UNIVERSITY OF OTTAWA

PROPERTY VALUES AND PROPERTY TAX CAPITALIZATION

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1. INTRODUCTION

Criticism of the property tax is a perennial feature of discussion in Canadian fiscal policy. It has been called inherently regressive, inelastic, and an inadequate generator of municipal revenues, yet, in spite of this, it remains a primary source of revenue for local governments. More than three decades ago, Netzer (1966, p.102) wrote:

> During the past century, no major fiscal institution [property tax system]... has been criticized at such length and with such vigour; yet no major fiscal institution has changed so little in modern times... yet this tax on wealth is more important in the fiscal system and relative to national income than are comparable taxes in any other advanced country in the world except Canada.

This statement is no less true today than it was over thirty years ago. Property tax remains the single most important source of local government revenue in both Canada and the United States. In fact, municipalities in Canada are more heavily reliant on property tax than are local governments in almost all other OECD countries*. Table 1.2 shows that the proportion of revenue received from property and related taxes has increased in all provinces and territories except Ontario, Alberta, and Yukon. The importance of this revenue source is most evident in New Brunswick, where it increased to 55.1 percent of total local government revenue in 2001. With the exception of a few provinces, property taxes make up a considerable portion of total revenue.

* See Table 4.1 for a relative comparison.

Table 1.2 Local Government Revenue and Percentage of Total Revenue From Property and Related Taxes, by Province, 1993 and 2001

	1993		2001	
	$ Thousands	Percentage of total revenue	$ Thousands	Percentage of total revenue
Newfoundland and Labrador	173.2	17.8	204.0	22.0
Prince Edward Island	20.5	12.2	37.9	18.2
Nova Scotia	578.2	34.8	724.7	43.4
New Brunswick	246.2	48.4	349.8	55.1
Quebec	6,727.7	41.4	7,277.3	42.2
Ontario	14,937.6	47.9	16,617.0	45.2
Manitoba	888.7	36.4	1,008.3	38.8
Saskatchewan	908.7	48.4	1,191.8	51.7
Alberta	2,596.3	39.3	2,544.7	27.0
British Columbia	1,989.7	27.0	2,473.7	28.5
Northwest Territories (a)	30.6	16.4	34.7	21.3
Nunavut	Na	Na	5.7	4.8
Yukon	18.9	45.1	21.1	43.5
Total	29,116.2	42.0	32,490.9	40.2

(a) Includes Nunavut before 1999.
Source: Treff, Karin and David B. Perry (2002)

The figures mentioned above relate to total property taxes. However, most public concern with property taxes is focused on the residential portion, rather than on the industrial or commercial portions. This is difficult to comprehend since property taxes in Canada generally discriminate in favour of residential property. Residential property bears a lower property tax burden than non-residential property in most provinces. The net result being that the average effective tax rate (i.e. the ratio between property tax payment and market value of property) on commercial property is greater than that on

residential property. Despite the apparent favouritism to those who pay the residential property tax, changes in this tax remain politically challenging.

Public finance theory asserts that a stream of taxes levied on an asset over time will reduce its market value by an amount equal to the present value of its tax stream. Accordingly, an increase in property tax payments, *ceteris paribus*, will lead to a lower house value, as such, property taxes are said to be capitalized. If the value of a house is $1.00 lower whenever the present value of the stream of property tax payments on the house is $1.00 higher, then property taxes are fully capitalized (i.e. degree of tax capitalization is 100%). A number of empirical studies [e.g. Church (1978); Orr (1968); Heinberg and Oates (1970); Hamilton (1982); Ihlanfeldt and Jackson (1982); Krantz, Weaver, and Alter (1982); Yinger, Bloom, Börsch-Supan and Ladd (1988) and Brasington (2001, 2002)] have sought to ascertain whether this is so, and have generally found at least partial evidence of tax capitalization.

The degree of property tax capitalization is an important and influential component when evaluating public policies that alter property taxes. Property tax capitalization effects the efficiency of the property tax. The degree to which property tax is a distortionary tax is in part determined by the degree of capitalization. With zero property tax capitalization, an increase in property tax raises the effective price of housing resulting in a decrease of housing consumption. On the other hand, with complete property tax capitalization the price of housing fully reflects property tax differentials, resulting in a constant effective price of housing. However, most importantly, the degree of capitalization will effect property tax incidence.[†] Since

[†] For example, consider a household whose relative tax payment increased, if the capitalization rate were equal to zero, the market price of the house would not be affected by the tax change. Thus, this household

property taxes are inherently visible, it is difficult to shift tax burdens onto any particular property without encountering some opposition. From a policy perspective, it is essential that an impact assessment be done to fully determine the incidence of the tax reform. However, the current lack of consensus among economists on the degree of capitalization makes it impossible to draw any definite conclusions on the incidence of the property tax.

The investigation into property values and capitalization will begin in section 2 with a highlight of various property tax incidence theories. These alternative views on property taxation bear important implications for both the efficiency of resource allocation and the distribution of the burden of the property tax. More importantly, however, to the purpose of this paper, these theories on property taxes allow for a comprehensive interpretation of the empirical property tax capitalization literature discussed in section 3. The central discussion on property tax capitalization will be followed by comments on property tax reforms in section 4, policy implications focusing on the Canadian experience in section 5, and concluding remarks in section 6.

2. PROPERTY TAX THEORY

Traditional View

The traditional view dates back to Simon (1943) and Netzer (1966) who took a partial equilibrium approach to property taxation, focusing on the effects of increasing the tax in the local housing market. Their analysis of property tax incidence begins by

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can avoid the higher taxes by selling and relocating. With capitalization, the tax increase is realized as a capital loss when the homeowners attempt to sell the house, thereby, incurring the full burden of the property tax increase.

splitting the tax into two components, the tax on land and the tax on improvements (i.e., structures and capital). The traditional view theory assumes that land is supplied in fixed amount; therefore, the component of the tax that falls on land will be strictly borne by landowners, as demonstrated by the diagram below.

Fig. 1. Tax on land

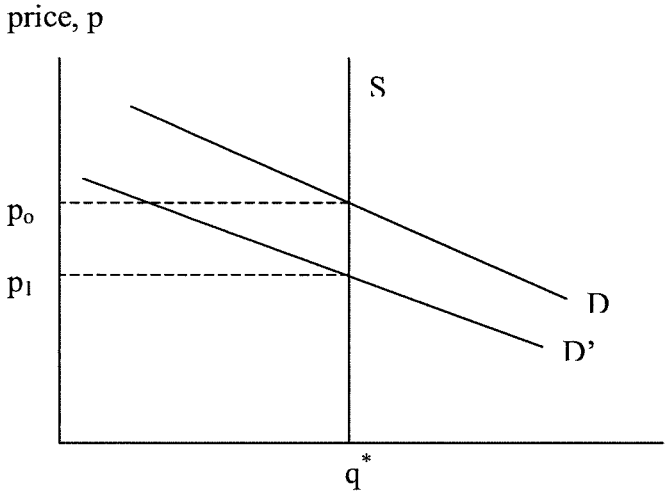

Fig. 1 illustrates the market adjustment mechanism for land when property tax is imposed under the traditional view assumption that land is in fixed supply. We observe that when property tax is imposed, demand for land decreases from D to D'. Demanders are willing to pay, p_o per unit of land when q^* units are supplied, however, suppliers receive only p_1, with a difference of $p_o - p_1$ accruing to the tax collector.

The value that consumers place on land, p_o, is unaffected by the tax imposed. If ownership of land is not concentrated, it follows that no individual owner will be able to successfully raise his price without the consequence of losing all his customers. Furthermore, even if ownership is concentrated, it can be shown that the level of property

taxes will not affect the profit-maximizing price and therefore, landowners will not have an incentive to alter land prices. In reality, within an urban setting, land ownership is widely diffused, making the competitive model universally relevant. Therefore, as long as the supply of land is perfectly inelastic, landowners bear the full brunt of the property tax.

