications of development for municipalities, capitalization effects and land use controls. Our basic model of fiscal zoning is presented in Chapter 2. The incorporation of upper level government grants into our model is presented in Chapter 3. In

Chapter 4 we examine the effects of metropolitan government on local incentives to zone fiscally. Hypotheses which derive from the model and its modifications are discussed in Chapter 5. In Chapter 6 we present the empirical results obtained from testing our model using the Toronto-Centred Region as a study area. Chapter 7 provides a summary of the dissertation and a review of its principal conclusions.

CHAPTER I

FISCAL ZONING CONSIDERATIONS

In this chapter we examine several important aspects of the fiscal zoning process as a prelude to our presentation of a fiscal zoning model in the following chapter and modifications to that model in subsequent chapters. While not all of the observations made in this chapter are incorporated in our model, they are still relevant considerations which will contribute to a better understanding of the formal model.

We begin this chapter with some comments on the public sector cost-revenue implications of municipal development. Residential growth is contrasted with nonresidential development and single-family residential with non-single family residential. A second major section of the chapter is devoted to a discussion of the capitalization of fiscal variables. This is an important aspect of the fiscal zoning process, since the capitalization into property values of fiscal surpluses and deficits arising from development provides the incentive for communities to control the type of development that occurs within their borders. The third section of this chapter provides a brief discussion of zoning controls themselves.

Cost-Revenue Studies

Concurrent with the post-World War II suburban development boom (in the United States), a plethora of local cost-revenue studies were conducted to determine the fiscal desirability of alternative development proposals. Many of these, however, "...were undertaken to 'make a case' for a predetermined course of action...most of these 'propaganda' studies are characterized by lack of objectivity, shortcut methods, and conclusions that almost invariably agree with initial hypotheses."¹

Residential vs. Non-residential Development

Several problems with such cost-revenue studies have been noted in the literature.² For example, the fiscal base of municipalities is often considered only from the very narrow point of view of property tax revenues. Little or no consideration is given to sales taxes or grants from higher levels of government (the latter point being developed in more recent literature) which constitute an increasing percentage of local revenues. Densely settled, low-income families "may prove a fiscal bonanza to a city with a sales tax",³ while industrial development would not provide such a sales tax base.

Education costs in cost-revenue studies are generally charged against residential uses alone and not against industry or commerce. If a portion of such costs were charged to industry, to reflect the fact that industry and commerce generate residential expansion with subsequent educational costs, then the fiscal case in favor of nonresidential uses and against residential uses might not be as strong as is generally believed. However, this approach is valid only when household demand for education in a given community is closely associated with industrial and commercial development there.⁴

Time considerations are also generally excluded from fiscal cost benefit analyses. While it is true that suburban development will usually attract families with young children, the education costs associated with these families may only reach their peak some ten or fifteen years after their arrival when all of the children are in school, declining to about the twentieth year after which the children's basic education will be finished. Over a thirty-year period, there will be no education costs associated with the family for roughly fifteen years. Fiscal surpluses derived during this period provide an (at least partial) offset to deficits

incurred during the school years. Consideration of the time span of residential uses weakens the case against residential development arising from education costs. However, the relevance of this aspect of fiscal cost-benefit analysis is diminished somewhat by the fact that municipal budgets must be balanced annually and municipal officials must face reelection every two or three years. A short run deficit rather than long run fiscal balance may be the more important consideration affecting local land use decisions with regard to residential development.

Margolis⁵ suggests that the use of marginal instead of average cost may also weaken the case against low-income residential development. The marginal cost of educating the children of new suburban families may be very low even though the average cost of education in that community may be quite high. This would be the case if the education of additional children did not require the expansion of school facilities or the hiring of extra teachers. In contrast, the arrival of a new industry might have a high marginal cost even though the average cost for industry was low if the new industry necessitated the widening of an access road or the extension of sewer facilities.

Some further comments about determining the marginal costs of development are in order. As indicated above, such an approach is highly dependent on specific information available in a community concerning existing capacity of public facilities, i.e. whether there is current slack in public service capacity or congestion. It is also essential in this approach to take into account total development expected in a community; this will significantly influence the costs which should be attributed to any individual development. Thus while a proposed development that imposes congestion costs on existing schools and necessitates the construction of additional education facilities has a high marginal cost attached to it in the short run, it may be the case that subsequent development is planned for which will be using the same incremental school to the point at which the cost of providing education to all the new residents is equal to the average education expenditures incurred on behalf of existing residents. In this case, it seems more appropriate to attribute to the initial new residents the average costs of education in the community rather than marginal costs.

The overriding problem in adopting a marginal cost

approach to fiscal impact studies is the detailed information required. Much of this must be obtained directly from local officials since, as indicated above, the marginal costs properly attributable to a specific development will depend on subsequent development plans. Knowledge of a community's future growth pattern is essential to such an undertaking. The marginal cost approach to fiscal impact determination is, therefore, more appropriate for individual community, rather than cross section, analysis.⁶

The important conclusion which emerges from the literature is that "the generalized statement that 'residential use does not pay its way' is in no wise supported."⁷ This result, based on cost-revenue studies conducted primarily in the 1950s, is essentially the same as that later derived by James and Windsor⁸ and Sternlieb⁹ based on general observations with respect to variations in property valuations and property tax rates across communities.¹⁰ While very wealthy communities with low tax rates may not find development of any kind fiscally profitable, poorer communities with very high tax rates may find almost any kind of residential development fiscally advantageous.

Single Family vs. Non-Single Family Residential Development

Recent studies indicate as well that within the residential category the conclusion that single family housing is always the most fiscally advantageous type of development is unwarranted. This result is based on more explicit consideration of the costs associated with different housing types. It is reasonable to expect that expenditures per dwelling unit will change as the type of unit under consideration is varied. In terms of polar cases, the expenditures associated with a studio apartment would undoubtedly be different from those attributable to a four-bedroom single family home.

A major source of variation in expenditures across housing types is to be found in education expenses incurred on behalf of their occupants. One study has indicated that the number of public school attendees per dwelling unit can range from zero for a highrise studio apartment to 1.293 for a four-bedroom single family house.¹¹ While the number of public school pupils will vary even within any one housing type, depending on the number of bedrooms considered, the study presents strong evidence that single family houses, townhouses, garden apartments and highrise

apartments generally have a decreasing number of pupils associated with them.¹²

The application of a given tax rate to housing units of different values would, of course, result in varying tax revenues derived from alternative units. Applied against a uniform 'expenditure per dwelling unit' figure, housing units which are increasingly lower in value would exhibit increasingly smaller surpluses (larger deficits), defined as the difference between tax revenues and expenditures associated with a given housing unit. Once the expenditures associated with different values (and types) of housing units are explicitly considered, it is no longer apparent that the lower the value of the unit the smaller the fiscal surplus it provides the community. If expenditures associated with lower value units fall faster than the tax revenues they provide the community at the given tax rate, then it is conceivable that lower value housing units will provide larger fiscal surpluses than higher value units. Depending on the relationship between housing value and housing type and, therefore, on the manner in which tax revenues and expenditures vary across housing values, it is conceivable that housing units at either end of the value spectrum may

provide larger fiscal surpluses (smaller deficits) than other housing units in the middle value range.

Empirical support for such possibilities is presented in Sternlieb¹³ and James and Windsor.¹⁴ In the former case, townhouses were found to be unequivocally more fiscally advantageous than single family houses in one community under consideration. In a second community, which differed from the first primarily by virtue of its substantial nonresidential tax base and lower tax rate, single family houses were the least fiscally advantageous of all housing types considered.¹⁵ In the James and Windsor study of 175 New Jersey municipalities, the authors determined that garden apartments would provide a fiscal surplus in 80 percent of the municipalities, whereas single family homes on lot sizes of one acre or more would be fiscally advantageous in only 63 percent of the communities.¹⁶

The noteworthy conclusion which derives from both the cost-revenue studies of particular development proposals and the fiscal considerations noted by recent authors is that particular community and housing characteristics will determine the 'profitability' of development. What is fiscally advantageous for one

community may not be so for another community. This observation constitutes an integral part of our fiscal zoning model presented in Chapter 2.

CAPITALIZATION

The presence of fiscal surpluses and deficits arising from new development brings us to a discussion of capitalization effects. The issue of the capitalization into property values of interjurisdictional differences in property taxes and local government expenditures has received considerable attention in connection with the Tiebout hypothesis. Responsiveness of property values to intercommunity differences in these variables is seen as a confirmation of the hypothesis that residents in their choice of housing location take fiscal considerations into account, a central tenet of the Tiebout model. Increases in property taxes are expected to be negatively capitalized into property values, while expenditures are positively capitalized.

As noted previously, the explicit introduction of the property tax into the Tiebout system of communities creates a situation in which new residents can receive the level of public goods provided in any one community at less than the average cost of providing those goods.

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simply by moving into the community and consuming less than the average value of housing in the community. A fiscal deficit is thereby imposed on existing residents. Once capitalization effects are taken into account, however, the incentive for new residents to seek fiscal transfers from the current residents of the community disappears. The presence of fiscal transfers will encourage the bidding up of property values in the community until, at full capitalization, new low-income residents pay the average costs of the expenditure benefits they are receiving. They pay lower property taxes than old residents but a high capitalization premium on their properties.

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It is reasonable to assume that capital is fully mobile and that fiscal transfers will be capitalized into land values. Fiscal surpluses received by new low-income residents will be positively capitalized into the value of land devoted to low-income housing while fiscal deficits imposed on old high-income residents will be negatively capitalized into the value of land devoted to high-income housing. As a result land devoted to low-income housing will command a higher price than land used for high-income housing. However, this price differential will tend to be

eliminated by the subsequent reallocation of land from high-income to low-income housing. The resulting increase in the supply of low-income housing will lower its price, thereby offsetting the effects of the capitalization of the fiscal surpluses. Hamilton¹⁷ sees this process ending at the point where the land price differential is fully eliminated and the effect of the increased supply of housing has completely offset the capitalization effect. Low-income residents of the community again will be paying less than the average cost of the local services they receive. They will be paying lower than average property taxes but will not have to pay any premium for access to the community.

Dyer and Maher¹⁸ suggest that this is not the end of the process. As long as it is fiscally advantageous for low-income families to move into the community they will continue to do so. Thus once initial capitalization effects are offset by the increased supply effect, the reemergence of fiscal benefits will attract new low-income entrants into the community, property values will again be bid up, a land price differential will again be established, a further shift from high-income to low-income housing will take

place and so on. The community will achieve stability only when all land devoted to high-income housing has been shifted to low-income housing.

The result of this extended process is the formation of a homogeneous low-income community. Low-income families will have moved into the community in order to acquire fiscal transfers while high-income residents will have left the community in order to avoid paying fiscal transfers. This does not mean, however, that a stable system of low-income and high-income communities emerges. On the contrary, the residents of the low-income community are no longer receiving any fiscal transfers and thus have an incentive to relocate in wealthier communities, thereby continuing the process. The above paragraphs describe the game of 'musical suburbs' referred to previously¹⁹ in which the poor continually follow the rich in order to acquire fiscal transfers from them.

It is worth noting that in the above analysis the long run increase in the supply of housing is made possible because of the implicit assumptions of a perfectly elastic long run supply curve of structures and a highly elastic long run supply curve of land. While the overall supply of land in a community is fixed, a high degree of land shifting between high-income

and low-income housing sectors is feasible. It is this elasticity which makes possible the expanded supply of low-income land (housing) in response to the land price differential created by the capitalization of fiscal transfers.

It should also be pointed out that even the overall supply of land in a community may not be perfectly inelastic if it is possible to annex rural adjacent areas as required.

Another type of supply response is worthy of consideration as well. Edel and Sclar's study²⁰ of long run supply adjustment in response to short run capitalization effects does not focus on the supply of houses and land within any one community, but rather on the supply of communities themselves. This approach would appear to overcome problems of inelastic land supply within any individual community,²¹ but it is obviously applicable in only a very long run, one longer than that envisaged by Hamilton.

The role of zoning within Hamilton's single community framework is to prevent the supply of housing to new residents from increasing beyond the point at which the capitalization effect exactly offsets the fiscal transfer effect and at which new

residents pay the average costs of the services they receive. In other words, zoning prevents the elimination of the price differential between land devoted to low-income housing and land devoted to high-income housing and the subsequent reemergence of fiscal transfers to low-income groups.²² Zoning can thus contribute to the stability of the Tiebout system and maintain the efficiency characteristics of that system. As thus developed by Hamilton, capitalization is an integral part of the Tiebout mechanism and will obtain when a Tiebout system of communities is in equilibrium.

However, it is more likely that zoning will restrict the supply of housing to residents seeking fiscal transfers from the community to a level below that consistent with efficiency. Fiscal transfers from existing residents to new residents will be negatively capitalized into the property values of existing residents. The capital losses incurred by existing residents as a result of the in-migration of new residents consuming less than the average value of housing in the community (and thereby receiving a fiscal transfer from existing residents) provides the incentive for the community to zone out any such

low-housing-value entrants.²³

With full capitalization the mix of residential uses in a community should not affect overall property values, since changes in property values will simply reflect fiscal transfers between income groups, a zero-sum game. But the distribution of gains and losses in the capitalization process is of great importance in the determination of land use policies. The restrictive zoning implications are the result of existing residents incurring capital losses on their houses as an offset to fiscal transfers (to new residents) attached to their properties. The result is to restrict new entrants to only those who consume at least the average value of housing in the community and who thereby impose no fiscal burdens on existing residents.

Incomplete Capitalization

The above discussion implicitly assumes that the demand for local public goods is uniform across consumers of different housing values. Once this assumption is relaxed, the possibility of incomplete capitalization of fiscal transfers presents itself.

Mieszkowski²⁴ has examined this situation with the aid of the following diagram. In this two-income-group world, the perfectly-stratified-community

equilibria would be EL and EH. In a mixed community where, it is assumed, the collective equilibrium has to be agreed upon unanimously, subsidization of the lower-income group by the higher-income group will lead to the equilibrium level of public goods represented by point EG. The subsidy of EGM (=KJ) rotates the low-income (high-income) group's budget line counterclockwise (clockwise) until there is unanimous agreement as to the level of output of the public good (EG). This is not an efficient result because the marginal rate of transformation between private and public goods is not the same for the two income groups. The inefficiency derives from the fact that the poor receive a subsidy which distorts their consumption pattern, encouraging them to consume more public goods (EG) than they would if they had received a straight income transfer (EL'). Because of the subsidy it pays, the high-income group consumes less public goods (EG) than it would if it had been able to make a straight income transfer to the poor (EH'). The over and under consumption of public goods by low and high-income groups, respectively, are direct results of the requirement that there be unanimous agreement on a common expenditure level.

As a result of these distortions in public goods consumption, incomplete capitalization takes place. The extent to which consumption patterns are distorted will influence the degree of capitalization which takes place.²⁵ This observation may account in part for the findings of empirical studies that less than full capitalization occurs.

Empirical Studies of Capitalization

The best known of the capitalization studies is Oates' analysis of 53 New Jersey communities, in which the author found that "...local property values bear a significant negative relationship to the effective tax rate and a significant positive correlation with expenditure per pupil in the public schools."²⁶ Oates found that approximately two-thirds of a tax increase was capitalized in the form of depressed property values and that this effect was approximately offset by the capitalization effects arising from the increased level of public school expenditures financed by the tax increase.

Pollakowski²⁷ reestimated Oates' equations using data for the San Francisco-Oakland-San José metropolitan area and derived rather mixed results,

which lend little support to Oates' conclusion. Hamilton has cautioned, however, that "there is no reason to expect Oates' results to be reproducible using other samples."²⁸ According to Hamilton, the nature of the coefficients attached to the tax and expenditure variables will depend on the demand for and supply of different types of communities. If there is a shortage of sites in fiscal 'havens', i.e. communities characterized by low taxes, high expenditures and restrictive land use zoning, then the demand for sites in fiscal 'slums', i.e. communities with high tax and low expenditure levels, will be augmented. Depending on the supply of these communities, 'slum' sites may earn a rent in the short run. In such a case, the public expenditure coefficient in a regression equation like Oates' would be negative rather than positive. While the exact opposite of Oates' result, it is nevertheless the case that such negative coefficients reflect consumer sensitivity to fiscal variables.

A similar point has been made by Pauly,²⁹ who demonstrates that even in the presence of capitalization effects, the coefficient of public expenditures may be zero. This situation arises in the following circum-

stances: there are three types of community - low, medium and high-expenditure-, demand for scarce sites in the medium-expenditure communities results in premiums being paid for houses there, and house values in the high-expenditure and low-expenditure communities remain equal (and lower than in the medium-expenditure communities); a linear regression of housing values on expenditures would show zero capitalization if the level of expenditures were distributed symmetrically about the mean. While Pauly's example is admittedly a special case, it indicates that caution is required when interpreting regression coefficients derived in attempts to determine capitalization effects.

Not only are negative and positive coefficients consistent with consumer fiscal sensitivity, but zero coefficients do not necessarily indicate the absence of capitalization. In addition to Pauly's special case, zero coefficients may also indicate the presence of long run supply adjustments following short run capitalization effects, as suggested above; zero coefficients are thus consistent with long run equilibrium in a system marked by responsiveness to fiscal variables. Consequently, Oates' results are of

primary value in that they are consistent with "...a model of the Tiebout variety in which rational consumers weigh (to some extent at least) the benefits from local public services against the cost of their tax liability in choosing a community of residence."³⁰

The above discussion of capitalization and the presence of zero coefficients has special relevance to the work of Edel and Sclar.³¹ In his article, Oates states that "It could be...that the negative association we have observed between property taxes and home values is primarily a short-run phenomenon, which would disappear over a longer period of time."³² Edel and Sclar attempt to prove this for Massachusetts communities by employing decennial census data for the period 1930 to 1970. They conclude that a falling coefficient for public school expenditures over time reflects a long run approach to Tiebout equilibrium. Local highway maintenance expenditures, on the other hand, are not capitalized (positively) to a statistically significant extent in any period.³³ While their results are consistent with the supply adjustment mechanism, they do not prove that such an adjustment has occurred, as indicated above.

The approach to a long run Tiebout equilibrium would suggest that fiscal zoning, if operative at all,

is only a short run phenomenon and is inadequate to restrict supply adjustments over longer periods of time. While Hamilton's analysis provides an economic rationale for fiscal zoning, Edel and Sclar's results would seem to indicate that fiscal zoning does not play a major role in urban housing markets and the local public economy.

It should be noted again, however, that there is a major difference between the supply adjustment mechanisms envisaged by Hamilton and by Edel and Sclar. Hamilton sees fiscal zoning as a means by which a given community can limit the supply of low-income housing within its borders, while Edel and Sclar see an expansion in the number of communities as a means by which services can be supplied to meet the demands of the total population desiring them. While Hamilton's analysis rests on long run market adjustments, Edel and Sclar's analysis rests on a public choice mechanism which is never specified; as such, it appears to have an important gap which needs to be filled before their conclusion with regard to long run equilibrium, and its implications for fiscal zoning, can be fully accepted.³⁴

Additional empirical support for the capitalization hypothesis is found in Orr, Oates and Rosen and Fullerton.³⁵ In the last case, the authors employ output measures rather than expenditure levels to determine the effects of public service benefits on property values. Their results, for the same sample of 53 New Jersey communities used by Oates, suggest capitalization rates close to 90 percent.

Criticism has been levelled at Oates' study, however, by King³⁶ who suggests that the tax effect in Oates' equation is misspecified and that the result is an upward bias in the estimated extent of tax capitalization by approximately 40 percent. The error arises from using the tax rate (t) as the tax effect variable, rather than the tax burden (tV). Use of the former variable implies the same capitalization effect in absolute terms regardless of the value of the house.

Reestimating Oates' equations with the tax variable properly specified, King finds (tax) capitalization to be about 40 percent complete. The addition of a variable describing municipal expenditures other than those for educational purposes leads to estimated capitalization of 70 percent. King has also studied tax capitalization in New Haven, Connecticut, where

results indicated capitalization to be roughly 30 - 50 percent complete. Based on his analyses, King concludes that "...our knowledge of the extent of tax capitalization is very much less than is commonly supposed."³⁷ Whether King's results are inconsistent with Oates' conclusion that consumers take fiscal variables into consideration 'to some extent at least' in their residential location choices is another matter.

In studies of capitalization in Canadian urban areas, a variety of results has been obtained. Hamilton found a 56 percent rate of capitalization of fiscal surpluses in Metropolitan Toronto. He noted that because variables reflecting the age of structures and neighborhood characteristics were not included in his analysis, this figure represented a lower bound on the extent of capitalization.³⁸

Wales and Wiens, on the other hand, found no evidence of tax capitalization in Surrey, British Columbia. Their explanation for this result was that homebuyers do not have the expertise to incorporate tax differentials into the prices they pay for houses.³⁹ It should be noted that this study is one of the few to find no empirical support for the capitalization hypothesis.

Chinloy⁴⁰ found the rate of tax capitalization in London, Ontario to be 51 percent. However, once he incorporated the effects of Ontario's property tax credits into his analysis the capitalization rate fell

to 4 percent. The validity of this additional step can be seriously questioned, though, since the property tax credits, which are administered through the income tax, may be perceived by the public to be reductions in income taxes rather than reductions in property taxes. Bird and Slack state that "...the conclusion that most people probably see little connection between the property tax and the property tax credit appears well-founded."⁴¹ Consequently, one feels more confident in Chinloy's capitalization results when property tax credits are excluded from the analysis.

Other problems can also arise from the specification of the capitalization equation. Linneman⁴² notes that debt service and local revenues from sources other than property taxes are often excluded from consideration. In such a case, a negative tax coefficient could reflect differential municipal efficiencies in providing a given level of local services. However, when local taxes and government aid are perfect substitutes, a high tax rate may also reflect the community's inability to acquire external grants and hence would be negatively capitalized into property values. On the other hand, if taxes and debt issue are perfect substitutes and differential taxes reflect differences in local debt service, the regression tax variable would be expected to have a zero coefficient.

In all cases where taxes and other sources of finance are not perfect substitutes in local financing, interpretation of the tax variable coefficient is rendered much more difficult. For example, if government grants are either of a compensatory or matching nature, an increase in taxes will increase public goods expenditures by an amount $(1 + \lambda)$ times the tax increase, where λ measures the proportion of tax increase that is matched or compensated. Since the tax increase generates a more than proportionate increase in public goods expenditures, it would be expected to be positively capitalized into property values. A higher tax rate corresponds to a higher level of government aid. Similarly, when tax changes are not exactly offset by debt issue (for a given level of public goods), i.e. they are not perfect substitutes, the tax rate may not necessarily be negatively capitalized into property values.

Recently Epple, Zelenitz and Visscher⁴³ have suggested that researchers attempting to find empirical support for the Tiebout process through capitalization of taxes and expenditures have failed to state what one would find in the absence of the Tiebout mechanism. The authors derive two sets of

equations, one characterizing a Tiebout system of communities and the other a non-Tiebout system. Because of simultaneity problems in the determination of the three endogenous variables: the tax rate, housing value and government expenditures, the two communities are empirically indistinguishable. Epple et al. conclude that "to date no meaningful test of the Tiebout hypothesis has been conducted."⁴⁴

While pointing to the difficulties of empirically testing the Tiebout hypothesis by determining capitalization effects, the works cited above do not invalidate the assumption of capitalization of interjurisdictional differences in tax and expenditure variables. Indeed, "...the bulk of the evidence to date suggests that differentials in the effective rates of property taxes, whether within or across jurisdictions, are often capitalized, sometimes to a significant extent."⁴⁵

The capitalization of fiscal transfers into property values is important to the theory of fiscal zoning for it reflects the incentive that current residents have to exclude newcomers who do not 'pay their way'. Were it the case that intracommunity fiscal transfers did not result in a discounting of the value of existing homes to compensate for those

transfers, then the fiscal incentive to limit entrants to only those families able to pay the costs of providing them with public services would be reduced.

