

Land Value Capture in Policy and Practice

Lawrence C. Walters
Stuart Grow Professor of Public Management
Romney Institute
Brigham Young University
760 TNRB
Provo, UT 84602

Abstract

Land Value Capture (LVC) has long been advocated by international organizations as a funding source to support local improvements in urban infrastructure and services. The question is whether it is an effective and sustainable option for local governments? This paper examines efforts to implement LVC. The distinction is drawn between cost recovery and LVC more broadly. Tools for cost recovery are assessed and successful strategies described. Available tools for LVC are evaluated and generally found wanting. An alternative approach using a restructured annual land tax is proposed.

Land Value Capture in Policy and Practice

Suppose that there is a kind of income which constantly tends to increase, without any exertion or sacrifice on the part of the owners: ... In such a case it would be no violation of the principles on which private property is grounded, if the state should appropriate this increase of wealth, or part of it, as it arises. This would not properly be taking anything from anybody; it would merely be applying an accession of wealth, created by circumstances, to the benefit of society, instead of allowing it to become an unearned appendage to the riches of a particular class.

Now this is actually the case with rent. The ordinary progress of a society which increases in wealth, is at all times tending to augment the incomes of landlords; to give them both a greater amount and a greater proportion of the wealth of the community, independently of any trouble or outlay incurred by themselves. They grow richer, as it were in their sleep, without working, risking, or economizing. What claim have they, on the general principle of social justice, to this accession of riches?

-John Stuart Mill, 1848 (2001, page 941)

The unearned increment resulting from the rise in land values resulting from change in use of land, from public investment or decision, or due to the general growth of the community must be subject to appropriate recapture by public bodies (the community).

-United Nations, 1976

Introduction

In the fields of urban public finance and international development the concept of “land value capture” has become a standard argument for implementing or reforming taxes based on land. Often the value of privately held land increases as a result of public investments in infrastructure, publicly approved changes in land use or broader changes in the community such as population growth. Proponents of Land Value Capture (LVC) argue that governments should use taxes and fees to collect some share of this increase in value for public purposes including funding infrastructure and service improvements. As reflected in the quotes above, the concept of LVC has been in circulation at least since John Stuart Mill wrote his treatise in 1848. The current literature on the use of LVC reflects a substantial consensus that “unearned increments” can and should be recaptured at least in part by the community. Few disagree with the Vancouver Action Plan - the founding document for UN Habitat – cited in the second quote above.

In the past two years, the Global Land Tool Network (GLTN) and UN-Habitat have partnered in the production of two notable works on LVC and land and property tax (LPT) more broadly. The first was the LVC scoping study (August, 2010) which concludes in part that

- Effective LVC/LPT systems require a political champion, a good property tax law and decentralized authority to implement the system.

- The effectiveness of the LVC/LPT system is greatly improved if it is imbedded in an effective land use management system.

- LVC/LPT systems require adequate training for at least three separate groups (policy makers, administrators and land developers)

- Efficient, accurate and timely land valuation is essential

- Countries should consider and evaluate all the available tools for LVC

The second work is a *Land and Property Tax: A Policy Guide* (Walters, 2011). This Guide notes that in designing an LVC/LPT, decision-makers should carefully consider four aspects of the local environment:

- How land and property rights are defined in the community

- How such rights are publicly recorded, or at least recognized, and defended

- The maturity of local land and property markets

- The administrative capacity of those public agencies charged with implementing the LPT system

Given the administrative and political challenges associated with LVC as documented in these two studies, it is important to ask if LVC is a practical and sustainable policy option for local governments?

Most authors agree with Brown and Smolka (1997) who conclude regarding land-based taxes that in theory: (1) publicly created value should be captured, (2) substituting land based taxes for other taxes to pay for investments is economically efficient, (3) land based taxes tend to lower prices and reduce speculation, and (4) land based taxes could cover a major part of public infrastructure improvements.

In discussing LVC it is important to distinguish between approaches that are intended to recover the cost of infrastructure investments and those that are intended to capture some share of the “unearned increment” in private land values as contemplated by Mill and the UN’s Vancouver Action Plan. As will become clearer below, most current approaches to LVC are focused on recovering the cost of specific infrastructure investments. But the intent of both Mill and the Vancouver Action Plan was to enable the public to share in any private wealth created by public or community action. Both objectives are legitimate policy goals, but they are not synonymous.

