Taxing Simply

District of Columbia Tax Revision Commission

Taxing Fairly

Full Report

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CHAPTER G

An Analysis of the Graded Property Tax

Robert M. Schwab and Amy Rehder Harris

Introduction

In most jurisdictions, land and improvements are taxed at the same rate. The District of Columbia is no exception to this general rule. Consider two homes in the District, each valued at $100,000. Home A is a modest home on a large lot; suppose the land and structures are each worth $50,000. Home B is a more substantial home on a smaller lot; in this case, suppose the land is valued at $20,000 and the improvements at $80,000. Under current District law, both homes would be taxed at a rate of 0.96 percent on the total value and thus, as Figure 1 shows, the owners of both homes would face property taxes of $960.[1]

But property can be taxed in many ways. Under a graded, or split-rate, tax, land is taxed more heavily than structures. Suppose the District were to decide to change its property tax so that the tax rate on land were twice as high as the rate on structures and rates were adjusted so that the two homes in this example continued to pay a total of $1,920. As the third row of Figure G-1 shows, this would require a tax rate on structures of 0.71 percent and a tax rate on land of 1.42 percent. Taxes on Home A would rise to $1,067 and taxes on Home B would fall to $853. A pure land tax, or site-value tax, takes this line of reasoning to its logical limit. Under a pure land tax, the tax rate on structures is set at zero and all revenues are raised by taxing land. An equal yield land tax in this example would require a tax rate of 2.74 percent. The owner of Home A would pay $1,371 in taxes under a pure land tax while the owner of B would pay $549.

This chapter is an analysis of graded property taxes and pure land taxes. It has the following organization: the history and theory of land taxes; domestic and international experience with graded taxes, with a particular focus on Pittsburgh; the distribution of the burden of graded property taxes and land taxes; questions of implementation; and a brief summary and conclusion.

The history and theory of land taxes

Economists have had a long-standing interest in land taxation.[2] The physiocrats, Adam Smith, David Ricardo, James Mill, and John Stuart Mill, all wrote extensively on the subject. But Henry George (1839–1897) is perhaps the person most closely

Figure C-1

Standard Property Tax, Graded Property Tax, and Pure Land Tax
Illustrative Example

	Home A	Home B	Total
Assessed Valuation			
Land	$50,000	$20,000	$70,000
Improvements	50,000	80,000	130,000
Total	$100,000	$100,000	$200,000
Standard Property Tax			
Land @ 0.96%	480	192	672
Improvements @ 0.96%	480	768	1,248
Total	$960	$960	$1,920
Graded Property Tax			
Land @ 1.42%	711	284	996
Improvements @ 0.71%	356	569	924
Total	$1,067	$853	$1,920
Pure Land Tax			
Land @ 2.74%	1,371	549	1,920
Structures @ .0%	0	0	0
Total	$1,371	$549	$1,920

associated with land taxation. George was a sailor, prospector, printer, reporter, San Francisco newspaper editor and publisher, political activist, and political economist (Gaffney, 1987). He was immensely popular, so popular in fact that he nearly won the New York mayoral election in 1886.

George is best known today for his 1879 book *Progress and Poverty.* As Tideman (1994) explains, George's primary concern was not to devise a better tax system, but rather to explain why a growing incidence of poverty accompanied rapid economic growth and to offer a remedy. From his experience in California in the 1850s and 1860s, he saw a causal connection between the returns to owning land during economic booms and the concurrent fall of wages. He viewed this as a result of an artificial scarcity of land caused by speculators withholding land from produc-

tion. His proposed solution: abolish all taxes except for a tax on land values (and so people often talk about George's proposal as a single tax). George argued that this tax would make more land accessible to those who wanted to use it productively and make land speculation unprofitable. The greater accessibility of land and removal of other taxes would raise wages and lower prices, thereby raising workers' standard of living. George suggested that the tax equal virtually all land rents; if the taxes collected were greater than government spending, the remainder would be returned to voters.

Very few economists today would agree with all of Henry George's proposals or with his analysis of the causes of poverty. Many would, however, support a call for substituting taxes on land for other taxes. We now turn to a discussion of the basic appeal of a tax on land.

NEUTRALITY AND TAX INCIDENCE

It has often been argued that a tax on land is neutral, where neutrality is defined along the following lines. All taxes impose a burden on taxpayers. It is tempting to view this burden simply as the amount of money paid to the tax collector. In many cases, however, there is a second element that requires attention. Most taxes will lead people to distort their decisions. If the federal government taxes wages, some people are likely to work less; if it taxes returns to capital (dividends, capital gains, interest) some people will save and invest less; if local governments impose high taxes, some people will choose to live in a different community. Economists call the economic cost of these distortions the excess burden, or deadweight loss, of a tax. Thus the total burden of a tax is the sum of the tax revenue collected (the direct burden of the tax) and the excess burden. Taxes can be judged according to many criteria. Excess burden is one sensible criteria. A "good" tax from this perspective is one that leads to only small distortions of people's choices. The best tax would be one that is neutral, i.e., one that does not in any way change anyone's behavior.

The standard property tax, like most taxes, imposes an excess burden and thus is not neutral. Faced with the prospect of higher property taxes, landowners are likely to develop their property less intensively than they otherwise would; a commercial developer might, for example, decide to build a smaller office building or a homeowner might decide not to renovate. In some cases, the property tax will reduce the anticipated returns from development so sharply that a landowner will choose to leave a property undeveloped.

There are some interesting historical examples of the deadweight loss from the property tax. In 1696, England introduced a tax on the number of windows in a house, which was believed to be a proxy for the size of the house and hence its value (Grinath, 1988). Clearly, the number of windows may be correlated with house value, but such a tax would place equal levies on homes with an equal num-

ber of windows regardless of location or state of repair. The tax may also lead to under-consumption of windows. When homeowners attempted to replace windows with other methods of letting in air and light, the tax was expanded to include all other forms of ventilation. A whole row of houses was built in Edinburgh without a single window in the bedroom story of the homes. Other homeowners would stop up windows and then reopen them after the assessor had been by their house. The window tax remained in effect well into the 19th century.

A tax on land is an important exception to the general rule that taxes distort decisions and thus generate deadweight losses. The analysis of a land tax in a static setting where we ignore the use of the additional revenue is straightforward. The supply of land is fixed. If land is taxed, people cannot reduce its supply in response; in the jargon of public finance, the supply of land is perfectly inelastic. Landowners can do nothing to escape the burden of the tax and thus a land tax does not distort economic decisions. It is neutral; it neither encourages nor discourages development. And this neutrality, of course, is part of its appeal.

If, on the other hand, we consider an increase in land taxes where we use the revenues to reduce the tax on structures or other improvements, the economic consequences will be very different. As we saw above, a tax on structures discourages development and thus is not neutral; it reduces the intensity with which land is used. Thus arguments that a tax on land can stimulate development turn in part on an implicit assumption that the revenues will be used to reduce the tax on structures. But let us be clear. In that sense, any tax will stimulate development as long as the negative effects of collecting the tax are less than the positive effects of reducing the tax on structures. Land taxes have no special claim as a tool to foster development. Almost certainly, for example, a national head tax would stimulate development in this sense.

Things become more complicated in a dynamic setting. Bentick (1979) and Mills (1981) have argued that land-value taxation need not be neutral with respect to the timing and nature of land development. In particular, the taxing of land values *may* distort the choice between earlier and later development of unused land parcels in favor of those projects that promise an earlier stream of net receipts. The implication of their models is that a movement in the direction of land taxation may hasten economic development, perhaps to an extent that is excessive purely on the grounds of efficiency. This effect, however, depends upon an important and controversial assumption concerning the way in which land is valued for tax purposes.

Oates and Schwab (1997) presented a simple example to illustrate the Bentick and Mills argument and to highlight the key issues. In that example, landowners can either devote their land to Use A and earn $1,000 per period forever or wait one period, develop their land in Use B, and earn $1,100 per period. Land-use decisions can never be changed once they have been made. At a 10 percent interest rate and with no taxes, neither option offers landowners an advantage over the other.

Now suppose the local government introduces a land tax. The impact of this land tax depends on how it is administered. There are two possibilities. Bentick and Mills assume implicitly that the government would, in periods 2 and beyond, treat land developed in Use A differently than land developed in Use B. In their view, since land-use decisions are irrevocable and the two land uses generate different land rents, land devoted to Use B should be taxed more heavily than land devoted to Use A. In this setting, all land would be developed in the first period. That is to say, the imposition of a tax on land would stimulate development.

At first blush, this line of argument seems compelling. But as David Wildasin (1982) and T. Nicolaus Tideman (1982) have pointed out, this form of a land tax is inconsistent with most peoples' view, including Henry George's, of a land tax. They would argue that, in the context of our example, the non-neutrality of land-value taxation results from the practice of taxing land on the value associated with its chosen use. If land were always assessed at each point in time for tax purposes on the basis of its "highest and best" use, irrespective of any commitments to a particular use, then land-value taxation would indeed be neutral. Taxation at such a *standard value* (Vickrey, 1970) would be use-independent and, hence, neutral. In terms of the Oates and Schwab example, *all* parcels would be taxed as if they produced a rental income of $1,000 in period one and $1,100 in all subsequent periods. In this case all land is treated identically, and a land tax must clearly be neutral. Taxes in this case are independent of a landowner's decision. Thus any decision that maximizes the value of a parcel of land in the absence of the land tax will continue to maximize value in the presence of the tax.