The incidence of the property tax on improvements is treated differently, since the supply of structures is regarded as being perfectly elastic in the long run and the net return to capital is taken as given

Fig. 2. Tax on improvements

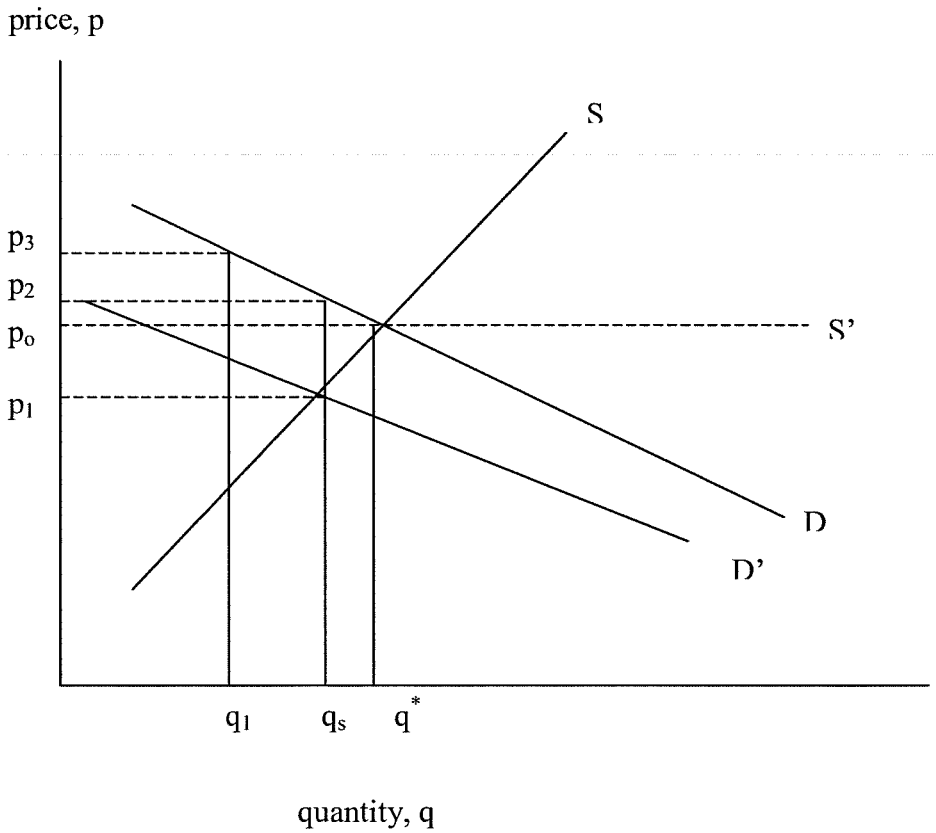

Fig. 2 illustrates the market adjustment mechanism for structures when property tax is imposed. In the short run, the supply of structures varies with price along S. When property tax is imposed, demand falls from D to D', and causes prices to rise for demanders from p_o to p_2 and prices received by suppliers to decrease from p_o to p_1. The

quantity of structures demanded also falls in the short run from q^* to q_s. However, in the long run the supply of structures is believed to be completely elastic (S'), therefore, structures will not be supplied on a permanent basis below p_o and any amount demanded will be supplied at p_o. When property tax is imposed, demand for structures falls from q^* to q_1, and the price demanders pay increases from p_o to p_3, thereby, incurring the full burden of the tax.

Since the supply of structures can be altered through investment decisions, the portion of the property tax that is assumed to fall on improvements may be shifted forward to the consumers of the services provided by the improvements. In the case of residential property, the tax on improvements is borne by consumers of housing. Owner occupied residences, both own and consume the services of their land and structure, so there is no question of burden shifting in this case. With respect to rental property, the perfectly elastic supply of capital implies that renters bear the property tax through higher rents and landlords do not bear the burden of the tax on improvements at all. For commercial or industrial property, the property tax on improvements will cause the cost of capital to increase. As a result, production costs increase and the tax burden is shifted to consumers in the form of higher prices. In summary, the component of the property tax falling on improvements is borne by housing consumers and consumers of produced goods. If housing and other consumption expenditure is a declining proportion of income as income increases, the tax burden is distributed regressively. (Aaron, 1975)

In reality, both tenets of the traditional theory, that the supply of land is completely inelastic, while the supply of improvements is completely elastic, are open to question. As a simple example, new land can be created through land fill operations and municipal boundaries can be altered. (Wildasin, 1986) Furthermore, there are several reasons why the traditional view might be incomplete or incorrect, as Aaron discusses.

First, housing and other consumption expenditures may have permanent income elasticity's close to unity, which means that if residential property tax is distributed in proportion to housing consumption, then property tax is progressive with respect to permanent income as housing expenditures are distributed progressively with respect to permanent income. Evidence on this matter is mixed, but housing consumption seems to be proportional to permanent income. A second reason why this view may be incomplete is that assessment practices, which vary across jurisdictions and classes of property, could mitigate or perhaps exacerbate the alleged regressivity of the tax. Third, the partial equilibrium nature of the traditional analysis makes it difficult to incorporate other possible incidence effects. For example, a tax on commercial improvements could not be passed on to consumers if the taxed firms face perfectly elastic demand curves, as would be the case if one considers firms in a small, open jurisdiction. However, the major challenge to the traditional perspective is the new view, which takes an entirely different approach that will be discussed in the following section.

New View

The new view of the property tax was developed by Thomas (1965), Mieszkowski (1972), Aaron (1975), and Zodrow and Mieszkowski (1983). Oddly enough, the new view argues that in fact all property owners pay the tax, since the property tax is viewed as a capital tax. The discussion of the new view of the property tax presented here is taken primarily from Aaron and Mieszkowski and Zodrow (1983). In general, the new view of the property tax follows Harberger's (1962) approach to capital taxation. In

general Harberger models assume perfect competition and that the overall capital stock in the nation is fixed. In addition, the capital stock is assumed to be perfectly mobile within the nation, resulting in an equal after-tax return to capital in all sectors of the economy.

Housing is viewed as the output of a production process that combines land and capital in the production of housing services. These types of models look at the effects of property tax in more than one sector. According to Mieszkowski, property tax can be viewed as a tax simultaneously imposed in thousands of jurisdictions throughout the entire economy. While the effective tax rate varies by jurisdiction and type of property, there is an 'average' tax rate on all property, which determines the incidence of the property tax system as a whole. The result that the capital portion of a uniform national property tax reduces the after tax rate of return to all capital in the nation by the amount of the property tax is typically associated with the new view. Since capital is perfectly mobile, other sectors of the economy will be affected. The process is as follows: When property tax is imposed, it reduces the return to capital in the housing sector. Capital flows out from the housing sector (increasing its pre-tax rate of return) into other sectors (decreasing their rate of return). Therefore, a uniform tax on the value of land and capital goods would be borne in full by the owners of capital goods since they would not be able to avoid it either by shifting assets to untaxed sectors or by raising prices. This conclusion follows from the uniformity of the tax rate in all sectors and the typical assumption that the total capital stock is supplied inelastically. The redistributional implications of the new view directly contradict the old view, since capital income is distributed progressively with respect to total income, the tax will be progressive in its incidence.

Of course, property taxes are not uniform on land and capital throughout the country. Some land and capital goods are wholly exempt, and effective rates vary widely. According to the new view, the initial effects of these tax differentials (the difference between local tax rates and the national average tax rate) follow the lines of the traditional analysis. That is a tax rate higher than average will be shifted forward in the form of higher prices or backward to a relatively immobile factor. The degree to which this will occur differs with each new view model. The predictions of these models generally depend on the elasticity of substitution between land and capital in the production of housing, assumptions concerning the mobility of consumers, and the elasticity of land supply. For example, a property that rents for $1,000 per year with a discount rate of 10%, and assumed life span of infinity, will have a present discounted value of $10,000 in the absence of taxation. If an annual $100 property tax is imposed, and residents are immobile, we might see the property tax fully forward shifted to renters. As a result, their cost of renting increases by $100 to $1,100 while the value of the property remains unchanged. However, if renters are mobile, we might observe the tax fully capitalized into the property's price. This means that the property continues to rent for $1,000, but now the owner must cover the $100 tax. The net return is $900 per year, reducing the present discounted value of the property to $9,000. (Guilfoyle, 2000)

Just as the old view was found to have problems, likewise the new view suffers from deficiencies. The conclusion that the property tax is progressive rather than regressive stems largely form two features of the new view analysis. To begin with, the new view and the old view attempt to answer different questions. The old view, by assuming the net return to capital to be fixed, can only be applied to the analysis of a

property tax in a small jurisdiction (i.e. an individual locality). The new view explicitly looks at the effect of an economy wide system of property taxation and does not necessarily support the conclusion that the property tax in any one locality or small group of localities is progressive in its incidence. Furthermore, a principal difference between the old view and the new view concerns the elasticity of capital supply; the old view assumes implicitly that the supply of capital is perfectly elastic, while the new view assumes explicitly that the supply of capital in the economy as a whole is perfectly inelastic. This empirical assumption is open to question. In the context of 'small' countries, it may be more appropriate to assume that the net rate of return is taken as fixed, with capital flowing freely across national boundaries. For example, Canada is, relative to the United States, an economically small country, and one that is very open. In particular, capital is highly mobile across the border, which means that the rate of return on capital in Canada is probably set in a fundamental way by that in the United States.