Recovering the cost of a specific infrastructure investment requires a careful estimation of relevant costs, the identification of affected land and an allocation process for assigning an appropriate share of the costs to each land parcel. There is often an assumption that the impact of the infrastructure investment on the market value of the affected properties is positive, but no attempt is made to measure that impact directly.

Capturing value in the broader sense requires four things to happen. First, land values must increase as the result of some public action or investment. This could range from broadly based population

growth that increases the demand for land to specific infrastructure or service improvements that impact some but not all parcels of land. Second, a valuation process must be implemented that identifies the change in land value and incorporates that change into the taxable value of the land. Third, either a special tax must be levied or the broader tax rate applied to land must be maintained at a sufficiently high level to capture the desired share of the increased value. Finally, the collection efforts must be sufficient to realize the increased revenue.

In the sections which follow country specific cases are considered in an effort to identify which policy goals are being pursued in practice and assess the practical potential of land value capture. This review draws on current literature that describes in some detail specific attempts to pursue land value capture as well as broader literature that assesses one or more of the specific requirements for land value capture to have practical relevance. Before doing so however, it is useful to first summarize briefly the literature assessing the impact of public investment on private land values and then assess the principal tools that are used to implement land value capture. The paper concludes with a discussion of the requirements for effective land value capture. As suggested, best practice will differ depending on the policy goal pursued.

Public Investment and Private Land Values

There is by now a rather large literature examining the impact of public investment and public land use management decisions on private property values. Much of the empirical literature examines the influence that investment in transportation infrastructure has on adjacent private land. For a recent review of over 85 studies that look at the relationship see Smith and Gihring (2006), which also provides the foundation for the PricewaterhouseCoopers report to the Property Council of New South Wales, Australia (2008). Other authors who have argued that public capital investment enhances private property values include Haughwout (2002), Siethoff and Kockelman (2002), Bhatta and Drennan (2003), Weber, Bhatta et al. (2003), Mikelbank (2004), Taylor and Brown (2006), Ayougu (2007), Moreno and Lopez-Bazo (2007), Canning and Pedroni (2008), and Carroll (2008). And at least one study has found that public-private partnerships in developing toll roads positively impacts adjacent property values (Vadali, 2008).

Given this preponderance of evidence the first condition articulated above that public infrastructure investment, public service levels and land use management decisions impact private property values seems adequately demonstrated. Further, it appears reasonable to accept that general population increases also lead to higher property values. Increased population density is strongly associated with increased demand for land, which readily translates into higher land values. Measuring the magnitude of

land value increases attributable to public actions is more problematic, especially if the estimates must be made in advance of the public action. If the objective is to recover specific costs, such measurements may not be required. But if the objective is to share in the private gains, measuring those gains seems essential. The next section describes some of the mechanisms that have been employed to capture all or part of this increased value for public purposes.

Value Capture Mechanisms

A wide range of mechanisms have been used over the centuries in an attempt to capture the unearned increment in land value that results from public and community actions. Walters (2011, 2012) provides a summary discussion of a number of these alternatives. The approaches can be broadly divided into two groups: one-time fees and taxes on the one hand, and annually recurring taxes on the other. Peterson (2009) identifies three strategies for using land as a basis for financing urban infrastructure improvements: developer exactions, value capture, and land asset management. Peterson argues that all three approaches can allow local governments to share in the land value gains created by public action, though only the second category is explicitly labeled value capture.

Developer exactions are similar to development fees in that they require land developers to incur off-site costs associated with their developments. But whereas development fees require a cash payment to the government, the exactions that Peterson contemplates require developers to actually make the investment in infrastructure which is then transferred to the local government. Peterson provides the example of a firm being required to spend \$1.45 billion of private infrastructure investment (plus 7 per cent of serviced land turned over to the government for moderate-income housing) in exchange for desert land outside of Cairo, Egypt. Peterson also argues that surplus public land can be sold to provide infrastructure funding, especially lands that have seen their value enhanced through some government action. Here Peterson points to Istanbul, Turkey, which raised \$1.5 billion by auctioning off a municipal bus station and administrative site, with the monies being used for capital improvements.

