

**Are Property Tax Abatements for Business Structures an
Indirect form of Land Value Taxation**

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Abstract

The efficiency advantages of a land value tax (LVT) compared to a traditional property tax on both land and structures are well established. In particular, a land-only tax does not discourage choices to build or maintain structures while the property tax does. Authorization or adoption of LVT is, however, quite rare. Much more common is the abatement of some or all of the tax on newly developed property. Property tax abatements take a variety of forms. The paper addresses the question: What form would property tax abatements take to achieve the advantages of an LVT? To best mimic an LVT, abatements should be *comprehensive, unconditional, and permanent*. A review the features of existing abatement programs across states finds instead that most are *particular, conditional, and temporary*. Policy recommendations are offered that would make abatement programs closer to the LVT ideal.

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Are Property Tax Abatements for Business Structures an Indirect form of Land Value Taxation

Introduction and motivation

The advantages of a land value tax (LVT) have been well known for a long time, going back at least to the time of Henry George (1879). Under an LVT, the value of land is taxed, but not the value of improvements applied to that land.¹ This form of taxation is recognized to have potential efficiency and equity gains as compared to a traditional property tax regime under which both land and improvements are taxed at the same rate. For a comprehensive review of LVT, see Dye and England (2009 and 2010). The essential question that we explore in this paper is whether it may be possible to mimic the effects of LVT for business property by using a traditional property tax system with abatements for capital, appropriately configured.

Property tax abatements—targeted tax reductions on newly developed property—have been used extensively in the United States since the 1970s to provide economic development incentives for both industrial and commercial property development. Anderson and Wassmer (1995, 2000) and Wassmer and Anderson (2001) chronicle the growing use of abatements as economic development incentives and evaluate their effectiveness. Wassmer (1992) models the interaction of abatements with other fiscal variables in a metropolitan area.

Consider an example of the potential use of abatements to imitate an LVT. In their study of local economic development incentives and their use by municipalities in metropolitan Detroit, Anderson and Wassmer (2000) found that the average community was granting tax forgiveness to about 35 percent of its potential industrial property. At least for that class of property, the concept of providing tax abatements to relieve improvements of taxation while retaining a tax on land is not inconceivable.

Reviewing all of the tax abatement programs in the United States, Dalehite, Mikesell and Zorn (2005) report that, "...there is a large amount of variation across states. Some states operate a single program with a narrow objective; some operate one program with several objectives that have some degree of differentiation between them, whereas others operate two or more separate programs with noticeable variation in the awarding process, objectives, and benefits." The varying design characteristics of existing property tax abatement programs include: property-use classes covered; types of improvements abated; whether abatement is total or fractional; duration of the tax reduction; imposition of special qualifying conditions; whether eligibility is automatic or at government discretion; and the particular form the tax reduction takes.

In this paper we provide an overview of an ideal abatement program from the point of view of mimicking the effects of an LVT. We then compare the properties of existing abatement programs to that ideal. Our comparison reveals that existing abatement programs fall far short of

¹ There are also split-rate variants of the LVT which tax improvements, but at a lower rate than land.

the ideal abatement program needed to mimic an LVT. Finally, we provide recommendations for structuring abatement programs with a view to using abatements as an indirect means of achieving the beneficial effects of an LVT.

Review of Literature

There is an extensive economic development literature that provides justification, both theoretical and empirical, for the selective use of incentives to foster economic growth in particular locations. The key idea motivating these incentives is that by reducing the cost of operating in a particular location, the government can enable a firm can operate more profitably and the firm will therefore be more likely to locate there. Some incentives, such as subsidies for hiring or training of new workers, are specifically designed to reduce labor costs for a firm. Other incentives are designed to reduce the cost of capital for the firm. Property tax abatements are a particular form of economic development incentive designed to reduce the cost of real and personal property. Typically, abatements apply to industrial property and are granted to firms making new capital investments either in the form of construction of new industrial plants, addition of new capital equipment, or the renovation of existing plants. Abatements have been used extensively since the early 1970s along with industrial development bonds (IDBs), tax increment financing (TIF), and other incentives.