ZONING CONSIDERATIONS

With full capitalization of fiscal transfers occurring, the incentive for current residents to control the entry of new residents is at its highest level. The extent of fiscal transfers associated with newcomers and the resulting capitalization effects will determine the incentives particular communities have to control development. The greater the fiscal transfers involved and hence the greater the capitalization effects in absolute terms, the greater the controls placed on new development, and vice versa. The nature of these 'controls' requires further discussion.

As noted in the Introduction, our use of the term 'zoning' refers to land use controls in general rather than solely to zoning bylaws, important as these are. While land use controls are directed at a wide variety of factors affecting development, it is essential to discuss the final effects of these measures.

There is good reason to believe that zoning's ultimate impact is on the value of new development in a community. Local controls which decree the type(s) of housing allowed to be built; the size of residential lots; lot frontages; minimum floor area per dwelling unit, in some cases; dedication of land for municipal parks, etc.; all of these influence the value of new properties. There is also some empirical evidence that this effect is important. One study, using a hypothetical \$50,000 single family house as a basis of reference, determined that "19.7 percent of the purchase price of a house may be related to government regulatory excesses of one form or another."⁴⁶ While the author cautions that this percentage represents an upper limit in her example and that her results must be used with care, it is safe to conclude from her work that the (housing) costs of local government regulation are far from negligible.

Another study found that:

...public policy decisions pertaining to minimum zoning requirements are significant factors explaining selling price variation. However, the size of the house - directly affected by the minimum size regulation [i.e. liveable floor area] and indirectly conditioned by minimum lot size requirements - is the single most important factor explaining selling price variation.⁴⁷

A further important conclusion of this study was that

singular changes in zoning requirements would have little impact on selling price. Rather, a general relaxation of zoning restrictions would be required in order to achieve substantial reductions in the selling price of new housing.

The studies just referred to focus on housing markets at the state (New Jersey) level. On a national scale, Marion Steele concluded that in 1971 in Canada "the price of land very largely explains variations from urban area to urban area in the price of the total house-land package."⁴⁸ It is interesting to note, however, that she accounts for the large differential between Montreal and Toronto in the average price of a lot in 1971 (\$2,200 and \$12,100, respectively) by pointing to the "...cost of developing the land in Toronto, including the carrying charges the developer must pay while awaiting subdivision and other approvals" and to "...the fact that throughout Montreal's history any sharp increase in the demand for housing has had relatively less impact, in the short run, on land prices, because of the relatively little land used and the absence of substantial government constraints on supply."⁴⁹ (emphasis added)

The assumption that local officials control the

value of new development in their communities through zoning regulations forms an integral part of Hamilton's theory of fiscal zoning. Indeed, Hamilton does not even bother to make assumptions about the relationships between zoning variables and housing values; rather, he assumes that the community's zoning ordinance itself directly states the minimum housing value to be consumed by new entrants.

In contrast, White's zoning variable is minimum lot size, through which the community indirectly controls the value of new houses; she assumes that housing value and lot size are positively related.⁵⁰

It is worth noting, however, two other effects of lot size on property tax revenues. Thus one impact of large lot sizes is to reduce the price of land per acre. The reason is that the demand for land when the minimum lot size is large (say, one acre) will be lower than demand when the minimum lot size is smaller (say, one-half acre). Consequently, the community with large-lot zoning will adversely affect its property tax revenues because of the lower price per acre of land.

At the same time, the service costs per acre of land will be less when lot sizes are large, thereby

offsetting the negative revenue effects. Services are of two basic types, those directed to property and those to persons. White assumes that services directed to property increase proportionately with lot size and that services directed to persons are independent of lot size. The implication of these assumptions is that service costs per acre of land fall with increasing lot size. Thus while it costs more to provide property services to a one-acre lot than a one-half acre lot, the cost on a per acre basis is the same. In other words, it costs approximately the same to service one one-acre lot or two half-acre lots. However, services to persons on a per acre basis are affected by lot size; the larger the lot size, the fewer households that can reside on an acre of land and hence the lower the per acre cost of services to residents.

White does not discuss the extent to which the price and cost effects of large-lot zoning offset each other. Rather, she simply states that "...if housing consumption increases with lot size, then the loss of revenue from land is made up by increased revenue from higher housing value and greater savings per acre in the incremental cost of public services."⁵¹

Regardless of the exact relationship between lot size and housing value, it appears intuitively plausible that they are positively related. If lot size did not contribute toward increased property value, but instead could simply be offset by reductions in housing consumption (thereby leaving little overall effect on property values), then it is doubtful that minimum lot size regulations would be as prevalent as they are.

In any case, lot size requirements are not crucial to an analysis of fiscal zoning, since the effective controlling device on newcomers is housing (property) values. It is safe to assume that local officials will avail themselves of the plethora of land use controls at their disposal to insure that the value of new housing allowed into their communities will further the fiscal interests of current residents.⁵²

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CHAPTER 2

FISCAL ZONING MODEL

In this chapter we present a model of fiscal zoning based on our discussion of fiscal and land use considerations in the previous chapter.

We assume that there are two wholly residential communities similar in all respects except the following. The mean value of houses in one (wealthy) community is higher than the mean value of houses in the other (poor) community. A common level of public expenditures per dwelling unit¹ is financed entirely by a property tax assessed on the full market value of houses in each community. Consequently, the property tax rate will differ between the two communities. In the poor community a higher tax rate will be required to raise the same amount of revenue as in the wealthy community. This inverse relationship between community tax base and the tax rate is illustrated by the dashed line AA in Quadrant I of Diagram 1.²

The difference in property tax rates between the two communities has important implications for the fiscal impact of development in each. In Quadrant II of Diagram 1 the vertical line is the locus of all points representing equality of revenues from development

DIAGRAM 1 - BASIC MODEL

with expenditures arising from development. Points to the left of this line represent situations where fiscal surpluses are being realized, while to the right of this line fiscal deficits are being incurred. A fiscal surplus is defined as an excess of tax revenues per new dwelling unit over public expenditures necessitated by the presence of the new unit. A fiscal deficit is defined as a shortfall in property tax revenues generated by a dwelling unit compared with the public expenditures made on its behalf. Fiscal surpluses/deficits are measured along the horizontal axis in Quadrant II.

The line BB, which is parallel to the horizontal axis at a level corresponding to the tax rate r_1 in effect in the poor community, indicates the range of net fiscal benefits which can accrue to the poor community as a result of alternative development strategies. It is derived by the application of the r_1 tax rate to the range of potential development values represented by the housing values along the horizontal axis in Quadrant I of Diagram 1. As indicated in Quadrant II, the poor community will benefit from most kinds of development, as reflected by the large section of BB which lies to the left of the vertical line. The intersection of the BB line with the vertical line occurs

when development of houses equal in value to the mean value of housing already in the community is considered. Fiscal surpluses (the portion of BB to the left of the vertical line) are acquired by development of houses greater in value than the mean value of housing in the community. Fiscal deficits are incurred by development of houses lower in value than the mean.

Line B'B' represents the range of possible surpluses and deficits for the low tax, wealthy community. It is drawn parallel to the horizontal axis at the r_2 tax rate level. The application of this tax rate to the same range of potential development values as in the poor community case results in more fiscal deficits being incurred and fewer fiscal surpluses being acquired (the greater part of B'B' lies to the right of the vertical line). Again, the intersection of the B'B' line with the vertical line occurs when development of houses equal in value to the mean value of houses already in the community is considered. It is again the case that fiscal surpluses in the wealthy community will be derived from the development of houses higher in value than the community mean, and fiscal deficits incurred from the development of houses below the mean value. But because the mean value of housing in the wealthy

community is high to begin with, the probability of fiscal surpluses is smaller, and of fiscal deficits is greater, than in the poor community.

Any fiscal transfers which are realized can be expected to be capitalized into property values. We assume that these are fully capitalized. Any new dwelling unit which provides a fiscal surplus to the community will cause existing properties to appreciate in value because the given level of expenditures can now be financed by a lower property tax rate, or alternatively, the same tax rate can now finance a higher level of public expenditures. The opposite holds true for additional dwelling units which create fiscal deficits. Prospective purchasers of existing houses will capitalize the value of such fiscal differentials into the price they pay for admission to the community.

The relevant relationships are illustrated in Quadrant III of Diagram 1. The line CC represents the locus of capitalized values of fiscal surpluses/deficits. As indicated by the CC line, the point on the vertical axis corresponding to the zero surplus/deficit (i.e. break even) point on the horizontal axis, is the zero capitalized value point. To the northeast of V along CC, capitalized values are negative (corresponding to fiscal deficits) and to the southwest of V capitalized values

are positive (corresponding to fiscal surpluses). As indicated in the diagram, the portion of line CC corresponding to the line BB (poor community) is to the left of the portion which corresponds to the line B'B' (wealthy community). This reflects the greater probability of positive capitalization effects in the poor community than in the wealthy community.

The dashed line DD in Quadrant IV of Diagram 1 illustrates the relationship between the mean value of housing in each community and the expected capitalized value of uncontrolled development. Note that here the segments of line CC marked off in Quadrant III are represented by single points. In other words, we are assuming that houses of different values have an equal probability of being developed, so that the midpoints of the segments marked off along CC can be used to represent the average or expected capitalized value of the net fiscal benefits to be derived from uncontrolled development. Line DD indicates that the wealthy community expects to lose from uncontrolled residential development while the poor community expects to gain.

Once communities have land use controls at their disposal, they are able to influence the fiscal gains or losses which occur from residential development within their borders. We postulate that a community will use

such controls to ensure that the residential development which takes place will provide at least a zero fiscal surplus, i.e. that it will at a minimum break even in terms of a fiscal cost-benefit analysis. In terms of our Diagram 1, only those housing values which provide revenues to the left of the vertical (break even) line in Quadrant II will be allowed into communities. This means that only new houses which are equal to or greater in value than the average value of housing already in a community will be allowed into the community. This result can be illustrated in our Diagram 1 simply by including an additional axis to the right of Quadrant IV along which is measured the 'minimum value of additional dwelling units'. As we proceed northward along this axis, the 'minimum value of new dwelling units' required by a community increases, i.e. its zoning becomes more restrictive.³

It must be emphasized that the DD line highlights two different relationships, one between the expected capitalized value of uncontrolled development and the average value of housing in a community and the other between the minimum value of new dwelling units and the average value of housing in a community. The second relationship results from the first relationship.

It is worthwhile to briefly examine the correspondence between the two vertical axes of Quadrant IV, the expected capitalized value of uncontrolled development and the minimum value of additional dwelling units.

Three observations in particular can be made. First of all, when the expected capitalized value of uncontrolled development is highly positive, the minimum value of new dwelling units will be very low, reflecting a non-restrictive zoning policy. In this case almost any type of development will fiscally benefit the community and there is little need to control development. However, when the expected capitalized value of development is highly negative, the minimum value of new dwelling units will be very high, reflecting a highly exclusionary zoning policy. In this case, almost any type of development will impose a fiscal burden on current residents so that strict controls will be imposed. Finally, when the expected capitalized value of development is equal to zero, the minimum value of additional units is the mean of the range of community mean housing values. Only the community whose mean housing value is equal to the mean of community means will have an expected capitalized value from uncontrolled development of zero. In keeping with our observation above that each community will require

a 'minimum value of new housing units' at least equal to its community average housing value, the community with a zero expected capitalized value of uncontrolled development will thus have a minimum housing value requirement set at its community average, which is equal to the mean of community housing value means.

A few comments are also in order at this point concerning our assumption that houses of different values have an equal probability of being developed in each community. First of all, it must be emphasized that this assumption should not be viewed in the context of development patterns that occur in practice, because 'in practice' is a situation in which zoning policies are already in effect in order to avoid the fiscal deficits that would occur from uncontrolled development, the situation to which our assumption of equal probabilities applies.

In a situation of uncontrolled development the assignment of probabilities to the development of different housing values is more problematic. In the case of wealthy communities, it appears reasonable to assign equal probabilities to the development of low-income and high-income housing. The major premise of the fiscal zoning literature is that the poor pursue the rich in a game of

"musical suburbs" in order to derive fiscal benefits without paying the full costs. The rich move into other wealthy communities in order to avoid making such transfers. Wealthy communities are thus the destination of rich and poor alike.

The same is not necessarily true of poor communities, however. The rich are deterred from locating there by virtue of the fact that they would have to make fiscal transfers to the existing poor residents. Assigning lower probabilities to the development of high-income housing in poor communities would lower the expected value of uncontrolled development there.

A change in our assumption along the above lines does not qualitatively affect our results in terms of the zoning incentives facing wealthy versus poor communities. Wealthy communities expect to lose from uncontrolled development and, therefore, have restrictive zoning policies; poor communities expect to gain from uncontrolled development, although to a lesser degree when low probabilities are assigned to development of high-income housing within their borders, and, therefore, have non-restrictive zoning policies.

Another aspect of this issue involves the ramifications of zoning policies in wealthy communities

on poor communities. In the previous paragraphs, we discussed situations of uncontrolled development and their implications for zoning policy in each type of community, wealthy and poor. No interaction between the two was mentioned. However, it is possible that, once restrictive zoning policies are introduced in wealthy communities, the probability of fiscal surplus development occurring in poor communities will increase due to the exclusion of such development from wealthy communities. Development which is excluded from wealthy communities because it would create fiscal deficits there may locate in poorer communities where it would generate fiscal surpluses. In circumstances where wealthy communities have already introduced restrictive zoning policies, the probability of such 'middle-income' development occurring in poor communities is higher, and the expected value of uncontrolled development greater, than in the case where there is no zoning in effect anywhere and the 'middle-income' development can still locate in wealthy communities.⁴ As discussed below, the distribution of housing development among communities will depend in large part on the number of communities in which development can occur and their zoning policies.

An additional point needs to be made with regard to the minimum value of new dwelling units. This point derives in part from our discussion of Single-Family vs. Non-Single Family Residential Development in Chapter 1. The exclusionary zoning of wealthy communities does not always reflect the fiscal profitability of expensive single family homes. If the wealthy community's tax rate is particularly low, due to commercial and industrial property tax revenues (see the appendix to this chapter), it may be the case that no type of residential development will fiscally benefit the community. Assuming that the community cannot ban development outright, it will attempt to minimize its losses by zoning for large-lot single family houses and thereby limiting the number of units which can be built. Note that this does not necessarily mean that expensive homes are the least fiscally disadvantageous on a per dwelling unit basis. Small apartment units may be less fiscally disadvantageous on a per dwelling unit basis than single family homes because of the much lower expenditure levels associated with apartment units. However, in terms of fiscal disadvantage per unit of land, the large-lot single family home emerges as the best option for the community because only a small number of

such units can actually be built on a given amount of land compared to the greater number of apartment units which can be built. In short, the use of exclusionary zoning practises may reflect either the fiscal desirability of only very expensive houses or alternatively the absence of fiscal advantage from any type of development.

The counterpart of this phenomenon in the poor community centres on the fact that it can gain from almost any type of development because of its high tax rate. Such communities may find large-lot single family houses to be the most fiscally advantageous per dwelling unit. In order to maximize the fiscal gains from development, however, such communities will encourage the development of apartment units, which provide smaller fiscal surpluses on a per dwelling unit basis but larger surpluses per unit of land developed. While such communities are not likely to discourage the development of single family homes, they are apt to favour apartment unit construction.

In the wealthy community the range of admissible new housing values is obviously more limited than in the case of the poor community. While the implications of fiscal zoning as far as the wealthy community is

concerned are thus exclusionary in nature, the same cannot be said of the poor community, where more inclusionary zoning is fully consistent with its best fiscal interests. Thus it is important to note that fiscal zoning is not synonymous with exclusionary zoning.

If we assume a large number of communities⁵ the effect of introducing land use controls will be to establish a system of communities homogeneous in terms of housing value: the variance of housing values within each community will be very small, while the variance across communities will be large, corresponding to the range of housing values indicated along the horizontal axis of Quadrant I in Diagram 1. The emergence of this system can best be examined if we begin with the simplest case of two communities, one wealthy and one poor, as presented in our model above. With the introduction of land use controls, entrants to the wealthy community will have to consume at least the mean value of housing in the community. Those not willing to do so have no option but to locate in the poor community where, if they consume more than the mean value of housing in the poor community, they will confer fiscal transfers on the current residents. In this case we would expect to see very little housing value variance in the wealthy community but considerably greater variance in the poor community.

We now assume a three-community system with a wealthy, poor and intermediate community. The intermediate community is characterized by housing the mean value of which lies between the mean housing values of the poor and wealthy communities. Those potential entrants to the wealthy community who are not willing to meet its minimum housing value requirement now have the option of moving into the intermediate community as long as they are willing to meet the intermediate community's minimum housing value requirement. By so doing they are able to avoid making fiscal transfers to the residents of the poor community. Of course, those families who are not willing to meet the intermediate community's minimum housing value requirement will still have to locate in the poor community.

Entrants to the poor community will now be consuming housing of a value somewhere between the mean housing value of the poor community and the mean value of the intermediate community rather than between the mean housing value of the poor community and the mean value of the wealthy community. Consequently, the variance of housing values within the poor community will be reduced. Additional increases in the number of communities in the system reduce the variance of housing values within each community even further. The final outcome of this process

is a system of communities characterized by minimal variance of housing values within their borders, i.e. a system of homogeneous communities.

Different Expenditure Levels Across Communities

Although our assumption in the preceding section of a fixed level of expenditures across communities may be considered highly restrictive, it should be noted that inter-community variation in expenditure levels does not affect the basic results derived above. To demonstrate this point, we begin by assuming that the expenditure level in each community is raised by a uniform amount. A higher tax rate is now required to finance the higher expenditure level; this is reflected in an upward shift in the AA line to A'A' in Diagram 2. The application of a higher tax rate to the given range of probable development values increases the amounts of revenue to be derived from alternative developments, as indicated by the line B'B'. It must be remembered, of course, that a higher expenditure level is in effect as well, as indicated by the line Expenditure 2 in Quadrant II of Diagram 2. The overall effect is to increase the absolute amounts of the surpluses and deficits to be derived from development of other than mean value housing. Development of new dwelling units

DIAGRAM 2 - DIFFERENT EXPENDITURE LEVEL

equal in value to the community's mean housing value will still produce a zero fiscal balance; this will simply occur at the higher level of expenditures and revenues.

The capitalized values of the surpluses and deficits will also increase, as indicated by the longer segment marked off on the C'C' line as compared with that on the original CC line. The C'C' line lies to the left of the CC line to reflect the fact that the fiscal break even point now occurs at a higher level of expenditures (and revenues). The expected capitalized value of uncontrolled development is again the midpoint of the segment marked off on C'C'. It is greater in value (in absolute terms) than when expenditures were at the lower level.

The effect on the DD line is to rotate it in a counter-clockwise direction as shown in Quadrant IV of Diagram 2. The additional axis to the right of Quadrant IV indicates that the zoning implications of this rotation are an increase in the minimum value of additional dwelling units allowed into the wealthy community and a reduction in the minimum value allowed into the poor community.

The above result is based on the assumption that

both communities have a higher level of expenditures than before. If we now assume that the wealthy community has the higher expenditure level, then $D'D'$ becomes the relevant dashed line in Quadrant IV. The wealthy community becomes relatively more restrictive in its zoning policy than it was before at the lower expenditure level. Intuitively, the wealthy community now has even more to lose from development than before.⁶

On the other hand, if we assume that the poor community has the higher expenditure level then the relevant dashed line in Quadrant IV is $D'D$. The poor community becomes relatively more expansionary in its development strategy. Intuitively, the poor community now has even more to gain from development than before.

Regardless of which of these assumptions we make, the result is essentially the same: a difference in expenditure levels tends to reinforce the basic difference in zoning policy between the wealthy and the poor community, namely, that the zoning policy of the former is more restrictive than that of the latter.

APPENDIX

Commercial and
Industrial Land Use

Our model is useful in explaining an empirical phenomenon noted by Fiscal and by White.¹ Residential communities which are experiencing commercial and industrial development often increase the required housing consumption, via zoning, of new entrants to the community. An example of this situation cited in the literature is the case of Mahwah, New Jersey. In that community 35 percent of property taxes are paid by commercial and industrial uses, primarily an automobile assembly plant. The zoning bylaws stipulate minimum lot sizes of two acres for new residential development, requiring houses considerably higher in value than the average of the existing housing stock.

With a nonresidential tax base a community can finance a given level of public expenditures at a lower residential tax rate than it could without commercial/industrial development. Assume that each of our two communities has a nonresidential tax base of the same value. The AA line will now be lower, A'A' in Diagram 3, than in the wholly residential situation we began with. Due to the lower residential tax rates in each community, the fiscal surpluses (deficits) and their capitalized

DIAGRAM 3 - COMMERCIAL/INDUSTRIAL TAX

values from the same development possibilities as before are now lower (higher) than previously. This means that the DD line will shift upward to D'D' and consequently that zoning policies will become more restrictive than previously, as seen in the higher 'minimum value of new housing' required in each community.

There is an intuitive explanation for this result. Residents coming into the community after commerce/industry has arrived will dilute the fiscal transfers existing residents derive from the nonresidential tax base, unless they provide a residential fiscal surplus at least equal to the commercial/industrial fiscal transfers.

Of course, the residential nature of the community will not be significantly altered if development of commerce and industry occurs after most residential development has taken place. In this case a community with a large nonresidential tax base may be characterized by low value housing. The timing of development and the amount of land available for further development at different stages are the critical factors here in determining the residential character of the community.

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GOVERNMENT GRANTS

The theory of fiscal zoning presented in Chapter 2 examined the role of local fiscal circumstances in determining community development patterns. Our model was cast in terms of communities which relied exclusively on property taxes for the financing of their public services. In the post-war period, however, communities have had to rely less and less on property taxes as alternative revenue sources have become available. The most important of these have been provincial grants to local governments. Because of their relative size, these grants have had a major impact on local fiscal circumstances. In the fiscal zoning context they are also expected to have influenced community development patterns. Grants reduce the incentive to zone fiscally by weakening the link between the community's fiscal balance and the development path it pursues. The effects of any particular type of grant, of course, will depend on its specific characteristics and its overall importance as a revenue source for the community.¹

We begin this chapter with a brief discussion of the relative importance of grants as a revenue source for Canadian, and in particular Ontario, municipalities. A theoretic discussion of the effects of different types of grants on local expenditure levels is then presented. Finally, we examine the effects of grants within the

context of our model.

Grants to Local Governments

A major change in local government revenue sources since the Second World War has been the increased role of provincial grants. By 1974 special purpose provincial transfers accounted for 42.4 percent of total local government revenues, while general purpose transfers were 5.9 percent of local revenues.² All types of grants, including federal government transfers, accounted for 49.4 percent of local government revenues in 1974. This figure represents an increase from the 1969 figure of 42.4 percent, and a major change from the 1950 figure of approximately 21 percent.³

By 1974 property tax revenues had declined to 35.9 percent of total local revenues, a substantial decrease from even the 1969 figure of 43.1 percent.⁴

In Canada over 90 percent of provincial grants to local governments, and over 65 percent of federal grants, are classified as 'conditional'.⁵ Conditional grants are of primary importance in the area of education and often contain equalization features.