Domestic and international experience with graded taxes

While it is true that the District's property tax is similar to the property tax in most cities (that is to say, land and improvements are taxed at the same rate), within the United States there are a number of examples of graded taxes and a handful of examples of pure land taxes. Moreover, graded taxes and land taxes are used extensively outside the United States. We now turn to a discussion of the experience with land and graded taxes.

THE PITTSBURGH EXPERIENCE[3]

Pittsburgh is the only major U.S. city that uses a graded property tax. In 1979 and 1980, Pittsburgh restructured its property tax system so that land was taxed at more than five times the rate on structures. Oates and Schwab (1997) sift through the evidence from this recent "natural experiment" in Pittsburgh, and we summarize their study here.[4]

In order to understand the effects of land-value taxation in Pittsburgh, it is important to place this tax reform in the context of the ongoing economic evolution of the city and metropolitan area.[5] Since the end of World War II, Pittsburgh has gone through a largely successful though often painful economic transition. The city was once a major manufacturing center. As the steel and other heavy manufacturing sectors shrank, the Pittsburgh economy became more oriented towards white-collar jobs. The banking and other service sectors, for example, grew very quickly as Pittsburgh became the regional financial leader. In 1940, manufacturing employment in the four-county Pittsburgh MSA accounted for almost half of the total workforce; in 1985, manufacturing employment constituted only 16 percent of total employment.

Pittsburgh has launched several major urban renewal projects. Renaissance I, initiated in the 1940s, was a major effort to revitalize the central business district through a public-private partnership. The project enjoyed a number of important successes. It was followed by a second major renewal effort in the late 1970s: Renaissance II. As before, the renewal effort involved an extensive partnership between public and private agents with a major focus on continued development of the central business district. Several major corporations decided to expand their headquarters in Pittsburgh and with public assistance constructed a series of major office complexes. The result was a striking surge in levels of commercial construction activity: There were commercial contract awards in 1980 for 9.5 million square feet of new space with (as discussed below) continued high levels of building activity through most of the decade.[6]

Pittsburgh has had a graded property tax system since 1913, a system under which land was taxed at a rate twice that of the structures on the land until 1979. As Figure G-2 indicates, Pittsburgh introduced a striking restructuring of the city's property tax in 1979 and 1980, raising the tax rate on land while leaving the rate on structures unchanged, thus raising the tax rate on land to about five times the rate on structures. This increased "tilt" of rates has been maintained and even increased slightly during the decade following the restructuring.[7]

Figure G-2 should be interpreted cautiously, however. Properties in the city of Pittsburgh are subject to taxation not only by the city government, but also by the county and the overlying school district. These latter two jurisdictions do not participate in the graded tax system but instead employ a conventional property tax that applies the same tax rate to land and structures. As the last column of the table indicates, this results in *total* tax rates on land in the city of Pittsburgh that are something more than twice the rate on structures. Properties outside the city are, in contrast, subject to conventional property taxation.

Oates and Schwab assembled time-series data on new building activity for a sample of 15 cities and metropolitan areas in the Rust Belt, including Pittsburgh.

Figure G-2

Pittsburgh Property Tax Rates

1972–1991

Rates expressed in mills

Fiscal Year	(a) Land Tax Rate	(b) Structure Tax Rate	(c) County Tax Rate	(d) School District Tax Rate	(e) Total Land Tax Rate	(f) Total Structure Tax Rate	(e) as a percent of (f)
1972	53.0	26.5	15.5	23	91.5	65.0	141%
1973	51.0	25.5	15.5	23	89.5	64.0	140
1974	51.0	25.5	15.5	23	89.5	64.0	140
1975	49.5	24.75	15.5	23	88.0	63.25	139
1976	49.5	24.75	15.5	29	94.0	69.25	136
1977	49.5	24.75	21.375	29	99.875	75.125	133
1978	49.5	24.75	21.375	29	99.875	75.125	133
1979	97.5	24.75	19.365	29	145.865	73.115	200
1980	125.5	24.75	23.0	29	177.5	76.75	231
1981	125.5	24.75	28.0	41	194.5	93.75	207
1982	133.0	32.0	29.0	36	198.0	97.0	204
1983	151.5	27.0	29.0	36	216.5	92.0	235
1984	151.5	27.0	29.0	40	220.5	96.0	230
1985	151.5	27.0	29.0	40	220.5	96.0	230
1986	151.5	27.0	31.25	40	222.75	98.25	227
1987	151.5	27.0	31.25	46	228.75	104.25	219
1988	151.5	27.0	31.25	46	228.75	104.25	219
1989	151.5	27.0	35.0	46	232.5	108.0	215
1990	184.5	32.0	36.5	46	267.0	114.5	233
1991	184.5	32.0	36.5	46	267.0	114.5	233

Source: Pittsburgh Office of the City Controller.

Figure C-3

Average Annual Value of Building Permits

	1960–1979	1980–1989	Percent Change
Akron	$134,026	$87,907	-34.41%
Allentown	48,124	28,801	-40.15
Buffalo	93,749	82,930	-11.54
Canton	40,235	24,251	-39.73
Cincinnati	318,248	231,561	-27.24
Cleveland	329,511	224,587	-31.84
Columbus	456,580	527,026	15.43
Dayton	107,798	92,249	-14.42
Detroit	368,894	277,783	-24.70
Erie	48,353	22,761	-52.93
Pittsburgh	181,734	309,727	70.43
Rochester	118,726	82,411	-30.59
Syracuse	94,503	53,673	-43.21
Toledo	138,384	93,495	-32.44
Youngstown	33,688	11,120	-66.99
15-City Average	$167,504	$143,352	-14.42%

Note: All data are in thousands of constant 1982 dollars.

Source: *National Tax Journal*.

Figure G-3 presents figures from their study for the real value of new building permits for the cities in their sample based on the Dun and Bradstreet data. The trends in Figure G-3 are striking. In 13 of the 15 sample cities, construction was higher during 1960–1979 than during 1980–1989. In some cases, the trends are dramatic: For example, construction fell by two-thirds in Youngstown and one-half in Erie. Columbus shows a slight rise. But Pittsburgh is a remarkable outlier: The real value of building permits on an annual basis rose by some 70 percent in the 1980s relative to the 20-year period preceding the tax reform.

Oates and Schwab point to two further interesting patterns. First, the Pittsburgh boom was a central city phenomenon; construction in the Pittsburgh suburbs was actually lower in the 1980s than in the mid- and late 1970s. Second, virtually all of the increase in Pittsburgh construction was in the nonresidential sector. Residential construction rose only slightly, while in sharp contrast, commercial and industrial construction more than tripled in annual value.[8]

Oates and Schwab then turn to the key question: What role did Pittsburgh's decision to increase the tax on land play in the city's construction boom? They argue that the increase in the land tax was probably not an important *direct* explanation of Pittsburgh's building boom. Some pieces of informal evidence support their conclusion. First, in their interviews with "development experts," the Pennsylvania Economy League (1985) found no evidence that the increase in rates of land taxation exerted a noticeable impact on construction activity.[9] Second, the League found that several of the major projects that were begun in 1981 were well along in the planning stages *before* the increase in the graded-tax ratio (though admittedly, plans are often left unfulfilled and it is possible that the increase in the tax on land increased the number of proposed projects that were actually built).

Third, it is clear that the dramatic changes in the Pittsburgh economy significantly increased the demand for office space but that the supply of office space was slow to respond. This excess demand for office space is apparent in data on office vacancy rates for Pittsburgh and some of the other cities in our sample. Vacancy rates in Pittsburgh ranged from less than 1 percent to 3.5 percent during 1978–1982. The data suggest, moreover, that the construction of several massive new office buildings in the early 1980s effectively brought the market back towards equilibrium, as office vacancy rates rose sharply by the middle of the decade.

How then do Oates and Schwab account for the Pittsburgh building boom? They assign a major role to a fundamental imbalance between the supply and demand for office space generated by the growing importance of the financial and service sectors in the Pittsburgh economy and the commitment from a number of major corporations to the Pittsburgh CBD.

Some proponents of land taxation have been disappointed by the Oates and Schwab conclusion, arguing that they have understated the importance of the change in tax policy. Oates and Schwab contend that this criticism is a serious misinterpretation of their position. Economic theory, they argue, tells us that a major increase in land-value taxation in Pittsburgh should have been (roughly) neutral. The critics of land-value taxation have suggested that the Pittsburgh tax reform was unimportant because it had little effect on development. The point here is that if land taxation is neutral, we would *expect* it to have no effects on any decisions. This is its very appeal: It does not distort economic choices. Thus, the responses of those interviewed are fully consistent with the traditional view of the neutrality of land taxation. Land taxation in itself should not — and apparently did not — hasten development.