The literature on the effectiveness of economic development incentives is also vast, with mixed evidence accumulated over the past thirty years. Early studies found very little significant evidence of effectiveness. Wassmer's (1990) review of the early literature (through the late 1970s) found that basic economic characteristics were important determinants of economic development, including local agglomeration economies, labor availability, and land prices. But, he found no clear evidence in the early studies that fiscal variables had an impact on business location decisions and broader economic development measures. Later studies using more sophisticated experimental designs and econometric analysis found selected cases where incentives had positive economic effects, if only within a given location or over a limited period of time. Tim Bartik (1991) reviewed the early studies and some later studies and concluded that, "The 'better' econometric studies appear to have reached some consensus about the effects of policies on a local economy." Bartik (1991) presents evidence that, "...economic development policies can significantly affect the growth of a state or metropolitan area..." One example of such evidence, from metropolitan Detroit, is that of Anderson and Wassmer (2000) which found that selected local development incentives can have a discernible effect on employment in a local economy, although that effect was found to be limited to particular incentives and their time and place of implementation. Current consensus holds that targeted or selective incentives may have positive economic development effects. With this background on economic development incentives in general, we now turn to consider property tax abatements in particular in order to set a context for consideration of abatements as a means of achieving an LVT.

Rationales for Tax Abatements

Garcia-Milà and McGuire (2002) provide a model wherein cities attract firms both for their own productive capital and for a form of agglomeration economies that they call "concentration externalities" that benefit other existing firms in the city. In this model, they find that it is

efficient for the city to offer tax incentives, in the form of a tax rate below the benefit tax level (i.e., below the cost of municipal services), to firms. This is a modern twist on the classic agglomeration economies rationale for the formation of cities.

Glaeser (2001) provides a response to Garcia-Milà and McGuire (2002) in which he gives a descriptive summary of five main economic rationales for location-based tax incentives:

- *Consumer and producer surplus*: Tax incentives reflect bids by communities to attract business firms that generate consumer and/or producer surplus for community residents.
- *Agglomeration economies*: Cities bid to capture firms that generate agglomeration economies.
- *Ex-post appropriation*: Cities give firms up-front payments in order to compensate for future tax increases.
- *Tax discrimination*: In order to extract maximum revenues from firms attracted to the city, inframarginal firms must be taxed at a higher rate and marginal firms at a lower rate.
- *Corruption and influence*: Tax incentives do not reflect maximization of tax revenue or welfare of city residents; rather, they reflect the ability of firms to bribe or coerce city government leaders.

Market Imperfection Rationale

Another rationale for property tax abatements is related to the fact that abatements are a form of cost reduction for a firm, and one of the only ways a local government can directly affect the cost of operating within that jurisdiction. If a community has negative characteristics in the sense that they increase the cost of doing business in that location, then property tax abatements provide a means by which the local government can compensate for that higher cost. If the land market operated efficiently, any negative characteristics of particular locations would be capitalized into the land's value. Consequently, we would expect that variations in land value would fully compensate for location characteristics. But, there are reasons to believe that land markets, and real estate markets more generally, are not perfectly competitive. If that is the case, then prices may not fully compensate for negative location characteristics. As Dalehite, Mikesell and Zorn (2005, p.159) say, "Abatements, therefore, substitute for an efficiently operating market system for land."

A Land Value Tax Rationale

While all of these rationales are potentially relevant under the right circumstances, we wish to investigate another rationale not yet considered in the literature. Abatements can be used to achieve the benefits of land value taxation by "un-taxing" improvements while retaining the tax on site value. Nobel laureate William Vickery (1999, p. 17) characterizes the part of the property tax that falls on improvements as "the worst of all taxes," and the part that falls on land "the best of all taxes."

Oates and Schwab (2009) review LVT relative to a traditional property tax and conclude (p. 71) that:

- The burden of a land tax falls entirely on landowners.

- A land tax is neutral and does not distort economic decisions and does not generate an excess burden (deadweight loss).
- A land tax has no impact on the timing of land development.