While the elasticity of capital supply remains contentious, there are several theoretical and empirical studies that cast doubt on the assumption that the supply of capital is insensitive to its net rate of return, thereby, questioning the validity of the new view. The importance of a variable capital supply for the new view of the property tax should be apparent: if property taxation reduces the supply of capital, it will lower capital/land and capital/labour ratios, reducing equilibrium land rents and wage rates. Some of the burden of the tax would then be shifted to other factors of production,

perhaps reducing the scope for debate regarding the incidence of the property tax itself and focusing on the incidence of the property tax system as a whole.[‡]

Benefit View

Although a decentralized market system has many advantages, it generally will not produce the optimal level of public goods. Tiebout (1956), writing in response to Samuelson's famous paper (1954) on public expenditure theory, sought to rebut the Samuelsonian conclusion that no market-like mechanism exists to determine efficient levels of public good provision, at least for local public goods. Tiebout claimed that at the local level, mobile households would make locational choices according to the tax and public service package chosen by various cities. In effect, consumers reveal their preferences for local public goods by moving to the jurisdiction that has the tax and service package that most closely satisfies their preferences, solving the informational obstacle to efficient public expenditure emphasized by Samuelson.

The Tiebout hypothesis is based on a number of assumptions of varying degrees of validity, including that local expenditure can be financed via a head tax.[§] Subsequent authors have examined the implications of replacing Tiebout's head tax with the more commonly observed property tax. This modeling alteration has given rise to the "benefit"

[‡] For further discussion on the effects of capital taxation on the supply of capital see ; Boadway, R. W., and D.E. Wildasin, *Public sector economics*, 2nd edition, Boston: Little, Brown, 1984. and Atkinson, A. B. and J. E. Stiglitz, *Lectures on public economics.* New York: McGraw-Hill, 1980.

[§] Other assumptions include; consumers are fully mobile, consumers have full information regarding revenue and expenditure patterns, there are a large number of communities in which consumers may choose to reside in, restrictions due to employment opportunities are not considered, there are no externalities with regard to public services supplied, and communities are sized such that they can produce services at the minimum of their average cost curve.

view of the property tax. This view asserts that the property tax does not necessarily lead to inefficiencies.

The "benefit view" approach was developed by Hamilton (1975, 1976a), Fischel (1975), and White (1975). Hamilton begins by showing that property tax can be seen as a system of average cost pricing for public services within a system of communities that are homogeneous with respect to residential house values. In addition, it is assumed that all households in a community consume the same level of public services and place the same value on these services. Strict zoning ordinances ensure homogeneous communities. That is, all households in a community are required to consume a minimum amount of housing services. The tax on housing services is exactly equal to the cost of providing public services to each household. No household has an incentive to consume more than the minimum level of housing services since they incur additional costs for any additional services consumed. If the zoning requirement is in fact binding and communities are homogeneous, public services are provided efficiently and property tax is non-distortionary. The zoning requirement keeps households from adjusting their housing consumption in response to the tax.

The binding requirement imposed by Hamilton was criticized at length by Zodrow and Mieszkowski (1983). According to these authors, the choice of tax instrument at the local level would become irrelevant with the appropriate zoning ordinances since all taxes would become a non-distortionary fee for public services. However, Hamilton extends his model to include communities with non-homogeneous housing by showing that perfect capitalization of residential property taxes and services into house values will still lead to average cost pricing for public services. Therefore, in a

community with heterogeneous housing and no capitalization, residents of the inexpensive housing enjoy public services at a lower cost than their neighbours in the expensive housing. This makes living in a relatively inexpensive house desirable. As such, individuals will compete to live in fiscally advantaged housing, driving up the price of such housing. As a result, inexpensive houses, although they have lower property taxes, sell for more due to the capitalization of fiscal benefits. Similarly, housing that is relatively more expensive compared to other housing in the community will sell at a discount. If in fact fiscal benefits are fully capitalized, there are two potentially important implications. Foremost, the analysis implies that property taxes do not lead to horizontal inequity (i.e. everyone receives the services that they pay for). Furthermore, since individuals pay for exactly the services they obtain, they demand an efficient level of public goods.

Hamilton states that "only when we know that consumers face efficient prices do we know that they will make efficient marketplace decisions", (Hamilton, 1983, pg. 86) as such, in order for the property tax to be non-distortionary, it must also not distort housing decisions. Hamilton (1983) shows that the property tax might be converted into and efficient price for public services via capitalization if for all houses the following relationship holds:

$$V + T = C(H) + C(LPS) \qquad (1)$$

Equation one states that if consumers are to face efficient price signals it requires that house value, V, plus property taxes, T, must equal the cost of providing the housing services, C(H), plus the average cost of providing the local public services, C(LPS). If this equality prevails, then fiscally advantaged housing, which commands a higher value,

must cost more to produce. In Hamilton's model (1976), fiscally advantaged housing cost more to produce since its fiscal advantage is capitalized into land values. This higher cost stems from the fact that inexpensive housing is built on land zoned for that purpose. This land sells for a higher price than other land in the community because it can be used for houses that sell at a premium. Hamilton assumes that land is supplied inelastically and that property taxes are fully capitalized into land values. These assumptions lead him to conclude that property tax is a non distortionary tax.

The above analysis implies that land development zoned for relatively expensive housing in a heterogeneous community would sell at a discount to land zoned for inexpensive housing development. This land price differential is maintained by proper zoning ordinances. Otherwise, inexpensive housing development will expand until the land for inexpensive housing and the land for relatively more expensive housing sells at a common price. Therefore, households owning less expensive houses will pay less for their public services than households owning relatively expensive houses. Redistribution will occur through the provision of public services. Residents no longer receive only what they pay for, and the outcome will no longer be efficient.

Hamilton concludes his analysis with the following important results. In the presence of full capitalization there can be no horizontal inequality. In addition, housing and public service bundles are efficiently supplied only when the following hold: land values are the same in all homogeneous communities; in heterogeneous communities, land value differentials exactly reflect the present value of fiscal benefit differentials; mean land value (per acre) is identical in all communities, regardless of house value or public service provision. Finally, in a free market, a proportional property tax will lead to

an oversupply of low income housing; therefore, in order to maintain efficiency, some form of control, such as zoning, is required.

Hamilton's work has been extended by Fischel (1985, 1995), who argues that if zoning ordinances are defined to encompass a wide variety of land use regulations, they become sufficiently restrictive to convert the property tax into the benefit tax envisioned by Hamilton (1975). Fischel emphasises that zoning ordinances are not limited to imposing minimum lot sizes and one home per lot, but can include an array of land use regulations (i.e. required frontage on a public road). More recently, Fischel (2000) argues that the empirical evidence on the existence of capitalization of property taxes and local public service expenditures into house values is sufficient to make the property tax a benefit tax at the local level.

The implications of the benefit view are astonishing. Essentially, the property tax is a user charge incurred by each household in exchange for the benefit of the local public service. Moreover, as a benefit tax, property tax no longer effects income distribution.

New View and Politics

The contribution to property tax literature put forth by Yinger (1982) is extremely significant. Yinger combines models of the housing market and of the voting process with a complete analysis of capitalization. Previous literature integrating politics and economics of local government did not fully incorporate capitalization theory. Zodrow (1983) provides an excellent summary of Susan Rose-Ackerman's work on the integration of politics and local government economics. Rose-Ackerman emphasises the

need for general models incorporating capitalization effects, which, Yinger has provided to some extent.

Yinger's analysis of a household's housing bid function leads him to derive the following house value function:

$$\ln (V) = \ln (?) + (c_3/c_2)\ln (E) - \ln (r + t) + S\ a_i \ln (X_i) \qquad (2)$$

where E is the level of local public services per household, t is the effective property tax rate (i.e. the ratio of property tax payment to the property's market value), r is the discount rate, and X is a number of housing characteristics. Equation 2 describes the capitalization of local fiscal variables into house values. It not only applies to variations in service and tax rates within a jurisdiction but also across jurisdictions. It is this derivation that leads Yinger to draw several important conclusions. Foremost, the degree to which differences in service levels between jurisdictions will be capitalized will depend on household preferences found in the utility function. In addition, differences in effective property tax rates between communities will be completely capitalized since the tax term in the house value equation is not a function of household preferences. Furthermore, Yinger states that his results imply that homogeneous communities can be formed without zoning barriers, contradicting Hamilton's argument. He comes to this conclusion by considering two income classes, rich and poor, and hypothesizing that the derivative of the bid for housing with respect to services is positive for both classes and increases with income. In this particular case, rich households will outbid poor households for housing in high service jurisdictions, such that zoning ordinances are not required to maintain the mean property tax base. Therefore, competitive bidding among

households implies that income sorting, and not fiscal zoning, is the main source of homogeneity.