'Unconditional' grants exhibit greater variability in their characteristics across provinces.

Conditional grants have played a major role in school board financing in the post-war period. In Ontario over the period 1970 to 1975 alone, the percentage of school board revenues accounted for by provincial grants increased from 50 percent to 59 percent.⁶ The share of property taxes in school board revenues fell from 48 to 38 percent. Because of equalization features, though, the actual level of support received by any single school board varied (in 1975) from 35 percent in Metro Toronto to over 95 percent in isolated areas of northern Ontario. Concurrent with these increases in provincial education grants in Ontario, a ceiling on school board expenditures per pupil was imposed. This requirement reflected a desire to have provincial grants act as a substitute for local property tax financing of education expenditures. From 1970 to 1974 school mill rates declined rather uniformly throughout the province, although in 1975 they increased. The decreases were accompanied, however, by increased municipal mill rates as municipalities attempted to occupy the tax room vacated by the school boards.

Provincial grants played a relatively less important role in municipal finances, accounting for

28 percent of revenues in 1970 and increasing to 36 percent by 1975.⁷ Property taxes decreased from 59 percent to 49 percent of municipal revenues over the same period. Almost two-thirds of such grants are conditional in nature, being allocated for transportation and for health and social purposes.

Ontario's system of unconditional grants tends to be more complicated than those of the other provinces. Unconditional resource equalization grants are available, as are general support grants towards the financing of municipal services.⁸ There are also general per capita grants which increase with the size of the municipality; additional per capita grants for communities providing their own police force or under contract with the Ontario Provincial Police; and, per capita grants which vary inversely with the population density of the community.

Theoretical Considerations

The effects of different types of grants on local expenditure patterns must be considered. The Musgraves⁹ have examined the effects of non-matching versus matching grants and of general versus earmarked grants. A non-matching grant has a simple income effect, whereas a matching grant has both an income and

substitution effect. Diagrammatically, these correspond to a shifting and a rotation, respectively, of the community budget line. In both cases, the effect is to stimulate expenditures on public goods, with the matching grant effect being the larger of the two.

In the case of general versus selective grants, the Musgraves demonstrate that beyond certain levels of consumption of a public good, selective grants become a lower cost means of achieving desired consumption levels. Overall, they conclude that "Budget cost is minimized if the desired increase in a particular public service is secured by way of a matching and selective grant."¹⁰ Alternatively, one can say that a given level of grants will have a more stimulative effect on the consumption of a public good(s) if the grant is of a matching and selective nature.

Netzer¹¹ indicates that while the purpose of federal grants is generally to stimulate the provision of public services at the local level, state grants are often intended to provide a substitute for local tax support of public services. He cites evidence, however, that state grants have had some stimulative effects and have not been simply a substitute for property taxes.

Netzer concludes that "The effects of grants-in-aid on the output of public services are thus by no means clear."¹²

With regard to Canadian studies of the effects of government grants, Auld found that in the province of Ontario conditional grants had a positive impact on per capita expenditures while Slack's results were less conclusive: they varied according to the functional form specified for the analysis.¹³ Slack did find evidence, however, that unconditional grants to municipalities increased municipal expenditures but by an amount considerably less than the grant itself.¹⁴

As indicated above, the categorization of government grants can become quite complex: federal versus state, matching versus non-matching, general versus selective (unconditional versus conditional). For purposes of examining the role of grants in our model, we divide grants into two major types: cost sharing and equalization.

Cost sharing grants pay a fixed percentage of the costs of providing specific public services. They constitute an important part of Ontario's system of 'conditional' grants to municipalities. Equalization grants vary inversely with the fiscal capacity of

communities. This is the basic characteristic of Ontario's 'unconditional' Resource Equalization Grants paid to municipalities and, more importantly, the 'conditional' Ordinary Operating Expenditure Grants paid to school boards.

As the above description indicates, these grants can be classified both by the financial basis on which they are paid (cost-sharing or equalization) and the services which they are intended to finance, either individual services, for which 'conditional' grants are paid, or municipal services in general, for which 'unconditional' grants are paid.¹⁵ The following matrix shows where these two characteristics coincide.

	Cost Sharing	Equalization
Conditional	X	X
Unconditional		X

It should be noted that several conditional grant programs (e.g. road maintenance) contain both cost sharing and equalization features. A basic 50 percent of the cost of providing the specific service is given, but the percentage can vary up to 80 percent of the cost

depending on the community's fiscal need. Since we are interested in provincial grants in terms of their fiscal impact on municipalities, rather than the nature of the services they help pay for, we will use the 'cost sharing, equalization' classification of grants for the purpose of incorporating them into our model.

Cost Sharing Grants

The most important characteristic of the cost sharing grants is that they reduce the cost of providing local services for all communities regardless of fiscal capacity. In the following analysis we assume that all communities benefit to the same extent from the cost sharing grants.¹⁶ We also assume that the grants are used as a full substitute for local property taxes in the financing of local services. This assumption allows us to keep the expenditure line in Quadrant II fixed at the original level. Again, expenditures are assumed to be equal for all communities.

The effect of the cost sharing grants on the tax rate is to reduce it proportionally (say, by one half) in all communities. This means that poor communities will experience a greater

reduction in tax rates, in percentage point terms (e.g. from 10% to 5%), than will wealthy communities, where a halving of the tax rate will result in a smaller decrease in percentage point terms (e.g. from 4% to 2%). Consequently, the AA line in Quadrant I will shift downward but in a nonparallel fashion, as indicated in Diagram 4.

Each community now requires less property tax revenue to finance its expenditures and therefore has a lower tax rate. The effect of the lower tax rate is to increase (reduce) the deficits (surpluses) to be derived from uncontrolled development. This is illustrated by the lower BB line, B'B', in Quadrant II. A greater portion of that line now lies to the right of the expenditure line in Quadrant II. The capitalized values of uncontrolled development will also be smaller than before, as indicated in Quadrant III along the line CC. Finally, the expected capitalized value of development will be smaller for all communities as well, so that the DD line in Quadrant IV will shift upward. The new DD line, D'D', will not be parallel to the original DD line, however. Poor communities will experience relatively larger reductions in their surpluses than wealthy communities will experience increases in their deficits. This is due to the

DIAGRAM 4 - COST SHARING GRANTS

greater percentage point decrease in tax rates in poor communities as compared with wealthy communities. The uneven shift of the DD line in Quadrant IV corresponds to the uneven shift of the AA line in Quadrant I. This shift in the DD line, it must be remembered, only reflects the effects of the cost sharing grants on local tax rates.

We must also consider the effects of the grants themselves. Since we have assumed that the dollar value of the grants is uniform across communities, the capitalized value of the grants will also be the same for all communities. This is illustrated in Quadrant III of Diagram 4 by a line drawn at a level corresponding to the capitalized value of the grants.

Once the positive capitalization effect of the grants is combined with the shift in the DD curve due to the lower tax rates in effect in the communities, the net result is a rotation of the original DD line to $D''D''$ in the manner illustrated in Diagram 4. (The line $D''D''$ lies parallel to $D'D'$; the space between them represents the capitalized value of the cost sharing grants.)

The implication of the rotation of the DD line is that wealthy communities will become less restrictive

in their zoning policies as indicated by the lower minimum value of new dwelling units they now require. The intuitive explanation for this result is that the services required by entrants to the community are now financed in part by government grants and impose less of a fiscal burden on existing residents, thereby reducing their resistance to development.¹⁷

It must be emphasized, however, that this result is contingent on our assumption that grants are a full substitute for local property taxes so that there is no stimulative effect on local public sector expenditures. To the extent that the grants and property taxes are not perfect substitutes and that there is a stimulative effect, the impact of grants on zoning restrictions will be diminished.

It is also interesting to note that, under the assumptions of our model, an analysis of per capita grants would be essentially the same as that of cost sharing grants. The similarity arises because in our analysis of cost sharing grants, all expenditure categories are implicitly assumed to receive grants. If the provincial government subsidizes (say) 50 percent of each expenditure category and hence 50 percent of all local expenditures, which we have

assumed to be constant across communities, then it is analytically equivalent to providing a per capita grant equal to 50 percent of local per capita expenditures.¹⁸

Per capita grants differ in a fundamental way, however, from cost sharing (and equalization) grants in that they are associated with persons rather than with services, either specific or general. This has important implications for municipal zoning policies. Per capita grants do not distinguish between wealthy and poor entrants to a community. All newcomers bring with them a standard per capita grant regardless of their economic status. Consequently, the wealthy community has no special incentive to reduce its resistance to admitting poor newcomers relative to wealthy newcomers. On the other hand, cost sharing (and equalization) grants, which are (generally) conditional in nature, may reduce the reluctance of wealthy communities to admit poorer residents if the grants are available for services which lower income groups might require (e.g. welfare).¹⁹

Thus the nature of grants, as well as their size in relation to local revenues, is an important consideration in determining their effects on municipal zoning practises.

Equalization Grants

We assume that equalization grants have the effect of lowering property tax ~~es~~ to that prevailing in the wealthy community. At this rate, r_2 , fiscal surpluses/deficits from uncontrolled development will be the same for all communities. The admission of residential development which creates fiscal deficits, and hence results in a higher tax rate than r_2 , will be compensated for by grants in order to restore the r_2 tax rate. The admission of residential development which creates fiscal surpluses, and hence results in a tax rate lower than r_2 , will be offset by fewer grants to reflect the less urgent need for fiscal relief through upper level government funding.²⁰ Local property taxes and government grants are again assumed to be full substitutes.

Diagrammatically, the AA line becomes horizontal at r_2 (the wealthy community's tax rate) and the line B'B' now indicates the range of revenues from additional dwelling units for any community (see Diagram 5). The line C'C' represents the capitalized values of the offsetting grants. The combined effect of the CC and C'C' lines is to produce a zero capitalization effect overall. Consequently, the expected capitalized value of development is zero

DIAGRAM 5 - EQUALIZATION GRANTS

so that DD becomes horizontal at D'D'. The major implication of the horizontal line D'D' is that suburban communities become less restrictive in their zoning practises. The intuitive explanation for this result is that the fiscal deficits which occur from development in the wealthier communities are now offset by grants so that there is no net fiscal damage done to the current residents of those communities.²¹

It should be noted again that the above analysis assumes full equalization, i.e. a system in which grants are made in order to lower tax rates to r_2 and payments are reduced in order to raise tax rates to r_2 . This grant system equalizes up as well as down.

Equalization grants which only equalize down reduce zoning incentives to an even greater extent than do grants which provide for full equalization. In the partial equalization case the expected value of uncontrolled development is positive; fiscal deficits are fully compensated for but fiscal surpluses are not offset by negative grants. In Quadrant IV of our Diagram 5 this situation would be represented by a point below that indicated on the D'D' line; this

point would correspond to a smaller value on the 'minimum value of additional dwelling units' axis, reflecting less restrictive zoning policies.

In the full equalization case a community can receive negative as well as positive equalization grants. It will not encourage development to the same extent that it would if it were able to admit fiscal surplus housing without grant reductions. With full equalization a community has nothing to lose or gain from development, while with partial equalization a community has nothing to lose but does have something to gain.²² In either case, of course, the presence of equalization grants is still expected to reduce a community's incentive to zone fiscally.

Before turning to a discussion of the empirical testing of the effects of grants on zoning incentives, we examine in the following chapter the implications for fiscal zoning of local government reorganization.

CHAPTER 4

METROPOLITAN GOVERNMENT

In the three major urban areas of this country, Toronto, Montreal and Vancouver, metropolitan government has been introduced. In all three cases land use planning has been affected by the reshaping of local government. In addition to the assignment of planning functions within the metropolitan federations, under the fiscal zoning hypothesis we would also expect land use patterns to have been influenced by the rearrangement of tax and expenditure responsibilities among local governments following reorganization. Despite varying reasons for metropolitanization and different degrees of success, in all cases local government reform has brought with it changes in the fiscal burdens borne by local taxpayers. Indeed, the presence of sharp differentials in property tax bases, tax rates, service levels and fiscal burdens among residents of the same metropolitan (geographical) area was an important motivating force behind government reorganization in the first place, at least in Toronto and Montreal (see below).

We begin this chapter with a brief discussion of the theoretical implications of government reorganization, with particular reference to the model developed

in Chapter 2. Some of the literature which has attempted to assess empirically the effects of government reform is then examined. In the final section of the chapter, a short history of government reform measures in Toronto, Montreal and Vancouver is presented. An appendix to this chapter provides a discussion of regional government in Ontario.

Metropolitan Government

Metropolitan government provides a mechanism whereby fiscal transfers among residents cannot be avoided by zoning out of individual communities potential entrants who would constitute a fiscal burden for existing residents. While some residential segregation by income level and housing value would still be expected even in a fiscally unified metropolitan area, one would expect that the restructuring of fiscal transfers implied by metropolitan government would reduce the restrictiveness of pre-metropolitan zoning regulations. Indeed, this is one of the results hoped for by advocates of metropolitan government.

The formation of a metropolitan government in its extreme form would, of course, mean the elimination of fiscal zoning by any single constituent municipality simply because that municipality would cease to exist.

We are basically concerned with the implications of metropolitanization which leaves local municipalities with autonomy to carry out their own land use planning.

The formation of a metropolitan government is similar to the assumption of public service financing and provision by higher level governments. In the former case new government levels are established to provide specified public services while in the latter case specific public services come under the aegis of higher level governments which are already in place.

Assuming a uniform service level throughout the metropolitan area, the tax rate to be applied in the constituent municipalities will be determined by that service level in conjunction with the total value of property in the metropolitan area. Because of the uniform tax rate, development of a given value of housing will create a fiscal surplus (or deficit) of the same value regardless of the community in which it occurs. Since the surplus (or deficit) will accrue to all the residents of the metropolitan service area, no particular fiscal benefit or cost will attach to residents in a given community from having development occur there. The capitalized value of development from the point of view of each community will be zero, since its residents will not receive the benefits of

fiscal surpluses nor incur the costs of fiscal deficits. With few public sector fiscal benefits (or costs) accruing specifically to the residents of any given community, the extent of development to be allowed will be determined by nonfiscal considerations. This means that the value of housing allowed into a community will bear little relationship to the tax base or value of housing already in the community.

In diagrammatic terms the AA line will become horizontal at the tax rate determined by the property tax base and expenditure level of the metropolitan area. Because this tax rate is applied uniformly across all communities, the fiscal surpluses and deficits to be derived from residential development will be the same regardless of where it occurs. From the point of view of any one community, the fiscal surpluses and deficits which result from development within its borders will be virtually zero (since the surpluses/deficits accrue to the metropolitan area as a whole). Their capitalized values will be zero as well. The CC line will become horizontal at the zero capitalization point, which leads to a horizontal DD line, D'D'. As seen in Diagram 6, one of the implications of the horizontal line D'D' is that formerly

DIAGRAM 6 - METROPOLITAN GOVERNMENT

II
EXPENDITURES
PER DWELLING UNIT

B B

TAX
RATE

A

A'

MEAN
HOUSING
VALUE

FISCAL
SURPLUS/DEFICIT
PER ADDITIONAL
DWELLING UNIT

C

(-)

C'

(+)

C

III
EXPECTED CAPITALIZED
VALUE OF
UNCONTROLLED
DEVELOPMENT

D'

D

IV

MINIMUM VALUE
OF ADDITIONAL
DWELLING UNITS

exclusionary suburbs will become less restrictive in their zoning policies, allowing houses lower in value than the community mean to be built.¹

In a consolidated area including only a few municipalities these results may not obtain however. It is possible in such circumstances that an individual community's tax base will constitute a large percentage of the total tax base, so that the effects of the development it allows to occur within its borders will have a significant effect on the metropolitan area tax base and tax rate and hence on its own fiscal circumstances. Surpluses and deficits derived from development within its borders may have a substantial impact on the community itself. In other words, the fewer the communities in the metropolitan area, the less the extent to which fiscal deficits can be divided and the greater the loss absorbed by any one community. Conversely, the less the extent to which fiscal surpluses are divided, the greater is the benefit accruing to any one community.

With a very large number of communities in the consolidated area, the diagrammatic results referred to above would obtain. At the other extreme, with a service area of one community (i.e. total local autonomy), our initial results of Chapter 2 would

apply. The extent to which the incentive to zone fiscally is removed, therefore, depends in this analysis on the number of communities included in the metropolitan area.

Furthermore, wealthy communities have a greater incentive to consolidate among themselves than with more disparate communities. By so doing they are able to reduce the level of inter-community fiscal transfers. From a wealthy community's point of view, its consolidation with other wealthy communities will result in a lower areawide tax rate than would be the case if it consolidated with poor communities. Just as similar households group together in an individual community in order to minimize fiscal transfers, so too do similar communities have the same incentive to group together.

Empirical Evidence

Empirical studies of metropolitan consolidation and assumption of service provision by higher levels of government have been carried out by Bradford and Oates and by Bahl and Vogt, respectively.²

Based on data for New Jersey municipalities, Bradford and Oates calculated changes in municipal tax rates, school expenditures and non-school

expenditures that could be expected from the introduction of metropolitan government. In the case of tax rates they found that there would be a redistributive effect from the suburbs to the central city, with the former experiencing increases and the latter experiencing decreases, thereby lending support to traditional suburban concerns about metropolitanization. More interesting, however, was their conclusion that metropolitan reorganization would lead to considerable redistribution among the suburban communities themselves, with only a weak statistical relationship to the income levels of the communities involved. In conjunction with the fact that the tax reductions accruing to central city landlords might only partially benefit lower income groups there, depending principally on the extent of forward shifting to tenants and long run adjustments in the supply of housing and rent levels, this led Bradford and Oates to conclude that "...the introduction of a metropolitan-wide tax on real property would redistribute income in nontrivial sums but in a rather haphazard way."³

In the case of equalizing school expenditures across communities, with total expenditures held at their pre-consolidation level,⁴ the redistribution

among suburban communities was greater than that between the suburbs and the central cities. In this case, however, there was a strong relationship between expenditure changes and community income levels, so that the primary redistributive effect was from suburban rich to suburban poor.

Finally, with regard to noneducational public expenditures, the authors concluded that metropolitan consolidation, if it attempted to equalize service levels across communities, would likely result in higher levels of noneducational public services being offered in suburban areas, part of the cost of which would fall on central city residents. The redistributive effect in this case would be from central city to suburban residents. Some inter-suburban redistribution from the rich to the poor would also likely occur.⁵

The overall redistributive effects of consolidation were far from clear, therefore, although Bradford and Oates suggested that there would likely be a move toward a more egalitarian distribution in the long run. They "...are not, however, convinced that the difference [between a fragmented and consolidated system of local government] would be very great unless the [consolidated system] involved a basic shift away from property taxes

to more progressive forms of taxation, or unless the secondary effects of reduced income segregation on individual productivity differences proved important."⁶

Bahl and Vogt examined the implications of both regional and state assumption of local service financing. Their primary concern was the equity effect of such shifting of responsibility, which has important implications for fiscal zoning. Presumably the reduction in interpersonal inequity arising from regional/state financing of local goods would reduce the incentive of lower-income groups to allow fiscal advantages to influence their residential location decisions. In turn this would be expected to reduce the incentive of higher-income groups to impose restrictive zoning regulations in order to avoid making fiscal transfers.

Bahl and Vogt's conclusions with respect to the equity implications of regional/state financing were dependent on how the reform was structured and, in particular, on the level of government which assumed responsibility and the means it used to finance the services. Based on the results of nine case studies of the effects of shifting responsibility for services to higher government levels, the authors concluded that

the greatest benefits in terms of equity were achieved when services were transferred to the state level where they were financed by personal income taxes. In contrast, "...in cases where a shift is proposed from a local property to a regional property tax, there is no reason...to expect a change in the relative distribution of effective tax rates across income classes."⁷ This observation applied only to distribution within the central city, however, rather than within the region as a whole (they used county governments in their analysis). In the two case studies the authors cited with regard to regional property tax financing of services, the distribution of relative tax burdens among central city residents changed only marginally as a result of county assumption of the financing of a set service package.

All central city residents still benefitted vis-à-vis suburban residents, however.⁸ Had Bahl and Vogt included the equity effects of the service transfer on suburban residents, they would likely have found a higher degree of interpersonal equity as a result of the shift than they did by focusing on central city residents alone. Since transfers to central city residents benefit both the rich and the

poor there, one would not expect to find a substantial alteration of central city relative tax burdens anyway.

The results of Bahl and Vogt's analysis clearly indicate that the financing of local services by higher government levels can be expected to create inter-jurisdictional transfers which, in turn, will reduce local incentives to zone fiscally, as discussed above.

The Creation of Metropolitan Toronto (Metro)

Toronto provides one of the best known and most successful examples of metropolitan government in North America. The federation of thirteen municipalities in the greater Toronto area in 1953 was largely in response to growth pressures following the Second World War. While the population of the central city remained relatively stable, the suburban population was increasing rapidly. For example, between 1945 and 1950 the population of North York increased from under 25,000 persons to over 100,000. The suburban areas found it difficult to meet the service requirements of their expanding populations; some municipalities sharply restricted, or even stopped, the issuance of residential building permits.

The basic objectives of the government reforms of 1953 were to facilitate the provision of certain

Services over the metropolitan area and to redistribute the tax base to alleviate the financial burdens imposed by rapidly expanding populations on small municipalities. The concept of regional planning received special recognition in the Municipality of Metropolitan Toronto Act. A Metropolitan Toronto Planning Area was established covering approximately 720 square miles, two-thirds of which were outside Metro's boundaries, and including twenty-six municipalities, thirteen of which were outside Metro.

In 1967 the thirteen municipalities of Metro were consolidated into six.⁹ This measure reduced the variation in tax bases among the municipalities. At the same time, responsibility for public welfare, garbage disposal and traffic engineering was transferred to the Metro government.¹⁰ The assignment of the welfare function to Metro was in response to the increasing disparities between welfare expenditures by the city of Toronto and the twelve suburban municipalities. While Toronto residents, through Metro, were contributing toward the financing of expanding physical services in the suburbs, suburban residents were not contributing to the increasing welfare burden that Toronto was experiencing.

Furthermore,

...there is no doubt that zoning bylaws, pressures against the creation of public housing in the suburban areas, and the sheer lack of social services for people in need reinforced the residential location of disadvantaged persons in the city and helped to keep them out of the suburban municipalities.¹¹

In the area of education, the number of school boards in Metro was reduced from eleven to six, their boundaries corresponding to the six Metro municipalities. The major responsibility for financing was placed at the metropolitan level, an area-wide mill rate for education was established, and strict limits were placed on the ability of local governments to finance additional education expenditures out of own tax sources. The powers of the Metropolitan Toronto School Board, which had been set up along with Metro Council, were expanded in the area of authorizing and financing capital and operating expenditures by local school boards.

In addition to the transfer of responsibilities from local municipalities to the Metro level, several functions were transferred to the provincial level around this time. In 1967 pollution control was transferred from Metro to the province and in 1968 the provincial government assumed responsibility for

local courts and jails as it did for property assessment in 1970.

With the creation of regional governments around Metro in 1971 and 1974, the planning area under the jurisdiction of the Metropolitan Toronto Planning Area was reduced; that body was finally abolished in 1974 and its responsibilities assumed by the Metro Council.