On the other hand, the part of the property tax that falls on improvements: can be shifted to others (such as renters); does distort economic decisions, in particular decreases the amount of investment in real estate improvements; delays the timing of land development. Also, although there are forces pulling in opposite directions, a land value probably discourages sprawl and favors more density of economic development than does a tax on improvements (Brueckner and Kim, 2003).

In short, the principal benefit of switching from a property tax to a land-only tax comes from eliminating the discouragement to investment from the tax on improvements (Dye and England, 2010). But if the LVT is such a good idea, why has there been only very limited implementation in the U.S. (Bourassa, 2009a) and internationally (Franzsen, 2009)? Part of the reason is that land value taxation *per se* has a number of obstacles: legal (Coe, 2009), administrative (Bell, Bowman and German, 2009), and political (Bourassa, 2009b). Property tax abatements on the other hand are widespread in use and fairly easy to implement.

As part of his review of LVT use in the U.S., Bourassa (2009a) examines the adoption of LVT in Pittsburgh in 1913 and then its rejection by voters in 2001. He goes on point out that currently in Pittsburgh, “virtually every kind of new construction or renovation is eligible for some form of property tax abatement (p. 17).” This is important because as Bourassa (2009a, p. 13) argues: “Abatements reduce the effective tax rates on improvements relative to land and thus achieve a similar result as land value taxation.” So we ask what particular form property tax abatements should take to best achieve the effects of LVT.

In a recent preliminary analysis for the City of Detroit Sands and Skidmore (2011) have estimated that tax abatements for industrial and residential properties currently reduce property tax revenues by \$15 million per year, representing 10.5 percent of property tax revenues collected in FY2010. They also explore an LVT as an alternative to the current property tax in Detroit, which features substantial abatements and other factors that result in 43 percent of the land value in the city being nontaxable. They illustrate the aggregate reduction in tax liability under an LVT for residential properties and the corresponding increase in tax liability for commercial and industrial properties. While their analysis is preliminary, awaiting detailed estimations using parcel-level data, it is suggestive of the potential feasibility of moving to an LVT.

How Could Abatements be Configured to Mimic LVT?

Property Values and Taxes

A traditional property tax system applies a nominal tax rate to the assessed value of property, including both the value of the land/site and the value of the capital improvements. The tax rate applied to improvements increases the cost of capital and thus discourages capital investment in business structures. Under a pure LVT, which taxes land only, the tax rate on capital improvements is reduced to zero. Abatement of a portion of the taxable value of improvements

reduces the effective tax rate on improvements. To mimic a pure LVT, the taxable value of improvements would have to be abated to zero reducing the effective tax rate to zero.

Both an LVT and abatement of improvements from the property tax base reduce the effective tax rate on improvements, but by different means. An LVT explicitly gives all improvements a zero or lower taxable value compared to land. An abatement program removes specified improvements from the property tax base. Both an LVT and an abatement program can be comprehensive and relieve all improvements from taxation, or be partial and relieve only a portion. In current practice abatement programs are partial, since the many different characteristics, such as class, type, and age affect the degree to which taxable value is reduced. Likewise, LVT can be and has been implemented in a way that partially taxes improvements. The partial form of land value taxation is a graded or split-rate property tax system which does tax improvements, but at a lower tax rate than the rate applied to land.

Ideal versus Actual: Efficiency versus Economic Development Objective

Caution is necessary when comparing an idealized policy regime with an alternative presented in actual practice. Similarly, caution is necessary when using a single criterion to evaluate policy alternatives when the actual policy choice is based on different or multiple objectives. It is the ideal, in terms of efficiency, for the tax rate on improvements to be reduced to zero leaving only the non-distorting tax on land value. Land value taxation in its pure form does just that. As noted, in actual practice abatement programs are partial with some portion of improvements value still subject to the property tax. Our focus in this paper is on the potential to consider tax abatements for business property as an indirect form of LVT. In order to avoid complexity, we analyze only pure elimination of the tax on improvements and not partial or split-rate systems. Arguably, partial abatement will achieve part of the efficiency benefits of LVT.