However, as Guilfoyle (2000) points out, this conclusion does not follow directly from Yinger's model. If the amount of housing required entering a community was fixed, as in a zoning requirement, then it holds true that rich households would outbid poor households. However, Yinger's model does not impose such a restriction. Households are free to select the consumption level of housing. Furthermore, there is no reason why rich and poor households would not select very different levels of housing, given a tax and service bundle; therefore, the assertion that the rich will bid more for one unit of housing is not relevant since households will consume different amounts of housing. Yinger's model does not prevent the conclusion that poor households will attempt to consume a small amount of housing in a high service jurisdiction.

Yinger's conclusions do not alter in the slightest with regard to the responses of the housing suppliers. Capitalization implies that it is more profitable to build housing in some communities relative to others. If the price of housing is different in different jurisdictions, suppliers will have an incentive to build in the jurisdiction with high house values. Yinger remarks that "once developers reach long-run equilibrium, that is, no more land can be profitably converted, all remaining variation in service-tax packages is capitalized into house values." Since house price is not only a function of housing characteristics but also external factors, for example, distance from the central business district (CBD), *ceteris paribus*, the price that a household is willing to pay for housing services decreases with the distance from the CBD, due to the increase in commuting

costs. Therefore, developers' profits decline as they add communities at the outer edge of an urban area, even if these communities have a desirable service-tax package.

Yinger's analysis differs from that of the new perspective since it is the average tax rate in the jurisdiction that is distortionary; whereas, the new view measures variations against the average tax rate on capital in the nation. According to Mieszkowski and Zodrow (1983), Yinger's model is consistent with the new view. However, unlike the new view models, Yinger does not explicitly model housing production. Individuals are selecting a level of housing services that are composed of both land and capital; however, he does not explicitly model this. Since the capital/land components are not explicitly modeled, there is no prediction as to the effect on the overall return to capital. Yinger does argue that deviations from the baseline tax rate are completely capitalized.

3. EMPIRICAL EVIDENCE OF PROPERTY TAX CAPITALIZATION

All studies of capitalization are based on the income approach to asset pricing, where the value of a house, like the value of any asset, equals the present value of the after-tax flow of services from owning it. Algebraically, this can be expressed as follows:

$V = R/r - T/r \quad (1)$

where V is the market value of a house, R is the annual rental value, T is the property tax payment, and r is the household's real discount rate. If we are interested in the effective property tax rate, $t = T/V$, then equation one transforms into,

$V = R/(r + t) \quad (2)$

Empirical tax capitalization studies attempt to estimate the impact of property taxes on house values using some variant of equation (1) or (2). For example, if we were to estimate equation (1) directly, then the minus one times the coefficient of T equals the degree of capitalization divided by the real discount rate.

Although the asset pricing equations are fairly simple, serious econometric problems arise when estimating the degree of tax capitalization. First, the property tax variable is endogenous, whether it takes the form of a tax rate or tax payment. Property tax payments equal the nominal property tax rate multiplied by the assessed value of the house. In principal, an assessed value is the assessor's attempt to estimate market value. Therefore, if the housing market experiences a shock and the assessor can observe this event, he or she can increase the house's assessed value and, thus, increase both its tax payment and effective tax rate. Furthermore, by definition, the effective tax rate is endogenous since its denominator is equal to the house value. In order to remedy the simultaneity problem, many studies utilize two-stage least squares or some other simultaneous equations procedure. However, without the analysis of the source of simultaneity, the selection of instruments for a two-stage least squares procedure is somewhat arbitrary and, as demonstrated by Pollakowski (1973), estimates of capitalization may be skewed by the use of inappropriate instruments.

Omitted variable bias is also a potential econometric problem. Since the assessed value of a house is determined by its structural and neighbourhood characteristics, it follows that property tax payments are correlated with these characteristics. However, these characteristics are essential explanatory variables in a house value regression. Therefore, if any of these characteristics were left out of equation (1), the coefficient of

the tax payment variable could be biased. The most effective method of avoiding the left out variable problem is to collect extensive data on housing characteristics. However, accurate data collection is terribly difficult to obtain, especially with regard to jurisdictional observations. The third problem that plagues capitalization studies is the difficulty in specifying the form of the capitalization equation. For example, equation (1) can be used only if one assumes that the house value is a linear function of housing characteristics. This assumption is not appealing, since it does not allow for a marginal valuation of a characteristic and, furthermore, it is not in agreement with literature findings that state that multiplicative and other non-linear forms perform better than linear ones. (Yinger et al., 1988)

The final econometric problem is the difficulty in specifying an appropriate discount rate. Recall that in order to obtain an estimate of the degree of tax capitalization, a study based on equation (1) must multiply the coefficient of the tax payment variable by the real discount rate. Therefore, the degree of tax capitalization depends on the value of the discount rate. Generally, all capitalization studies assume a value for the discount rate and calculate the degree of tax capitalization based on that assumption. Unfortunately, this problem cannot be avoided (i.e. one cannot estimate the discount rate and capitalization rate separately). To mitigate the concern of utilizing an inappropriate discount rate, one can bring outside information pertaining to the decision of selecting a particular discount rate.

Given these econometric problems, researchers have applied an array of different approaches in estimating property tax capitalization. The empirical review classifies the studies according to literature standard, which separates them into three broad categories:

studies based on aggregate data (i.e. studies in which jurisdictions are the observations), studies based on micro-data (i.e. individual houses are the observations), and natural experiments (i.e. studies that analyse the effects of policy reform). The studies reviewed are listed in Table 4.1 both by type and year of publication. This section draws heavily on Bloom, Ladd, and Yinger (1983) and Yinger, Bloom, Börsch-Supan and Ladd (1988). These works provide an excellent review of the large number of empirical capitalization studies.

Table 4.1 Summary of Empirical Studies of Property Tax Capitalization

Studies based on Aggregate Data	Studies bases on Micro-Data	Studies based on Natural Experiments
Orr (1968)	*Wales and Weins (1974): CAN*	*Gabriel (1981)
*Oates (1969, 1973)	*Church (1974)	*Rosen (1982)
*Hein berg and Oates (1970)	*Chinloy (1978): CAN	Yinger, Bloom, Börsch-Supan and Ladd (1988)
*Pollakowski (1973)	*Hamilton (1979, 1982): 1982-CAN	Dee (2000)
*Edel and Sclar (1974)	*Ihlanfeldt and Jackson (1982)	
*Gustely (1976)	*Lea (1982)	
*McDougall (1976)	Krantz, Weaver, and Alter (1982)	
*Rosen and Fullerton (1977)	*Goodman (1983)	
*King (1977)	Chaudry-Shah (1989): CAN	
*Reinhard (1981)	Palmon and Smith (1998)	
Carroll and Yinger (1994)	Brasington (2001, 2002)	

*CAN: Study utilizes Canadian data.

Aggregate Studies

Aggregate capitalization studies generally capture the relationship between interjurisdictional variations in average property taxes and the corresponding variation in average property values while holding other determinants of housing value constant. Capitalization of interjurisdictional tax difference can arise due to differences in tax bases, access to provincial or federal aid, or costs of providing public services. This type of capitalization should be distinguished from capitalization of intrajurisdictional tax differences, which generally arise due to bias assessment practices. Both types of capitalization will be evaluated.

Wallace E. Oates's (1969) capitalization study serves as the foundation for the majority of aggregate studies, which are merely extensions of Oates seminal work utilizing data from fifty-three New Jersey municipalities to determine the relationship between property values, local property taxes, and expenditures. Oates employs a multiple regression technique to regress the median value of owner occupied dwellings in various communities on the median number of rooms per house, the percentage of houses constructed since 1950 (serves as a proxy for the age of the housing stock), the distance from Manhattan and the center of the municipality, median family income, annual public school spending per pupil, the effective tax rate, and the percentage of poor families in the municipalities (families with an annual income less than $3000). By including the percentage of poor families residing in the municipalities, Oates accounts for the potential understatement of homeowner's median income in a community with a relatively large number of low-income families, since poorer families would more likely reside in rental dwellings than wealthier families in suburban communities.