Does this mean that Pittsburgh's land taxes are an ineffective policy tool and that the decision to increase the tax on land was irrelevant? The answer, Oates and Schwab argue, is "no." What would have happened if the city had not decided to tax land more heavily? Pittsburgh was under severe fiscal pressure in the late 1970s, and some type of tax increase was virtually unavoidable. Had an increase in land-value

taxation not been introduced, city officials would have turned to another form of taxation: perhaps higher taxes on structures or (more likely according to contemporary reports) the introduction of a significant increase in the city's wage tax. Both theory and empirical evidence strongly suggest that such tax increases would have had a serious negative effect on the Pittsburgh economy. It is against the backdrop of such alternatives that the tax on land values needs to be considered. The role of land-value taxation in Pittsburgh should be understood in a setting of *differential* taxation. The relevant issue here is how the effects of the land-value tax *compared* with those of the available alternative sources of tax revenues. It appears that a land tax did not cause a building boom in Pittsburgh, but it did allow the city government to avoid policies that might have undercut that boom.

GRADED TAXES AND LAND TAXES IN OTHER U.S. CITIES

A number of Pennsylvania cities other than Pittsburgh have used a graded tax at various times, and their experiences offer a further opportunity to study the effect of split-rate taxation. Tideman and Johnson (1995) looked at construction in 55 Pennsylvania cities and towns over the 1980–1992 period. Seventeen of these cities used a split-rate tax over at least part of the sample period (Aliquippa, Carbondale, Clarion, Coatsville, DuBois, Duquesne, Harrisburg, Hazleton, Lock Haven, McKeesport, New Castle, Oil City, Pittsburgh, Scranton, Titusville, Uniontown, and Washington).[10] They found no evidence to support the argument that the difference between the tax rate on land and the tax rate on structures led to increased construction.

Stephen Cord (1983) interprets the Pennsylvania experience quite differently. Cord compares Scranton with a similar, neighboring city, Wilkes-Barre. Although these cities had nearly equal revenue per capita, as well as similar ethnic characteristics, the former had a history of using the graded tax. In 1979, Scranton nearly doubled the tax rate on land and removed the property tax from new construction while Wilkes-Barre kept the standard flat-rate property tax. Cord shows that in the two years following the tax change, average annual building permits increased 22 percent in Scranton and decreased 44 percent in Wilkes-Barre from the three previous years. His analysis of McKeesport came to similar conclusions. In 1980, McKeesport increased the tax rate on land, decreased the tax rate on buildings, and offered three-year tax abatements for new construction. Construction in McKeesport rose in 1980–1981 relative to the preceding three years but fell in two neighboring cities that maintained the standard property tax.

The Center for the Study of Economics also presents some compelling information regarding economic development in Pennsylvania cities that use the graded tax. Washington, Pa., which adopted a graded tax in 1985 and expanded it throughout the next decade, compares favorably with neighboring Uniontown, which also adopted a graded tax but quickly rescinded the tax after one year. Average annual

construction per person over the 1987–1995 period was 23 percent higher in Washington. Similarly, they found that New Castle experienced a 70 percent increase in the number of building permits issued within a three-year period following its change to a graded tax. Two neighboring towns that retained their flat rate during that time experienced 66 percent and 90 percent decreases in building permit issues.

Amsterdam, N.Y., is one of the few cities outside Pennsylvania to experiment with a graded tax. City leaders hoped that a split-rate tax would increase economic development (Reeb, 1993). The state of New York passed the required enabling legislation in 1993 and the graded tax went into effect in Amsterdam on July 1, 1995, the beginning of a new fiscal year. The tax, a victim of a mayoral election defeat, was repealed on June 30, 1996. Under the short-lived graded tax, 25 percent of the property tax burden fell on land as compared to 12 percent under Amsterdam's standard property tax. During the year it was in effect, few people seemed to notice the change. In fact, Don Reeb, an economist heavily involved in drafting the law, discovered that no one attending a local Chamber of Commerce meeting was aware of the tax change. Reeb surmised that these business owners were not alerted by an increase in their property tax bill since property taxes are so small relative to the businesses' value of sales. The Amsterdam assessor claimed that only three of Amsterdam's 20,000 residents contacted the assessor's office to ask questions about the tax change.

Along with cities and towns that switched to the split-rate tax over the years, there are at least two U.S. towns that were founded on Henry George's tax principles. As Woolery (1982) explains, Fairhope, Ala., was founded in 1894 on the premise that all public revenues would be derived from land taxes. The original founders formed the Fairhope Single Tax Corporation, which owned and managed the land through leases rather than issuing deeds. As the need for public services increased, so did the necessary rent charged to the lessees. This led to disputes that more than once ended in court. The corporation has faced many lawsuits, including a case it appealed to the Alabama Supreme Court over the legality of the Fairhope Single Tax Corporation. Surviving these, Fairhope struck oil in the late 1970s. With the prospects of oil income from the land, the corporation may no longer need rental income to support public outlays, thus diverting the experiment away from a test of the George idea.

Arden, Del., also was founded on Henry George's tax principles (Wiencek, 1992). Frank Stephens, a sculptor and businessman, spent seven years as a lieutenant for George, working to bring the single tax movement into the American political realm. Following a failed attempt to elect Georgist politicians in the 1896 congressional races across the state of Delaware and George's death in 1897, Stephens returned to Delaware in 1900 to buy a 162-acre farm north of Wilmington.

On this land he formed Arden as a single tax community. Arden's deed established that no property would be owned privately; instead, the land would be held in trust by three trustees and leased to residents in 99-year leases. Residents would pay an annual land rent based on the value of the parcel they occupy, as determined by elected assessors. This land rent would be the "single tax" used to fund the community. Architect and single-tax apostle Will Price designed the community, allocating nearly half the land to forests, paths, and roads. The community, once founded, attracted a unique group of residents who were not required to pledge faith in the teachings of George. Artisans, woodworkers, authors, and poets of all political persuasions moved into the community. They found the cost of residency low since they were not allowed to buy land, but only needed to build a modest dwelling and pay the annual land tax.

INTERNATIONAL EXPERIENCE

In Denmark, as early as 1844, the national property tax was assessed on the value of the land but not the improvements on the land. The site-value property tax was abolished in 1903 and replaced with a flat-rate tax on the total value of land and improvements. However, this tax change hurt the many small farmers in Denmark who had invested heavily in improvements but had limited holdings of land. These farmers joined together to lobby for a return to the site-value tax. In 1922, legislation was introduced to split the national land tax into a composite-rate or graded tax. Today, all cities in Denmark use a graded property tax (Center for the Study of Economics). The effects of a graded tax on development have not been studied extensively in Denmark despite the widespread use of the graded tax because the proportion of overall revenues raised by the property tax has decreased with time (Silagi, 1994).

Australia has experimented extensively with the graded tax (Edwards, 1984). A federal land tax was initiated in 1911 and then revoked in 1952. Prior to 1976, all of the states in Australia taxed property based on the value of the unimproved land. Today, all but the state of Tasmania continue to use a land tax, although the revenue raised by the states is relatively small.

Many of the local governments in Australia also use variants of the graded tax. The Sydney City Council, for example, began levying a tax on the unimproved value of land in 1916 (Archer, 1972). The tax is proportional, and the rate is determined annually to meet the budgetary needs of the city. Valuation of land is based on fair market value, which implies that it is based on the property's value in its highest potential use, not on its value in its current use. This is in contrast to methods employed in the United States, where typically site value is assessed as the "land value proportion of the current market value of an improved property" (Archer, 1972, p. 23). Assessments rely on market data that include sales evidence. Sales of

both vacant land and of parcels for redevelopment serve to reveal unimproved capital values of land.

Lusht (1992) and Flaherty and Lusht (1996) studied the effects of land-value taxation in Australia by looking at economic development among the municipalities in the Melbourne statistical district. In 1919, municipalities were granted the choice among property tax bases, including land values, a variation of capital value, or a combination of the two. The freedom to choose a property tax base did lead to some early switches, but few changes have happened since the 1960s. By 1991, 27 of the 56 municipalities in the district were using land taxation, 28 were using capital-value taxation, and one used a combination of the two tax bases. Both studies focused on 28 of the municipalities that were classified as containing "substantial land available for residential development," 15 with land-value taxation and the other 13 with a flat-rate tax on both land and improvements. Lusht looked at economic development among the municipalities in the Melbourne statistical district. Comparing the municipalities, he found those using a land tax were located closer to the center of the city and had residents with slightly higher income. Controlling for these differences, his time-series analysis showed that those areas with land-value taxation had higher rates of residential development over the 1983–1987 period. Flaherty and Lusht compared the selling prices of residential lots and the stocks and flows of residential development for this cross-section of municipalities. The authors could not clearly identify the effect of a land-value tax on the selling price of lots. The inability to show a relationship between the tax used and lot values can be explained as the combination of capitalization of the land tax decreasing prices and the favorable tax treatment of improvements increasing prices. Their study showed that those areas with land-value taxation had more dense residential development and a larger stock, but they found no association between land-value taxation and residential flows for 1990–1993.