The principal benefit of LVT is the efficiency gain from substituting a tax on land, which is neutral, for a tax on improvements, which increases the cost of capital and discourages capital investment. But efficiency is not the only goal. New economic development is often touted as the justification for adoption of abatements and indeed for the adoption of land-only or split-rate regimes. Attention to new construction only would dilute the argument made below that the ideal tax abatement system should be comprehensive and also apply to preexisting construction. That said, we now characterize elements of an ideal abatement program designed to mimic an LVT.

An Ideal Tax Abatement to Mimic LVT

Abatements for capital applied to land intended to replicate the effects of a pure LVT would have to have the following properties:

- *Permanent*, i.e. no fixed time limit on the abatement after which capital improvements become taxable
- *Comprehensive*, i.e. all capital improvements must be abated completely and must apply to all capital in the particular class of property

- *Unconditional*, i.e. no restrictions on qualifying for the capital tax abatement and no claw-back provisions

Permanence of the abatement is required to mimic an LVT. This means that the abatement program cannot have a fixed time horizon during which capital is not taxed and after which capital becomes taxable. The ideal LVT has a zero tax rate on the value of all forms of capital and only taxes land value. The simple mathematical model of property value presented in the Appendix indicates that under an LVT capital improvements must be taxed at a zero rate from the time of development forward to infinity. Thus, an abatement intended to mimic an LVT should permanently abate the value of capital improvements applied to the land.

The second requirement of an abatement intended to replicate an LVT is that it be comprehensive. That is, the abatement must apply to all capital improvements within the property context to which it applies. Rather than abating certain types of capital improvements, and not others, or abating capital improvements for selected properties, and not others, the abatement program should apply to all forms of capital improvements. While the ideal LVT would apply to all types of property (industrial, commercial, residential, etc.), we anticipate that any consideration of abatement use to mimic an LVT would be selective. Even so, an abatement for industrial property in a particular region, for example, should apply to all capital improvements of industrial properties in that region.

Finally, the abatement should be unconditional. This means that the abatement program should not be conditioned on the addition of a particular number of jobs at a particular location, as is often the case with abatement programs. While capital and labor are certainly complementary in the production of goods and services, the property tax abatement program is specifically designed to affect the cost of capital. Other incentive programs can reduce labor costs. The capital incentive should not be tied to a labor incentive, especially if the policy objective is to replicate an LVT. The sole purpose of the abatement as indirect LVT is to reduce the effective property tax rate on capital. Therefore, no conditions for qualification should limit the application of the abatement. Furthermore, conditions on minimum threshold investments, as are often applied in abatement programs, are inappropriate if the intent is to replicate an LVT. All capital improvements should be taxed at a zero rate, not just those exceeding an arbitrary threshold. Finally, clawback provisions that require a firm to repay abatements if the employment conditions of the program are not met are also inappropriate if the policy goal is to achieve an LVT.

In actual practice, abatements have been adopted with political constraints and to achieve objective different or narrower than the efficiency of capital allocation—such as a desire to attract new business and jobs to the area. So if the objective is to achieve the benefits of a pure LVT, there are a number of potential limitations in using abatements, as they are currently employed in most cases, including:

- *Time limitations*, most abatement programs are of limited duration
- *Selectively available*, most abatement programs are available to a selected class of property (e.g. industrial or commercial) and within that class of property the abatements

are only available for selected purposes (e.g. new construction, renovation or expansion of a plant)

- *Conditional*, most abatement programs are conditional on creation of new jobs, or provision of a minimum amount of new investment, and many now have clawback provisions if the conditions are not fulfilled

An essential design characteristic of the ideal tax abatement is that it applies to all capital improvements. That includes all forms of new construction, additions, and renovation. It also includes all existing capital improvements. Most state programs for industrial and/or commercial property abate some or the entire tax base associated with new construction. Some also abate the value of new additions or renovation. None cover existing capital improvements. So, a major challenge in configuring tax abatements as an LVT lies in the treatment of existing capital improvements.