While it is certainly true that public lands have value which can be converted from land assets to infrastructure assets, it is hard to see this conversion as land value capture in any sense. It is conversion of a valuable public asset from one form to another, rather than public participation in private land value gains. Developer exactions seem closer to the core concept since they are trading some public action (permission to develop land) for infrastructure, either directly or indirectly. What seems to be the case in many instances, though, is that the magnitude of the value capture is limited to the value of the infrastructure. To be sure, this is a significant amount, as Peterson rightly points out. But if this is a fair

assessment, it places developer exactions, whether in cash or in kind, in the category of cost recovery mechanisms.

It appears then that most alternatives have significant shortcomings as LVC tools. (Walters, 2012) It is also curious that annual land taxes are slighted in most discussions of LVC. Peterson argues that betterment taxes fell out of favor for a period. But he acknowledges that Colombia has seen some resurgence in their use. The United Kingdom, France and India, at least, also continue to attempt LVC through betterment levies of various sorts. The discussion which follows will therefore focus on just two of options: betterment levies of several types and the portion of the annual property tax that applies to land.

Betterment taxes--

The general premise that if the state creates value by declaring land developable, the state should be a beneficiary of that value, is unimpeachable. Knowing exactly what that value might be or when return of it to the state might take place is quite another matter. ... How to arrive at land values is a fundamental issue that appears to confound everyone from real estate experts to government officials. (Booth, 2012, 89)

In concept, betterment taxes are intended address the issues raised by Booth by allowing the community to capture part of the increased value resulting from infrastructure improvements or changes in land use. Betterment taxes differ from development or impact fees because they are conceived as an explicit attempt to share in the private value gain resulting from the public action. They differ from annual property taxes in that they are a one-time assessment and generally apply only to the increment in value resulting from the public investment or the change in land use.

Betterment taxes often range from 30 to 60 percent of the value increment. In Denmark prior to 2004, for example, when farmland was legally transferred to an urban zone, a special land development gains tax (*frigørelsesafgift*) required payment of approximately 50 percent of the increase in value resulting from the change in zoning. As indicated, this tax was repealed in 2004. Similar land use changes in Poland can bear a tax of up to 30 percent of the increment in value when the land is sold within a five year period.

Betterment levies were used as early as 1921 in Colombia, with some legislation having its origins as early as 1562 in Portugal, 1607 in Mexico's colonial period and 1662 in London, England (Day 2005; Smolka and Amborski 2000). Betterment taxes have a long history, but most recently they are seeing some resurgence in India. Under the Town Planning Act, a number of cities have adopted or are considering a betterment "charge." Over the years, betterment taxes have generally not fared well.

They tend to be politically very unpopular and perhaps as a result, difficult to collect in any sustained way. Mexico is just one case where betterment levies are permitted but not widely used because of implementation issues (Bird 2004). Betterment levies assessed in-kind have been more successful. These in-kind transfers may take the form of land transferred to local governments or off-site infrastructure improvements required by local governments.

As noted by Day (2005) and by Fensham and Gleeson (2003), betterment taxes can be effective at capturing all or part of the incremental value generated by the conferral of specific development rights or the impact of specific projects, if decision makers and administrators have the political will to actually collect the levies. On the other hand, if the public project results in a reduction of property value for some owners, there is little inclination on the part of public officials to compensate property owners. Further, and perhaps more critical, betterment levies simply fail to capture broader market trends and positive urban externalities that result in land value increases.

In their study of betterment levies in Bogotá and Manizales, Colombia, Borrero, Durán et al. (2011) conclude the following: (1) financed projects have to correspond to the real needs of the city and its population, (2) there is the political will of decision bodies to implement and execute them, and (3) there is an institutional capacity to implement the projects. This list is stated slightly differently by Day (2005) and Bahl and Wallace (2008). In their summary of the administrative conditions required to implement a betterment levy, Bahl and Wallace include (1) a quantifiable impact on land values, (2) identifiable beneficiaries, (3) a public mechanism to implement the levy, and (4) the political will to implement the levy.