Gail Cook has provided some analysis of the effects of the 1953 and 1967 reforms in Toronto. In a study¹² of the effects of the 1953 reforms on education expenditures, she found that federation resulted in an increase in such expenditures, largely the result of raising and equalizing service standards across the metropolitan area. While acknowledging the presence of a redistribution of fiscal burdens (with respect to education) among constituent municipalities, the size of such shifts and the particular 'recipients' and 'donors' are not identified.

In a study¹³ of metropolitan finance following the consolidation of the thirteen municipalities in 1967, Cook found that expenditures on fire and education, both of which were affected by the consolidation, increased; on the other hand, expenditures on

police protection, which was not affected by the consolidation, did not increase following reorganization. Fire protection was affected because it was a local government function. Police protection, on the other hand, had been a metropolitan function since 1957 and was not affected by the 1967 consolidation.

The Montreal Urban Community (MUC)

Municipal reform in the Montreal metropolitan area has involved two government reorganizations. In 1965 the government of Quebec amalgamated the thirteen municipalities of île Jésus to form the municipality of Laval. In 1970 the Montreal Urban Community (MUC) came into being to facilitate the coordination of local government policies among thirty municipalities on the island of Montreal.¹⁴ It is important to note that not all of the municipalities in the Montreal metropolitan area were included in these reorganizations. The South Shore communities and those north of Laval were not affected.

The motives for the formation of the MUC¹⁵ differed markedly from those which influenced the creation of Metro in 1953. In that case, municipal restructuring was seen to be a vehicle for facilitating the expansion of transportation, water and sewerage services

occasioned by the rapid growth the Toronto area was experiencing at that time. The emergence of the MUC was prompted by a perceived need to better coordinate local government policies on the island of Montreal with respect to crime, pollution and poverty.

Efforts in June 1969 to pass legislation creating the MUC were vigorously opposed by the administration of the City of Montreal, which wanted an amalgamation of the Montreal island communities. By December 1969 the City of Montreal had softened its opposition, in considerable part due to a police strike in October of that year. The settlement of that strike would have involved substantial cost increases if met by the City of Montreal alone. The MUC, and its assumption of responsibility for police services on the island,¹⁶ provided a means by which the higher costs could be spread over a wider area. This very fact led to serious problems within the MUC in its early years, when the suburban municipalities refused to approve the 1972 MUC budget. The suburbs objected to paying \$16 million of a \$51 million reimbursement to the City of Montreal by the suburbs for police services provided in 1971. Suburban mayors contended that property taxes would increase by as

much as \$260 per house if the \$16 million were paid; the chairman of the MUC at the time, Lucien Saulnier, indicated that property taxes, on a \$10,000 house, would decrease by \$3.79 for Montreal property owners and increase by amounts ranging from \$3.12 (Montreal North) to \$53.31 (Dorval) for suburban property owners. The budget for 1973 was similarly rejected by the suburbs.

A 1974 paper commented that "...the Montreal government thus far is a failure. Some municipalities have openly defied the law, refusing to pay their share of police integration costs" and that "...a tax increase was the first result of metropolitan reform. The minority position of the suburbs on the council also caused resistance....The Montreal reform obviously was not based on a well thought-out strategy."¹⁷

The MUC is also responsible for the assessment of taxable property, the design of an official land use plan, inspection of food production and marketing, and air and water pollution control. With regard to planning, it is important to note that land use proposals formulated at the metropolitan (MUC) level have no legal effect on local decisions, but can only try to influence them. Area municipalities have

complete control, within statutory limits under provincial legislation, over local land use plans, zoning, subdivision regulations, and housing and building codes.¹⁸

The Greater Vancouver Regional District (GVRD)

The formation of metropolitan government in Vancouver was the outgrowth of a policy adopted by the provincial Department of Municipal Affairs in 1964 to introduce regional government throughout British Columbia. The motives for government reform in Vancouver, therefore, differed from the motives which prompted the formation of metropolitan government in Toronto and Montreal. The policy of regionalization, and its application to the Vancouver urban area, "...was not a response to immediate problems or to pressure from outside the department. It was created by civil servants who sought to provide a framework for orderly development of local government in the future."¹⁹ Indeed, the district for Greater Vancouver was not created until June 1967, by which time thirteen other districts had already been established.

In order to minimize opposition to the creation of a regional government in the Vancouver area, which would have been, in effect, a metropolitan government,

the provincial government tried to make the event an inconspicuous one. Initially, the district was called the Regional District of Fraser-Burrard, which had no substantive meaning (Fraser and Burrard were bodies of water). The present name, Greater Vancouver Regional District, was adopted in 1968.²⁰ Furthermore, the district was initially made part of the regional hospital authority for Vancouver and was not assigned any specific functions. The hospital district simply acquired an additional title and no additional responsibilities. During 1968 and 1969 the GVRD was assigned responsibility for certain regional functions and the hospital district became an adjunct to it, although legally the GVRD was still part of the hospital district. Consequently, opposition to the introduction of metropolitan government in Vancouver had little opportunity to surface. Government reform was gradual and low-key and was not centred on any particularly urgent issue around which opposition forces could rally. The initial successes of GVRD, especially in the area of debt financing, ensured acceptance of an expanding role for it once it was in place.

The GVRD gradually assumed functions previously

performed by special purpose regional authorities, including water supply and distribution, drainage and sewage disposal, and regional parks. It also became responsible for public housing, air pollution control and municipal labour relations. It should be noted that municipalities within the GVRD are not required to accept public housing, but they do have to share in the costs of providing public housing within the GVRD.

A regional planning function is also exercised by the GVRD through a Planning Department and a Technical Planning Committee (TPC). The former body is responsible for the implementation of the Official Regional Plan which had been prepared by the Lower Mainland Regional Planning Board in the 1960s and covers an area that also includes three regional districts adjacent to the GVRD. The TPC advises the regional board of directors (the equivalent of a municipal council) on amendment proposals to the Official Regional Plan and acts as a liaison between the board and government departments and member municipalities.

Finally, it is important to note that education is one function that was not acquired by the GVRD.

Generally each constituent municipality has its own school board.

Having presented this review of metropolitanization in major Canadian cities, we turn our attention in the next chapter to a discussion of how we intend to measure empirically the effects these reforms have had on local land use policies. We will be concerned as well with the effects of provincial grants on local development.

APPENDIX

Regional Government in Ontario

In the late 1960s and 1970s extensive local government reorganization took place in Ontario. Municipal consolidation and the introduction of regional government occurred in rapidly expanding and urbanizing areas throughout the province. We would expect these reform measures to have a major impact on local finances and consequently on land use policies. However, because of the recent introduction of these measures compared with the creation of Metro, any empirical analysis of their effects on zoning policies is problematic. Nevertheless, it is important to appreciate the reasons for and general characteristics of these reforms, as well as to be aware of some evidence concerning the effects these reforms have had on local fiscal circumstances.

Between 1969 and 1975 eleven regional governments were created, some 201 local municipalities were amalgamated into 79 and numerous local boards and commissions were dissolved. By these measures it was intended to foster more effective local decision-making and to provide a means of sharing the costs of providing local government services and thereby alleviating

fiscal burdens on poorer communities.

With the introduction of regional government, a realignment of public service responsibilities took place, as indicated in Table A-1. In addition, the provincial government assumed certain functions: assessment of real property and the administration of justice, as noted above in the discussion of Metro, and family benefits payments. The provincial role in interregional public transit was increased with the establishment of the Toronto Area Transit Operating Authority in 1974. One of its major responsibilities is the operation of the GO transit commuter service.

Consolidation of some 1,400 school boards into 182 boards accompanied the local government reforms. In addition, provincial grants to school boards increased, from 48 percent of their revenues in 1969 to 60 percent in 1973. Other provincial grant programs (unconditional and conditional) were introduced or augmented in order to equalize the financial capacities of local governments. In 1972 a Property Tax Credit Plan was introduced in order to more closely integrate personal income and property tax payments.

Several of the regional governments were established in the Toronto area. These include York (1971), Durham (1974), Peel (1974), Halton (1974) and Hamilton -

Table A-1

Major Changes in Responsibilities
Introduced with Regional Government

<u>Service</u>	<u>Responsibility</u>	
	<u>Before</u>	<u>After</u>
Police	Local	Local/Regional
Social Services	Local/County	Regional
Health Services	Local/County	Regional
Roadways	Local/County	Local/Regional
Water Supply	Local	Regional
Water Distribution	Local	Local/Regional
Sewer Treatment	Local	Regional
Sewer System	Local	Local/Regional
Garbage Collection	Local	Local
Garbage Disposal	Local	Regional
Planning	Local	Local/Regional
Fire	Local	Local
Parks and Recreation	Local	Local
Borrowing	Local	Regional

Source: Regional Government in Perspective: A Financial Review, Ontario Tax Studies, No.11, Ministry of Treasury, Economics and Intergovernmental Affairs, Municipal Finance Branch, Toronto, May 1976, p.9.

Wentworth (1974).

The boundaries of Metro were not expanded as part of the regional government program. It is felt that this may have been due to fears on the part of provincial politicians that an expanded Metro would constitute a serious rival to the provincial government itself. By 1973 the population of Metro was 30 percent of the population of Ontario. A variety of considerations, including political, went into the determination of regional boundaries, so that the regions which finally emerged reflected tradeoffs and concessions among government units.¹

A major financial impact of these government reforms was to shift taxes. These shifts resulted from both the amalgamation of municipalities and from the transfer of service responsibilities to the new regional governments. Taxpayers in urbanizing areas were expected to experience increases in taxes while those in urban cores were expected to have tax decreases. The impact of tax increases was to be eased by provincial transitional transfer payments designed to phase in any property tax increases. The provincial property tax credit and a farm tax reduction program were also expected to limit the impact of the tax shifts on lower income groups.

Actual tax increases and decreases were greater and less, respectively, than anticipated because of increased service expenditures following regionalization. Salaries and benefit levels and service levels tended to increase. At the local level, municipalities significantly expanded those services which remained under their jurisdiction following reorganization. At the regional level, governments expanded those services for which they assumed additional responsibilities. Over the 1970-1975 period municipal expenditures in regions for recreation (lower tier function) increased by 170 percent while expenditures for planning and general government services (shared responsibility) increased by 250 and 184 percent, respectively.²

Hamilton-Wentworth Review Commission

Several review commissions have recently undertaken detailed analyses of the effects of regionalization within specific regions. One was a 1978 study of the Hamilton-Wentworth Region. Among its findings was evidence that substantial shifts in tax burdens had occurred following government reorganization. In four of the thirteen constituent municipalities, shifted tax burdens were the primary reason for

increased taxes over the 1972 to 1977 period.

Inflation was the second most important reason for tax increases in these four municipalities. Inflation was the primary factor in the other nine municipalities. In six of these, the second most important reason for increased tax burdens was tax shifts. Only in the city of Hamilton was a decrease in tax burden realized as a result of the restructuring of local government.³

Residential property taxes in the more rural areas of the region increased by 72.5 percent (Binbrook) to 106.6 percent (West Flamborough) following government reform. In the urbanized areas taxes increased by 42 percent (Waterdown) to 57.6 percent (Ancaster) (see Table A-2).

It is important to note here that increases in taxes would have been even higher in areas outside of Hamilton if the provincial system of transitional grants had not been in effect. The Review Commission indicates that without this tax relief, taxes would have increased in Waterdown by 54.3 percent (instead of a low 42 percent) and in West Flamborough by 131.8 percent (instead of an already high 106.6 percent).

It was fully expected, of course, that tax shifts would occur following government reform.

TABLE A-2

Residential Property Taxes
on Typical Households

Area	1972	1977	Increase	
	\$	\$	\$	%
Town of Ancaster	496	781	285	57.6
Town of Dundas				
Dundas	602	914	312	52.0
West Flamborough	396	818	422	106.6
Ancaster	495	861	366	73.9
Township of Flamborough				
West Flamborough	396	703	307	77.6
East Flamborough	367	692	325	88.6
Beverly	372	706	334	89.3
Waterdown	478	679	201	42.0
Township of Glanbrook				
Glanford	360	712	352	97.8
Binbrook	425	617	309	72.5
Hamilton City	526	766	240	45.5
Town of Stoney Creek				
Saltfleet	438	764	326	74.3
Stoney Creek	440	680	240	55.2

Source: Report of the Hamilton-Wentworth Review Commission,
Table 7-20, p.113.

"Indeed, the transfer of some of these [tax] burdens was one of the reasons for introducing regional governments originally."⁴ This was particularly true as it applied to the provision of roads and welfare services.

It is difficult at this point to determine the effects of these reforms on local land use controls. The Review Commission indicated that a 1976 Regional Housing Requirements Study for Hamilton-Wentworth had noted that assisted housing units for low-income families and senior citizens were to be found almost exclusively in Hamilton. However, "In the short time since that housing report was prepared, the situation has been corrected by the construction of new senior citizen units in Ancaster and Dundas and new family units in Dundas and Stoney Creek. In addition, a recent survey concludes that there is no longer any significant demand for assisted units in Glanbrook."⁵ The 1976 study had also pointed to a lack of diversity in housing types and costs in parts of the region and the predominance of single detached dwellings. The Review Commission noted, however, that "...there appears to be a growing willingness to see a variety of housing types constructed."⁶ There is some

indication, therefore, that regional government may have contributed to making land use controls in Hamilton-Wentworth less restrictive.

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CHAPTER 5

TESTABLE HYPOTHESES

The model presented in Chapter 2 indicated that the practise of fiscal zoning will be reflected in local development patterns, while the analyses of Chapters 3 and 4 suggested that the fiscal zoning process, and hence local development patterns, will be modified by the existence of higher level government grants and the reform of local government structures along metropolitan lines. For the purpose of empirically testing our model, therefore, we need to address the issue of measuring the development characteristics of individual communities.

One of the major conclusions stemming from our basic model is that in a completely localized system of communities which rely solely on property taxes for the financing of local expenditures we would expect to find a considerable degree of housing value homogeneity within communities. Wealthier communities will only allow in wealthier residents, leaving the poorer communities to accept residents who cannot meet the minimum housing value requirements of the wealthier communities.

Both government grants and metropolitanization reduce the incentive of wealthier communities to practise fiscal zoning by alleviating the fiscal burdens associated with the acceptance into the community of residents less wealthy than the current residents. By easing the restrictiveness of their zoning policies, these communities would be expected to experience an increase in the variety of housing values developed within their borders. The more important the role of government grants in the financing of local expenditures, the more heterogeneous (less homogeneous) communities would be. Similarly, the greater the degree of metropolitanization, primarily in terms of the range of services provided by the metropolitan government, the more heterogeneous (less homogeneous) communities would be. We would therefore expect to see a positive association between a measure of community heterogeneity (in terms of housing value) and indices of the importance of provincial grants to local governments and of the extent of metropolitanization. The specific measures we have chosen are discussed below.

Family Income Segregation

As just indicated, a "true" test of our model would require the use of a measure of community homogeneity in terms of housing value. Unfortunately, the unavailability of the necessary data precludes this and we are forced to use a proxy for housing value. The alternative which we have chosen is income. The use of income as a proxy for housing value finds support in the housing literature which examines the relationship between these two variables.

In his seminal work on housing, Richard Muth found high correlations between the average value of housing consumed per household and the median income of families and unrelated individuals in census tracts for individual cities. His results were as follows:¹

<u>City</u>	<u>R²</u>
Houston, Texas	.85
Milwaukee, Wis.	-.12
Memphis, Tenn.	.85
San Diego, Cal.	.61
Dayton, Ohio	.76
Syracuse, N.Y.	.77

Margaret Reid's early extensive work in the same area also indicates that there is a high correlation between housing value and income. Her results, based

on census tract data for seven metropolitan areas, were as follows:²

<u>Metro areas</u>	<u>Number of Tracts</u>	<u>R²</u>
Chicago	88	.629
Cleveland	42	.820
Detroit		
a)	49	.853
b)	49	.919
Los Angeles	29	.520
Minneapolis-St. Paul	15	.842
New York		
a)	37	.353
b)	38	.628
Philadelphia	62	.734

More recently, DeLeeuw³ found an R² value of .62 when he regressed metropolitan area median house value on annual homeowner income for nineteen metropolitan areas. When he regressed median gross rent on median income, he found the coefficient of determination (R²) to be .60.

Winger examined relationships between income and housing value using Standard Metropolitan Statistical Area median sales values and median gross incomes of purchasers grouped by type of housing purchased, i.e. new and/or existing units, for three years, individually and combined. The coefficients of determination for the regressions using 'existing units' data were always higher than those using 'all units' or 'new units' data. Winger's results for the combined (1962-64) regressions are presented below:⁴

	<u>R²</u>
All Units	.5476
New Units	.4723
Existing Units	.6816

Marion Steele studied factors affecting the demand for housing in Canada. After making the general statement that "The pre-eminent influence on housing choices is income",⁵ she proceeded to examine the relationship between income and the quantity of housing consumed as indicated by the mean sales value of single-detached houses and mean gross rent. She concluded that "The relation is quite strongly linear in each case."⁶ This was true using data for Canada as a whole and for urban areas of 30,000 population and over.

The coefficient of determination for the housing value/income relation thus varies from approximately .60 to .90. It is important to note that the highest R^2 values are obtained in the empirical work which focuses on individual cities or individual metropolitan areas (Muth and Reid, respectively). The studies which examine the housing value/income relation across metropolitan areas obtain coefficients of determination closer to the lower end of the range noted above.

Since our fiscal zoning model is developed in the context of a Tiebout system of communities, which is geographically represented by a large number of suburban communities whose residents migrate from a central city, and since the effects of metropolitanization on incentives

to zone fiscally constitutes an integral part of our model, the fact that very high R^2 values are generally obtained when the housing value/income relation is examined in the context of geographically unified areas, as in the work of Muth and Reid, increases our confidence in the use of income as a proxy for housing value in order to test our model.

Some additional considerations, in support of using an income measure of community homogeneity to test our model should be noted. Apart from the issue of the housing value/income correlation, use of income data has the desirable feature of including all residents in the community. For this reason, income data may allow for a more comprehensive measure of community homogeneity than would housing data from the ownership market alone or some artificial combination of housing data from the ownership and rental markets, assuming that the required data were available in the first place. It is important to note that Hamilton et al.⁷ found the Gini coefficient of housing value within census tracts to be related to their fiscal variables in directions directly opposite to those predicted by their model of fiscal zoning. These perverse results were especially surprising in light of the fact that the Gini coefficient of family income for the same census tracts

behaved as expected. The authors indicated that the problem with their results might have been due to the exclusion in the housing value data of all rental property. "Although we are at a loss to explain why, it would appear that homeowners are a biased sample of households, and that the bias is a function of our [fiscal] variables."⁸

Apart from the possibility of biased results emerging from the use of restricted housing value data, biases may also arise from using income as a proxy for housing value. It may be the case, for instance, that a strong relationship between an income measure of community homogeneity (heterogeneity) and fiscal variables reflects the impact of socio-economic characteristics of communities on their fiscal circumstances as well as the impact of local financing methods on the development patterns which occur in communities (fiscal zoning).

Thus in the case of subsidies it may be that the income heterogeneity of a community is indicative of a 'need' for financial assistance in the form of government subsidies. The presence of a high positive correlation between community heterogeneity and the financing of services through government subsidies may reflect this 'need' as well as the effects of subsidy programs on the

willingness of communities to permit more heterogeneous development to occur. This possible bias would appear to be more relevant in the case of central cities, though, than in the case of suburban communities which have developed under zoning controls. In the latter case one can legitimately question why, in the absence of grant programs, was varied development allowed to occur in the first place. Nevertheless, there is a possibility that the use of income data as a proxy for housing value data may overstate the fiscal zoning effect.

An offsetting bias may be operative in the case of metropolitanization. Under the fiscal zoning hypothesis metropolitanization prevents communities from avoiding fiscal transfers to new residents since communities must finance metropolitan services for these people regardless of where they locate in the metropolitan area. Consequently, there is less fiscal reason to exclude them from their own borders. The easing of zoning restrictions would be reflected in more varied development patterns. The line of causation thus runs from greater community contributions toward metropolitan finances to more varied housing values and, using our proxy, to greater income heterogeneity. One can speculate, however, that income heterogeneity may be negatively associated with metropolitan financing instead

of positively as hypothesized under fiscal zoning using income as a proxy for housing value. If, as above, income heterogeneity reflects financial 'need', then the greater a community's income heterogeneity the more it is likely to benefit from metropolitan programs and the less it is likely to be required to contribute toward their funding. High income heterogeneity would be associated with relatively small contributions to metropolitan programs. Under the fiscal zoning hypothesis, it is relatively large contributions to metropolitan government that are associated with varied housing development and, by our proxy, with high income heterogeneity. Thus, there is a possibility that the use of income data as a proxy for housing value data may understate the fiscal zoning effect.

While the nature of such biases is highly speculative, and depends substantially on the extent to which income heterogeneity indicates fiscal 'need', the reader should nevertheless be aware of potential biases. It is also worth stating again, however, that in the admittedly limited literature on fiscal zoning, the only discussion of data bias arises in the context of Hamilton et al.'s attempt to use housing value data, not income data.

Apart from Hamilton et al.'s problematic use of housing value data, there are no studies which test for the presence of fiscal zoning by examining the variability of housing values within communities. As previously indicated, Hamilton et al. decided to use the Gini coefficient of family income to test their model. Brannman et al.⁹ used an index (of their own construction) of income group clustering in thirty metropolitan areas in the United States to test for the presence of fiscal zoning.

Pack and Pack¹⁰ applied the Leik index of ordinal consensus to five household characteristics including income to measure the homogeneity of suburban communities in Pennsylvania. The Packs rejected the use of the Gini coefficient of income, since homogeneity is consistent with Gini values at both ends of the 0 to 1 range of possible values; Gini coefficients, the authors contended, measure equality but not homogeneity. In a community in which every household has exactly the same income, the perfect income equality will be reflected in a Gini value of 0; the community will also be perfectly homogeneous.

At the other extreme, in a community in which one household has 100 percent of the income and the other households have absolutely nothing, this perfect income inequality will be reflected in a Gini value of 1. However, this community will be only marginally less homogeneous than the first community since every household except the wealthy one will be in exactly the same position.

It should be noted, though, that a situation of extreme inequality and significant homogeneity may not be a stable one, as would be the case of perfect equality and perfect homogeneity. In terms of the Hamilton version of the Tiebout system, the one wealthy individual is likely to be making significant fiscal transfers to the other lower-income groups in his community, which provides an incentive for him to move to another community of similarly wealthy individuals. After his departure the Gini coefficient changes immediately to 0⁰ and the community is characterized by perfect income equality and perfect homogeneity. This new situation is also a stable one.

It appears that communities will have Gini values close to 1 only in the middle of a game of 'musical suburbs', prior to the implementation of restrictive zoning regulations.¹²

It is not sufficient, of course, to simply note the presence or absence of income segregation across communities. Land use theory, which abstracts from local fiscal considerations,¹² suggests that some stratification of communities according to various socio-economic characteristics will occur. Consequently it is essential for the theory of fiscal zoning to determine to what extent the pattern of community homogeneity is the result of fiscal, or public sector, variables rather than private sector variables. In the latter category are such traditional considerations as the fraction of homes built before a certain date, the degree of homeownership in the community, etc.¹³

A number of variables have been used in the literature to capture the effects of fiscal influences on community zoning practises. Branfman et al. used four such variables:

- (1) the local property tax as a proportion of personal income in the 1950s and in the 1960s;
- (2) the percentage of total local government revenues in each of thirty metropolitan areas that is derived from the local property tax;

- (3) the proportion of expenditures on local schools that is financed by the property tax; and,
- (4) the type of education grant received by municipalities.