Abatement of new construction and renovation can achieve the LVT objective in the long-run, but given the durability of industrial and manufacturing structures it will take a very long time. As old capital improvements depreciate to the point where they are economically obsolete, they are replaced by new capital improvements. This process can take a very long time, however. That is especially true for infrastructure improvements for manufacturing and industrial properties. Much of the manufacturing infrastructure currently in place in the United States dates back to the late 19th or early 20th Centuries. In some industries, characterized by fast-paced technological progress, the rate of capital obsolescence is much quicker. Given these different situations, the ability of tax abatements for new capital improvements to yield an effective LVT system is dubious.

A more effective approach in achieving an effective LVT system via abatements may be to consider how abatements may be configured to abate both all new capital improvements and some value portion of existing improvements.

An Inventory of Abatement Practice in the United States

Dalehite, Mikesell and Zorn (2005) define standalone property tax abatement programs (SAPTAPs) as having the following four characteristics:

- They provide for a reduction in the tax liability for select parcels
- They have a purpose beyond tax relief alone
- There is a time limit on how long the reduction remains in effect
- They can be used by themselves and not in conjunction with other incentive programs

According to the Dalehite, Mikesell and Zorn (2005) inventory of state abatement programs in the United States, a total of 35 states provide SAPTAPs for real property improvements. Unfortunately, that inventory does not provide information on the extent of abatements for improvements within each state. A given state may provide a very limited form of abatement for improvements. Distressingly from an LVT point of view, 16 states provide abatements for land. A total of 24 states provide abatements for personal property.

States typically provide abatements only under certain conditions. According to Dalehite, Mikesell and Zorn (2005) the most common condition requires a threshold value of new investment or increased property value. Eighteen states have such a requirement for abatement eligibility. Another eight states require a threshold increase in jobs or payroll.

Most states provide tax abatements for capital improvements applied to land. Table 1 reports that 32 states do that. In addition, 24 states provide abatements for personal property (machinery, equipment, and other property not permanently affixed).

Table 1: Types of Property Abated

Property Class	Number of States
Improvements	32
Land	16
Personal property	24

Source: Dalehite, Mikesell and Zorn (2005).

Typically, states make abatement programs available to manufacturing or commercial property classes, as indicated in Table 2. Twenty-nine states provide abatements for commercial property and 33 states do so for industrial or manufacturing property. Twenty states provide tax abatements to residential property as well. In all likelihood, the abatements provided by states for residential property are for multifamily dwellings or apartment buildings.

Table 2: Property Classes Abated

Land Use	Number of States
Commercial/tertiary	29
Industrial/manufacturing	33
Primary activities	9
Residential	20

Source: Dalehite, Mikesell and Zorn (2005).

Next, consider the mode of tax abatement. Table 3 illustrates that the most frequent mode of offering abatements is to abate a percentage of the value added of the property. This is the typical case where an abatement program abates a share of the value of new construction or renovation. The second most frequent mode is to abate a percentage of the value of the property. In these cases, it is a portion of the property tax base being abated. Alternative modes such as abating a percentage of the tax liability or a rate reduction alter the property tax rate as well.

Table 3: Modes of Abatement

Mode of Abatement	Number of States
1. Percent of tax liability	8
2. Percent of taxable value	12
3. Rate reduction	1
4. Reclassification	1
5. Percent of value added only	15
6. Value freeze	6
7. Payments in lieu of tax	3
8. Deferral of tax payments	1
9. Reimbursement or incentive payment	4

Source: Dalehite, Mikesell and Zorn (2005).

It should be noted that several of these modes of abatement are related to one another. The first mode listed in Table 3 is to abate a percentage of the tax liability. Appendix 2 demonstrates that proportional reduction in the amount of tax is algebraically equivalent to both the second and third modes listed in Table 3—abating a percent of taxable value and a rate reduction. Thus, a total of 21 states are essentially using the same mode of abatement (8 abating a percent of liability, 12 abating a percent of value, and 1 providing a rate reduction). Moreover, since the fourth mode, reclassification, is usually implemented as either a value or rate reduction, one additional state is probably using an equivalent mode.