These lists also suggest that betterment levies come with their own set of difficulties in implementation. As suggested by Booth (2012), it is often difficult to determine in advance how a given public investment or permitted land use change will impact land values. It may also be difficult to determine precisely which properties will be affected and therefore who should pay the tax. Finally, collecting betterment levies has often proven politically difficult in any sustained manner. As Day (2005) reports, sustained political will with regard to betterment levies has often been lacking. To understand how betterment levies work in practice, it is useful to consider several examples in greater detail.

Case studies

Latin America

Over the years, Latin America has been a focal point for initiatives to pursue land value capture. A number of countries take the principle of land value capture quite seriously and have made multiple

attempts to implement it. This section offers only a brief review of some of the more notable attempts. One such variation on the betterment tax is being implemented in São Paulo, Brazil. In this approach, a local government agency identifies the amount and type of additional development that will be permitted in a given area. Recognizing that allowing such additional development creates private value, the policy then allows the agency to issue Certificates of Additional Construction Potential (CEPACs) for that area, and sell the CEPACs through an electronic auction. Sandroni (2010) provides a more detailed discussion of the multiple CEPAC auctions that have been used in São Paulo. Some have been quite successful while the results for others are more mixed. Not surprisingly, the difference seems to be in how the markets perceive the proposed incremental development.

In Argentina, provinces and municipalities may finance certain public works by *contribuciones de mejoras* (betterment taxes) when the improvements result in increased land values. Rezk reports that as a rule, the governments “identify certain categories of beneficiaries and share part of the cost of construction among them in proportion to estimated benefit” (Rezk 2004, 285). The approach seems to fall pretty clearly in the cost recovery category.

Of all countries where betterment levies have been used to fund infrastructure improvements, Colombia is often cited as a success story. As noted earlier, betterment levies (*Contribución de Valorización*) in Colombia date from 1921. Over the past fifty years, betterment levies have contributed significantly to local revenues in Bogotá, Cali, Medellín and other Colombian cities, often yielding over 25 percent of local own-source revenues. In 2007, for example, betterment levies raised US\$900 million from 1.5 million urban lots in Bogotá. (Borrero, et al, 2011) Given this track record it is important to understand how these levies are designed and implemented. Borrero, et al (2011) provide a very useful description that allows just such an understanding.

Betterment levies in Colombia are a type of special assessment intended from the beginning to provide a means for recovering infrastructure costs. Enabling legislation specifically notes that the fiscal base for betterment levies is the incremental value properties experience because of the public investment. The legislation further notes that the amount of the levy must be related to the amount of the investment, and should be a function of the benefit rendered to a given property. Finally, the legislation stipulates that the amounts collected must be used exclusively to finance the project generating the benefit and consequent fiscal obligation. (Borrero, et al, 2011) Thus, it can be seen that while these betterment assessments are well established and accepted in Colombia, they fit into the cost recovery category rather than sharing in unearned incremental value. To be sure incremental value is created by these infrastructure projects, and that value creation renders the levies much more

politically acceptable. Political success is also enhanced through public participation in the process of project selection and levy determination. But the *Contribución de Valorización* is a system of cost recovery and does not meet the land value capture standard contemplated by Mill and the Vancouver Action plan.

In a more recent effort to pursue land value capture, Colombia passed Law 388 in 1997, which requires local governments to adopt a master plan for future development and adopt *plusvalías* as one of the plan's main sources of income. The basic notion is that as cities adopt development plans, they create value as previously agricultural land is brought into the urban development sphere, or land use and densities for existing urban land are adjusted to accommodate future growth. Under the terms of the 1997 law, cities are required to capture 30 to 50 percent of this increased value through a levy known as the *Participación en Plusvalías*. While this is an explicit attempt to capture unearned increments in land value created by specific public actions, implementing the law has proven difficult and controversial. It was not until 2004 that Bogotá began to see any revenue from this source, after several rounds of clarifying negotiations. Through 2009, *plusvalías* generated between US\$5.5 and US\$6 million per year, or about 0.35 percent of Bogotá's own-source revenue. Perhaps more troubling than the minimal revenue the policy generates is the apparent impact on the availability of land. Acosta (2008, page 89) notes that construction companies are willing to pay the tax, but they are finding that landowners are resistant due to the impact the tax has on their expected returns and they are therefore unwilling to sell land. Thus, it would appear at this writing that Colombia faces many of the same challenges that the United Kingdom has faced over the years in trying to implement a true value capture scheme. But Colombia remains an important experiment and will bear watching in the years ahead. (de Botero & Smolka, 2000; Restrepo, 2010; Acosta, 2008)