The authors found "...no substantial relationship between residential patterns and fiscal incentives for imposition of controls."¹⁴

Hamilton et al. paid particular attention to education grants to school districts. They made a distinction between compensatory grants (i.e. equalizing grants) and 'all other' grants, which were almost exclusively flat-aid grants (i.e. grants giving a specified amount per pupil). The basic variables they used were:

- (1) flat-aid grants as a fraction of school district revenue in the state; and,
- (2) compensatory aid as a fraction of school district revenue in the state.¹⁵

The authors concluded that "Flat-grant aid to school districts had an insignificant effect upon residential income segregation in the suburbs. Compensatory aid reduces income segregation significantly if we consider only those SMSAs with more than three suburban school districts."¹⁶

It is important to note that the studies by Hamilton et al. and by Brannman et al. did not consider

the effects of local government reform on the development process, an issue of concern to us.

Our Variables

We begin this section with a discussion of our dependent variable, GINI, the Gini coefficient of family income. We are using this variable as an indicator of community homogeneity, as was done by Hamilton et al.

The calculation of our GINI variable requires some comment. Bronfenbrenner and Morgan both discuss the trapezoidal method of calculating the concentration ratio (i.e. the ratio of the area between the line of equality and the Lorenz curve to the area under the line of equality) while Kakwani and Podder consider a method involving direct estimation of the Lorenz curve.¹⁷ We have opted to use the former method as it is simpler to carry out and allows for manual calculation. This method is considered reasonably accurate if a sufficient number of income categories are used. Morgan suggests that eight or more income groups will provide a close approximation to the true degree of inequality. Family income data in both the 1961 and 1971 censuses is available for eight income

categories, so this is the number we have used. Five income categories are common to both years (\$2,000-2,999; \$3,000-4,999; \$5,000-6,999; \$7,000-9,999; \$10,000-14,999). The 1961 categories of under \$1,000 and \$1,000-1,999 were consolidated by 1971 into the single category under \$2,000. The 1961 category of \$15,000+ by 1971 was divided into the categories \$15,000-19,999 and \$20,000+.

It is common procedure to use the midpoints of the closed income categories to represent the average income level in each category. Determination of the average income of the open-ended income category is more problematic. Hamilton et al. determined the average for this category by assuming it had a 'triangular distribution', without providing any further explanation.¹⁸ Morgan suggests that "exact data or good guesses about the nature of the open ended bracket are important."¹⁹ Without exact data on the average income in the open-ended category or grounds for guessing this average, we decided to incorporate this category in our calculations as a residual, since we had data on the overall average income of each community and since we were assuming the average incomes of the seven closed income

categories to be their midpoints. An illustration of our method of calculation, along with the data sources for and detailed specifications of our variables, are presented in the appendix to this chapter.

Fiscal Variables

As noted previously, a variety of fiscal explanatory variables were used by Hamilton et al. and by Branfman et al. In keeping with our focus on the zoning implications of higher level government grants, as discussed in Chapter 3, and of metropolitanization, as discussed in Chapter 4, we will use two fiscal variables in our regression equations to represent these influences. Our explanatory variable SUBS is the percentage of total municipal revenues accounted for by provincial grants.²⁰ The higher this figure is, the less dependent the community is on the property tax for the financing of its services and the less important are fiscal zoning considerations. We expect the coefficient of this variable to be positive.

We have chosen as our indicator of the effect of metropolitanization the variable METRO, which is the percentage of total municipal expenditures which is accounted for by payments made to metropolitan governments, school boards or county governments.

Municipal expenditures include both own-purpose expenditures and the payments to the upper tiers. The higher this percentage is, the greater the community's involvement in the financing of services in other communities via the upper tier governments. As explained in Chapter 4, metropolitanization will weaken the incentive of wealthier communities to exclude since by so doing they are no longer able to avoid financing the services of less wealthy residents in the metropolitan area, whom they must now subsidize through upper tier service provision. Indeed, by expanding the scope for development within their own borders, the residents of such wealthy communities may be able to reduce the fiscal transfers they pay by sharing the burden with newcomers who may be less wealthy than themselves. Consequently, we expect the coefficient of our METRO variable to be positive.

Nonfiscal Variables

We have included several 'control variables' in our regression equations in the same spirit that Hamilton et al. and Branfman et al. used similar variables. Their purpose is to gauge nonfiscal effects on community GINI values. Hamilton et al. included twelve such variables in their regression analysis, while Branfman et al. incorporated three.

The four control variables we have chosen to use are as follows:

PREW, the percentage of dwellings built before 1946: the older a community's housing stock is, the greater the extent to which the filtering process has been operative and hence the greater the diversity of housing values and family income in the community. The result is a higher GINI value. The expected sign of the PREW coefficient is positive.

OWN, the percentage of dwellings owner-occupied: the greater the percentage of owner-occupied dwellings in a community, the greater the support we would expect to find for fiscal zoning and hence the lower the community's GINI value. A community of home-owners is likely to be more aware of property values, property taxes and other fiscal matters than is a community of renters and more inclined to try to influence fiscal decisions. The expected sign of the OWN coefficient is negative.

AREA, land area in square miles: the greater the geographic size of the community, the greater the variety of development we would expect to see and hence the greater the degree of income inequality. The use of externality arguments to limit development which

might have adverse fiscal implications for existing residents will be less feasible if the community can physically accommodate a variety of 'incompatible' land uses without creating significant externalities. The expected sign of the AREA coefficient is positive. FAM, the number of families in the community: Hamilton et al., who used virtually the same variable in their empirical work, expected larger populations to be associated with greater heterogeneity than smaller populations. It is not clear to us why this should be the case. While it is likely to be true that with larger populations there will be more people in absolute terms in extreme income categories, it is also true that there will be more people in other income categories. There is no particular reason to believe that the distribution of people among income categories will be different. It seems possible to have both large and small communities of similar people. Since we are including non-fiscal variables in our empirical analysis in the spirit of Hamilton et al., and since data on the number of families in communities are readily available, we decided to explore, as an interesting side issue, the association, if any, between community size, as reflected by our FAM variable, defined above, and our dependent variable GINI. Hamilton et al. expected the coefficient of their family variable to be positive: the larger the number of families the

greater the degree of heterogeneity, as reflected by the Gini coefficient of family income. On the other hand, we do not expect to see a positive coefficient for our FAM variable.²¹

In order to determine the influence of fiscal and nonfiscal factors on the community Gini coefficients of family income, we will apply multiple regression analysis to our variables. The same statistical approach was adopted by Hamilton et al. and by Branfman et al. Our findings are presented in the following chapter.

APPENDIX

GINI COEFFICIENT OF FAMILY INCOME (1971): Richmond Hill, Ont.

Income Category (1)	No. of Families (2)	Income (3)	% of Families (4)	% of Income (5)	Cumulative % of Income (6)	Paired Sums of (6) (7)	Trapezoidal Areas (4)*(7) (8)
\$2,000	180	*1,000 =	180/1,000 = .0225	.0019	.0019	.0019	.0000
\$2,000-2,999	195	*2,500 =	.487,500 .0243	.0052	.0071	.0090	.0002
\$3,000-4,999	470	*4,000 =	1,880,000 .0587	.0202	.0273	.0344	.0020
\$5,000-6,999	645	*6,000 =	3,870,000 .0805	.0417	.0690	.0963	.0078
\$7,000-9,999	1,780	*8,500 =	15,130,000 .2222	.1629	.2319	.3009	.0669
\$10,000-14,999	3,040	*12,500 =	38,000,000 .3795	.4090	.6409	.8728	.3312
\$15,000-19,999	1,130	*17,500 =	19,775,000 .1411	.2129	.8538	1.4947	.2109
		79,322,500					
\$20,000+	570	*23,820 =	13,577,480 .0712	.1462	1.0000	1.8538	.1320
			1.0000	1.0000			.7510

Avg. Income

\$11,598

8,010

92,899,980

$$R = 1.0000 - .7510$$

$$= .2490$$

$$GINI = R * (10)^4$$

$$= 2490$$

(See Chapter 6,
Footnote 4.)

Dependent Variable

GINI: The Gini coefficients of family income were calculated using the methodology illustrated on the preceding page and family income data presented in the 1971 Census Tract Bulletins, Series B, for Census Metropolitan Areas, Table 3 (Toronto: Catalogue 95-751; Hamilton: Catalogue 95-739; Oshawa: Catalogue 95-744; Montreal: Catalogue 95-734; Vancouver: Catalogue 95-758). Census tract family income data for 1961 were not published in the census tract bulletins; the data were supplied to us by Statistics Canada.

Fiscal Variables

All fiscal variable data for the Toronto-Centred Region were obtained from the 1971 and 1961 editions of Municipal Financial Reports Data published by the Ministry of Treasury, Economics and Intergovernmental Affairs. The 1971 data were obtained from Volumes 2A, 2D and 2F, each of which provided data for different geographic areas; the 1961 data were all contained in one volume.

SUBS = (Total Ontario Subsidies)/(Total Revenue)*100
SUBS61 = (Grants and Subsidies; Province: Total)/
 (Total [Revenue])*100

PCON = (Ontario: Specific Subsidies)/(Total Revenue)*100
PCON61 = (Grants and Subsidies: Province: Roads plus
 Health and Welfare)/(Total [Revenue])*100

PUNCON = (Ontario: General Subsidies)/(Total Revenue)*100
PUNCON61 = (Grants and Subsidies: Province: Municipal)/
 (Total [Revenue])*100

OWNEX = (Total Own Expenditure [Revenue Fund])/(Population)
OWNEX61 = (Total [Expenditure] less Metro General Rates
 and Education)/(Assessed Population)

METRO = (Upper Tier Levy plus Education)/(Total Own
 Expenditures plus Transfers)*100

METRO61 = (Metro General Rates and Education)/(Total
 [Expenditure])*100

METRO61 = (Metro General Rates)/(Total [Expenditure])*100

EXPEN = (Total Own Expenditures plus Transfers)/(Population)

LOC61 = (Total [Expenditure] less Metro General Rates)/
 (Assessed Population)

Our fiscal variable data for the Vancouver Census
 Metropolitan Area were obtained from Municipal Statistics,
Including Regional Districts and Improvement Districts,
for the Year Ended December 31, 1971, issued by The
 Ministry of Municipal Affairs, Tables XIV (General
 Revenue) and XV (General Expenditure).

SUBS = (Unconditional Transfers From Other Governments:
 Provincial, plus Conditional Transfers: Provincial
 Gov't)/(Total [Revenue])*100

PCON = (Conditional Transfers: Provincial Gov't)/(Total
 [Revenue])*100

PUNCON = (Unconditional Transfers From Other Governments:
 Provincial)/(Total [Revenue])*100

METRO = (Transmission of Taxes Levied for Other Governments: Other, plus Conditional Transfers to Other Governments)/(Total [Expenditure])*100

OWNEX = (Total [Expenditure] minus Transmission of Taxes Levied for Other Governments: Other and Conditional Transfers to Other Governments)/(Population [1971 Census])

Our fiscal variable data for the Montreal Census Metropolitan Area were obtained from Les Finances Municipales, 1971, published by Le Bureau de la Statistique de la Province du Québec.

SUBS = (Transferts Conditionnels: Gouv. Qué. plus Transferts Inconditionnels: Taxe de Vente)/(Total des Activités Municipales [Revenues])*100

OWNEX = (Total des Activités Municipales [Dépenses])/(Population [1971 Census])

Non-Fiscal Variables

OWN = (Owner-Occupied)/(Occupied Dwellings)*100
Data were obtained from the 1971 Census Tract Bulletins, Series A (Toronto: Catalogue 95-721; Hamilton: Catalogue 95-709; Oshawa: Catalogue 95-714; Montreal: Catalogue 95-704; Vancouver: Catalogue 95-728) and the 1961 Census Tract Bulletins, Series CT (Toronto: Catalogue 95-530; Hamilton: Catalogue 95-523; Oshawa: Catalogue 95-527), Table 2.

PREW (1971) = (Period of Construction: Before 1946)/(Occupied Dwellings)*100

PREW (1961) = (Occupied Dwellings - (Period of Construction: Since 1945))/(Occupied Dwellings)*100

Data were obtained from the 1971 Census Tract Bulletins, Series B, Table 2 and the 1961 Census Tract Bulletins, Series CT, Table 2.

FAM: the number of families in the community. For both 1971 and 1961 figures were calculated by summing the number of families in each income category provided in the income data referenced above.

AREA: land area of the community in square miles. The 1971 data were obtained from the 1971 Census, Special Bulletin, Geography, Land Areas and Densities of Statistical Units (Catalogue 98-701), Table 5. The data used in the 1961 regressions were obtained from the 1966 Census, Introductory Report to Volume I: Population (Catalogue 92-601), Tables 3 and 4.

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CHAPTER 6

EMPIRICAL RESULTS

In this chapter we examine the results we obtained from the empirical testing of our model in the manner described in the previous chapter. Our attention is directed primarily to the results for the Toronto-Centred Region. Empirical testing of our model for the Vancouver and Montreal metropolitan areas proved to be problematic because of data limitations. In the case of Vancouver we were restricted to using data for only the eighteen communities comprising the Vancouver census metropolitan area. For reasons explained below, we feel that this limited number of observations may be insufficient to provide a valid test of our model. In the case of Montreal data on education expenditures and on transfers from lower tier to metropolitan or county governments were not available for 1971. Data of any kind for the year 1961 were not available, except for scattered information pertaining to a few of the larger municipalities. For these reasons we have relegated our empirical analyses of the Vancouver and Montreal metropolitan areas to an appendix.

1971 Results - Toronto

We ran our regression with the central cities of

the Toronto, Hamilton and Oshawa census Metropolitan areas (CMAs), which together constitute our Toronto-Centred Region, both included and excluded. We adopted this procedure for the following reason. Hamilton et al. and Hamilton¹ have presented evidence that the theory of fiscal zoning is not relevant for central cities. These authors contend that the sheer size and diversity of such cities preclude a close association between property taxes paid and public service benefits received by their residents. Property taxes are viewed by residents as an excise tax on housing rather than as a payment for local services. In other words, the central city does not have a readily identifiable tax/expenditure package, as do the suburban communities which surround it.

It is also the case that Tiebout's system of communities included only suburban communities. The central city was simply the point of origin for residents in search of their utility maximizing tax/expenditure package in suburbia.

Canadian central cities, however, have not experienced many of the problems that central cities in the United States have faced in recent decades. It is questionable whether Canadian central cities are

simply 'points of origin'. Instead the Canadian central city may be a community which residents consider in their municipal tax/expenditure search.

Our model presents us with an opportunity to briefly comment on this interesting issue; of course, a separate analysis would be required to take into account all the complexities involved. In keeping with the notion that fiscal zoning does not apply to the central city and in the context of our Diagram 1 in Chapter 2, we can consider the central city to be the poorest of the communities along the average housing value axis. The poorest community, which expects to benefit from almost any kind of development, has little reason to use restrictive land use controls. In sharp contrast, the wealthier suburban communities have a strong incentive to practise fiscal zoning. This suggests that inclusion of central cities in empirical analyses of fiscal zoning could cause distortions in the results obtained. It is interesting to note, however, that whether we include or exclude the central cities, our results are essentially the same. This suggests that Canadian central cities can legitimately be included in studies of community choice and that they are different from their American counterparts.²

We now take a closer look at our empirical results for the Toronto-Centred Region. The reader is directed to equations 1 and 1' in Table 1. In both equations the coefficients of all the explanatory variables have the expected signs and are significant, with the exception of the FAM variable. This particular result confirms our suspicion that the number of families in a community should not affect the distribution of families among income groups, as discussed in the previous chapter. It is interesting to note that the family variable used by Hamilton et al. did not prove to be significant either in their empirical work.³ Both of our regressions have high R^2 s and are significant at the 99% level.

Our results indicate that a one percentage point increase in the share of provincial grants in municipal revenues is associated with an increase of twenty-seven (eq.1') points in community GINI value. Based on our method of calculating GINI, perfect inequality is reflected in a value of 10.000 and perfect equality in a value of 0.⁴ The range of GINI values for the Toronto-Centred Region in 1971 was 2.006 to 3.724. The range of SUBS values was 8.08 (8.08 percent of total municipal revenues accounted for by provincial grants) to 30.20.

TABLE 1

Regression Results
Toronto-Centred Region
1971

	Central Cities Included	Central Cities Excluded
	Equation 1	Equation 1'
Constant	2054.17 (7.59187)	2036.62 (6.97040)
PREW	12.2337 (4.65534)	10.8011 (3.13221)
OWN	-11.6907 (-3.46119)	-12.4023 (-3.59655)
AREA	3.72404 (3.95953)	3.96176 (4.12520)
FAM	.00218574 (1.51522)	.000712170 (.364803)
METRO	8.35362 (2.38785)	11.0011 (2.46344)
SUBS	29.1115 (3.50449)	27.2175 (3.19980)
R ²	.6875	.6382
F-Statistic	13.2020* df(6,36)	9.69995* df(6,33)

* Significant at 99% level.

Dependent variable: (Gini coefficient of family income) $\times 10^4$

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A one percentage point increase in the share of municipal expenditures directed to upper tier governments is associated with an increase of eleven (eq.1') points in the community GINI value. The range of our METRO variable was 31.15 (31.15 percent of municipal expenditures accounted for by payments to upper level governments) to 72.09.

The categorization of information on Ontario grants in the 1971 publication of municipal financial statistics⁵ allows us to explore further the effects of provincial subsidies on our index of community homogeneity, the Gini coefficient of family income. The category of General Grants covers four types: Unconditional, Mining Municipalities, Residential Property Tax Reduction Program and Other General. The category of Specific Grants includes four types: Roadways, Health, Welfare and Other Specific. We have simply renamed these two overall categories Unconditional and Conditional, respectively. Our variables PUNCON and PCON represent the shares of total municipal revenues accounted for by each category.

Unconditional grants, which are for the most part per capita grants, are not expected to strongly influence local zoning decisions since, as discussed

in Chapter 3. they do not distinguish between the type of entrants to the community or the fiscal circumstances of recipient communities. Since a community receives the same per capita grant whether it allows in a poor resident or a wealthy one, unconditional grants provide little inducement to wealthier communities to relax their zoning standards.⁶

The conditional grants have both cost sharing features (80% of welfare costs, 50% of road and bridge construction and maintenance, and varying percentages of different health facilities) and equalization features (in the cases of welfare and roads & bridges). Both cost sharing and equalization grants are expected to weaken incentives to zone fiscally, as discussed in Chapter 3.

Our regressions using the two variables PUNCON and PCON in lieu of SUBS are presented in Table 2. One regression uses only PUNCON, another uses only PCON and the third uses both variables. The striking results which emerge are the presence of significant positive coefficients for PCON and the absence of significant coefficients for PUNCON. These results are fully consistent with our expectations.

TABLE 2

Regression Results
Toronto-Centred Region
1971

	Central Cities Included			Central Cities Excluded		
	1	2	3	1	2	3
Constant	2234.41 (6.751)	2195.95 (8.704)	2201.25 (7.770)	2181.83 (6.140)	2177.59 (7.925)	2199.73 (7.191)
PREW	14.0273 (4.418)	10.3212 (3.912)	10.2733 (3.552)	11.2150 (2.617)	8.60819 (2.562)	8.33361 (2.222)
OWN	-9.6111 (-2.44)	-10.842 (-3.37)	-10.805 (-3.20)	-10.371 (-2.61)	-11.663 (-3.56)	-11.514 (-3.35)
AREA	4.50079 (3.880)	2.89831 (3.022)	2.87764 (2.660)	4.61422 (3.916)	3.17689 (3.257)	3.09177 (2.806)
FAM	.000690 (.4116)	.001691 (1.264)	.001668 (1.143)	-.00130 (-.576)	.000057 (.0318)	-.00008 (-.040)
MBRO	7.15218 (1.634)	11.0099 (3.190)	11.0837 (2.851)	11.6406 (2.110)	13.6126 (3.179)	13.9691 (2.914)
PUNGO	18.6758 (.7639)		-.94080 (-.043)	13.9997 (.5610)		-3.8867 (-.176)
PCON		38.0206 (3.925)	38.1274 (3.766)		35.8464 (3.650)	36.2592 (3.541)
R ²	.5876	.7065	.7066	.5304	.6623	.6626
F-Statistic	8.54*	14.44*	12.03*	6.21*	10.78*	8.97*
d.f.	(6.36)	(6.36)	(7.35)	(6.33)	(6.33)	(7.32)

Dependent variable: (Gini coefficient of family income) $\times 10^4$

*Significant at 99% level.

The importance of conditional grants and the insignificance of unconditional grants is all the more interesting in light of the fact that in thirty-three of the forty-three communities which constitute our Toronto-Centred Region the dollar value of the unconditional grants is greater than the dollar value of the conditional grants, in many cases by a wide margin.

It is apparent that the nature of provincial grants, and not simply their size, is a key determinant in their effect on community homogeneity patterns. The importance of conditional grants to community development incentives is more understandable when one remembers that their practical effect is to ease the financial burden of providing services often associated with growth, i.e. road systems, health facilities and welfare payments.

As far as the other explanatory variables in these expanded regressions are concerned, they have the expected signs and are statistically significant, again with the exception of the FAM variable.

While the above regressions examine local fiscal burdens in percentage terms (for the SUBS, PCON, PUNCON and METRO variables), we felt that it might be worthwhile to explore the association between our GINI variable and an absolute indicator of local fiscal

circumstances. As discussed in Chapter 2, pp. 81-84, differences in expenditure levels across communities will modify the incentives each community has to zone fiscally. If 'poor' communities have higher expenditure levels than 'wealthy' communities they will be even more receptive to development (which will contribute to financing these higher expenditures) than they were under a situation of uniform expenditures across communities. In this case per capita expenditures would be negatively associated with community homogeneity (positively associated with the Gini coefficient). If wealthy communities have higher expenditure levels, they will be more restrictive in their zoning policies (to prevent less 'wealthy' entrants from enjoying these services) than they were under a situation of uniform expenditures across communities. In this case per capita expenditures would be positively associated with community homogeneity (negatively associated with the Gini coefficient).

Toward testing this hypothesis, we ran regressions which incorporated the fiscal variable OWNEX, own expenditures (i.e. total expenditures minus payments to upper tier bodies) on a per capita basis. The

coefficients of our previous variables are again significant and have the expected signs.⁷ The OWNEX variable is significant in the regression which includes the central cities (Table 3, eq.1) and not significant in the regression which excludes the central cities. These results indicate that the central cities are an important factor in deriving any conclusions with respect to our variable for local expenditures.

As far as the central cities are concerned, it may be the case that high levels of own expenditures are the result of the extreme heterogeneity of these communities, both in terms of income and a variety of socio-economic factors. The positive relationship between the OWNEX and GINI variables appears to be strong enough to bias our regression results for these two variables.