The fifth mode of abatement listed in Table 3 is a proportional reduction in taxation of the value added due to a capital improvement project. The sixth mode, freezing the tax base at the pre-improvement value, is a special case of this where all of the value added is excluded from the tax base. (See Appendix 2.) Thus, a total of 21 states are essentially using the same mode of abatement, only differing in the degree to which they are abating value added (with 15 states abating a portion of value added and 6 states abating all of the value added).

Finally, consider the maximum duration of abatements. Table 4 lists the duration distribution among the various state abatement programs. Note that some states have multiple abatement programs, each with a distinct duration. The maximum duration among abatement programs ranges from a low of one year to a high of 25 years. The modal duration is 10 years, with 60 percent of the states offering abatements limiting the duration of the abatements to no more than 10 years. It is curious that five states listed in Table 4 provide very short abatement durations, of less than five years. It would not seem that such short abatement periods would have any material impact on the investment decisions of firms. At the other extreme, five states provide abatement periods of at least 20 years. Those longer abatement periods would appear

capable of very substantially reducing the property tax rate on the property value abated, particularly so if the value abated is due to capital improvements. It would be good to know how the duration of abatements in each case varies with the type or class of property (as in Tables 1 and 2) or the mode of abatement (as in Table 3), but the data provided in Dalehite, Mikesell and Zorn (2005) is not reported in that form. From their raw data such a crosstabs description may be possible, however. We would expect that if what is being abated is property value related to capital improvements for industrial or manufacturing property, for example, that the duration of the abatement would be substantially long enough to reduce the effective tax rate on the improvements enough to induce the firm to make the improvements. That would require a relatively long abatement period, perhaps tied to the economic life of the improvements being made or the term structure of the financing used for the improvement project.

Table 4: Maximum Duration of Abatements

Maximum Duration of Abatement (years)	Number of States
25	2
20	3
17	1
15	4
12	3
10	21
7	1
5	12
3	1
2	2
1	2

Source: Dalehite, Mikesell and Zorn (2005).

Of course, tax abatements ultimately have the effect of reducing the effective property tax rate. In the final analysis, what we would like to know is the extent to which abatements of all types and forms combine to reduce the effective property tax on improvements. That would give us the ultimate measure capturing all of the features of abatement programs. Bell and Kirschner (2008) provide an overview of data sources available on effective property tax rates. Yet, there is no currently available decomposition of nominal tax rates and the factors that specifically result in lower effective tax rates (e.g. assessment practices, abatements, and other tax preferences).

Evaluation of How Well Abatement Practice Aligns with the Goals of LVT

Our outline of the ideal property tax abatement program designed to replicate an LVT in section 3 and our inventory of existing abatement programs in the United States in section 4, indicate that at present abatement programs are not well configured. Existing abatement programs apply to types of property that are inappropriate (e.g. land), provide incomplete abatement for capital

improvements (e.g. abate only a fraction of new investment), and remain in force for a limited period of time (e.g. ten year limit).

In order to achieve the policy objective of mimicking an LVT, property tax abatement programs will have to be substantially redesigned, or alternatively, targeted abatement programs will have to be developed with an explicit LVT motivation. It is feasible to design a targeted property tax abatement program that applies to all capital improvements in for a selected class of property in a particular location. A city could easily implement a comprehensive, permanent, and unqualified abatement program for all industrial capital improvements in a targeted economic zone, for example. This would be especially easy to implement in a new industrial development park where all new capital investment in that park is taxed at a zero rate permanently. Alternatively, a city could implement a targeted abatement program where all new homes and commercial development in a planned unit development (PUD) are provided abatements for the capital improvements applied to the land within that PUD. A number of possibilities exist, short of applying abatements city-wide for all classes of property as would be ideal to replicate an LVT. A city-wide LVT for all classes of property may be the ideal first-best optimum. What we are exploring in this paper is a second-best optimum with abatements providing an efficiency enhancement that is a second-best optimum in a local economy.