United Kingdom

During the 20th century, the UK has made multiple attempts to implement a betterment levy. (Plimmer and McNab 2008, Booth, 2012) In 1947, the Town and Country Planning Act essentially nationalized all development value. The law was abolished after four years. In 1967, the Land Commission Act introduced an explicit betterment levy on the realization of land development value and created the Land Commission to administer the tax. The initial tax rate was 40 percent with the expectation that the rate would move higher over time. With the change of government three years later, the Land Commission was abolished. In 1975, the Community Land Act again attempted to nationalize the development value of land. In preparation for full implementation, a Development Land Tax of 60 percent of incremental value resulting from development approval was put in place. Similar to

the experience in Bogotá, Plimmer and McNab (2008, 4) observe that “[t]he provisions were complex, avoidable, unpopular and raised little revenue.” The Act was never fully implemented and was repealed in 1980. The Development Land Tax was repealed in 1985. Plimmer and McNab (2008) argue that in addition to the administrative challenges associated with these efforts, one of the primary reasons for failure was that land owners faced with the value capture taxes simply withheld their land from the market until the tax was abolished contributing to an overall land shortage. Thus, when the UK government proposed another betterment levy in the form of a Planning Gain Supplement in 2006, the proposal met with stiff opposition from a number of quarters and was never adopted.

Most recently the UK in 2011 began to implement a Community Infrastructure Levy intended to recover the cost of infrastructure investments. As Booth notes, “The attempts by central government to capture land value have thus moved from direct taxation of betterment value to the negotiated settlement of contributions to the costs of infrastructure provision.” (Booth, 2012, pg 84-85)

India

India provides another instance where betterment levies are receiving substantial attention. A number of states in India have enabling legislation that allows local governments to impose betterment levies for infrastructure improvements. In the period 1998 through 2002, betterment charges represented major sources of local revenue in both Bangalore, Karnataka and Surat, Gujarat (Mohanty, et al, 2007). In recent years, several cities including Mumbai, Delhi, Bhopal and Bangalore have attempted to impose such levies. Within the past year, Bangalore has even announced that it will assess a betterment charge for regularizing land titles in selected areas. (*Deccan Herald*, 2011) (Rates will range from US\$3/m² to US\$8/m², depending on lot size)

But betterment charges in India continue to face stiff political opposition and legal challenges. The judiciary has interpreted most state laws to require local governments to actually make infrastructure investments prior to assessing any betterment charge. The result is that in the vast majority of cases, the betterment charge is a cost recovery mechanism. As one senior government official told this author, “Betterment charge and cost recovery are the same in India.”

There are several important observations that can be made from these cases. First, betterment levies can be used successfully if properly designed. In this instance, proper design generally means cost recovery rather than LVC in a broader sense. Second, public support and compliance are greatly increased if the charge is tied to a specific project, the public has significant input into the selection of the project and the calculation of the charge, and monies collected are expended according to the plan.

Third, legal and political considerations often mean that the government must spend the money first and then recover its costs through a betterment charge.

From one perspective these lessons present a very optimistic picture. Local governments can effectively recover infrastructure costs through betterment charges in many contexts. On the other hand, for advocates of LVC in the broader sense, the general failure of the betterment charge approach after multiple attempts in several countries removes one of the few remaining options for LVC. Rather than giving up on the policy goal however, it may be worth taking a somewhat different approach to the annual land value tax.

An alternative approach to land value capture

One of the fundamental questions which must be addressed in designing an annual property tax is what to include in the tax base. Should the tax be levied on land (site value), permanent improvements or both? Clearly there are examples from around the world to justify any of the three options. But one might ask, from a theoretical perspective, what is the rationale for taxing either land or improvements? Certainly the first response is that land is immovable and therefore provides a very attractive tax base for local governments. But of course there is more to the story than “because we can.”