A number of countries in Africa, including South Africa use some form of land-value taxation. The new South African constitution, passed in 1996, restricts the means by which local governments can raise revenue to property taxes, excise taxes, and utility charges. South African law allows local governments to choose between a flat-rating approach, a composite-rating approach, or a site-rating approach. Flat-rating entails levying an equal tax rate on both the value of the land and the improvements built on the land (and is thus equivalent to the standard property tax in the United States). Composite-rating entails levying different tax rates on the land and improvements (i.e., it is a graded tax), where the improvements are usually taxed at a lower rate. Site-rating entails levying a tax only on land.

A study carried out by Michael Bell and John Bowman (1997) presents an interesting analysis of property taxes in many jurisdictions within South Africa.

Johannesburg currently uses a site-rating approach. The Greater Johannesburg Transitional Metropolitan Council expected nearly 23 percent of its revenue for 1995–1996 to come from the property rate. Land-value assessments are based on the status of the land as either nonincome-producing or income-producing. For nonincome-producing, or residential, property both improved value and land value are assessed. The latter is assessed by "relating a number of sales in a particular township to a hypothetical stand of 1,000 square meters using land conversion factors and then adjusting this value by the percentage positive and negative land attributes unique to that particular stand" (Bell and Bowman, 1997, page 51). For income-producing property, assessment of land value is based on "fair market value," where comparable sales at comparable times are used to capture the market value of the land in question.

The city of Cape Town currently uses a flat-rating approach but has plans to change to a site-rating approach. In 1991, the city council appointed a Committee of Enquiry to study the benefits of site-rating. The committee recommended a goal "to attain a ratio of 10:1 in favor of the rating of land as against improvements" (Bell and Bowman, 1997, page 98). Despite the recommendation for composite-rating, for political reasons the city council decided to first value sites and implement the tax on land. As local jurisdictions are integrated with the end of apartheid, new areas are being brought under Cape Town's jurisdiction. Many of these areas are former black local authorities, where prior to the mid-1990s, blacks were forbidden to own much of the land. Without ownership, no local government in the past could levy a property tax, so the properties had never been assessed. Now that ownership is allowed, the city must assess values before it can tax the properties, a process that requires time and money. Leaders believe that the time necessary to assess the values of improvements and land may undermine the legitimacy of existing property taxes if existing assessments, which were done in 1979, become grossly out of date while the new areas are considered. Clearly, the city is in a transitional stage in its development of property taxation as a revenue source.

From 1903 to 1913, Canada introduced site-value taxation in the western provinces in an effort to encourage the breakup of large areas of land held by absentee owners, to prevent land speculation, and to spur construction (Kitchen, 1995). Assessments reflected the highest and best use of the land in question. Provinces have since relinquished the property tax to the municipalities. Today, cities in the four western provinces either exempt improvements from the property tax base or record the improvements on the assessment roll at a percentage of their full value (Perry, 1990). The most common levels at which improvements are assessed is three-fifths to two-thirds of the full value. Both Quebec and Newfoundland require separate assessments of land and improvements, even though the provinces levy a flat-rate property tax.

The incidence of a graded property tax in the District of Columbia

Our chapter to this point has focused largely on some of the efficiency issues surrounding the graded property tax. But efficiency is clearly not the only criterion one should use in the evaluation of tax policy. The incidence of a tax is also an important issue. Here we offer some evidence on a fundamental question: Who would bear the burden of a split-rate property tax in the District? Two earlier studies have looked at this problem: The Department of Finance and Revenue's (DFR; now the Office of Tax and Revenue) 1994 study *The Impact of a Split-Rate Property Tax in the District of Columbia* and the Pro-Housing Property Tax Coalition's 1991 study *Real Property Tax Rates for Tax Year 1992*. They offer strikingly different views on the incidence of a graded property tax. The DFR report concludes that a move to a split-rate tax would "shift property taxes burdens generally onto residential property owners and away from other property uses" (page 1); the Coalition finds that a split-rate tax would reduce taxes on owner-occupied housing by 12 percent. Our hope here is to shed some light on the key issues that lead to such different conclusions.

Our analysis is based on DFR data on real property assessments by neighborhood and class.[11] These data include separate assessments of the value of land and improvements and allow us to evaluate the impact of a split-rate tax. There are at least two important limitations to our analysis. First, while we can have confidence in the assessed valuation of the sum of improvements and land, it is unclear how much faith we can place in the accuracy of the separate assessment of land and improvements. Under current District tax policy, land and structures are taxed at the same rate and thus it would make little sense for the District to put a great deal of effort into developing accurate measures of land values; for all practical purposes it makes no difference if we think of a $100,000 property as $25,000 of land and $75,000 of structures or $75,000 of land and $25,000 of structures. If the District did adopt a graded tax, it would need to determine land values much more carefully and it is quite possible that, as a consequence, our view of the distribution of the burden of the tax could change significantly. Nonetheless, we proceed as though the valuations of land and structures are accurate. Second, we focus on the statutory incidence of a graded tax but do not consider the economic incidence of the tax. That is, we have not tried to estimate the extent to which the burden of a graded tax would be shifted.

Our analysis proceeds along the following lines. We have data on the number of parcels, the assessed value of land, and the assessed value of improvements for each of the District's five classes of property and each of the District's neighborhoods. We begin by examining current tax policy. To do so, we calculate property taxes for each class and neighborhood given current tax rates. As shown in the first panel of Figure G-5, current tax rates in the District range from 0.96 percent for owner-

Figure C-4

Summary of Alternative Tax Policies

BASELINE

ALTERNATIVE ONE
- Land tax
- Eliminate classification
- Eliminate homestead exemption

ALTERNATIVE TWO
- Equal tax rate on land and improvements
- Eliminate classification
- Eliminate homestead exemption

ALTERNATIVE THREE
- Graded tax
- Land taxed twice as heavily as improvements
- Tax rates changed by the same proportion for all classes
- $10,000 homestead exemption for land
- $20,000 homestead exemption for improvements

ALTERNATIVE FOUR
- Land tax
- Tax liability held constant for each class
- $10,000 homestead exemption for land
- $20,000 homestead exemption for improvements

ALTERNATIVE FIVE
- Graded tax
- Land taxed twice as heavily as improvements
- Tax liability held constant for each class
- $10,000 homestead exemption for land
- $20,000 homestead exemption for improvements

occupied housing (Class 1) to 5 percent for vacant property (Class 5). Since the District has a traditional property tax, the tax rate on improvements and land in the

first panel of Figure G-5 is the same. Our calculations of tax revenues reflect the $30,000 homestead exemption but do not reflect special provisions for senior citizens. Throughout this chapter we refer to these estimates of tax liabilities under current tax policy as the Baseline.

We then examine five alternative policies. All five alternatives raise the same revenue as the Baseline, and thus our analysis is best thought of as an example of *differential* tax analysis where we compare the effects of a possible tax change *relative* to those of current policy. We summarize each alternative in Figure G-4 and for each alternative we present the required equal yield tax rates in Figure G-5, relative tax revenues for all of the District for each of the five classes of property in Figure G-6, and relative tax revenues for each neighborhood and each property class in Figures G-7–G-11. We also present a set of maps (Figures G-12, G-13, and G-14) that summarize the information on owner-occupied housing from Figure G-7.

As Figure G-4 shows, Alternative One is a pure land tax: Structures are not taxed, all revenue is raised by taxing land, and all land is taxed at the same rate regardless of its current use. Taxing all land at the same rate requires the elimination of classification and the homestead exemption. Alternative One is very similar to DFR's "split-rate tax" (Department of Finance and Revenue, 1994, p. 16). The DFR analysis is based on a tax rate of 5 percent, chosen so as to avoid cutting taxes on vacant (i.e., Class 5) property. As DFR explains, a 5 percent land tax raises significantly more revenue than does the District's current property tax system. Our analysis is based on a land tax of 3.67 percent (Figure G-5), which is the equal yield tax rate.

Figure G-6 shows clearly that this land tax would shift a significant portion of the burden of the property tax from the owners of rental residential and nonresidential property to homeowners. All of the entries in Figure G-6 are index numbers that show tax revenues from an alternative relative to a second tax policy. The first panel of Figure G-6 shows tax burdens for Alternative One for each class of property relative to the Baseline. The first entry in that table of 151.7 implies that owner-occupied housing (Class 1) would pay 51.7 percent higher taxes under Alternative One than under the Baseline. Taxes for all other classes of property would fall.

At first blush, it might seem that these results mean that shifting taxes from structures to land would always harm homeowners. We would argue that a somewhat different interpretation would be more helpful. The key issue here is the District's classified property tax. Under current policy, homeowners face a tax rate that is less than half the rate on commercial property (Figure G-5). A pure land tax does two things: it shifts the burden from structures to land, and it taxes all properties at the same rate and thus requires the end of classification. The uniform taxation of all property does harm homeowners, but shifting the tax from structures to land does not.