The absence of a significant coefficient for OWNEX in the latter case, that focusing on 'suburban' communities alone, may be explained in the following manner. Our analysis in Chapter 2 indicated that the higher the level of local expenditures, the greater the incentive for new residents to move in and obtain large fiscal transfers from existing residents. This

TABLE 3

Regression Results
Toronto-Centred Region
1971

	Central Cities Included		Central Cities Excluded	
	1	2	1'	2'
Constant	936.257 (1.550)	1308.14 (3.177)	1101.19 (1.710)	1393.53 (3.245)
PREW	10.3640 (3.869)	9.98917 (3.747)	10.0387 (2.953)	9.19997 (2.702)
OWN	-9.3885 (-2.74)	-9.2884 (-2.76)	-10.397 (-2.89)	-10.189 (-2.91)
AREA	2.52377 (2.348)	2.42550 (2.307)	2.88166 (2.505)	2.77500 (2.524)
PAM	.001782 (1.276)	.001510 (1.083)	.000845 (.4431)	.000416 (.2218)
METRO	19.1694 (3.067)	11.1731 (3.171)	18.7692 (2.897)	12.6786 (2.904)
SUBS	34.8814 (4.131)	37.4810 (4.336)	33.4261 (3.655)	35.1573 (3.867)
OWNEX	3.40912 (2.050)		3.03580 (1.620)	
EXPEN		1.67950 (2.311)		1.49028 (1.976)
R ²	.7210	.7289	.6656	.6775
F-Statistic	12.9238 *	13.4443 *	9.09950 *	9.60466 *
Dependent variable	(7.35)	(7.35)	(7.32)	(7.32)
Intercept at 99%				coefficient of family income) x 10 ⁴

analysis was carried out in the context of a system of communities wholly dependent on property taxes and not part of a metropolitan government organization. Once these assumptions are relaxed, it may well be that the level of locally provided services becomes only a minor consideration influencing development patterns. This becomes a particularly plausible assumption if one considers that the more highly valued services are likely to come under the aegis of upper tier governments. Those public services which are left solely to municipal governments to provide may not be the services with respect to which potential residents are interested in obtaining fiscal transfers. In short, local services may be considered as a residual category which is not heavily weighted in the utility functions of urban residents.

In the same vein, however, the coefficient of an alternative measure of the absolute fiscal commitment of municipalities turned out to be significant, regardless of whether the central cities were included or excluded (Table 3, eqs. 2 and 2').⁸ The alternative variable we used was EXPEN, total municipal expenditures (including all payments to upper tiers) per capita. The positive coefficient for EXPEN is under-

standable. For the great majority of our communities, the transfers to upper tier bodies exceed their own expenditures. The greater are such transfers, the greater is the incentive for communities to seek new residents to share in that fiscal burden. Hence we would expect the EXPEN variable to have a positive coefficient.

1961 Results - Toronto

Our results for the 1971 data strongly indicate the presence of fiscal zoning motives in accordance with our model in the Toronto-Centred Region. The availability of comparable data for the year 1961 also made it feasible to examine whether similar fiscal relationships obtained a decade earlier.

There are some important differences between the 1961 and 1971 data which should be noted. Because of metropolitan expansion over the 1961-1971 period, the number of communities constituting census metropolitan areas was smaller in 1961 than in 1971. In the case of our Toronto-Centred Region there were forty communities in 1961, three less than in 1971. While the expansion of the boundaries of the metropolitan area tended to increase the number of communities over

the 1961-1971 period, municipal consolidation, particularly in Metro Toronto in 1967, offset this effect, leaving a relatively constant number of communities.⁹

In addition, the observations used for the AREA variable in our 1961 regressions are based on 1966 data. The 1961 land area data do not provide figures for townships, while the 1966 data do. Census maps of metropolitan areas were compared to ensure that boundaries had not changed substantially over the five year interval 1961-1966. The only major change was the amalgamation of Trafalgar Township with Oakville, for which the necessary adjustments in land area figures were made.

Our results for the 1961 data were radically different from those for 1971. None of the regressions we ran for the Toronto-Centred Region was significant overall nor were any of our fiscal variables (SUBS61, PUNCON61, PCON61, METRO61 and OWNEX61). Only the constant term and the variable PREW61 were generally, but not always, significant.

We suspected that part of the explanation for these poor results might lie in the use of the Toronto-Centred Region as our study area for 1961. Instead

the Toronto census metropolitan area (CMA) alone might be considered the relevant geographic area for study of post-war development patterns up to 1961. Certainly the construction of transportation infrastructure linking the Hamilton and Oshawa CMAs to the Toronto CMA was a phenomenon of the 1960s more than it was of the 1950s.

Accordingly we reran our regressions using only data for the Toronto CMA. Our results from so doing were more encouraging. The R^2 values approximately doubled and several regressions became significant at the 95% level. More interestingly, some of our fiscal variables achieved significance, notably the METRO61 variable and the OWNEX61 variable (see Table 4).

The t-values for many of the control variables were low, however. They provide a striking contrast to our results for these variables based on 1971 data.

Neither the SUBS61, PUNCON61 or PCON61 variables were significant in any of the equations. This may be due to the fact that provincial grants accounted for rather small proportions of municipal revenues in 1961. Unconditional Grants constituted less than four percent of revenues in twenty one of the twenty six

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TABLE 4

Regression Results
Toronto Census Metropolitan Area
1961

	1	2	3	4
Constant	201.111 (.1442)	496.053 (.3848)	81.8917 (.0540)	246.490 (.1415)
PREW61	7.42867 (1.716)	7.72289 (1.792)	7.30287 (1.670)	7.47498 (1.636)
OWN61	-8.48273 (-1.172)	-9.38568 (-1.188)	-7.66596 (-1.089)	-8.68982 (-.9984)
AREA61	3.64047 (1.563)	4.25209 (2.133)	3.40771 (1.287)	3.73245 (1.194)
PAM61	-.001043 (-.4307)	-.000807 (-.3278)	-.001193 (-.4886)	-.000998 (-.3733)
METRO61	36.3658 (2.164)	33.4351 (2.201)	37.2200 (2.074)	35.9647 (1.856)
SUBS61	18.0369 (.5758)			
PUNCON61		39.4496 (.5306)		22.7471 (.2114)
PCON61			25.5140 (.5345)	15.2336 (.2206)
OWNEX61	11.4742 (2.181)	10.5133 (2.064)	11.9116 (2.135)	11.3190 (1.773)
R ²	.5472	.5459	.5460	.5472
P-Statistic d.f.	3.10707* (7.18)	3.09157* (7.18)	3.09288* (7.18)	2.56823* (8.17)

* Significant at 95% level.
Dependent variables: (Gini coefficient of family income) x 10⁴
Four equations are with central city included.

communities in the 1961 Toronto CMA and less than five percent in twenty five communities; Conditional Grants accounted for less than ten percent of revenues in twenty two communities; Total Grants accounted for less than fifteen percent of revenues in twenty two communities.¹⁰ One can speculate that the role of provincial grants in the municipal revenue structure in 1961 was sufficiently small that they were unlikely to strongly affect incentives to zone fiscally.

Some comments on our METR061 variable are necessary at this point. This variable is directly comparable to that used for the 1971 data since it expresses payments to upper tier governments as a percentage of total municipal expenditures, including such payments. In the 1971 publication of municipal financial statistics, payments for educational purposes were classified as 'transfers'. In the 1961 data there is no category for education 'transfers' but rather one for education 'expenditures', suggesting that education was a purely local service and did not involve payments to an upper tier level (i.e. upper tier school board). Based on Cook's¹¹ discussion of the effects of the 1953 metropolitanization of Toronto on education, it is not clear that education should be

viewed as a strictly local service in 1961.

Cook notes that in 1953 the Metropolitan School Board instituted a metropolitan-wide levy to finance part of the costs of education. Furthermore, in 1953 the Corporation of the Municipality of Metropolitan Toronto was given sole power to float debt issues for school purposes and the Metropolitan School Board was given the power to assign students to schools outside their own municipalities. Given this restructuring of education financing in 1953, it could be argued that education should be viewed as a metropolitan service rather than a local one.

However, the 1953 reorganization also involved consolidation of school boards along municipal lines in an effort to reduce variations in educational standards within municipalities and to provide for a more equitable financing of educational services at the municipal level. While these measures rendered education a less localized service than it had been prior to 1953, it certainly did not become a fully metropolitanized service either. Closer examination of the 1961 municipal data for Metropolitan Toronto also indicates that approximately 44 percent of the education 'expenditures' of constituent municipalities

were transfers to the Metropolitan Toronto School Board. It is also true that the metropolitan levy was paid by residents to their municipalities which in turn transferred it to the metropolitan board. Consequently, education may still have been perceived as a largely local service.

In view of these considerations, we decided that it might be more appropriate, despite the 1953 reforms, to view education as a local service as of 1961. Toward this end, we reran the regressions with education excluded from our METRO61 variable, leaving that variable to represent the ratio of payments to metropolitan and county governments to local expenditures plus such payments. The overall regressions were not significant, with one exception (see Table 5, eq.1), nor was our new METRO61 variable. Only the control variables were significant (but not always) and had the right signs. Upon further reflection this outcome became somewhat more understandable, since the new METRO61 variable, which excluded education, was of a generally small magnitude. In twenty five out of the twenty six communities in the Toronto CMA in 1961, the ratio of payments to upper tier governments to local expenditures plus payments was under 20 percent and in

TABLE 5

Regression Results
Toronto Census Metropolitan Area
1961

	<u>Central City Included</u>		<u>Central City Excluded</u>
Constant	3993.96 (4.571)	2507.09 (3.892)	2295.43 (3.285)
PREW61	9.66073 (2.087)	8.78356 (2.048)	11.4207 (2.121)
OWN61	-15.2736 (-1.895)	-11.5048 (-1.723)	-10.8222 (-1.595)
AREA61	7.39316 (2.784)	4.99731 (2.576)	4.87086 (2.482)
PAN61	66166396 (.702454)	-.000883521 (-.374961)	.00204932 (.477997)
METRO61	-29.3634 (-1.208)		
PCON61	-70.3657 (-1.307)		
LOC61		5.18096 (1.923)	5.49875 (2.004)
R ²	.4583	.4956	.4562
P-Statistic d.f.	2.67932* (6.19)	3.93008* (5.20)	3.18843* (5.19)

*Significant at the 95% level.

Dependent variable: (Gini coefficient of family income) $\times 10^4$

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fifteen communities it was under 15 percent. It is questionable whether such low percentages would greatly affect development patterns.

If we speculate, as we have above, that our SUBS61 variable is insignificant because of the small percentage shares of subsidies in total revenues in 1961 and that our METRO61 variable is insignificant because of the small percentage shares of payments to upper tiers in total expenditures in 1961, then we would have to find evidence of fiscal zoning in a variable which is completely local in nature. To test for such a relationship, we simply used the level of local expenditures per capita (including education), LOC61, as our only fiscal variable. We used the same control variables as before. The overall regressions were significant at the 95 percent level as were the constant term, the PREW61 variable, the AREA61 variable and the LOC61 variable (see Table 5, eqs.2 and 3). The signs of the variables were as expected.

A brief comment about the sign of the LOC61 variable is in order. We noted in Chapter 2 (pp.81-84), and restated earlier in this chapter (pp.174) in connection with the OWNEX variable, that we expect per capita expenditures to be positively associated with

the Gini coefficient if 'poor' communities have higher expenditure levels than 'wealthy' communities. On the other hand, if 'wealthy' communities have higher expenditure levels, then we expect per capita expenditures to be negatively associated with the Gini coefficient.

A number of alternative assumptions can be made about the variation of municipal expenditures across communities. In particular, one can assume that per capita expenditures increase with community wealth, reflecting a positive income elasticity of demand for local services; or, one can associate higher per capita expenditure levels with poorer communities which have to provide a variety of social services to their residents and which may have urban disamenities to alleviate. One may also assume that noneducational expenditures are higher in poor communities and educational expenditures are higher in wealthy communities. It may be the case, however, that educational expenditures are higher in poor (central city) communities, but that the quality of education is higher in wealthy suburban areas (see our discussion of Public Goods Zoning in the Introduction).

The fact that a statistically significant positive coefficient for LOC61 emerges is at least consistent with the hypothesis that municipal expenditures per capita are greater in poor than in wealthy communities.

(What is particularly important about these regression results, however, is the presence of a significant relationship between a fiscal variable and a variable (GINI) which is being used as an indicator of community development patterns. As such they lend support to the theory of fiscal zoning as developed in preceding chapters.

APPENDIX

Regression Results for
Vancouver and MontrealVancouver

Our regression results using the same variables for the Vancouver census metropolitan area were considerably less significant than in the Toronto case. We ran twenty-nine regressions, some of which included the central city and others which did not. Only one equation turned out to be significant overall in terms of its F-statistic; it is reproduced as equation 1 in Table 6.

The constant term, the PREW, FAM and AREA variables are all significant (at the 95% level of confidence). The coefficient of the FAM variable is negative, however, contrary to the expectation of Hamilton et al.

More importantly, our fiscal variables are not significant. This is true not only for equation 1, but also for most of the other equations we ran, which included the fiscal variables SUBS, PCON, PUNCON and OWNEX, all as previously defined. The only instances of significant results for fiscal variables occurred in equations 2 through 6 presented in Table 6.

The sign of the SUBS variable in equation 2 is positive, as expected, and significant. We are not

TABLE 6.

Regression Results

Vancouver Census Metropolitan Area

1971

Central City Included

Central City Excluded

	1	2	3	4	5	6	7
Constant	2026.16 (2.817)	-695.870 (-.3687)	-960.603 (-.4989)	-1114.31 (-.5609)	-486.691 (-.2292)	-699.779 (-.3131)	-773.852 (-.4048)
PREW	53.1705 (3.660)	41.5626 (3.001)	53.3076 (3.705)	48.3209 (2.958)	48.2923 (2.868)	44.7663 (2.421)	49.4284 (2.969)
OWN	6.65631 (.7352)	16.7511 (1.242)	17.6128 (1.307)	18.2713 (1.319)	14.9061 (1.025)	15.9313 (1.048)	17.3287 (1.268)
AREA	4.83427 (1.898)	2.91229 (1.093)	4.59758 (1.802)	3.73897 (1.298)	4.93399 (1.837)	4.12756 (1.328)	3.83813 (1.330)
PAM	-.00802 (-1.81)	-.00922 (-1.87)	-.01159 (-2.22)	-.01094 (-2.01)	-.01771 (-1.59)	-.01613 (-1.36)	-.01071 (-2.03)
METRO	-38.846 (-.401)	-49.104 (-.431)	-108.48 (-1.00)	-75.803 (-.630)	-96.830 (-.855)	-70.195 (-.557)	-71.649 (-.607)
SUBS		21.4381 (2.145)					10.1602 (.6204)
PUNCON	-74.087 (-1.27)		23.5734 (2.202)	25.4670 (2.254)	21.3859 (1.848)	23.4046 (1.872)	
PCON				11.3726 (.7120)		9.94130 (.5873)	
OWNEX		5.02637 (1.383)	6.06435 (1.582)	6.12659 (1.558)	5.49715 (1.355)	5.64578 (1.338)	5.47792 (1.475)
R ²	.6741	.6729	.6784	.6955	.6658	.6796	.6986
F-Statistic d.f.	3.44741* (6.10)	2.93936 (7.10)	3.01319 (7.10)	2.56996 (8.9)	2.56161 (7.9)	2.12139 (8.8)	2.98023 (7.9)

*Significant at 95% level.

fully satisfied with this result, however, because of the presence of an outlier in the observations. The village of Lion's Bay received fifty-nine percent of its revenues in the form of government grants, a considerably higher proportion than other communities in the metropolitan area; the second highest percentage share is approximately thirty-three percent. When we reran the above regression with Lion's Bay excluded the coefficient of SUBS dropped from 21.4381 to 10.1602 and the t-value decreased from 2.14577 to .620465 (see equation 7). This single community would appear to exert considerable influence on the SUBS coefficient. Consequently, we cannot consider our significant coefficient for SUBS in equation 2 to be a reliable indicator of fiscal zoning motives.

In the remaining four equations (# 3-6) it is the PUNCON variable which is significant. Again, however, the inclusion of Lion's Bay makes a critical difference to the results. This particular community receives all of its provincial subsidies in the form of unconditional grants; as noted above, these account for fifty-nine percent of its total revenues. When we excluded Lion's Bay from our observations and reran

the above regressions, the coefficients of PUNCON changed to the following: with central city included:

-27.2219 (PCON not included) and -10.2331 (PCON
(-.289516) (-.0997829)

included); without central city: -67.5343 (PCON not
(-.951086)

included) and -63.4288 (PCON included).
(-.840955)

Based on theoretical considerations noted in Chapter 3 and our empirical results for the Toronto-Centred Region, we thought that the coefficient of the PCON variable would be significant in at least some of our equations. The fact that it is not cannot even be attributed to small values for the variable, since conditional grants account for more than 10 percent of total revenues in half of the eighteen communities and more than 15 percent in seven of the communities.

Some comments are also in order about our METRO variable. As indicated in our discussion of metropolitanization in Vancouver, education has remained a local responsibility. Consequently, we did not include transfers to school boards as part of our METRO variable. (It will be remembered that in the case of Toronto education transfers were made to either the Metropolitan Toronto School Board or county school boards.)

The transfers we did include were 'Conditional Transfers to Other Governments' and 'Transmission of Taxes Levied for Other Governments' (excluding school boards). In none of our communities did these transfers account for more than 4.5 percent of total expenditures including transfers. The small percentage shares of such transfers may explain our lack of significant results for the METRO variable.

It is worth mentioning, however, that the OWNEX variable, when it appears in an equation, is always positive and in some cases comes close to achieving statistical significance. This result is generally consistent with that obtained for the OWNEX variable in the case of Toronto.

The general absence of significant results in the Vancouver case leads to the following tentative suggestion. It concerns a fundamental aspect of the theory of fiscal zoning, namely its association with the Tiebout model of community formation. As discussed in previous chapters, in the Tiebout model residents shop among suburban communities for their utility-maximizing tax/expenditure package. The property tax system, however, provides an opportunity for newcomers to obtain fiscal transfers from current residents by consuming less than the average value of

housing in a community. Fiscal zoning emerges as a means of preventing such transfers from being realized. It is important to note, though, that Tiebout's third assumption was that "There are a large number of communities in which the consumer-voters may choose to live."¹ He stated that: "The greater the number of communities and the greater the variance among them, the closer the consumer will come to fully realizing his preference position."² While it is impossible to define a 'large number' of communities, it seems reasonable to speculate that the eighteen communities within the Vancouver metropolitan area may not provide enough variety in public service levels to make 'shopping around' for a utility-maximizing one a viable option.³

Montreal

The Montreal census metropolitan area is characterized by a great number of communities, ninety-eight of them in 1971. One would expect that a Tiebout-type mechanism would be operative in such a setting and that fiscal zoning would function to minimize transfers among income groups.

Unfortunately, as indicated at the beginning of this chapter, data problems preclude as detailed an analysis of the Montreal CMA as was possible in the case of Toronto. The most serious deficiency in the

data is the exclusion of education revenues and expenditures from the municipal financial data published by the Bureau de la Statistique of the Quebec Government. Municipalities collect school taxes on behalf of the school boards to which they belong, but these funds are not considered to be part of the municipal revenue/expenditure package, unlike the situation in other provinces. Since education is a major public service for which people 'shop around', its omission from municipal revenue/expenditure data seriously compromises any study of fiscal zoning.

Similarly, data on transfers to governments other than school boards (metropolitan or county governments or special districts) are not available. Indeed, a category heading for such transfers ('Quote-Part') appeared in the publication Les Finances Municipales for the first time only in 1976. We are, therefore, unable to use our variable METRO.

We ran regressions on 1971 data⁴ using our four nonfiscal variables and one fiscal variable, SUBS. The results are presented in Table 7 below. It is important to note that both equations 1 and 2 are significant at the 99% level. The R^2 value is low in both cases, however. The constant term and the PREW variable are

TABLE 7
Regression Results
Montreal Census Metropolitan Area
1971

	Central City Included 1	Central City Excluded 2	Central City Included 3	Central City Excluded 4
Constant	2441.64 (15.66)	2416.83 (12.33)	2554.36 (11.77)	2526.49 (10.36)
PREW	15.0787 (6.633)	15.2265 (6.369)	14.9656 (6.552)	15.1431 (6.312)
OWN	.881272 (.4122)	1.16375 (.4594)	.593978 (.2728)	.931877 (.3644)
AREA	.098800 (.0323)	-.371481 (-.0977)	-.010075 (-.0032)	-.584738 (-.1531)
FAM	.000758 (.5115)	.002318 (.3070)	.000968 (.6404)	.002871 (.3776)
SUBS	-1.19085 (-.4106)	-1.08050 (-.3647)	-2.55150 (-.7443)	-2.44523 (-.7044)
OWNEX			-.442174 (-.7490)	-.451291 (-.7590)
R ²	.3799	.3718	.3839	.3759
F-Statistic d.f.	10.9068* (5.89)	10.4162* (5.88)	9.13769* (6.88)	8.73443* (6.87)

* Significant at 99% level.
Dependent variable: (Gini coefficient of family income) x 10⁴

highly significant but the remaining variables, both nonfiscal and fiscal, are not. It should be noted that we cannot explain the absence of a significant coefficient for the SUBS variable by the presence of low observed values. On the contrary, they range from 6.26 percent of local revenues (excluding property taxes for school purposes, of course) to 86.25 percent. Although the vast majority of provincial grants are unconditional in nature, and therefore are less likely to influence zoning behaviour than if they were conditional, we still would have expected a more significant impact based simply on their relative importance as a local revenue source.

Inclusion of the OWNEX variable did not qualitatively change the above results (see equations 3 and 4).

A possible explanation for the absence of any evidence of fiscal zoning in the case of the Montreal CMA may be found in the uniqueness of the province of Quebec. Marion Steele noted that: "The relation of values in Quebec to various housing characteristics, and indeed virtually all aspects of housing in Quebec, is so different from that for the rest of the country

that this province demands special comment."⁵

✓ This statement may apply to the zoning 'aspect of housing' as well. Steele's subsequent discussion of the income elasticity of demand for housing lends support to this hypothesis.

Steele finds remarkably low values for the income elasticity of demand for housing (under .50) at all levels of urbanization in all provinces. The income elasticity, however, tends to be higher the lower the level of urbanization. To account for the variation in elasticity across urban size groups, Steele suggests that:

...land is cheaper the lower the level of urbanization, and the minimum "bundle" of housing is smaller because of less strict building and zoning bylaws. As a consequence, the value-to-income ratio for the lowest income level is much less in rural areas than in urban areas. The value-to-income ratio at high income levels does not show nearly as much difference. This pattern yields elasticities for owners in rural areas which are much higher than those in urban areas.⁶

Similar considerations may explain the striking difference in income elasticities of demand for housing (by homeowners) between the Toronto CMA (.18) and the Montreal CMA (.40).

It seems reasonable to speculate that (part of) the explanation for the relatively high income elasticity in the Montreal CMA may lie in the absence of restrictive zoning bylaws there compared to the

Toronto CMA. If housing consumption in Montreal were less constrained by zoning standards, then it would be more responsive to changes in income; this would be reflected in a higher income elasticity of demand for housing. It will also be remembered that Steele found the price of land in Montreal to be considerably less than in Toronto and accounted (in part) for this differential by noting an absence of substantial government constraints on the supply of land in Montreal.

Steele's explanation for different income elasticities across urban size groups, as applied to the Montreal-Toronto income elasticity differential, is certainly consistent with our finding that fiscal zoning is not an empirically relevant phenomenon in the Montreal CMA.

CHAPTER 7

SUMMARY & CONCLUSIONS

This dissertation has examined the fiscal motives which induce communities to employ restrictive land use controls. The objectives of the paper were to determine whether fiscal zoning is an empirically relevant phenomenon in Canadian cities and whether changed fiscal circumstances, resulting from higher level government grants and metropolitanization, are likely to influence zoning policies and hence community development patterns.