Inclusion of the last variable gives rise to a fundamental dilemma in the capitalization literature. Capitalization theory assumes that higher taxes lead to lower property values; however, a community with relatively low housing values requires relatively higher tax rates in order to finance a given level of service. Therefore, it is difficult to determine the direction of causation between tax rates and housing values. However, no study has convincingly shown that it is measuring capitalization and not the fact that communities with low property values require high tax rates to finance services. Similarly, this problem arises when examining the effects of public expenditures.

Oates employs both ordinary least squares (OLS) and two stage least squares (2SLS) to estimate median property values. By performing 2SLS he tends to the simultaneous equation bias not addressed by OLS. However, the tax term coefficient from 2SLS estimation is the same as that of the OLS suggesting that if there is an endogeneity problem, the 2SLS estimation does not completely correct it. As such, both estimation procedures lead Oates to conclude that local property values bear a significant negative relationship to the effective tax rate and a significant positive correlation with expenditure per pupil in public schools. Utilizing a discount rate of five percent and forty-year life span, Oates finds that tax differentials are fully capitalized. If a three percent discount rate and an infinite life span are assumed, capitalization is approximately sixty-one percent. Oates (1973) modifies his model in response to Pollakowski's (1973) criticism, and obtains ninety percent capitalization.

Several subsequent authors attempt to improve on Oates's work. A. Thomas King (1977) offers two significant contributions to the measurement of capitalization effects. Foremost, he observes that most prior studies rely on an improper specification of the tax

price term. As King notes, "[w]hereas the hypothesis suggests capitalization of the tax burden ... [Oates] suggests capitalization based upon the tax rate" (p. 426). Most importantly, King suggests that the tax price term be included as part of the dependent variable in order to avoid a possible bias in the tax term coefficient. Accordingly, King re-estimates Oates's 2SLS equations from both his 1969 and 1973 papers correcting for the misspecification by replacing the effective property tax rate with an estimate of the property tax payment. The estimates obtained show that, in Oates's case, the misspecification for the tax effect created and upward bias of approximately forty percent in the estimated tax capitalization. Using a discount rate of five percent and forty-year life span, King finds that tax differentials are sixty to seventy percent capitalized. Therefore, with a three percent discount rate and infinite house life, King's capitalization estimate is approximately thirty-six percent. Reinhard (1981) states that while the contributions made by King are irrefutable, the estimation technique employed is flawed by an error of econometrics. This leads Reinhard to conclude that in fact Oates type equation result in a downward bias in the tax coefficient that directly contradicts King's findings. Reinhard finds over one hundred percent capitalization at a five percent discount rate and forty year time horizon.

Rosen and Fullerton (1977) contend that annual public school spending per pupil is a deficient proxy for capturing the quantity and quality of local public service. The deficiency stems from the unjustifiable assumption that output can be measured by inputs. Utilizing Oates's sample, they proceed to estimate capitalization by replacing per student spending with grade four student achievement test scores. Their results suggest

capitalization rates close to sixty percent, if a three percent discount rate and an infinite time horizon is assumed.

Larry Orr (1968) provides insight into the effects of tax differentials and expenditures on rental residences in his empirical analysis focusing on municipalities in the Boston area. Orr's results suggest that residential rents were unaffected by local taxes and expenditures, which imply that they may be capitalized into the value of the buildings. Stated differently, Orr concludes that a substantial portion of property taxes on the improvement component of rental housing is borne by property owners, as apposed to occupants. Heinberg and Oates (1970) reformulate Orr's model based upon their argument that particular variables were misspecified. While finding no significant expenditure effect, their study obtained a negative effect of taxes on rent levels, a result that casts doubt on Orr's model specification.

Most recently, Carroll and Yinger (1994) examine the incidence of the property tax on rental housing and whether or not the property tax is a benefit tax. Utilizing data for 147 towns and cities in the Boston SMSA in 1980 they find that a $1.00 increase in property tax results in a rent increase of $0.15 on average. With respect to the tax burden on landlords, the magnitude of the results varied with each community. Interestingly, they found that all else equal, there is more tax shifting on to tenants in a community with low public service costs than one with high public service costs. Nevertheless, rent increases never fully compensate landlords for tax increases due to the mobility of tenants; they find that on average, higher rents offset only 55 percent of the tax differences paid by landlords. As a result, a predominant portion of the property tax falls

on landlords. Therefore, concluding that in their sample, property tax on rental housing cannot be considered a benefit tax.

Findings from the aggregate literature range from 100 percent tax capitalization (Heinberg and Oates, 1970; Reinhard, 1981) to no capitalization (Pollakowski, 1973; Orr, 1968) although most studies find between 40 percent and 90 percent capitalization (Oates, 1969, 1973; McDougall, 1976; King, 1977; and Rosen and Fullerton). These findings must be interpreted with caution due to the unresolved methodological problems (Bloom, Ladd, Yinger, 1983). All studies except King (1977) use average effective tax rate as their independent tax variable. However, as noted earlier the effective tax rate is determined by the ratio between the average tax payment and average house value, inevitably leading to the simultaneity bias problem. Furthermore, it is not clear to what extent these average price figures fully reflect individual experiences. These studies generally rely on census data, where the house price reflects the house owner's guess as to what the property is worth. The accuracy of these house price predictions is therefore questionable. Secondly, aggregate studies typically utilize too few housing characteristics, increasing the risk of omitted variable bias. Lastly, the selection of a discount rate, as explained earlier, is required to estimate the degree of tax capitalization. Oates (1969, 1973), Heinberg and Oates (1970), King (1977), Reinhard (1981) and McDougall (1976) all utilize a 5 percent discount rate while, Rosen and Fullerton (1977) use 6 percent, and Edel and Sclar (1974) and Gustley (1974) use 8 percent. This variation can be explained by the fact that studies utilizing data from different time periods may require different discount rates. In particular, discount rates should account for changes in the real rate of interest as well as future inflation rates.

Micro-data Studies

Cross-sectional micro data studies add a new perspective to the analysis of property tax capitalization by examining the effect of intrajurisdictional tax differences (Wales and Wiens, 1974; Church, 1974; Chinloy, 1978; Ihlanfeldt and Jackson, 1982) as well as interjurisdictional tax differences (Hamilton, 1979) or both intrajurisdictional and interjurisdictional tax capitalization (Goodman, 1983; Chaudry-Shah, 1989). There are several advantages generally associated with micro-data studies. First, micro-data studies measure property taxes more accurately than studies utilizing aggregate data. One reason is that tax payments estimates can be obtained from multiplying the nominal tax rate with the assessed value of the home. In addition, many of the studies utilize actual sales price rather than owner estimates, therefore making the effective property tax rates very accurate. Secondly, since the observations are individual houses, the estimates are free from potential aggregation problems. As a result they control for variations in public service levels to a greater extent since public services vary more across than within jurisdictions. Lastly, micro-data studies tend to have more explanatory variables for both housing and neighbourhood characteristics, therefore, reducing the risk of omitted variable bias.

Overall, these studies find significant capitalization of both intrajurisdictional and interjurisdictional property tax variations. The only exception from the micro-data group listed in Table 4.1 is Wales and Weins (1974) and Chinloy (1978), which find no evidence of capitalization. Average findings of both types of capitalization are within the

40 to 90 percent range, similar to the aggregate literature findings. The degree of property tax capitalization is difficult to pinpoint given such a large range, but the consistency with respect to the existence of property tax capitalization is unprecedented.

Wales and Weins look at approximately 1800 sales of residential property in 1972 for the municipality of Surrey, British Columbia. Their inability to reject the null hypothesis of no capitalization was greatly criticized by Yinger et al. (1983). Their conclusion should be treated with scepticism due to two methodological problems, simultaneity bias and misspecification of the tax variable.

Chinloy (1978) argues that the actual property tax rate as levied may not be equal to the effective tax rate facing a consumer, due to various tax reduction provisions. In Canada (and in particular, Ontario) the principal tax reduction instrument takes the form of a provincial tax credit against property taxes paid. Taking this tax credit into account, the effective property tax rate is estimated and the degree to which property taxes are capitalized is measured for the city of London, Ontario. The respective data is obtained from the 1974 Survey of Housing Units (SHU), in which the sample contains 1224 single family, owner-occupied dwellings in London, with details on both household and house characteristics. Chinloy is consistent with findings by Wales and Weins, that there are little significant capitalization effects. However, he does caution that the results obtained are not necessarily general, since they are influenced by the property tax credit. Lastly, Chinloy concludes that the property tax in Ontario is not regressive but mildly progressive due to the inclusion of the property tax credit, which at the time averaged 26 percent of the property tax liability.