Figure C-5

Tax Rates Under the Baseline and Five Alternatives*

Tax Rates in Percentages

BASELINE

	Improvements	Land
Class 1	0.96%	0.96%
Class 2	1.54	1.54
Class 3	1.85	1.85
Class 4	2.15	2.15
Class 5	5.00	5.00

ALTERNATIVE ONE

	Improvements	Land
Class 1	0.00%	3.67%
Class 2	0.00	3.67
Class 3	0.00	3.67
Class 4	0.00	3.67
Class 5	0.00	3.67

ALTERNATIVE TWO

	Improvements	Land
Class 1	1.53%	1.53%
Class 2	1.53	1.53
Class 3	1.53	1.53
Class 4	1.53	1.53
Class 5	1.53	1.53

ALTERNATIVE THREE

	Improvements	Land
Class 1	0.66%	1.32%
Class 2	1.06	2.12
Class 3	1.27	2.54
Class 4	1.48	2.95
Class 5	3.44	6.87

ALTERNATIVE FOUR

	Improvements	Land
Class 1	0.00%	2.91%
Class 2	0.00	4.78
Class 3	0.00	3.95
Class 4	0.00	4.10
Class 5	0.00	5.20

ALTERNATIVE FIVE

	Improvements	Land
Class 1	0.72%	1.44%
Class 2	1.16	2.33
Class 3	1.26	2.52
Class 4	1.41	2.82
Class 5	2.55	5.10

Note: Class 1 — Residential, Owner-Occupied; Class 2 — Residential, Tenant-Occupied; Class 3 — Hotel and Motel; Class 4 — Commercial; Class 5 — Vacant Land.

**See Figure G-4 for a description of the Baseline and five alternatives.*

Alternative Two is designed to make this point clear. As Figure G-4 explains, Alternative Two is a standard property tax that taxes land and improvements at the same rate. It eliminates classification and the homestead exemption, and thus treats property in all classes equally. Alternative Two would require an equal yield tax rate of 1.53 percent (Figure G-5). As Figure G-6 shows, a standard property tax without classification would impose a much higher burden on homeowners than would a pure land tax. The third panel of that table shows tax burdens under Alternative One (the pure land tax) relative to Alternative Two (the standard property tax with-

Figure G-6

Tax Revenues by Class Under the Five Alternatives
Relative to Current Law
(Baseline = 100)

ALTERNATIVE ONE/BASELINE	
Class 1	151.7
Class 2	76.7
Class 3	92.8
Class 4	89.5
Class 5	70.6

ALTERNATIVE TWO/BASELINE	
Class 1	190.9
Class 2	99.2
Class 3	82.5
Class 4	71.0
Class 5	30.5

ALTERNATIVE THREE/BASELINE	
Class 1	79.5
Class 2	90.8
Class 3	100.9
Class 4	104.8
Class 5	134.8

ALTERNATIVE FOUR /BASELINE	
Class 1	100.0
Class 2	100.0
Class 3	100.0
Class 4	100.0
Class 5	100.0

ALTERNATIVE FIVE/BASELINE	
Class 1	100.0
Class 2	100.0
Class 3	100.0
Class 4	100.0
Class 5	100.0

Note: Class 1 — Residential, Owner-Occupied; Class 2 — Residential, Tenant-Occupied; Class 3 — Hotel and Motel; Class 4 — Commercial; Class 5 — Vacant Land.
**See Figure G-4 for a description of the Baseline and five alternatives.*

out classification). As Figure G-6 shows, homeowners would pay 20.5 percent lower taxes under the land tax. Thus, while it is true that District homeowners would pay higher taxes under a pure land tax than under current tax policy, it is the end of classification and not the shift of taxes from structures to land that leads to this result. Homeowners would in fact be better off under a pure land tax than they would be under a traditional property tax with uniform tax rates.

Would it be possible to design a tax system that shifts more of the burden from structures to land but avoids raising the tax burden on homeowners? The answer is "yes," and we present several possibilities below. But before doing so, it is important

Figure C-7

Class I: Residential, Owner-Occupied

Relative Property Tax Revenues by Neighborhood for Selected Alternatives (Baseline = 100)

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
1	American University Park	174.0	97.3	126.1	106.5
2	Anacostia	135.6	77.1	37.0	84.3
3	Barry Farms	150.8	79.6	48.1	87.1
4	Berkley	147.7	94.0	111.2	102.8
5	Brentwood	201.9	92.2	103.6	100.9
6	Brightwood	136.7	87.1	80.9	95.3
7	Brookland	144.7	86.5	78.4	94.6
8	Burleith	119.1	87.9	84.5	96.2
9	Capitol Hill	169.9	95.5	118.0	104.5
10	Central	138.0	87.6	83.2	95.8
11	Chevy Chase	157.1	94.5	113.7	103.4
12	Chillum	154.5	89.4	91.1	97.8
13	Cleveland Park	139.1	91.0	98.3	99.6
14	Colonial Village	145.5	92.8	106.0	101.5
15	Columbia Heights	168.9	89.6	92.2	98.1
16	Congress Heights	148.9	82.1	59.0	89.8
17	Crestwood	156.7	94.3	112.9	103.2
18	Deanwood	159.1	83.4	64.7	91.2
19	Eckington	181.0	88.8	88.8	97.2
20	Foggy Bottom	117.9	87.7	83.5	95.9
21	Forest Hill	168.3	96.5	122.3	105.5
22	Fort Dupont Park	135.9	82.8	62.0	90.6
23	Foxhall	154.6	93.9	110.9	102.7
24	Garfield	158.8	94.0	111.5	102.9
25	Georgetown	142.9	92.5	104.7	101.2
26	Glover Park	167.7	93.0	107.0	101.7
27	Hawthorne	183.4	99.2	134.5	108.6
28	Hillcrest	165.1	89.6	92.2	98.1
29	Kalorama	106.5	85.5	74.0	93.6
30	Kent	142.1	92.8	106.0	101.5
31	Ledroit Park	191.0	94.6	114.0	103.5

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
32	Lily Ponds	155.2	84.3	68.8	92.2
33	Marshall Heights	143.3	77.1	37.0	84.4
34	Mass. Avenue Heights	128.5	91.2	99.1	99.8
35	Michigan Park	161.9	92.2	103.3	100.8
36	Mt. Pleasant	115.6	85.2	72.6	93.2
37	North Cleveland Park	153.9	94.1	112.0	103.0
38	Observatory Circle	129.0	89.1	90.0	97.5
39	Old City #1	231.5	102.5	149.0	112.2
40	Old City #2	154.8	90.2	94.6	98.7
41	Palisades	144.8	91.8	101.9	100.5
42	Petworth	150.9	86.8	79.6	94.9
43	Randle Heights	141.5	80.8	53.4	88.4
44	R.L.A. (N.E.)	–	–	–	–
45	R.L.A. (N.W.)	233.6	90.6	96.3	99.1
46	R.L.A. (S.W.)	117.9	82.8	61.9	90.5
47	Riggs Park	115.4	81.8	57.5	89.4
48	Shepherd Park	132.9	89.2	90.1	97.6
49	16th Street Heights	189.5	97.3	126.0	106.5
50	Spring Valley	131.0	91.1	98.7	99.7
51	Takoma Park	128.7	84.7	70.6	92.7
52	Trinidad	198.3	90.9	97.7	99.4
54	Wesley Heights	124.6	87.8	84.0	96.0
55	Woodley	176.6	99.1	133.7	108.4
56	Woodridge	216.9	98.0	129.2	107.2
66	National Training School	85.6	74.0	23.2	80.9
68	Airfield and Research	–	–	–	–
69	D.C. Village	–	–	–	–
	Others	272.6	109.0	177.5	119.3

Note: Missing numbers occur for neighborhoods with no properties in the relevant class.

to emphasize one point. As we argued above, a key feature of a pure land tax is neutrality; it does not distort anyone's economic decisions. A hybrid graded tax coupled with classification will clearly not be neutral; if we tax some uses at higher rates than others, then some land will be devoted to uses that are taxed relatively lightly. There might be excellent reasons on equity grounds to maintain classification, but the marriage of a land tax with property tax rates that vary across uses takes tax policy in two very different directions at the same time.