The fiscal motive for zoning calls into question the traditional rationale for zoning, namely the control of externalities arising from the proximate development of different land uses. Numerous statistical studies have failed to find substantial evidence of the presence of externalities as reflected in reduced property values for land uses incurring the externalities. Explanations for these results include the obvious possibility that externalities are not as prevalent as is frequently suggested and the less obvious possibility that they are so highly localized that they are not reflected in the statistical analyses carried out so far. The latter explanation, however, calls into question

the use of extensive generalized land use controls to deal with such 'next-door' phenomena. The numerous conceptual and empirical problems associated with the externalities rationale for zoning prompted our inquiry into the fiscal rationale for zoning.

Canadian cities provide an interesting context within which to examine the issue of fiscal zoning, for they have experienced the important changes in fiscal circumstances which are believed to influence community zoning behavior. Provincial government grants to municipalities increased substantially in the post-war period. During the same period municipal transfers to upper tier governments for the provision of a variety of services increased as well. This was particularly true in the case of those cities which were part of local government reorganization along metropolitan lines. Metro Toronto is the earliest and most noteworthy example of such reform. Vancouver and Montreal experienced similar reforms but at much later dates.

The limited literature on fiscal zoning presents a variety of approaches to determining its empirical relevance and a similar disparity in results. Hamilton et al. found significant evidence of fiscal zoning.

Branfman et al. found no evidence of fiscal zoning; but Hamilton reinterpreted one of their variables and suggested that its coefficient indicated the presence of fiscal zoning. Finally, James and Windsor found no evidence of fiscal zoning.

We conducted our analysis of fiscal zoning in two stages. In Chapter 2 we presented a basic model of fiscal zoning which linked fiscal considerations to the setting of zoning regulations. The important conclusion which derived from this analysis was that in situations where local public services are funded entirely by property taxation the practise of fiscal zoning is expected to lead to the formation of communities which are homogeneous in terms of housing values, i.e. the variance of housing values within their borders is minimal. In Chapters 3 and 4 of the dissertation we examined the effects of provincial government grants and municipal reorganization on local incentives to zone fiscally. Both elaborations on the basic model indicated that such alterations in fiscal circumstances would result in formerly restrictive communities becoming less restrictive in their zoning practises. In the case of provincial grants, communities become relatively less dependent

on property taxes as a revenue source and consequently place less emphasis on the tax revenues to be derived from development. In the case of municipal reorganization, communities must share the costs of services provided by upper tier governments and cannot avoid them by limiting development within their own borders. There is less incentive to use restrictive land use controls because local development is less important in determining the municipal costs for which communities are responsible.

In the second stage of our analysis we tested empirically the hypotheses derived from our fiscal zoning model. We employed multiple linear regression analysis. Our dependent variable was the Gini coefficient of family income, which we used to measure the homogeneity of residential development experienced by communities. We regressed this variable on two fiscal variables and four non-fiscal 'control' variables. Our fiscal variables were designed to reflect the elaborations of our basic model made in Chapters 3 and 4. Thus our first fiscal variable was the percentage of total municipal revenues accounted for by provincial grants. Our second fiscal variable was the percentage of total municipal expenditures accounted for by payments to upper tier governments.

Our results for the Toronto-Centred Region provided strong evidence of a fiscal motive for zoning. First of all, there was a statistically significant positive association between our fiscal variable for grants and the Gini coefficient of family income. This indicated that a community's development pattern was more heterogeneous the higher the percentage of its revenues accounted for by provincial grants. This result was fully consistent with our expectations based on our theoretical analysis in Chapter 3. Further empirical analysis of provincial grants indicated that conditional grants had a greater influence on community homogeneity than did unconditional grants.

There was also a statistically significant positive association between our fiscal variable representing government reorganization and the Gini coefficient of family income. This indicated that a community's development pattern was more heterogeneous the higher the percentage of its expenditures accounted for by payments to upper tier governments. This result was fully consistent with our expectations based on our theoretical analysis in Chapter 4.

Our results for Vancouver and Montreal were less

significant than those for Toronto. Several explanations for these results were offered in Chapter 6. New approaches to the study of fiscal zoning in the cases of these two urban areas are worth pursuing.

At this point it is necessary to discuss our results in the larger context of reforming land use patterns through fiscal reform. Our findings of empirical support for the theory of fiscal zoning strongly suggest that provincial grants and government reorganization can significantly affect local incentives to zone fiscally and can consequently influence local development patterns. This conclusion stands in sharp contrast to James and Windsor's conclusion that fiscal reform is unlikely to ease the restrictiveness of local zoning practises.¹

Fischel,² however, has also questioned the appropriateness of fiscal reform as a means of effecting land use reform. His argument does not rest on the absence of fiscal zoning behavior, as in the case of James and Windsor, but rather it rests (in part) on the nature of the zoning incentives provided by upper level grants. He states that:

Landowners/developers who formerly could point to the fiscal benefits of at least some types of housing now [after removal of the property tax base and assumption by...

the state of all or most responsibility for providing local services] have no means of compensating communities for the loss of their open spaces. Thus the new equilibrium could be even more restrictive, as communities shift from selective exclusion of lower income housing to general restriction of all development.)

This argument ignores the fact that the purpose of fiscal zoning, and of zoning in general, is to exclude (to different degrees) rather than to include. Fiscal zoning is effective only when it excludes lower value housing, an active policy which constitutes an intervention into the operation of the housing market. Consequently, fiscal reform measures which reduce the incentive to exclude are likely to have some effect on easing the restrictiveness of zoning. Furthermore, Fischel's argument appears to rest on the alleged importance to communities of 'open spaces'. It also does not consider that adequate 'open spaces' may be one of the local public goods for which state grants will be available.

It is interesting to note that Fischel comes to his conclusion on the basis of an article by White⁴ in which she takes a less extreme position on the same issue. White merely points out that the fiscal (and other) reform measures she discusses would reduce the

Number of Acres of
Vacant Land
Zoned for
Residential Use

Zoning Efficiency Index	Fewer Than 1,500		1,500- 7,499		7,500 or more		Total	
	#	%	#	%	#	%	#	%
	Towns		Towns		Towns		Towns	
0-.1	18	18.4	0	-	2	6.9	20	12.7
.11-.50	33	33.7	1	3.2	1	3.4	35	22.2
.51-.90	31	31.6	12	38.7	11	37.9	54	34.2
.91-1.00	16	16.3	18	58.1	15	51.7	49	31.0
Total	98	100.0	31	100.0	29	99.9	158	100.1

The table indicates that the majority of communities with 1,500 acres or more of vacant residential land have index values in the .91-1.00 range (58.1 and 51.7 percent for the "1,500-7,499 acre" and "7,500 or more" categories, respectively). Furthermore, 38.7 and 37.9 percent (for the same categories) have index values in the .51-.90 range; these are above the mean efficiency value and, given the extent of the range, could be well above the mean, in the .80-.90 range, for example. James and Windsor observe, however, that "...if all the municipalities studied had simply zoned for minimum lots of one acre or more, three-fourths of them would have had ideal zoning for their fiscal interests. Instead, only half the communities approached the ideal.", p.137.

48. Ibid., p.137.

49. See fn.47 above.

50. The 'overzoning' phenomenon has been noted by Richardson and is a generally recognized feature of planning.
See Harry W. Richardson, Urban Economics, pp.99-105.

51. See our related discussion on pp. 77-78.

did unconditional grants. This suggests that a system of grants which is specially designed to deal with exclusionary zoning policies may significantly reduce the use of such restrictive controls.⁸

However, it is worth noting another concern expressed in the literature over the use of state (provincial) grants to relieve local communities of fiscal burdens arising from development. It is that states themselves may become restrictive in their policies affecting migration of residents from other states. In other words, states may acquire a fiscal incentive to exclude newcomers; exclusionary policies may simply be shifted from the local level to the higher government level. Mills suggests that "...higher levels of government may not prove much less exclusionary-minded than local governments have proven" and notes that:

Some predominantly rural states have been blatantly exclusionary in their attitude toward land use controls, but even highly urbanized states show an antiurban bias in statewide land-use control plans. The catchwords are 'ecological protection', 'open-space preservation', and 'protection of farmland from urban growth'.⁹ (Single quotation marks reflect italics in original.)

Furthermore, "...it is not clear that the social damage from exclusionary actions by states will be less.

serious than those by local governments."¹⁰ This brings us considerably beyond the confines of our main concern, namely local exclusionary zoning, but it does indicate some of the potential ramifications of measures intended to influence local zoning policies.

Nevertheless, this dissertation indicates that there is considerable scope for local land use reform through the alteration of local fiscal circumstances by means of grant programs and/or municipal reorganization. Reforms in these two areas can make an important contribution toward modifying the highly exclusionary nature of many contemporary zoning policies.

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FOOTNOTES

INTRODUCTION

1. Some of the court cases most frequently cited in the literature are the following:

Burlington NAACP v. Mt. Laurel Township (New Jersey):
The court found the town's zoning plan to be highly exclusionary and unconstitutional. The community was ordered to prepare a new plan which would enable lower income groups to move into Mount Laurel if they wished.

Construction Industry Association of Sonoma v. City of Petaluma (California):
The court ruled that Petaluma's controls on development, which included restricting the issuance of building permits to five hundred a year, were unconstitutional (they violated the 'right to travel'). This decision was later reversed on a technicality.

Golden v. Planning Board of Ramapo (New York):
The community enacted a zoning ordinance that scheduled areas in the community for development over an eighteen-year period. Its constitutionality was upheld, in a split decision, by the New York State Court of Appeals.

2. In particular, see Anthony Downs, Opening Up the Suburbs.
3. For an interesting discussion of the first of these effects see Michelle J. White, "Job Suburbanization, Zoning and the Welfare of Urban Minority Groups."
4. See Dick Netzer, Economics of the Property Tax, p.132.
5. See Duane Windsor, Fiscal Zoning in Suburban Communities, p.72.
6. See Robert Schafer, The Suburbanization of Multifamily Housing, p.13.
7. Howard Pack and Janet Rothenberg Pack, "Metropolitan Fragmentation and Suburban Homogeneity."
8. The Assisted Housing Study, Planning Department, Municipality of Metropolitan Toronto, cited in Report of the Royal Commission on Metropolitan Toronto, Honourable John P. Robarts, Commissioner, June 1977, 2 Volumes, p.32.

9. George A. Nader, Cities of Canada, Volume Two: Profile of Fifteen Metropolitan Centres.
10. Michael Goldberg and Peter Horwood, Zoning: Its Costs and Relevance for the 1980s, p.
11. Ibid., p.14.
12. John P. Crecine, Otto A. Davis and John E. Jackson, "Urban Property Markets: Some Empirical Results and Their Implications for Municipal Zoning."
13. Frederick H. Rueter, "Externalities in Urban Property Markets: An Empirical Test of the Zoning Ordinance of Pittsburgh."
14. S.M. Maser, W.H. Riker and R.N. Rosett, "The Effects of Zoning and Externalities on the Price of Land: An Empirical Analysis of Monroe County, New York."
15. D.M. Grether and Peter Mieszkowski, "Determinants of Real Estate Values."
16. Edwin S. Mills, "Economic Analysis of Urban Land-Use Controls."
17. Robert L. Bish and Hugh O. Nourse, Urban Economics and Policy Analysis.
18. T.N. Tideman, "Three Approaches to Improving Urban Land Use."
19. In particular see Robert C. Ellickson, "Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls."
20. Ibid., p.708.
21. Quoted in Edwin S. Mills, "Economic Analysis of Urban Land-Use Controls," p.516.
22. Ibid., p.516.
23. George A. Nader, Cities in Canada, Volume One: Theoretical, Historical and Planning Perspectives, p.289.
24. Ibid., p.291.
25. William A. Fischel, "Externalities and Zoning," p.41.

26. Edwin S. Mills and Wallace E. Oates, "The Theory of Local Public Services and Finance: Its Relevance to Urban Fiscal and Zoning Behavior."
27. Ibid., p.8.
28. Public goods zoning and fiscal zoning may be in conflict in the case of industrial location. See *ibid.*, p.8.
29. Richard F. Babcock, The Zoning Game: Municipal Practices and Policies, p.31.
30. Bruce W. Hamilton, "Property Taxation's Incentive to Fiscal Zoning."
31. Ibid., p.126.
32. Mahlon Straszheim, "Interdependence between Public-Sector Decisions and the Urban Housing Market."
33. Mieszkowski demonstrates that in a community in which residents have different demands for public goods, incomplete capitalization of fiscal surpluses and deficits will take place. See Peter Mieszkowski, "Notes on the Economic Effects of Land-Use Regulation." For a synopsis of his argument see Chapter 1 below, p. 46.
34. In particular see William Alonso, Location and Land Use: Toward a General Theory of Land Rent.
35. Ibid., p.117.
36. Ibid., p.117.
37. Charles Tiebout, "A Pure Theory of Local Public Expenditures."
38. It should be noted that a property tax system which varied the assessment ratio according to the costs imposed by new entrants would be equivalent to a head tax system.
39. Bruce W. Hamilton, Edwin S. Mills and David Puryear, "The Tiebout Hypothesis and Residential Income Segregation."
40. Eric J. Brannman, Benjamin I. Cohn and David M. Trubek, "Measuring the Invisible Wall: Land Use Controls and the Residential Patterns of the Poor."

41. Bruce W. Hamilton, "Property Taxation's Incentive to Fiscal Zoning."
42. Ibid., p.129.
43. Duane Windsor, Fiscal Zoning in Suburban Communities.
44. Further discussion of the studies by Hamilton et al. and by Brannman et al. is included in Chapter 5.
45. Franklin J. James, Jr. and Oliver Duane Windsor, "Fiscal Zoning, Fiscal Reform, and Exclusionary Land Use Controls."
46. Ibid., p.131.
47. The index is defined as $I = \frac{AVG - MAX}{MIN - MAX}$, where
 - MAX = net annual fiscal cost per acre of undeveloped land zoned in lot size category imposing greatest net fiscal cost per acre or offering smallest net fiscal benefit,
 - MIN = net annual fiscal cost per acre of undeveloped land zoned in lot size category imposing least net fiscal cost per acre or offering greatest net fiscal benefit,
 - AVG = average net annual fiscal cost per acre of undeveloped land of actual zoning for single-family homes in the municipality.

The average fiscal cost per acre of undeveloped land zoned for single family use in the community's zoning ordinance is determined by: multiplying the number of acres of land zoned for minimum lot sizes in each category by the net fiscal cost per acre for each lot size category, summing over all lot size categories, and then dividing by the total number of vacant acres zoned for single family homes.

It should be emphasized that this index measures the efficiency of single family zoning and does not consider other housing types. An index value of one reflects perfect fiscal zoning (i.e. a zoning plan from which the community would derive maximum fiscal benefits), while a value of zero indicates the absence of fiscal zoning (i.e. a zoning plan from which the community would derive minimum fiscal benefits). James and Windsor's results are presented in the following table:

Number of Acres of
Vacant Land
Zoned for
Residential Use

Zoning Efficiency Index	Fewer Than 1,500		1,500- 7,499		7,500 or more		Total	
	#		#		#		#	
	Towns	%	Towns	%	Towns	%	Towns	%
0-.1	18	18.4	0	-	2	6.9	20	12.7
.11-.50	33	33.7	1	3.2	1	3.4	35	22.2
.51-.90	31	31.6	12	38.7	11	37.9	54	34.2
.91-1.00	16	16.3	18	58.1	15	51.7	49	31.0
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The table indicates that the majority of communities with 1,500 acres or more of vacant residential land have index values in the .91-1.00 range (58.1 and 51.7 percent for the "1,500-7,499 acre" and "7,500 or more" categories, respectively). Furthermore, 38.7 and 37.9 percent (for the same categories) have index values in the .51-.90 range; these are above the mean efficiency value and, given the extent of the range, could be well above the mean, in the .80-.90 range, for example. James and Windsor observe, however, that "...if all the municipalities studied had simply zoned for minimum lots of one acre or more, three-fourths of them would have had ideal zoning for their fiscal interests. Instead, only half the communities approached the ideal.", p.137.

48. Ibid., p.137.

49. See fn.47 above.

50. The 'overzoning' phenomenon has been noted by Richardson and is a generally recognized feature of planning.
See Harry W. Richardson, Urban Economics, pp.99-105.

51. See our related discussion on pp. 77-78.

CHAPTER 1

1. Ruth L. Mace, Municipal Cost-Revenue Research in the United States, p.170.
2. In particular see Julius Margolis, "On Municipal Land Policy for Fiscal Gains."
3. Ibid., p.250.
4. See Thomas Muller, Fiscal Impacts of Land Development: A Critique of Methods and Review of Issues.
5. "On Municipal Land Policy for Fiscal Gains."
6. For additional discussion of this point see Thomas Muller and Grace Dawson, Fiscal Impact of Residential and Commercial Development, pp.10, 12, 75 and 137.
7. Ruth L. Mace, Municipal Cost-Revenue Research in the United States, p.177.
8. "Fiscal Zoning, Fiscal Refor, and Exclusionary Land Use Controls."
9. George Sternlieb, Housing Development and Municipal Costs.
10. These may vary considerably across communities. For example, in 566 New Jersey municipalities for the year 1970, local expenditures per capita ranged from \$179 to \$496, while equalized municipal tax rates ranged from \$.45 to \$1.35. See Duane Windsor, Fiscal Zoning in Suburban Communities, p.91.
11. See George Sternlieb, Housing Development and Municipal Costs, p.7.
12. Non-educational expenditures on behalf of residents may also vary according to household size which, in turn, is related to housing type. Sternlieb provides evidence of increasing household size as housing type moves from highrise apartments to single family units (see *ibid.*, p.4). A similarity in household size as between larger townhouse units and single family houses should be noted, although the presence of two-bedroom townhouses, with their appreciably smaller household size, would tend to lower the overall household size....

figure for townhouses. We were unable to find comparable data for Canada, either in the census or the 1974 CMHC Housing Survey.

13. Ibid.
14. "Fiscal Zoning, Fiscal Reform, and Exclusionary Land Use Controls."
15. See Sternlieb, p.52.
16. These were the only two housing types compared in this study. More detailed comparisons among garden apartments and single family houses on different lot sizes are presented in Duane Windsor, Fiscal Zoning in Suburban Communities.
17. Bruce W. Hamilton, "Capitalization of Intra-jurisdictional Differences in Local Tax Prices."
18. James C. Dyer IV and Michael D. Maher, "Capitalization of Intra-jurisdictional Differences in Local Tax Prices: Comment."
19. See p. 17.
20. Matthew Edel and Elliott Sclar, "Taxes, Spending, and Property Values: Supply Adjustment in a Tiebout-Cates Model."
21. See text below on p. 53.
22. Grether and Mieszkowski ("The Effects of Non-residential Land Uses on the Prices of Adjacent Housing: Some Estimates of Proximity Effects") found in the case of New Haven, Connecticut, that land zoned for single family residences sold for roughly ten times less per acre than land zoned for apartment buildings. Mieszkowski ("Three Aspects of Urban Land Use Regulation") also cites a benefit-cost study of the Oshawa Airport by R. Crowley which found that land zoned for apartments sold for roughly seven times per acre the amount that land zoned for single family residences did. Finally, Hamilton ("Local Government, the Property Tax, and the Quality of Life: Some Findings on Progressivity") discusses land differentials in North York, a Toronto suburb. In that community land zoned at twelve units per acre sold for one and two thirds times the amount that land zoned for two dwelling units per acre did.

23. It is implicitly assumed that the wealthy residents of the community derive no financial benefit from ownership of the housing in which the poor live. In the model with capitalization, as developed by Hamilton, no distinction is made between wealthy/owners and poor/renters.

With regard to the degree of exclusion through zoning, it is worth noting that in her analysis of large-lot zoning, White ("Fiscal Zoning in Fragmented Metropolitan Areas") concludes that a fiscally-motivated community will restrict development beyond the maximum fiscal surplus level because of the additional benefits such restrictions have on the scarcity value of existing properties. She suggests that even the supply of additional high-income housing will be restricted, not because of adverse fiscal transfers between income groups, but because supply restrictions would increase the scarcity value of existing high-income housing. Only if the construction of higher quality housing than already exists in the community is permitted by local zoning is it possible to increase the total value of housing in the community. This will occur when the positive effects of the restricted housing supply more than offset the reduced fiscal surplus brought into the community by the construction of higher quality housing beyond the maximum FST (Fiscal Squeeze Transfer) level. See White, pp.73-80.

24. Peter Mieszkowski, "Notes on the Economic Effects of Land-Use Regulation."
25. For a fuller discussion, see *ibid*.
26. Wallace E. Oates, "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis," p.968.
27. Henry O. Pollakowski, "The Effects of Property Taxes and Local Public Spending on Property Values: A Comment and Further Results."
28. Bruce W. Hamilton, "The Effects of Property Taxes and Local Public Spending on Property Values: A Theoretical Comment." p.647.

29. Mark V. Pauly, "A Model of Local Government Expenditure and Tax Capitalization."
30. Wallace E. Oates, "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis," p.968.
31. "Taxes, Spending and Property Values: Supply Adjustment in a Tiebout-Oates Model."
32. "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and the Tiebout Hypothesis," p.967.
33. The major conclusion of their study is that while a Tiebout mechanism may be operative for some local public goods (education), it may not be applicable to all such goods, for example, highway expenditures, where considerable spillovers (thru traffic) may be involved.
34. Wagner provides the following example of a situation in which no intercommunity long run supply adjustment occurs. Assume that there are five cities of equal size in a metropolitan area, that 60 percent of the residents of each city prefer policy A to B, and that each city initially enacts policy A. Tiebout efficiency requires that three cities follow policy A and two cities follow policy B. In this case, however, all five cities will follow policy A and this will be a stable equilibrium. There is no obvious mechanism by which a redistribution of policies (services) among the cities, and in particular, an expansion of the specific policy B, can be effected. Richard E. Wagner, The Fiscal Organization of American Federalism: Description, Analysis, Reform.
35. Larry L. Orr, "The Incidence of Differential Property Taxes on Urban Housing"; Wallace E. Oates, "The Effects of Property Taxes and Local Public Spending on Property Values: A Reply and Yet Further Results"; Harvey S. Rosen and David J. Fullerton, "A Note on Local Tax Rates, Public Benefit Levels, and Property Values."

36. Thomas A. King, "Estimating Property Tax Capitalization: A Critical Comment."
37. Ibid., p.430.
38. Bruce W. Hamilton, "Capitalization and the Regressivity of the Property Tax: Empirical Evidence." See p.176.
39. T.J. Wales and E.G. Wiens, "Capitalization of Residential Property Taxes: An Empirical Study." The authors state that: "...it is indeed difficult for the individual to determine how much more he should pay for a house that differs from another only in terms of a low tax bill, with the calculation presumably involving his discount rate and a comparison of expected time periods of holding the houses, expected resale values and expected future tax payments for the two houses." P.332. They also suggest that "...buyers do not trust their own judgement on a house in the face of what appears to be an abnormally low tax assessment." P.333. It is worth noting that King (1977) raises some questions about the methodology used by Wales and Wiens. See his comments in fn.6, p.429.
40. Peter Chinloy, "Effective Property Taxes and Tax Capitalization."
41. Richard M. Bird and Enid Slack, Residential Property Tax Relief in Ontario, p.119. Also, see their comments on pp.97 and 105.
42. Peter Linneman, "The Capitalization of Local Taxes: A Note on Specification."
43. Dennis Epple, Allan Zelenitz and Michael Visscher, "A Search for Testable Implications of the Tiebout Hypothesis."
44. Ibid., p.424.
45. Bird and Slack, Residential Property Tax Relief in Ontario, p.143. For a brief survey of tax capitalization studies see their Appendix A.
46. Kristina Ford, "Afterword - A Guide to Cost Conversion," p.320.