Many authors have argued that the property tax is a benefits tax, and taxes paid represent the “tax price” for local services, especially those services which have attributes of public goods. But if we take this argument seriously, it would seem to suggest that land and improvements should be taxed differently. It is hard to imagine that vacant land imposes the same burden on local services that urban land uses impose. People going about their daily lives create the demand for public services, and those daily lives are generally carried out in the improvements placed on land. There may be minimal access requirements and perhaps fire suppression demands created by vacant land, but surely such demands are far smaller than those created by the improvements typically occurring on land.

This line of reasoning implies that if we accept the benefit tax argument for taxing property, land should be taxed very lightly and improvements at approximately the cost of providing services to those improvements. But such a conclusion misses the point made many years ago by Mill, David Ricardo, and Henry George. Land value is socially created, and often with little effort on the part of the landowner. The whole basis for LVC is the argument that the community should be able to share in that socially created value. Thus, the argument for taxing improvements is that they create the majority of

demand for public services. The tax rate should therefore reflect the cost of those services. The argument for taxing land is precisely so that the community can share in socially created land values. The tax rate on land should reflect the policy choice regarding the proportion of land value to be captured for public purposes. Setting aside for the time being the tax on improvements, the next paragraphs consider how the tax rate on land should be calculated if LVC is the objective.

Calculating the LVC capture rate

Consider the following hypothetical example of a city in which policy makers wish to capture 40 percent of the unearned increment in land value for public purposes, while taxing all land at one percent of its market value. (This one percent rate is likely high if the intent is to have a base rate that reflects the “benefits” of public services to vacant land.) If the market value of land last year was \$420 million and land values are increasing at five percent per year, then current year land values total \$441 million. And the desired total tax revenue would be as follows:

$$\text{Tax on base land value} = 1\% \times \$420 \text{ million} = \$4.2 \text{ million}$$

$$\text{Tax on incremental land value} = 40\% \times (\$441 - \$420) = \$8.4 \text{ million}$$

$$\text{Total tax} = \$4.2 \text{ million} + \$8.4 \text{ million} = \$12.6 \text{ million}$$

Thus, the same revenue could be collected either by levying a one percent tax on all land, and a separate value capture tax of 40 percent on the incremental value, or by levying a single tax of 2.857 percent of total land value.

This example can be generalized. Let L_t represent the total land value in tax year t , and let other variables be defined as follows:

r_b = tax rate to be applied to all land (1 percent in the above example)

r_c = the value capture rate (40 percent in the above example)

Δ = the incremental rate of change in land values (5 percent in the example)

Then the desired tax on all land value is given by

$$\text{Base revenue} = r_b L_{t-1}$$

And the value capture component is given by

$$\text{Value capture revenue} = (L_t - L_{t-1})r_c$$

But since land values in the current year are equal to land values from the previous year, augmented by the rate of change, this expression can be rewritten as

$$\text{Value capture revenue} = (L_{t-1}(1 + \Delta) - L_{t-1})r_c$$

which readily simplifies to

$$\text{Value capture revenue} = \Delta r_c L_{t-1}$$

Adding the two revenue calculations together and dividing by the tax base in order to obtain an overall rate, we have

$$\text{Overall land tax rate} = \frac{r_b L_{t-1} + \Delta r_c L_{t-1}}{L_{t-1}(1 + \Delta)}$$

which simplifies to

$$\text{Overall land tax rate} = \frac{r_b + \Delta r_c}{1 + \Delta}$$

The implication of this expression is that a tax rate can be calculated and applied to land which will both yield a given base tax rate on all land and a desired value capture rate on the incremental increase in land values. To calculate such a rate, three pieces of information are required: the desired base rate to be applied to all land; the desired value capture share and the rate of increase in land values.