While there are certainly potential obstacles, both legal and political, to such a policy being developed, there is reason to believe that it may be feasible to consider. Local governments have been very creative in the design and implementation of abatement programs in the past. There is no reason to believe that they cannot be similarly creative in designing and implementing a new generation of abatement programs intended to obtain the favorable efficiency characteristics of an LVT.

Policy recommendations for structuring abatement programs

Policy Options

To achieve the full efficiency benefits of a pure LVT, abatement of improvements should be permanent, comprehensive, and unconditional. In actual practice though, both LVT and property tax abatements are often adopted for the stated objective of stimulating new local economic development. The policy choices mapped out in Anderson and Wassmer (2000) for economic development incentives such as tax abatements include:

- Free choice: status quo policy option allowing communities to offer local incentives at their own volition
- Elimination: since in many cases the benefits of such incentives do not clearly exceed the costs in terms of foregone tax revenue it may be prudent to eliminate incentives or ban them via state legislation
- Regulation: it may make more sense to target the use of incentives more clearly, and in the present context focus manufacturing or commercial abatements specifically toward and LVT

Issues and Option for focusing Tax Abatements toward LVT

While the ideal may not be obtainable, the redesign of property tax abatement programs can be focused in the in the proper direction. If our policy objective is to use tax abatements in some business applications to imitate an LVT, we offer these preliminary suggestions for redesigning abatements and observations on issues of implementation.

What classes of property should be included? The more comprehensive the better. Even if political and authorization constraints do not permit the extension of abatements to preexisting construction, all new business construction should be abated for a time period that approaches the economic life of the structure. The value of land should not be abated; land taxation is a neutral way of raising revenue. Jurisdictions that currently include personal property—business equipment and inventories—in the property tax base should abate this class of property as well.

What design features of abatement programs best serve the objectives? The mode of program implementation that is most direct is a percentage reduction of the taxable value of improvements—ideally 100%. It is possible to achieve algebraically similar results by reducing the tax liability or tax rate. The issue of abating only new property versus the value of all improvements goes back to our earlier discussion of the broad goal of efficiency versus the narrower and more politically attractive goal of encouraging new economic development. If the goal is to stimulate new development, abatement of value added is an acceptable design feature.

Abating just the value of new construction does have one practical advantage in implementation. One of the difficulties in design and implementation of and LVT is the accuracy of separate assessment of land and improvements (Bell, Bowman and German, 2009). Real estate transactions bundle site and structures in a single price, so there is not direct market evidence on the component values. Abating only new construction obviates this practical difficulty of assessment administration. With new construction the site is purchased separate from the structure.

What legislative changes are required? The property tax is administered at the local government subject to conditions set by the state, either in the state constitution or in authorizing statutes. Coe (2009) examines provisions in the each of the state constitutions regarding uniformity, equality, universality, and proportionality requirements for taxes in general or the property tax in particular. Based on this, he evaluated the legal feasibility of LVT either in its pure or split-rate form and concludes that (p. 155): “a land value tax would most likely run into serious legal challenges in a large number of jurisdictions.” Dalehite, Mikesell and Zorn (2005) observe that some form of abatement program is present in 35 states. We infer from this large majority that indirect implementation of LVT in the form of abatements should be less subject to legal and constitutional constraints that would be direct enactment of an LVT.

What impacts can be expected? Evidence on the impacts of LVT implementation is sketchy, as revealed in Anderson (2009). Theory indicates that there should be clear efficiency gains from implementation of an LVT in an urban area, yet the empirical evidence to date is inconclusive. The best studies we have are plagued by complications related to the imperfect implementation of LVTs. There is some evidence that an LVT can alter the capital/land ratio in an urban area, as

in the Pittsburgh case, for example. That would lead to a more compact city with higher density of development, reduced commuting costs, and limited sprawl. While we have limited conclusive evidence of such effects so far, that is not unexpected due to the limited number of cases where LVTs have been implemented in a semi-pure way.