47. Lynne B. Sagalyn and George Sternlieb, Zoning and Housing Costs: The Impact of Land Use Controls on Housing Price, p.48.
48. Marion Steele, The Demand for Housing in Canada, p.79.
49. Ibid., p.82.
50. Michelle J. White, "Fiscal Zoning in Fragmented Metropolitan Areas." In a footnote White suggests that the community can control the lot-size, house-value relation through use of building code, setback and square foot of living area regulations. See her fn.1 on p.39.
51. Ibid., p.48.
52. Mills suggests that "There are too many ways to use too many land-use controls, each acceptable to the courts in some circumstances, for the cumbersome legal machinery to have much effect on efforts to exclude." "Economic Analysis of Urban Land-Use Controls," p.534. See also fn.50 above.

CHAPTER 2

1. With the same family size in each community, this translates into a common expenditure level per capita as well.
2. The line AA is not intended to reflect an exact functional relationship between the average housing value of communities and their tax rates. Rather, its purpose is simply to illustrate in general terms the relative positions in Quadrant I of our 'poor' and 'wealthy' communities. It is therefore consistent with the analysis in Quadrants II and III, which applies only to these two communities. Similar considerations obtain in the case of line DD in Quadrant IV; that dashed line is intended to highlight the relative positions of the two communities in terms of the expected value of uncontrolled development and the minimum value of additional dwelling units.

It should also be noted that our analysis is conducted in terms of a fixed expenditure level and varying property tax rates across communities, rather than a constant tax rate and varying expenditure levels across communities, in order to be consistent with the literature on fiscal zoning and because this approach is easier to present diagrammatically.

Finally, it should be pointed out that we are also assuming a uniform distribution of services within each community. This is a common assumption in the fiscal zoning literature, although White does mention in passing the possibility that fiscal surpluses derived from expensive housing may benefit only older residents of a community, citing the example of road improvements in older neighborhoods. In any case, wide variations in service levels are not likely to be as prevalent within suburban communities as they are within central cities. But it is also worth noting that in the case of education, Ontario has an expenditure ceiling per pupil which is designed to promote greater educational uniformity province-wide, so that variations in school quality even within Ontario central cities are not likely to be that substantial.

3. The addition of the dashed line requires that the DD line be at a 45° angle emanating from the intersection of the dashed line and the horizontal axis of Quadrant IV. This is required in order to reflect the fact that the minimum value of new dwellings is set equal to the average (mean) value of housing already...

in the community. It should be reiterated that community land use controls do not extend to the actual setting of minimum values for new housing units. Rather, a variety of physical and financial requirements are specified which limit the construction of new units to those in the desired value range. See Chapter 1, Zoning Considerations.

4. White ("Fiscal Zoning in Fragmented Metropolitan Areas") has suggested that while suburban zoning policies may indeed "bottle up" the poor in central cities, they may also bottle up middle-income groups which help finance the services provided to the poor.
5. This is an important assumption in Tiebout's model.
6. This does not mean that new housing units equal in value to the community average would not be permitted in the community, but rather reflects a higher level of restrictiveness in land use controls to ensure that new units are in fact at least equal in value to the community average. Land use controls formulated with the community's mean housing value in mind would likely result in some new units being built which were slightly less in value than the community average. (This problem could be avoided, of course, if local officials could set minimum housing value requirements directly, a possibility which we have ruled out.) The greater the fiscal deficits associated with such below-average value units, the greater the incentive for the community to ensure that they are not built. The design of land use controls with housing values in mind which are above the community average will increase the likelihood that the lowest value of new housing units built will be at the community average and not fall below it.

CHAPTER 2 - APPENDIX

1. William A. Fischel, "Fiscal and Environmental Considerations in the Location of Firms in Suburban Communities"; Michelle J. White, "Self-Interest in the Suburbs: The Trend toward No-Growth Zoning."

CHAPTER 3

1. The reader is referred at this point to our review of the fiscal zoning literature in the Introduction. The articles by Hamilton et al. and by Branfman et al. both deal with the effects of state grants on community development patterns.
2. See Tri-Level Task Force on Public Finance, Volume II, p.48. Comparable figures for 1980 were 40.4 percent and 4.7 percent, respectively (Provincial and Municipal Finances 1981, p.50).
3. See Tri-Level Task Force on Public Finance, Volume II, p. 63. This percentage was 45.9 in 1980 (Provincial and Municipal Finances 1981, p.50).
4. See Tri-Level Task Force on Public Finance, Volume II, p.48. The 1980 figure was 34.6 percent (Provincial and Municipal Finances 1981, p.50). The relative importance of different expenditure categories has remained stable over the years. Education expenditures still dominate local spending patterns (41.7 percent in 1971; 40.1 percent in 1980), followed by Transportation and Communication (13.5 percent in 1974; 12.0 percent in 1980) and Protection (7.8 percent in 1974; 8.2 percent in 1980). See Tri-Level Task Force on Public Finance, Volume II, p.59 and Provincial and Municipal Finances 1981, p.51.
5. These figures are from the 1973 edition of Provincial and Municipal Finances and apply to the year 1972. It should be noted that the 65 percent figure cited for federal grants refers only to federal grants to municipalities. There are three types of federal grants: 'conditional transfers from federal government', 'unconditional transfers from federal government' and 'unconditional transfers from federal government enterprises'. In the 1981 edition of Provincial and Municipal Finances, federal grants were categorized as either 'grants in lieu of taxes; federal government and enterprises' or 'specific purpose transfers from federal government'. The latter represented 54 percent of the total. Approximately 87 percent of provincial grants to municipalities in 1980 were 'specific purpose transfers'. See Provincial and Municipal Finances 1973 (p.50) and 1981 (p.51).

6. See Local Government Finance in Ontario 1975 and 1976, p.44. By 1980 this pattern had largely been reversed, with grants representing 51 percent of school board revenues and property taxes 46 percent. See Local Government Finance in Ontario 1980, p.30.
7. See Local Government Finance in Ontario 1975 and 1976, p.29. Municipal revenues were subsequently re-categorized. In the 1977 edition of Local Government Finance in Ontario, however, the 1975 municipal revenue figures were regrouped according to the new classification, so that while a direct 1970-1980 comparison is not possible, one for 1975-1980 is possible. Under the new classification, taxation accounted for 43 percent of municipal revenues in 1975 and 42 percent in 1980; grants represented 32 percent of revenues in 1975 and 29 percent in 1980. Unlike school boards, municipalities did not experience large changes in revenue shares during the latter half of the 1970s. See 1977 and 1980 editions of Local Government Finance in Ontario, p.11 and p.17, respectively.
8. Detailed information on Ontario's grants is available in Provincial Financial Assistance to Municipalities, Boards and Commissions.
9. Richard A. Musgrave and Peggy B. Musgrave, Public Finance in Theory and Practice.
10. Ibid., p.538.
11. Dick Netzer, Economics of the Property Tax.
12. Ibid., p.451.
13. D.G.L. Auld, "Provincial Grants and Local Government Expenditure"; Enid Slack, "Local Fiscal Response to Intergovernmental Transfers."

14. For a summary review of the literature in this area, the reader is referred to Bird and Slack, Residential Property Tax Relief in Ontario, Appendix E, Econometric Studies of Local Fiscal Response to Inter-governmental Grants.
15. See Enid Slack, "provincial-Municipal Grant Reform in Ontario," for a considerably more detailed classification of Ontario's very complex grants system.
16. Since we have assumed a constant expenditure level across communities, a cost sharing program which finances 50 percent of municipal expenditures implies that all communities receive the same dollar amount of grants per household.
17. Conversely, poor communities will become less expansive in their development strategies. The intuitive explanation for this result is that poor communities now have government grants to ease their fiscal burdens and therefore do not have to rely as heavily as before on new development for fiscal relief.
18. The effect on community zoning policies may not be substantial, however, if the per capita grant is small. In 1971 the basic per capita grant in Ontario was only \$7.50 for metropolitan or regional municipalities and \$5.00 for other municipalities. Of course, as Hamilton et al. point out, if the per capita grants are so large that the property taxes needed to finance local services become trivially small, then they will likely have a marked effect on development patterns.
19. One can view a cost sharing grant for welfare as a large per capita grant for poor people, one which exceeds in value the unconditional per capita grant attached to all residents.
20. This possibility may not be relevant for those very wealthy communities which initially have tax rates below the r_2 level, since they may not be receiving grants which can be reduced to offset the benefits they derive from development which provides fiscal surpluses.

21. Again, low housing value communities will become less expansive in their zoning. The fiscal burdens borne by their residents are now being eased by government grants; consequently, they do not have to rely as much on development of higher than mean value housing to improve their fiscal circumstances.

With regard to the possible stimulative effects of equalization grants, it should be noted again that in the case of Ontario's equalization grants to school boards, there is a maximum expenditure level per pupil which is set by the provincial government.

22. George Fallis has commented that explicit grants may be required to induce communities to admit inexpensive housing; in other words, fiscal gains, and not just the absence of fiscal losses, may be required to induce communities to become fully non-restrictive in their zoning policies. See Housing Policy for the 1980s. See also our discussion on p.297, particularly White's comments.

CHAPTER 4

1. Again, communities characterized by very low mean housing values will become less expansive in their zoning practises. The intuitive explanation for this result is that these communities, through metropolitan provision of public services, are receiving fiscal transfers from the wealthier suburban communities and consequently do not have to rely to the same extent as before on development within their own borders to alleviate their fiscal burdens.
2. David F. Bradford and Wallace E. Oates, "Suburban Exploitation of Central Cities and Governmental Structure"; Roy W. Bahl and Walter Vogt, Fiscal Centralization and Tax Burdens: State and Regional Financing of City Services.
3. "Suburban Exploitation of Central Cities and Governmental Structure," p.78.
4. Bradford and Oates note that their assumption of unchanged spending and revenues following metropolitan consolidation is somewhat unrealistic and that a general 'leveling upward' of expenditures in most categories would likely ensue, with consequent general increases in tax rates. Nevertheless, "...the pattern of relative changes between city and suburbs and among the suburbs themselves would still be essentially the same as described in the preceding analysis." *ibid.*, p.81.
5. Their conclusions here are based on the rather unrealistic assumption, however, that suburban/central city noneducational service requirements (services to property, in part) would be similar in nature, whereas in fact significant quantity and quality variations are likely to exist. Their assumption about uniform metropolitan educational expenditures (services to people) is more realistic.
6. *Ibid.*, p.84.
7. Fiscal Centralization and Tax Burdens: State and Regional Financing of City Services, p.124.
8. In Denver central city residents were estimated to receive tax relief of \$2.3 million, or about \$4.40 per capita. Without a shift to a regional property tax, i.e. under the current situation, the same expenditure package would cost \$7.0 million, so that by shifting the central city residents...

could experience a 33 percent (approximately) reduction in property taxes. In the case of San Diego, central city residents were estimated to experience a reduction in property tax liability from \$3.9 million to \$1.54 million, a 61 percent decrease. These figures reflect a substantial inter-jurisdictional transfer of resources from the suburban communities to the central city.

9. The thirteen municipalities were: the City of Toronto; the townships of East York, Etobicoke, North York, Scarborough, and York; the towns of Mimico, Leaside, Weston, and New Toronto; and the villages of Swansea, Forest Hill, and Long Branch. The six municipalities were the City of Toronto and the Boroughs of York, Etobicoke, Scarborough, North York and East York. The Goldenberg Report of 1965, which served as the basis for the 1967 reforms, had recommended the consolidation of the thirteen municipalities into only four.
10. Under the system of local government created in Toronto in 1954, the Metropolitan Council had exclusive responsibility for: the administration of justice; borrowing and issuing debentures; property assessment; public transportation (except steam railways and taxis); regional planning; provision of homes for the aged, hospitalization and burial of indigents, and maintenance of neglected children.
The two tiers shared responsibility for: education (under a two-tiered system of Metropolitan and area school boards); housing and development; parks; planning; roads and traffic control; sewage disposal; water supply. The constituent municipalities had exclusive responsibility for: fire protection; garbage collection and disposal; licensing and inspection; local distribution of hydro-electric power; policing; public health; general welfare assistance; recreation and community services; collection of taxes.
The Metropolitan government assumed responsibility for policing and for licensing businesses in 1957.
Source: Report of the Royal Commission on Metropolitan Toronto, p.14.
11. Albert Rose, "Two Decades of Metropolitan Government in Toronto: 1953-1973," p.40.
12. Gail C.A. Cook, "Effect of Metropolitan Government on Resource Allocation: the Case of Education in Toronto."

13. Gail C.A. Cook, "Toronto Metropolitan Finance: Selected Objectives and Results."

14. A list of the municipalities affected by these reorganizations is as follows:

Laval: Auteuil, Chomedey, Duvernay, Fabreville, Laval des Rapides, Laval sur le Lac, Laval West, Pont Viau, St. François, St. Vincent de Paul, Ste. Dorothee, Sainte-Rose, Vimont (St. Elzéar).

Montreal Urban Community: East Sector - Anjou, Montreal East, Montreal North, Pointe-aux-Trembles, Saint-Léonard; West Sector - Baie d'Urfe, Beaconsfield, Dollard-des-Ormeaux, Kirkland, Pierrefonds, Pointe-Claire, Roxboro, Sainte-Anne-de-Bellevue, Sainte-Genevieve, Saint-Raphael-de-l'Ile Bizard, Senneville; Centre Sector - Côte-Saint-Luc, Hampstead, Lasalle, Mont-Royal, Montreal West, Outremont, Saint-Pierre, Verdun, Westmount; Centre-West Sector - Dorval, Dorval Island, Lachine, Saint-Laurent, Montreal.

Sources: André Bernard, Jacques Léveillé and Guy Lord, Profile: Montreal; Jean Godin, "Local Government Reform in the Province of Quebec," respectively.

15. The municipal restructuring of Laval has attracted considerably less attention than the MUC, primarily because of the more traditional nature of its reorganization.

16. Police integration became effective in 1972, but cost-sharing was retroactive to January 1970.

17. Jean Godin, "Local Government Reform in the Province of Quebec," p.64.

18. The Montreal Urban Community Transportation Commission (MUCTC) is made up of eighteen MUC member municipalities, including the City of Montreal, and part of the City of Longueuil. The MUCTC was not a new local government body, but rather a new name given to the old Montreal Transportation Commission which had been in operation since 1950. The Metropolitan Transit Board, a department of the MUC, advises the MUC and the MUCTC on transportation matters and is responsible for the coordination of transportation services over the entire MUC area.

19. Paul Tennant and David Zirnhelt, "Metropolitan Government in Vancouver: The Strategy of Gentle Imposition," p.128.
20. The GVRD is composed of the following municipalities: Vancouver, Burnaby, Surrey, Richmond, North Vancouver District, Coquitlam District, Delta, New Westminster, North Vancouver City, West Vancouver, Port Coquitlam, White Rock, Port Moody, Lion's Bay, Unincorporated areas: University Endowment Lands, Bowen Island, ICCC-Buntzen.
Source: Tennant and Zirnhelt, *ibid.*, p.132.

CHAPTER 4 - APPENDIX

1. "Halton region came into being as a lumping together of municipalities 'left over' from Peel and Hamilton-Wentworth. A more incongruous mixture could not have been imagined." "Why we can't afford regional government," The Financial Post, August 9, 1980, p.s16.
2. Regional Government in Perspective: A Financial Review, p. 22.
3. However, taxes in Hamilton still increased because of inflation, expanded public services, etc. For actual figures see Report of the Hamilton-Wentworth Review Commission, Table 7-15, pp.104-106.
4. *Ibid.*, p.109.
5. *Ibid.*, p.140.
6. *Ibid.*, p.140.

CHAPTER 5

1. Cities and Housing, p.196.
2. Housing and Income, p.180. The criteria Reid used in selecting census tracts from each metropolitan area did not exclude the possibility of a considerable gap between the average income reported and the income of owner-occupants. The tracts varied greatly in the likelihood of this gap. "Some attempt was made to hold it constant by stratifying the tracts by the importance of unrelated individuals and of tenant occupancy. This was done for Detroit and New York." (p.181) No further explanation is provided, in particular the characteristics of the a) and b) subsets for the two metropolitan areas which were stratified.
3. "The Demand for Housing: A Review of Cross-Section Evidence", p.10.
4. "Housing and Income", p.229.
5. The Demand for Housing in Canada, p.88.
6. Ibid., p.92.
7. "The Tiebout Hypothesis and Residential Income Segregation."
8. Ibid., p.113.
9. "Measuring the Invisible Wall: Land Use Controls and the Residential Patterns of the Poor."
10. "Metropolitan Fragmentation and Suburban Homogeneity"; Robert K. Leik, "A Measure of Ordinal Consensus."
11. The Gini coefficient will be examined further below.
12. Alonso assumes that "Municipal services and tax rates are uniform throughout the city." Location and Land Use: Toward a General Theory of Land Rent, p.19.
13. Hamilton et al. use twelve such 'nuisance' variables. See their Appendix 4A, pp.117-118.
14. Brannfman et al., p.501.

15. The authors multiply these aid variables by a dummy variable equal to zero if the SMSA has three or less suburban school districts and equal to unity if it has more than three. See their discussion of this point on pp.109 and 112.
16. Hamilton et al., p.112.
17. Martin Brønfenbrenner, Income Distribution Theory; James Morgan, "The Anatomy of Income Distribution"; N.C. Kakwani and N. Podder, "On the Estimation of Lorenz Curves from Grouped Observations."
18. "The Tiebout Hypothesis and Residential Income Segregation."
19. "The Anatomy of Income Distribution," p.281.
20. Hamilton et al. also use 'percentage of total revenue' figures rather than total dollar amounts or per capita amounts.
21. See fn.3 in Chapter 6.

CHAPTER 6

1. Hamilton et al., "The Tiebout Hypothesis and Residential Income Segregation"; Bruce W. Hamilton, "Property Taxes and the Tiebout Hypothesis: Some Empirical Evidence."
 2. This may be due in part to the fact that the central cities of the Toronto-Centred Region are not the locations of last resort for people who have been excluded from the surrounding suburbs, a manner in which American central cities are frequently portrayed. It is important to note that the central cities of the Toronto-Centred Region are not the poorest communities in the Region. In 1971, of forty three communities in the Toronto-Centred Region, Toronto had the eighth highest median value of owner-occupied housing, although Hamilton had the second lowest and Oshawa the fifth lowest. In terms of highest average family income Toronto ranked thirty sixth, Oshawa thirty eighth and Hamilton forty first.
 3. It should be noted that any possible influence of our FAM variable is not being picked up by our AREA variable since the two variables are not highly correlated (.11107 in eq.1 and .17794 in eq.1'). Furthermore, the Gini coefficient of family income is not already standardized for the number of families, so an argument along these lines cannot be used to explain the absence of a significant coefficient for the FAM variable. It is interesting to note that in our results for Vancouver presented below the coefficient of the FAM variable is sometimes significant but the sign of the coefficient is negative, contrary to the expectation of Hamilton et al.
- The empirical work conducted by Hamilton et al. was based on data for suburban and central city census tracts in 19 Standard Metropolitan Statistical Areas (SMSAs). The control variables they used which most closely resemble our own, as well as the coefficients and t-values they obtained in the third (final) version of their regressions, are as follows:

	<u>Suburb</u>	<u>Central City</u>
Number of Families in Tract (1,000s)	2.75 (0.04)	105.79 (1.24)
Fraction of Homes in Tract Built Before 1950	3.90 (2.44)	3.34 (1.96)

Fraction of Homes in	-2.73	-12.42
Tract Occupied by	(1.29)	(5.10)
Owner		

Dependent variable: (Gini coefficient of income) $\times 10^3$

4. The usual range of values for the Gini coefficient is 0 to 1.0. In order to provide a greater appreciation of the scope of Gini values across communities, we have adjusted the scale by multiplying the basic Gini values by 10^4 . Bronfenbrenner's (Income Distribution Theory) method of calculating Gini values uses the same scaling factor; Hamilton et al. use a scaling factor of 10^3 .
5. This publication is commonly referred to as the "Blue Book".
6. It should be pointed out that Resource Equalization Grants come under the heading of Unconditional Grants. Their effect is not likely to be of great importance, however, since they are not applicable to all communities, but only to those with especially low tax bases. Wealthy suburban communities would not expect to receive any assistance under this program.
7. Although the constant term is no longer significant. Again, the FAM variable is not significant.
8. However, the t-value was lower in the regression which excluded the central cities.
9. In the Toronto-Centred Region there are twenty-eight municipality names which are common to the 1961 and 1971 data.
10. By way of contrast, in 1971 Unconditional Grants accounted for less than 4 percent of revenues in only ten communities out of forty-three; Conditional Grants accounted for less than 10 percent of revenues in only sixteen communities; and Total Grants accounted for less than 15 percent of revenues in only eleven of the forty-three communities.
11. "Effect of Metropolitan Government on Resource Allocation: The Case of Education in Toronto."

APPENDIX - CHAPTER 6

1. Charles Tiebout, "A Pure Theory of Local Public Expenditure," p.419.
2. Ibid., p.418.
3. This observation is even more applicable to the situation in 1961 when there were only twelve communities in the Vancouver census metropolitan area outside the central city. We did not analyze the 1961 data for the Vancouver CMA because of the poor results obtained for the year 1971.
4. Les Finances Municipales was first published in 1964. Municipal financial data for prior years are only available for selected communities and are highly aggregative in nature. Consequently we were unable to conduct any meaningful analysis for the year 1961.
5. The Demand for Housing in Canada, p.81.
6. Ibid., p.25.

CHAPTER 7

1. The reader is referred here to our discussion of the serious limitations of James and Windsor's analysis. See Introduction, pp.26-27.
2. William A. Fischel, "Equity and Efficiency Aspects of Zoning."
3. Ibid., p.315.
4. Michelle J. White, "Self-Interest in the Suburbs: The Trend toward No-Growth Zoning."
5. Ibid., p.200.
6. Edwin S. Mills, "Economic Analysis of Urban Land-Use Controls"; William A. Fischel, "Equity and Efficiency Aspects of Zoning."
7. George B. Fallis, Housing Policy for the 1980s.

Fallis also suggests that such an approach is likely preferable to greater provincial control over local land use decisions.

8. Such an approach would seem to have a greater chance politically of being adopted than measures suggested by Mills, namely, the introduction of locally levied head taxes in conjunction with the abolition of residential land use controls. For further discussion of these proposals, see Edwin S. Mills, "Economic Analysis of Urban Land-Use Controls," p.537. The major advocate of abolishing zoning is Bernard Siegan, Land Use Without Zoning. While these changes may be a desirable long term goal, it is more difficult to view them as solutions to exclusionary zoning in the shorter run. Similar considerations apply to proposals to increase the fungibility of zoning. See Robert Nelson, Zoning and Property Rights and William Fischel, "Equity and Efficiency Aspects of Zoning Reform" and "A Property Rights Approach to Municipal Zoning. Robert Ellickson favours a revival of nuisance law to deal with many land use conflicts. His proposals, however, are an alternative to externalities zoning rather than to fiscal zoning. See "Alternatives to Zoning: Covenants, Nuisance Rules, and Fines as Land Use Controls."

9. Edwin S. Mills, "Economic Analysis of Urban Land-Use Controls," p.520.

10. Ibid., p.520.

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