Table 1 provides example calculations for different combinations of these three factors. What the table demonstrates is that in most land markets with land value increases of between four and ten percent per year, cities can capture 40 percent of the value increase by applying overall land tax rates on the order of two to four percent, if the underlying rate on all land is one percent or less. Of course higher base rates will result in higher overall rates as well. It should be noted also that in property markets that are overheated and value increases exceed ten percent per year, the overall rate approaches one-third to one-half the rate of price increases. Such rates are likely to have the desirable effect of restraining the market and reducing land speculation.

Table 1: Example calculations of annual overall land value tax rates required for combinations of base land value tax, value capture shares and land value increases

Base tax rate applied to all land	Municipal share of land value increase	30%	40%	50%	60%
	Rate of land value increase	Required Overall Land Value Tax Rate			
0.5%	-2%	-0.102%	-0.306%	-0.510%	-0.714%
	0	0.500%	0.500%	0.500%	0.500%
	2%	1.078%	1.275%	1.471%	1.667%
	3%	1.359%	1.650%	1.942%	2.233%
	4%	1.635%	2.019%	2.404%	2.788%
	5%	1.905%	2.381%	2.857%	3.333%
	6%	2.170%	2.736%	3.302%	3.868%
	7%	2.430%	3.084%	3.738%	4.393%
	8%	2.685%	3.426%	4.167%	4.907%
	9%	2.936%	3.761%	4.587%	5.413%
	10%	3.182%	4.091%	5.000%	5.909%
	15%	4.348%	5.652%	6.957%	8.261%
	20%	5.417%	7.083%	8.750%	10.417%
25%	6.400%	8.400%	10.400%	12.400%	
1.0%	-2%	0.408%	0.204%	0.000%	-0.204%
	0	1.000%	1.000%	1.000%	1.000%
	2%	1.569%	1.765%	1.961%	2.157%
	3%	1.845%	2.136%	2.427%	2.718%
	4%	2.115%	2.500%	2.885%	3.269%
	5%	2.381%	2.857%	3.333%	3.810%
	6%	2.642%	3.208%	3.774%	4.340%
	7%	2.897%	3.551%	4.206%	4.860%
	8%	3.148%	3.889%	4.630%	5.370%
	9%	3.394%	4.220%	5.046%	5.872%
	10%	3.636%	4.545%	5.455%	6.364%
	15%	4.783%	6.087%	7.391%	8.696%
	20%	5.833%	7.500%	9.167%	10.833%
25%	6.800%	8.800%	10.800%	12.800%	
2.0%	-2%	1.429%	1.224%	1.020%	0.816%
	0	2.000%	2.000%	2.000%	2.000%
	2%	2.549%	2.745%	2.941%	3.137%
	3%	2.816%	3.107%	3.398%	3.689%
	4%	3.077%	3.462%	3.846%	4.231%
	5%	3.333%	3.810%	4.286%	4.762%
	6%	3.585%	4.151%	4.717%	5.283%
	7%	3.832%	4.486%	5.140%	5.794%
	8%	4.074%	4.815%	5.556%	6.296%
	9%	4.312%	5.138%	5.963%	6.789%
	10%	4.545%	5.455%	6.364%	7.273%
	15%	5.652%	6.957%	8.261%	9.565%
	20%	6.667%	8.333%	10.000%	11.667%
25%	7.600%	9.600%	11.600%	13.600%	

The table also includes two special cases. The first is fairly straightforward since it is the case where there is no increase in land values. In the event that land values are stable, the proposed formula

collapses to the base rate applied to all land, since there is no incremental value to be taxed. The second special case raises an important issue regarding land value capture. Some have argued that if the public intends to capture a significant share of land value increases resulting from public action, the public should also be prepared to compensate landowners if land values fall as a result of public action. The first row of the table demonstrates the effects of a two percent decline in land values.

As demonstrated in the numerical example above, it is quite conceivable that the land value capture portion of the tax will be larger than the base tax. Similarly, if values fall, the incremental loss in value may exceed the base tax. Several options could be considered to deal with this possibility. First, landowners could be given credit toward their overall property tax bill (including land and improvements), or credits could be issued toward future land tax bills. Second, policymakers could take the position that the land tax bill should not be allowed to fall below zero. Third, and the most likely scenario, a policy could be adopted that the land tax obligation will never be less than the base land tax, thus placing a floor on the amount of tax due. There is insufficient space here to pursue these issues further, but they merit further attention, since recent history has amply demonstrated that land markets go down as well as up.