What are the political obstacles to this type of change? The growth and jobs banner under which abatement programs are usually presented has political appeal. On the other hand, abatements will be characterized by some as give-aways to rich corporations. In his review of political obstacles to LVT, Bourassa (2009b) argues that while there are clear benefits in theory, implementation can be a tough sell. There will be uncertainty as to the benefits and the redistribution of tax burdens from a change to LVT from the traditional property tax. The two largest experiments with LVT in the United States—Pittsburgh and Hawaii—were ended, suggesting political problems for adoption. Bourassa (2009b) concludes that in both of these cases LVT was not rejected on the merits, but because in voters' minds LVT was associated with and the scapegoat for other policy failures: bad land-use planning in Hawaii; in Pittsburgh a decades overdue reassessment of property was not accompanied by a downward adjustment in tax rates, so voters were handed a huge tax increase at the same time the relative tax rate on land was increased. Whether an expansion of abatements would be confused in voters' minds with other contemporaneous policy change remains to be seen.

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Appendix 1: Property Tax Compared to Land Value Tax Mathematically

Following Anderson (2005) and Turnbull (2005) we express the value V of a property with structural density S and development time T as the sum of two discounted net revenue streams, the net revenue stream w prior to development, and the net revenue stream $R(S, T)$ subsequent to development, net of development cost $C(S)$. Using a discount rate r reflecting the opportunity cost of capital, the value of the property can be written as:

$$V(S, t) = \int_0^T w e^{-rt} dt + \int_T^\infty R(S, T) e^{-rt} dt - C(S) e^{-rt}. \quad (1)$$

If we include a property tax applied at rate τ to the land and at rate θ to the improvements, the value expression can be written as:

$$V(S, T) = \int_0^T w e^{-(r+\tau)t} dt + \int_T^\infty [R(S, T) - (r + \theta)C(S)] e^{-(r+\tau)t} dt. \quad (2)$$

Under an LVT, the tax rate applied to improvements (θ) is zero in the value expression:

$$V(S, T) = \int_0^T w e^{-(r+\tau)t} dt + \int_T^\infty [R(S, T) - rC(S)] e^{-(r+\tau)t} dt. \quad (3)$$

In this case, the tax on land is additive component of the discount rate used in computing the present discounted value of both income streams, but there is no tax impact related to the development cost regardless of the capital intensity of the development (S).

The key to viewing abatement as a form of LVT is that abatement must eliminate the property tax effect of development cost and do so permanently. The full cost of capital improvements $C(S)$ in equation (3) must be relieved of taxation. That includes all capital improvements that occur over time.

Appendix 2: Equivalence Among Modes of Tax Abatement

Three of the modes of tax abatement listed in Table 3 are algebraically equivalent:

- proportional reduction in tax liability,
- proportional reduction in taxable value, and
- proportional reduction in the tax rate.

To see this, note that the tax T is the product of the tax rate r and the tax base b , $T = rb$. An abatement that reduces the tax liability by the fraction θ can be written as $(1 - \theta)T = (1 - \theta)rb$. This expression makes it clear that reduction in liability is equivalent to either a reduction in the tax rate from r to $(1 - \theta)r$ or a reduction in the tax base from b to $(1 - \theta)b$.

There is also a correspondence between two of the other modes of abatement:

- proportional reduction in value added due to a capital improvement project, and
- freeze in taxable value.

In particular, a freeze is the special case of a 100% reduction in value added. Suppose that the initial tax base is b_0 and the capital improvement project increases the tax base by the amount b_1 . The combined tax base is $b_0 + b_1$. The tax liability on that combined base would be $T = r(b_0 + b_1) = rT = rb_0 + rb_1$. If a portion θ of the value added is abated, the tax liability is reduced to $T = rb_0 + r(1 - \theta)b_1 = r[b_0 + (1 - \theta)b_1]$. The abatement has the effect of reducing the combined tax base by the amount of the portion of value added abated. Alternatively, abating a portion of the value added is equivalent to a rate reduction from the tax rate r to $r(1 - \theta)$ on the added portion of tax base: $T = rb_0 + [r(1 - \theta)]b_1$. A value freeze, is a special case of this where we set the parameter $\theta = 1$. In this case, all of the value added is taxed at a zero rate and the property's taxable base is simply the original tax base before the capital improvement project.