Hamilton (1982) is interested in evaluating net local fiscal incidence. He does so by looking at the progressivity of the net effect of the property tax plus public expenditure plus fiscally induced restrictive zoning. Hamilton argues that every jurisdiction's objective is to exclude low-income housing, thereby, improving it's per household tax base. As such, the existing residents will be better off since public service provision will be less expensive, thus, giving residents and incentive to support the fiscally motivated zoning. Using a sample consisting of detailed descriptions of 410 residential properties in ten jurisdictions of Metropolitan Toronto, Hamilton empirically examines the progressivity of the property tax. Results indicate that there is little income redistribution carried out by Metropolitan Toronto, despite the nominal progressivity of the property tax. Given the fiscally induced restrictive zoning condition, evidence suggests a capitalization rate of approximately 56 percent. Put differently, over half of the progressive property tax is compensated by capitalization effects. Thus, even though a low-income household faces a relatively lower tax liability, house price will increase above its competitive value offsetting the 56 percent of the present value of the tax savings.

Chaudry-Shah's (1989) main objective is to measure net fiscal incidence at the local level. He argues that the analysis of the capitalized burdens (property tax) and benefits (local public services) of the local public sector offers a straightforward methodology in measuring local fiscal incidence. Chaudry-Shah modifies Oates's and King and Reinhard's (1977, 1981) approach to include intrajurisdictional variation in taxes due to assessment errors and interjurisdictional capitalization due to differences in the effective tax rate. Both capitalization models are implemented empirically by

analyzing differences in residential property values due to the provision and financing of local public goods in the City of Edmonton and surrounding municipalities. The study utilizes disaggregated data on house sales based on a random sample of 875 residential properties sold in the summer of 1977 in 27 communities within the City of Edmonton and eight neighbouring municipalities. There are two overall conclusions that emerge from the analysis of this paper. First, the incidence of the residential property tax is highly regressive. Secondly, the overall impact of the local public sector in Edmonton is to redistribute income from the middle class to the poor and the rich.

Palmon and Smith (1998) estimate the degree of capitalization with two empirical innovations. They hypothesize that the ratio of rent to house prices is equal to the sum of the net of user cost of housing and the property tax cost of housing, resolving the under identification problem. The data utilized in the study was obtained from fifty subdivisions of the northwest suburbs of Houston, Texas. The data is conducive to the study of capitalization since service levels are identical within the sample area but tax rates vary substantially. Palmon and Smith find full capitalization of property tax differentials. Leading them to conclude that, in fact, rational real estate market participants do discount properties burdened by higher taxes, implying that only unexpected tax changes can be passed on to new buyers. However, their result relies on several strong assumptions. First, they use observations of the rental prices of rental housing to estimate the rental price of owner occupied housing. This estimate is then used to calculate the rent price ratio. Second, they assume that they can safely omit several variables deemed important to the calculation of the net user cost of housing, such as the real discount rate, the expected rate of market appreciation and the house's deprecation rate. They argue that

these terms will be correlated with observable variables such as the house's age and size that are included in their regression. While it is true that there may be a correlation between the omitted variables and the included variables, it is possible that their regression results are subject to omitted variable bias. Palmon and Smith find the rate of capitalization to be 55 percent.

Brasington (2001, 2002) empirically investigates Hoyt's (1999) theoretical work on whether the degree of capitalization depends on the size of the community. More specifically, the study examines whether the rate of capitalization of taxes, crime, and school quality into house prices depends on the size of the community. The data used in the study is composed of housing sales from 1991 from the six largest metro areas in Ohio. To test for the relationship between capitalization and community size, Brasington employs a house price hedonic model. To estimate the model he employs two techniques, least squares corrected for heterosketasticity and Epple and Sieg's (1999) estimation technique, which addresses the endogeneity problem. Both estimation techniques lead to the same conclusion. First, the rate of capitalization of local public services seems stronger in smaller municipalities. Second, taxes are capitalized into housing prices, but the rate of capitalization is weaker for larger municipalities. Therefore, if taxes are held constant, large communities experience less property value loss when their level of local public provision declines. Whereas, small communities experience stronger capitalization rates, incurring a greater loss in property value when public service declines.

Natural Experiments

The last three studies to be discussed, Gabriel (1981), Rosen (1982), and Yinger et al. (1988) present consistent evidence confirming the theory of property tax capitalization. What distinguishes these studies from the preceding studies is their attempt to observe the response of housing values to institutional changes that alter property taxes. Furthermore, these studies have the added advantage of measuring capitalization without the usual endogeneity problem since provincial or state-wide tax reform can be treated exogenously.

Two of the studies look at the large property tax changes induced by Proposition 13 in California to study interjurisdictional tax capitalization in the San Francisco area in 1978-1979 (Gabriel, 1981 and Rosen, 1982). Both of these studies examine the same geographic area over the same time frame and regress the average change in house price on the change in property tax, *ceteris paribus*, for each community. Gabriel estimates a capitalization ratio of approximately 12:1. Therefore, each $1 decrease in property tax liability associated with the tax reform leads to a $12 increase in residential property values. Rosen estimates a capitalization ratio of 7:1.

Of particular interest is the fact that neither Rosen nor Gabriel control for changes in local public service quality. This is due to the special circumstances of Proposition 13. Proposition 13 rolled back 1979 assessed values to their level in 1975 for individuals who owned their houses in 1975. After 1979, assessed values are capped at 2 percent a year unless the property sells, in which case the assessed value is the market value; and the effective property tax rate in a community cannot exceed 1 percent. Moreover, in 1978, at the time of the Proposition, the State government compensated municipalities for their property tax losses. As such, Rosen argues that, due to the government bailouts

supporting local public expenditure, a change in service quality was prevented. (Yinger et al., 1988)

Although both studies employ the same basic model in the same time period and over the same geographic location, results vary. This variation in tax capitalization finding can be attributed to specification differences. Gabriel does not include a constant term in his regression while Rosen does. Including a constant term would capture any overall differences in the price level of housing. Rosen corrects for the possibility of heteroskedasticity and utilizes changes in housing characteristics as control variables, whereas Gabriel employs levels of housing characteristics in 1979.

Due to widespread disparities in effective property tax rates within many jurisdictions, the Massachusetts Supreme Judicial Court ordered all cities and towns in Massachusetts to assess all property at full market value in the early 1970s. Yinger, Bloom, Börsch-Supan and Ladd (1988) examine the effects of this court-ordered property revaluation in Massachusetts. The study measures the degree of intrajurisdictional capitalization by utilizing a sample that consists of housing sales before and after revaluation. They conclude that the degree of tax capitalization varies by community. In the communities with the best data, Waltham, Brockton, and Barnstable, tax capitalization rates are 21, 16, and 33 percent respectively. According to empirical results, all estimates indicate incomplete capitalization though their model predicts complete intrajurisdictional capitalization. According to Yinger et al., the main reason why the degree of capitalization is less than 100 percent is because households do not expect pre-revaluation tax differences to persist, even before re-evaluation is announced. However, evidence to support this assertion is lacking.

4. REFORMING PROPERTY TAXATION

Popular discontent with the distribution of property tax liability has led to a wide variety of special exemptions and credits and to suggestions that the tax base and assessment practices should be altered. Historically, the property tax has been unpopular due to several characteristics it possesses. Foremost, the administration of the property tax is a difficult task to accomplish equitably. In addition, property tax imposes a levy on unrealized capital gains, which forces taxpayers to divert funds from other sources. Also, property tax is highly visible since a large percentage of taxpayers remit their taxes in lump sum payments. Lastly, property tax has long been considered to be regressive, though as demonstrated in section two, this last point is debatable. To deal with these shortcomings, several alternatives have been proposed some of which will be the highlighted in the following sections.