Figure C-8

Class 2: Residential, Tenant-Occupied

Relative Property Tax Revenues by Neighborhood for Selected Alternatives (Baseline = 100)

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
1	American University Park	95.7	96.3	124.7	106.0
2	Anacostia	57.3	85.2	74.7	93.8
3	Barry Farms	64.2	87.2	83.7	96.0
4	Berkley	133.1	107.1	173.5	117.9
5	Brentwood	102.7	98.3	133.9	108.3
6	Brightwood	69.1	88.6	90.0	97.6
7	Brookland	64.6	87.3	84.2	96.1
8	Burleith	78.3	91.3	102.0	100.5
9	Capitol Hill	82.3	92.4	107.2	101.8
10	Central	77.7	91.1	101.2	100.3
11	Chevy Chase	83.7	92.8	109.1	102.2
12	Chillum	71.7	89.4	93.4	98.4
13	Cleveland Park	68.5	88.5	89.3	97.4
14	Colonial Village	85.4	93.3	111.3	102.7
15	Columbia Heights	73.0	89.8	95.1	98.8
16	Congress Heights	54.1	84.3	70.5	92.8
17	Crestwood	90.9	94.9	118.4	104.5
18	Deanwood	64.8	87.4	84.5	96.2
19	Eckington	71.8	89.4	93.5	98.4
20	Foggy Bottom	84.3	93.0	109.8	102.4
21	Forest Hill	75.2	90.4	98.0	99.5
22	Fort Dupont Park	61.8	86.5	80.5	95.2
23	Foxhall	90.7	94.9	118.1	104.4
24	Garfield	63.0	86.9	82.1	95.6
25	Georgetown	85.2	93.3	111.0	102.7
26	Glover Park	83.7	92.9	109.1	102.2
27	Hawthorne	115.7	102.1	150.8	112.4
28	Hillcrest	72.6	89.6	94.6	98.7
29	Kalorama	66.0	87.8	86.1	96.6
30	Kent	78.6	91.4	102.4	100.6
31	Ledroit Park	85.8	93.4	111.8	102.9

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
32	Lily Ponds	64.3	87.3	83.8	96.1
33	Marshall Heights	53.1	84.0	69.2	92.5
34	Mass. Avenue Heights	100.5	97.7	130.9	107.5
35	Michigan Park	82.8	92.6	107.8	101.9
36	Mt. Pleasant	72.8	89.7	94.9	98.8
37	North Cleveland Park	81.0	92.1	105.5	101.3
38	Observatory Circle	61.2	86.3	79.7	95.0
39	Old City #1	102.9	98.4	134.0	108.3
40	Old City #2	76.7	90.8	99.9	100.0
41	Palisades	72.6	89.6	94.6	98.7
42	Petworth	76.2	90.7	99.2	99.8
43	Randle Heights	48.6	82.7	63.3	91.0
44	R.L.A. (N.E.)	–	–	–	–
45	R.L.A. (N.W.)	110.0	100.4	143.4	110.6
46	R.L.A. (S.W.)	81.2	92.1	105.8	101.4
47	Riggs Park	52.7	83.9	68.6	92.4
48	Shepherd Park	74.3	90.1	96.8	99.2
49	16th Street Heights	84.8	93.2	110.5	102.6
50	Spring Valley	69.2	88.7	90.2	97.6
51	Takoma Park	64.5	87.3	84.1	96.1
52	Trinidad	90.3	94.7	117.6	104.3
53	Wakefield	74.6	90.2	97.2	99.3
54	Wesley Heights	59.9	86.0	78.0	94.6
55	Woodley	91.5	95.1	119.2	104.7
56	Woodridge	93.8	95.8	122.2	105.4
66	National Training School	45.1	81.7	58.8	90.0
68	Airfield and Research	–	–	–	–
69	D.C. Village	–	–	–	–
	Others	83.4	92.8	108.7	102.1

Note: Missing numbers occur for neighborhoods with no properties in the relevant class.

There are at least two ways to implement a split-rate tax while trying to treat all classes of property equally. Alternative Three is a graded tax where land is taxed at twice the rate as that on structures.[12] Tax rates in all classes are changed by the same proportion; in particular, as the fourth panel of Figure G-5 shows, the tax rate on improvements is 31 percent lower under Alternative Three than under the Baseline (i.e., current tax policy in the District) and the tax rate on land is 38 percent higher.

Figure C-9

Class 3: Hotel and Motel

Relative Property Tax Revenues by Neighborhood for Selected Alternatives (Baseline = 100)

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
1	American University Park	–	–	–	–
2	Anacostia	188.8	134.1	203.4	133.0
3	Barry Farms	61.5	90.0	66.3	89.2
4	Berkley	–	–	–	–
5	Brentwood	102.9	104.4	110.9	103.5
6	Brightwood	62.3	90.3	67.1	89.5
7	Brookland	136.6	116.0	147.1	115.0
8	Burleith	–	–	–	–
9	Capitol Hill	52.2	86.8	56.3	86.1
10	Central	98.4	102.8	106.0	101.9
11	Chevy Chase	58.8	89.1	63.3	88.3
12	Chillum	–	–	–	–
13	Cleveland Park	–	–	–	–
14	Colonial Village	–	–	–	–
15	Columbia Heights	64.4	91.0	69.3	90.2
16	Congress Heights	40.2	82.6	43.3	81.9
17	Crestwood	–	–	–	–
18	Deanwood	179.9	131.1	193.9	129.9
19	Eckington	187.8	133.8	202.4	132.6
20	Foggy Bottom	95.4	101.8	102.8	100.9
21	Forest Hill	–	–	–	–
22	Fort Dupont Park	–	–	–	–
23	Foxhall	–	–	–	–
24	Garfield	48.3	85.4	52.0	84.7
25	Georgetown	77.0	95.4	83.0	94.6
26	Glover Park	–	–	–	–
27	Hawthorne	–	–	–	–
28	Hillcrest	198.2	137.4	213.5	136.2
29	Kalorama	98.5	102.9	106.2	102.0
30	Kent	–	–	–	–
31	Ledroit Park	56.3	88.2	60.7	87.5

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
32	Lily Ponds	–	–	–	–
33	Marshall Heights	–	–	–	–
34	Mass. Avenue Heights	71.7	93.6	77.3	92.7
35	Michigan Park	–	–	–	–
36	Mt. Pleasant	70.1	93.0	75.5	92.2
37	North Cleveland Park	43.5	83.8	46.9	83.1
38	Observatory Circle	93.3	101.0	100.5	100.1
39	Old City #1	95.2	101.7	102.6	100.8
40	Old City #2	130.6	114.0	140.7	113.0
41	Palisades	–	–	–	–
42	Petworth	–	–	–	–
43	Randle Heights	198.2	137.4	213.5	136.2
44	R.L.A. (N.E.)	–	–	–	–
45	R.L.A. (N.W.)	–	–	–	–
46	R.L.A. (S.W.)	80.4	96.6	86.6	95.7
47	Riggs Park	–	–	–	–
48	Shepherd Park	–	–	–	–
49	16th Street Heights	16.8	74.5	18.1	73.9
50	Spring Valley	–	–	–	–
51	Takoma Park	102.9	104.4	110.8	103.5
52	Trinidad	196.7	136.9	211.9	135.7
53	Wakefield	–	–	–	–
54	Wesley Heights	–	–	–	–
55	Woodley	–	–	–	–
56	Woodridge	121.4	110.8	130.7	109.8
66	National Training School	–	–	–	–
68	Airfield and Research	–	–	–	–
69	D.C. Village	–	–	–	–
	Others	–	–	–	–

Note: Missing numbers occur for neighborhoods with no properties in the relevant class.

Alternative Three is very similar to the proposal in the Pro-Housing Property Tax Coalition's 1991 study and DFR's "modified classified split-rate tax."[13]

As the fourth panel of Figure G-6 shows, taxes on Class 1 and Class 2 property under Alternative Three would be 9 percent lower than under the Baseline and taxes on commercial property would be 5 percent higher. The second column of Figure G-7 and Figure G-12 presents tax burdens on owner-occupied homes for

Figure C-10

Class 4: Commercial

Relative Property Tax Revenues by Neighborhood for Selected Alternatives (Baseline = 100)

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
1	American University Park	95.0	106.9	106.1	102.1
2	Anacostia	46.1	87.3	51.4	83.3
3	Barry Farms	70.8	97.2	79.1	92.8
4	Berkley	124.2	118.7	138.8	113.3
5	Brentwood	75.5	99.1	84.3	94.6
6	Brightwood	89.0	104.6	99.4	99.8
7	Brookland	64.5	94.7	72.0	90.4
8	Burleith	126.7	119.7	141.5	114.3
9	Capitol Hill	51.1	89.3	57.1	85.2
10	Central	96.0	107.4	107.2	102.5
11	Chevy Chase	85.5	103.1	95.5	98.4
12	Chillum	81.1	101.4	90.6	96.8
13	Cleveland Park	58.5	92.3	65.3	88.1
14	Colonial Village	170.6	137.4	190.5	131.2
15	Columbia Heights	67.3	95.8	75.1	91.4
16	Congress Heights	41.5	85.4	46.4	81.5
17	Crestwood	170.6	137.4	190.5	131.2
18	Deanwood	64.3	94.6	71.8	90.3
19	Eckington	76.4	99.5	85.4	95.0
20	Foggy Bottom	96.0	107.4	107.2	102.5
21	Forest Hill	86.7	103.6	96.8	98.9
22	Fort Dupont Park	96.2	107.4	107.4	102.5
23	Foxhall	123.2	118.3	137.6	112.9
24	Garfield	67.5	95.9	75.4	91.5
25	Georgetown	93.4	106.3	104.3	101.5
26	Glover Park	88.2	104.2	98.6	99.5
27	Hawthorne	170.6	137.4	190.5	131.2
28	Hillcrest	99.6	108.8	111.2	103.9
29	Kalorama	107.3	111.9	119.8	106.8
30	Kent	102.5	110.0	114.5	105.0
31	Ledroit Park	69.7	96.8	77.8	92.4