In putting forward this new approach to land value capture, it is not expected that cities will recalculate the overall land tax rate every year, though such recalculation is possible if deemed desirable. Rather, the expectation is that the overall rate will be based on policy choices about the base rate and the desired value capture rate, and a longer term average rate of increase in land prices. While land prices should be monitored every year, it is likely that the overall rate will be adjusted only every three to five years based on longer term market trends.

The approach just outlined is intended to address broad-based increases in all land values. It is important also to consider more narrow application in cases where specific public action such as changing land use or density creates substantial incremental value for particular land parcels. Currently, most approaches attempt to capture the value increase in a single payment which pretty consistently results in landowner objections and political resistance. The lessons learned from the UK and Bogotá experiences suggest that it will be very difficult to capture 30 to 100 percent of the incremental value created by such public action in a single year. If the city is able to spread the capture out over multiple years, in the form of an additional land value tax, it seems likely that LVC will become more palatable. In deferring the amount recaptured tax officials should also factor in the time value of money and calculate a rate that will yield a present value equal to the desired capture share.

Consider the following example. Suppose that a community approves the conversion of land from agricultural to residential and commercial uses. In doing so, the value of the land is increased several orders of magnitude, and city policy stipulates that a significant proportion of this increase (say, 40 percent) should be captured for public purposes. Assume also that the city determines to collect this increment over a ten year period. The rate that will need to be applied in order to achieve the desired goal will depend on the choice of a discount rate, which will generally be the city's borrowing cost. Table 2 illustrates the rates required given different borrowing costs, and assuming 40 percent recapture rate spread over ten years. In each case, the present value of the taxes generated will equal 40 percent of the increment in land value.

Two scenarios have been presented. In the first, a LVC tax rate was calculated for an entire community experiencing broadly based land value increases. In the second, particular parcels experience substantial value increases and the community seeks to recapture some share of those increases over a period of time. The intent of this presentation is to suggest that perhaps there is another approach to LVC that merits more careful consideration, an approach based on an annual tax on land. What this very preliminary analysis has attempted to show is that there is significant potential for developing a practical and feasible method to achieve the Vancouver Action Plan objective.

Table 2: Example calculation of LVC tax rate given 40 percent recapture rate over ten years

City borrowing cost	Required LVC rate
0%	4.00%
6%	5.43%
8%	5.96%
10%	6.50%
12%	7.08%
20%	9.54%

The Way Forward

In considering any particular approach to LVC, local authorities should begin by clearly defining the policy objective, whether that objective is cost recovery for specific investments or LVC more broadly defined. If the goal is cost recovery, the experiences reviewed here and by Peterson (2009)

would suggest that the first option to consider is some type of developer exaction, whether in cash or in kind.

If specific developers cannot be identified, some variation on the Bogotá approach to betterment charges should be carefully considered. The public should be engaged in selecting projects and evaluating betterment assessment methods. The method of allocating costs and determining betterment charges should be simple and easily communicated. Projects should be completed as agreed.

In some cases, the sale of public assets can also serve to translate one type of public asset into another. (Peterson, 2009) In particular if development rights are considered a public asset, the experience in São Paulo suggests that these rights can be sold at auction. Some jurisdictions (e.g., Bangalore) are also considering using transferable development rights to compensate land owners for partial expropriation of land.

If the policy objective is LVC as contemplated by Mill and the UN's Vancouver Action Plan, the approaches just described will likely fail, based on the cases presented here. What is suggested here is a recasting of the motivation for the annual property tax. The tax on improvements can be motivated as a benefit tax, and should be approximately equal to the cost of providing the services the tax is intended to fund. The argument is put forward here that the tax on land can be motivated as a LVC instrument, and can be used to capture either broadly based value increases or substantial increases in land value for particular properties. In the latter case, communities will need to spread the recapture over several years in order to make the tax more politically acceptable.

As a final thought, it should be noted that all of these approaches to cost recovery and LVC are likely to succeed only to the extent that they are understood and accepted by the public. Such acceptance requires sound, fair and transparent administrative practices and public engagement in key decision making processes.

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