Alternatives to the Property Tax

An extreme change in local government taxation would be to completely replace the property tax with another levy; however, given the revenue generating importance of property taxes, a more moderate approach is realistic. An approach that introduces a new levy and reduces the reliance on property tax as a source of local revenue is considered moderate and realistic. The two largest local non-property revenue sources are the income tax and sales tax. Both of these taxes are used extensively in other parts of the world (including United States) and yield substantial amounts to the localities that

employ them. Moreover, in Scandinavia, local governments' income tax accounts for more than 90 percent of local revenue. See Table 4.1 for a relative comparison between Canada and other OECD countries. Therefore, either municipal income or municipal sales taxes are two possible alternatives or supplements to property taxes. (Kitchen, 2002)

Table 4.1. Relative Importance of Local Taxes in the OECD Countries, 1998

	Own tax sources as a percentage of total local tax revenues				Local taxes as a percentage of GDP
	Income	Sales	Property	Other	
Federal States					
Australia	0.0	0.0	100.0	0.0	1.1
Austria	56.0	30.3	9.6	4.1	4.6
Belgium	84.2	14.2	0.0	1.6	2.2
Canada	0.0	1.5	92.7	5.7	3.3
Germany	79.1	5.7	15.0	0.2	2.8
Switzerland	84.3	0.3	15.4	0.0	5.2
United States	6.3	21.0	72.8	0.0	3.5
Unweighted Average	44.7	10.4	43.7	1.9	3.3
Unitary States					
Czech Rep.	89.8	5.2	4.9	0.1	4.5
Denmark	93.6	0.1	6.3	0.0	15.8
Finland	95.8	0.0	3.9	0.2	10.2
France	0.0	10.2	50.6	39.1	4.7
Hungary	0.1	76.6	22.6	0.7	1.7

Iceland	80.2	6.5	13.2	0.0	7.7
Ireland	0.0	0.0	100.0	0.0	0.6
Italy	12.9	14.9	17.3	54.9	4.9
Japan	47.2	20.8	31.1	1.0	7.2
Korea	15.3	29.9	51.4	3.4	3.7
Luxembourg	92.6	1.2	6.0	0.3	2.6
Netherlands	0.0	37.1	62.8	0.0	1.2
New Zealand	0.0	9.1	90.8	0.0	2.1
Norway	90.2	2.0	7.8	0.0	8.0
Poland	63.0	3.3	33.6	0.1	3.3
Portugal	21.6	34.8	43.2	0.4	2.1
Spain	26.4	35.4	34.6	3.5	5.7
Sweden	100.0	0.0	0.0	0.0	15.8
Turkey	27.7	30.1	2.3	39.9	4.7
U.K.	0.0	0.0	99.5	0.5	1.4
Unweighted Average	40.8	16.3	32.5	10.3	5.1

Source: Kitchen (2002)

There are several advantages associated with the adoption of local income and sales taxes as a partial substitute for property tax. Employing these alternatives might improve the equity of the tax system since income tax is relatively more progressive than property tax. In addition these alternatives provide a more adequate source of revenue since the proceeds would increase by a greater amount with a given increase in personal income. However, as with any tax there are several disadvantages associated with these levies. Foremost, locally administering these taxes is difficult and expensive to operate. Furthermore, if administered by the federal or provincial government, a loss in local autonomy would result. In addition, if some localities choose not to adopt the tax, then, due to household mobility, distortions brought about by households attempting to escape the tax may induce greater distortions than those associated with the property tax.

The previous account does not lead one to conclude that either levy is necessarily superior to the property tax. For example, local sales taxes were first levied in Montreal in 1935 and by 1964, 353 municipalities in Quebec utilized this source of revenue. However, due to problems of tax evasion and disputes over the division of tax proceeds among localities, the province eliminated the municipal sales tax. Manitoba adopted a scheme that remains in place today, in which, municipalities may levy sales tax on liquor, hotel accommodations, and restaurant meals, though, the taxes are subject to the approval of the provincial Cabinet and may be collected by the province. Given the dominance and the established nature of the property tax, it is unlikely to be replaced as the main source of local revenue, thus, the next two sections examine proposed changes to the real property tax. (Bird and Slack, 1983; Johnson, 1976; Aaron, 1975; Bird, 1975)

Administrative Reform: Assessment Practices

The most criticized aspect of property tax administration is assessment practices. This criticism reduces to three important points. First, it is argued that the ratio of assessed value to market values shows a large variation both within and among localities; even for the most homogeneous of communities (i.e. households with similar properties, within the same municipality, have different tax liability). Second, within jurisdictions, owners of different types of property are treated differently by assessors. For example, in most provinces, farm property is assessed using criteria that bestow favourable treatment. Furthermore, low income housing is assessed at a higher rate than high income housing, multiple dwelling units are assessed at a higher rate than single family dwellings and both

old-decaying houses and new houses are assessed at a higher rate than older well maintained housing. Third, assessment practices vary among jurisdictions within and across provinces. This is of importance since assessed values are often used for other purposes such as determination of tax rates, debt limits, and provincial aid. Some of the assessed differences are intentional and are designed to accomplish objectives like increasing grants from provincial governments or encouraging industries to locate in a particular municipality. Other variations are not intentional and are due to infrequent sales of some properties, tendency for some assessors to undervalue properties with which they are unfamiliar, and the infrequency of reassessment.

Suggestions for improving assessment generally include, establishing provincial assessment organizations, improving the training of assessors, and frequent reassessments at 100 percent of market value, all of which are occurring to some degree. In addition, its been advocated by Johnson (1976) that the tax bill provide information on both the assessed and market value and the average ratio of assessed to market value in the locality and that the taxpayer have access to the material the assessor used in making the assessment (Aaron, 1975). Many provinces are attempting to significantly improve real property assessment practices in order to better deal with the inequities of the system. In Prince Edward Island, Nova Scotia, New Brunswick, Yukon, and the Northwest Territories, the entire assessments procedure rests with the provincial or territorial government. Furthermore, many provinces have taken initiatives to increase the frequency of property reassessments. Nova Scotia, New Brunswick, Alberta, and British Columbia are all on annual reassessment cycles. Table 4.2 provides a brief summary of the current assessment practice in Canada.

Table 4.2 General assessment practice by province and territory

	Assessment base	Frequency of assessment	Responsibility for assessment function
Newfoundland	Market value	Every 10 yrs in St. John's; every 6 yrs elsewhere	Provincial and local
Prince Edward Island	Market value	At least once every 10 years	Provincial
Nova Scotia	Market value	Annual	Provincial
New Brunswick	Real and true value	Annual	Provincial
Quebec	Market value	Three year cycle	Local
Ontario	Current value	Currently 3 year cycle; moving to annual by 2004	MPAC

Manitoba	Market value	Four year cycle	Provincial and local
Saskatchewan	Fair value	Three year cycle	SAMA
Alberta	Market value	Annual	Local
British Columbia	Market value	Annual	BCAA
Northwest Territories	Land at market value and buildings at replacement cost	At least once every 9 years	Territory
Yukon	Land at market value and buildings at replacement cost	Five year cycle	Territory

MPAC: Municipal property assessment corporation
SAMA: Saskatchewan assessment management association
BCAA: British Columbia assessment authority
Source: Kitchen (2002)

The most recent property tax reform in Ontario begins with the establishment of the Municipal Property Assessment Corporation (MPAC) in 1998. MPAC is a non-profit organization that undertakes all assessment in the province and ensures uniform assessment practices. Slack (2002) provides and excellent account of Ontario's long standing history with property tax reform including the recent 1998 reform. Slack evaluates the recent property tax reform and concludes that the tax system has not altered significantly in terms of equity, but rather, increased the complexity of property tax administration. Inequities between different classes of property have not been eliminated nor have inequities within classes been reduced, except for residential property. There are inherent lessons in Ontario's property tax reform experience that Slack draws attention to. Foremost, the longer a government waits to reform a tax, the more arduous a task it becomes. With respect to property taxes, infrequent reassessments result in far greater tax

shifting than frequent assessments. More importantly, regardless of how economically desirable a policy may be in the long run, if short run effects are sufficiently undesirable to create strong political opposition, any policy may be terminated.

Assessment practices coupled with property tax capitalization have crucial implications for the equity and efficiency of the property tax. The belief that property tax distorts housing market decisions prevail in the economic literature. As long as assessments are related to market values, the property tax alters the gross price (i.e. market value plus property taxes) a household must pay to purchase a house, leading to a decrease in housing consumption which is less than the efficient amount. However, the existence of capitalization alters this argument since the market price of housing reflects the property tax. Yinger et al. (1988) argue that assessment errors lead to inefficiency if they alter housing consumption at the margin. Consider two homes otherwise identical but due to an assessment error one has a higher tax payment. If there is complete capitalization, that is, if the market price of each house fully reflects the present value of their tax payments, they should be equally attractive to house buyers, since the asset price plus the present value of the tax liability would be the same for both houses. Therefore, with complete capitalization, assessment errors do not cause inefficiency. It is important to note that this argument applies to the expected stream of tax differences and not the current tax difference. Furthermore, empirical evidence suggest capitalization rates below 100 percent, therefore, the extent of inefficiency in the housing market caused by assessment error will depend on the source of incomplete capitalization.