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
32	Lily Ponds	95.3	107.1	106.4	102.2
33	Marshall Heights	48.2	88.1	53.9	84.1
34	Mass. Avenue Heights	119.6	116.9	133.6	111.6
35	Michigan Park	73.2	98.2	81.7	93.7
36	Mt. Pleasant	83.3	102.3	93.0	97.6
37	North Cleveland Park	69.3	96.6	77.4	92.2
38	Observatory Circle	89.4	104.7	99.8	99.9
39	Old City #1	90.6	105.2	101.2	100.4
40	Old City #2	92.9	106.1	103.8	101.3
41	Palisades	52.5	89.9	58.7	85.8
42	Petworth	52.4	89.8	58.6	85.7
43	Randle Heights	46.1	87.3	51.5	83.3
44	R.L.A. (N.E.)	77.2	99.8	86.2	95.3
45	R.L.A. (N.W.)	44.3	86.5	49.5	82.6
46	R.L.A. (S.W.)	65.0	94.9	72.6	90.6
47	Riggs Park	92.1	105.8	102.8	101.0
48	Shepherd Park	99.0	108.6	110.5	103.6
49	16th Street Heights	69.7	96.8	77.9	92.4
50	Spring Valley	108.4	112.4	121.1	107.3
51	Takoma Park	57.9	92.0	64.6	87.8
52	Trinidad	76.4	99.5	85.3	94.9
53	Wakefield	112.6	114.1	125.8	108.9
54	Wesley Heights	92.6	106.0	103.4	101.2
55	Woodley	170.6	137.4	190.5	131.2
56	Woodridge	79.9	100.9	89.3	96.3
66	National Training School	–	–	–	–
68	Airfield and Research	170.6	137.4	190.5	131.2
69	D.C. Village	143.3	126.4	160.0	120.7
	Others	101.6	109.6	113.5	104.6

Note: Missing numbers occur for neighborhoods with no properties in the relevant class.

each neighborhood. Here again, all of the data are index numbers and show tax liabilities under Alternative Three relative to the Baseline. Thus, for example, Figure G-7 shows that homes in American University Park would face taxes under Alternative Three that are 97.3 percent of the taxes they face under current tax policy. Figures G-7 and G-12 suggest that the benefits from this shift to a graded tax would be widespread. Taxes would fall by 15 percent or more in 12 neighborhoods,

Figure C-11

Class 5: Vacant Land

Relative Property Tax Revenues by Neighborhood for Selected Alternatives (Baseline = 100)

	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
1	American University Park	73.3	137.4	103.9	101.9
2	Anacostia	40.8	106.9	57.9	79.3
3	Barry Farms	65.5	130.1	92.8	96.5
4	Berkley	73.3	137.4	103.9	101.9
5	Brentwood	73.3	137.4	103.9	101.9
6	Brightwood	73.3	137.4	103.9	101.9
7	Brookland	71.2	135.4	100.9	100.5
8	Burleith	73.3	137.4	103.9	101.9
9	Capitol Hill	57.7	122.8	81.8	91.1
10	Central	73.3	137.4	103.9	101.9
11	Chevy Chase	73.3	137.4	103.9	101.9
12	Chillum	73.3	137.4	103.9	101.9
13	Cleveland Park	73.3	137.4	103.9	101.9
14	Colonial Village	73.3	137.4	103.9	101.9
15	Columbia Heights	67.0	131.4	94.9	97.5
16	Congress Heights	73.3	137.4	103.9	101.9
17	Crestwood	73.3	137.4	103.9	101.9
18	Deanwood	70.9	135.1	100.4	100.2
19	Eckington	41.8	107.9	59.3	80.0
20	Foggy Bottom	73.3	137.4	103.9	101.9
21	Forest Hill	73.3	137.4	103.9	101.9
22	Fort Dupont Park	73.3	137.4	103.9	101.9
23	Foxhall	73.3	137.4	103.9	101.9
24	Garfield	73.3	137.4	103.9	101.9
25	Georgetown	73.3	137.4	103.9	101.9
26	Glover Park	73.3	137.4	103.9	101.9
27	Hawthorne	73.3	137.4	103.9	101.9
28	Hillcrest	73.3	137.4	103.9	101.9
29	Kalorama	48.1	113.7	68.1	84.4
30	Kent	73.3	137.4	103.9	101.9
31	Ledroit Park	35.7	102.1	50.6	75.7

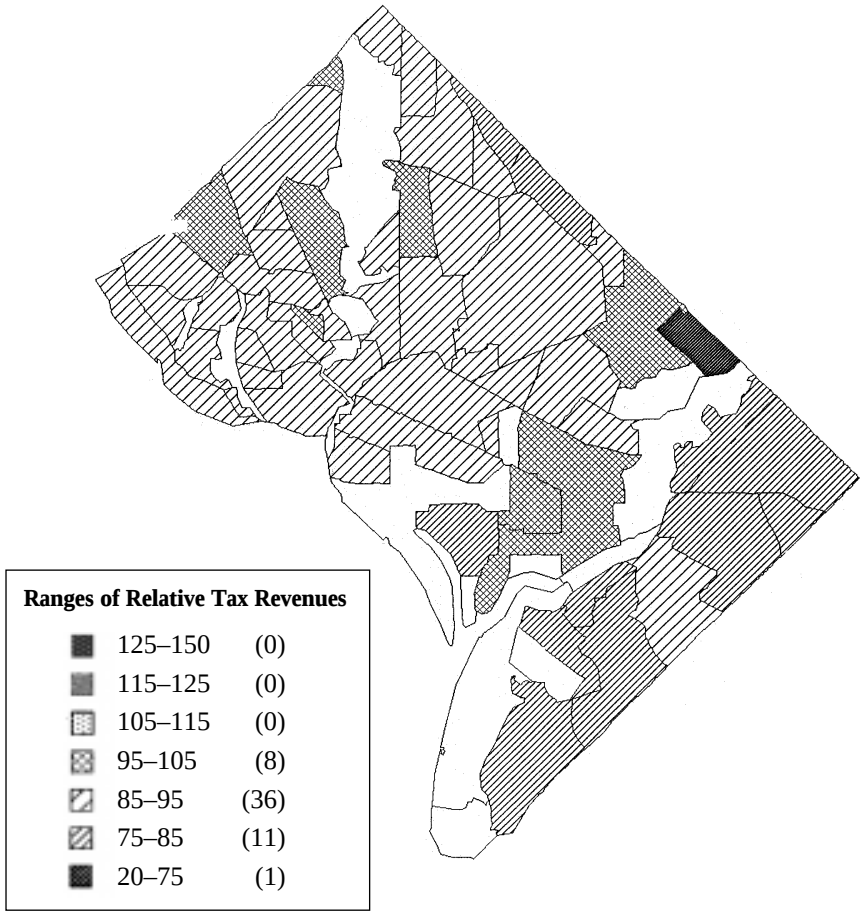
	Neighborhood	Alt. One	Alt. Three	Alt. Four	Alt. Five
32	Lily Ponds	73.3	137.4	103.9	101.9
33	Marshall Heights	63.0	127.7	89.2	94.7
34	Mass. Avenue Heights	73.3	137.4	103.9	101.9
35	Michigan Park	–	–	–	–
36	Mt. Pleasant	61.1	126.0	86.6	93.4
37	North Cleveland Park	73.3	137.4	103.9	101.9
38	Observatory Circle	73.3	137.4	103.9	101.9
39	Old City #1	73.3	137.4	103.9	101.9
40	Old City #2	72.9	137.0	103.3	101.6
41	Palisades	73.3	137.4	103.9	101.9
42	Petworth	69.1	133.4	97.9	99.0
43	Randle Heights	69.6	133.9	98.6	99.3
44	R.L.A. (N.E.)	73.3	137.4	103.9	101.9
45	R.L.A. (N.W.)	–	–	–	–
46	R.L.A. (S.W.)	73.3	137.4	103.9	101.9
47	Riggs Park	73.3	137.4	103.9	101.9
48	Shepherd Park	73.3	137.4	103.9	101.9
49	16th Street Heights	73.3	137.4	103.9	101.9
50	Spring Valley	73.3	137.4	103.9	101.9
51	Takoma Park	73.3	137.4	103.9	101.9
52	Trinidad	52.0	117.4	73.6	87.1
53	Wakefield	73.3	137.4	103.9	101.9
54	Wesley Heights	73.3	137.4	103.9	101.9
55	Woodley	–	–	–	–
56	Woodridge	73.0	137.0	103.4	101.6
66	National Training School	–	–	–	–
68	Airfield and Research	–	–	–	–
69	D.C. Village	73.3	137.4	103.9	101.9
	Others	73.3	137.4	103.9	101.9

Note: Missing numbers occur for neighborhoods with no properties in the relevant class.

fall by 5 percent to 10 percent in 36 neighborhoods, and remain roughly unchanged in the remaining eight neighborhoods. Tax decreases would be large in Anacostia and surrounding neighborhoods (Figure G-12), and thus there is at least some evidence that low-income homeowners would enjoy a significant part of the benefits from a split-rate tax.