Structural Reform: Tax Base Alterations

One very important issue with regard to property tax is the base for the tax. In Canada, for the most part, the property tax base is composed of real property, including land, buildings, and structures. Provincial differences in property tax bases are due to the varying degrees of inclusion for machinery and equipment affixed to real property. Regardless, suggestions have been made for both widening and narrowing the base or changing the base completely.

Proponents, arguing that the property tax base is too narrow, claim that it leads to inequities and inefficiencies. One such equity argument is that the real property tax is levied on gross rather than net value (i.e. capital value less liabilities). Because the owners of two similarly priced properties have different sized mortgages on the properties but pay equal property taxes, it is considered inequitable. The real property tax is also questioned on economic efficiency grounds since the tax is levied on land and improvements but exempts other forms of capital. (Aaron, 1975)

One solution to some of the problems is to widen the property tax base to include all assets and allow a deduction for liability. Essentially, the property tax would become a wealth tax. In principle, this might make the tax more equitable and more efficient but from a practical perspective, it would make it near impossible for the property tax to be administered at the local level. Furthermore, to my knowledge, no province includes personal property in their tax base. Therefore, if the tax is to remain a local source of revenue, this alternative should be discarded.

Gaffney (1973) suggests that the base be narrowed to include only land. By no means is this a novel idea, quite the contrary, the case for taxation of site values, either

exclusively or at a rate substantially higher than that applied to the value of structures, dates back to Henry George in 1879. Again, this argument is based on equity and efficiency grounds. Equity arguments range from the assertion that site taxation would increase the progressivity of the tax[**], to assertions that the determination of land value is driven by growth or government expenditures. Therefore, since increases in land value are unearned, land values should be taxed; whereas, the creation of structures requires effort and sacrifice on part of individuals and should not be taxed.

The strongest argument to support land value taxation is based on economic efficiency, that is, it does not distort economic decisions. If the supply of land is perfectly inelastic, imposing a tax would not affect the amount available; thus, the land would proceed to be utilized in such a way as to maximize the return from it. With regard to a tax on structures, the tax would not be neutral. Imposing a tax on improvements decreases the return to investment in buildings that leads to a supply reduction. As a result, not only does a tax on structures reduce the quantity of housing but also, lowers the quality of housing, since both landlords and homeowners have a disincentive to improve the attractiveness and functional attributes of their buildings.

Whether the property tax should be replaced by a land value tax bears theoretical and practical considerations. From a theoretical perspective, as discussed earlier, the inelastic supply assumption is questionable. From a practical perspective, the administrative difficulties in separating land and improvement values is enormous (since the use to which land is put generally determines property value), not to mention the massive redistributions of tax burdens, as well as major shifts in property values.

** This of course depends on the incidence assumptions made, recall the traditional view, new view, etc.

5. POLICY IMPLICATIONS

Though highly condensed, the theoretical and empirical sections of this paper demonstrate that the current state of knowledge on the incidence of the property tax and the extent to which it is capitalized in house values is quite unclear, and for policy-makers seeking guidance, probably unsatisfactory. Thought, no overall consensus on the literature of the incidence and capitalization of property tax exists, it is essential to examine policy implications in order to better assess any potential property tax reforms.

The view outside the economics profession on property tax is widely regarded as regressive. A crucial reason for rejecting the view that property tax is regressive is due to the classification of incidence analysis. That is, households for incidence analysis are classified by annual income. As discussed earlier, correcting for this methodological bias by averaging household incomes over a period longer than one year, suggests that the property tax is proportional or progressive with respect to income. Therefore, while the property tax is not the best of all possible taxes, it now seems that it's not the fiscal villain it has sometimes been made out to be.

In regards to property tax incidence theory, it's important to clearly specify the policy agenda that one is concerned with when examining the incidence of the property tax. If the concern lies with a particular tax change in a particular city, the traditional view of incidence may approximate the truth; if concern lies with the incidence of the property tax in general, the new view would most likely approximate the true incidence. Furthermore, as Slack (2002) advocates, it is imperative that prior to property tax reform implementation, an impact assessment to determine the shifts in taxation must be done.

Regardless of one's views on the incidence of the property tax, it is the way in which the tax is administered that's of importance, in particular, to how households perceive the tax, and, therefore, how they will react to proposed changes. The administration of the property tax plays a crucial role due to its significant influence on the expectations of households. For example, if tax differences due to assessment error or infrequent assessments are expected to persist indefinitely, then property taxes are expected to be completely capitalized. Likewise, if tax differentials were to last a specified period, incomplete capitalization would occur. As such, knowledge of capitalization can help maintain effective property tax rates. Though, a relative change in property tax rates inevitably leads to capital gains or losses for current owners, assuming property tax is capitalized, I still believe that accurate and frequent assessments at market value is good public policy since it promotes horizontal equity in the long-run.

The safest path a policy maker can take is in pursuing those policies that would be considered desirable regardless of what the incidence of the property tax turned out to be. Administrative reforms as those mentioned earlier are currently being implemented across the provinces, along with policies to alleviate financially distressed households (i.e. property tax credits), irrespective of whether these households bear an undue portion of the property tax. Since the incidence debate is unlikely to be resolved, this implies that alleviation schemes should be evaluated very carefully. If the distribution of these tax credits make sense in their own right, they may still be attractive as part of a general income support system for low-income households. It seems, however, highly unlikely that such support payments should be distributed by such means as the property tax, when there are welfare programs whose primary purpose is to redistribute income.

Lastly, real policy concern should not reside with the incidence of one particular tax but with the incidence and distribution of the tax system as a whole. If the observed distributional results of the tax system are not to the country's liking there are other means by which to tackle this problem rather then utilizing a meagre local tax. Furthermore, property tax is the mainstay of the local fiscal system, and by no means should municipalities be concerned with distributive issues. More attention should be paid to making the property tax a more efficient and productive instrument rather than tending to its alleged regressivity.

6. CONCLUSION

The real property tax is a major source of local revenue in every province and has annually provided on average more than 50 percent of local revenue from own-source over the years. Considering its long standing negative publicity, the durability of the property tax is particularly noteworthy. As such, this paper has attempted to provide the reader with an understanding of both the theoretical and empirical perspectives in order to better assess the incidence of property tax. In addition, this paper has ventured to highlight some of the policy implications of property tax in the Canadian economy.

With respect to property tax theory, economists have yet to reach a consensus on the incidence of the tax, nor any definite conclusion as to the distribution of the incidence. Though the populace at large contend that the property tax is regressive, economic analysis suggests that this view is incomplete on at least two grounds. First, if the property tax is considered a tax on capital, then all capital owners share the burdens of the property tax. Since the ownership of capital is progressively distributed with

respect to capital, the property tax becomes a progressive, not a regressive tax. Secondly, the use of annual income in classifying households for incidence analysis is biased, since annual income is not the best measure of a household's economic position, rather permanent or normal income should be used instead. Correcting for this bias suggests that the property tax is proportional or progressive with respect to income distribution.

Providing and examination of the empirical property tax capitalization literature was driven by the fact that in order to determine an accurate assessment on the incidence and efficiency of the property tax, the degree of capitalization is required. While the examination of the empirical literature led to a definitive consensus on the existence of property tax capitalization, its magnitude is questionable. With a common 3 percent discount rate, the range of capitalization remains large, from 15 percent to 120 percent. Taking methodological differences into consideration, there is no explanation as to why such a great divergence of capitalization degrees is observed. Yinger et al. (1988) attempt to answer this question by stating that it is in fact the expectations of households and quality of information that are the primary sources for the observed variations in capitalization rates. However, they provide no concrete evidence to support this conclusion. Therefore, lack of consensus on theoretical incidence theory and empirical capitalization theory confirms the inconclusive nature of property tax incidence.

Lastly, the paper attempted to highlight some alternatives to the property tax and suggest some reforms to the tax. There is a strong case for allowing municipalities to levy sales or income tax if administered by senior governments. However, this does not allow for as much autonomy as would exist if municipalities could choose their own rates. Over the years there has been a shift toward improving property tax administration, where

upper-tiered governments are taking more responsibility for the assessment function. For example, MPAC, which is responsible for all assessments in Ontario, has taken the initiative to increase property assessment frequency to an annual basis. Due to this initiative, property tax theory hypothesises that difference in effective tax rates should decline, making property taxes more equitable. However, according to Slack (2002), the Ontario tax reform has not eliminated inequities nor simplified property tax administration. This leads to the conclusion that in an ideal system, the role of property tax would be smaller, but in reality it is unlikely to ever disappear.

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