Figure C-12

Alternative Three: Relative Property Tax Revenues by Neighborhood for Class 1

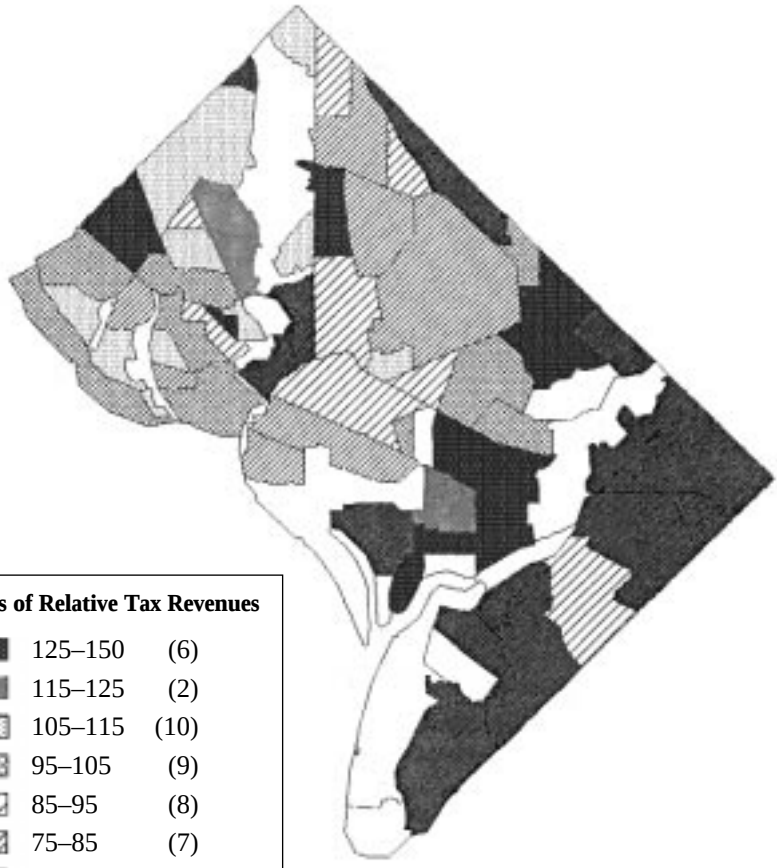


Note: White areas designate neighborhoods with no Class 1 taxable properties.

Alternatively, it would be possible to design a land or graded tax with different tax rates for each class of property that generated the same revenue from each class as under the Baseline. Alternative Four is a pure land tax that, as the fifth panel of Figure G-5 (page 236) shows, incorporates tax rates of 2.91 percent for Class 1 to

Figure G-13

Alternative Four: Relative Property Tax Revenues by Neighborhood for Class 1

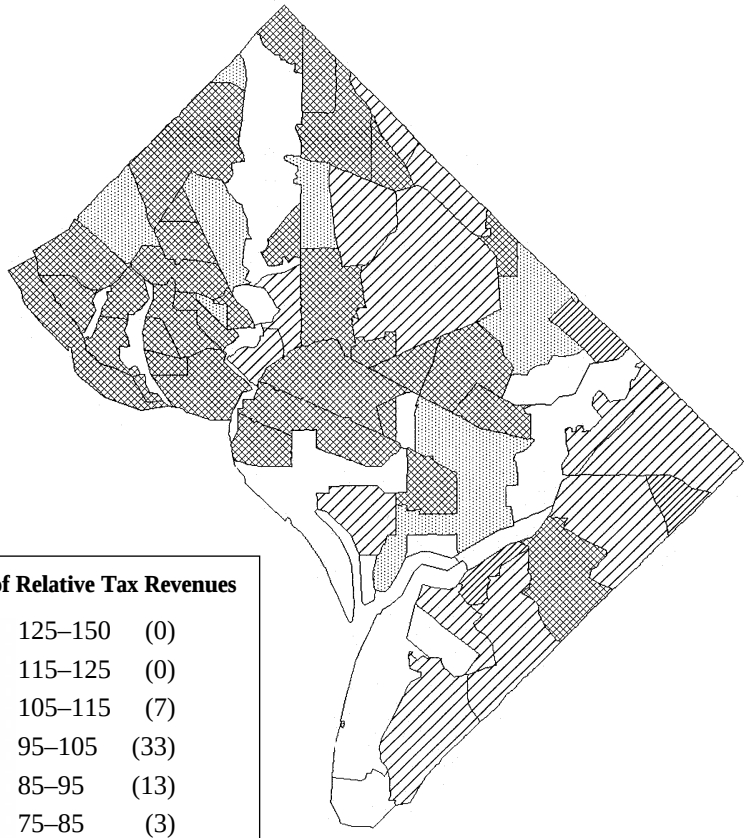


Note: White areas designate neighborhoods with no Class 1 taxable properties.

5.2 percent for Class 5. By design, tax revenues for each class of property under Alternative Four are the same as under the Baseline and thus all of the entries in the fifth panel of Figure G-6 (page 237) are exactly 100. While in the aggregate homeowners face the same tax liabilities, the impact of this hybrid land tax would have

Figure C-14

Alternative Five: Relative Property Tax Revenues by Neighborhood for Class 1



Note: White areas designate neighborhoods with no Class 1 taxable properties.

quite different effects on different neighborhoods. The third column of Figure G-7 (page 238) shows that taxes under Alternative Four would rise by more than 15 percent in nine neighborhoods, rise 5 percent to 10 percent in 10 neighborhoods, remain roughly unchanged in nine neighborhoods, fall by 10 percent to 15 percent

in eight neighborhoods, and fall by more than 15 percent in the remaining 20 neighborhoods. Figure G-13 suggests that low-income homeowners would stand to gain the most under this version of the land tax. Taxes would rise or remain unchanged in most of the neighborhoods west of 16th Street and fall in most of the neighborhoods east of 16th Street. Here again, many of the sharpest declines would be concentrated in Anacostia and surrounding neighborhoods.

Alternative Five is a graded tax version that is similar in many ways to Alternative Four and DFR's "classified split-rate tax." Tax revenues are the same in each class as under the Baseline and thus all of the entries in the last panel of Figure G-5 (page 236) equal 100. The tax rate on land is set at twice the rate on structures; the last panel of Figure G-6 (page 237) shows that the required tax rates on land range from 1.44 percent for Class 1 to 5.1 percent for Class 5. The last column of Figure G-7 (page 238) and Figure G-14 shows that Alternative Five would have only a minimal impact on homeowners in most neighborhoods. Taxes would remain essentially unchanged in 33 neighborhoods, rise by 5 percent to 10 percent in seven neighborhoods, and fall by more than 10 percent in 16 neighborhoods.

The assessment of land values

From the standpoint of neutrality, accurate assessments of land values under a split-rate or pure land tax are not an absolute necessity. All that is required is that taxes be independent of the way land is used so that taxes cannot influence a landowner's decisions. But from a legal and administrative standpoint, accurate assessments are essential. However, the accurate assessment of land is difficult in an urban setting such as the District, where developed vacant land is sold only rarely. In this section, we look at some alternative approaches to estimating the value of land.[14]

According to the Appraisal Institute, there are a number of textbook techniques for assessing land values. When information on sales of vacant sites is available, the assessor would use this information to assess land values of like properties. However, in the District such sales are rare, particularly for residential properties. Subdivision analysis is not applicable in the District, where very little residential land that can be subdivided for sale exists. The income capitalization approach requires information on the cash flow for the property. The District currently uses the allocation method for vertical properties such as condominiums, where a percentage of the sales price is allocated to be the value of the land, since such properties do not have distinct lots. The allocation percentage is usually 30 percent, but can vary depending on the property's location within the city.

For the valuation of commercial land, the District plans to rely heavily on the extraction method. Under the extraction method, the assessor measures the sales

value of the improved property and estimates the depreciated value of the buildings; land value is then the difference between the former and the latter, i.e., land value is measured as a residual. Residential land in the District is valued on a neighborhood-section basis. Since many neighborhoods are far from homogeneous, the District has created sections within neighborhoods of approximately 600 to 800 properties. Each property is categorized in one of four classes: single family, end row house, row house, or flat (multifamily or apartments). The District is developing a land chart as a base for assessments that contains the median values for the four categories within each of the sections. For individual properties, adjustments are made for the size of the lot, location or presence of alleys, corner influence, presence of an extra deep or extra wide lot, location of property, use, etc. These adjustments are based on the experience and judgment of the assessor.

While the extraction method might in the end prove to be the best of the available approaches, there is an important conceptual problem that deserves attention. A sensible definition of the value of a parcel of land is the amount someone would be willing to pay for the land if it were undeveloped. Thus in an important sense, land should not be assigned the residual value but instead the structures should be considered as the residual. If we knew what someone would be willing to pay for the land alone and what someone would pay for the sum of the land and structures, then the structures are worth the difference between the two. The original cost of the structures in this view is irrelevant.

Under some circumstances, this distinction is simply an academic issue. To illustrate, suppose someone has developed a parcel of land for Use A. In this example, the interest rate is 10 percent, structures cost $10,000, structures never depreciate, the project generates an annual return of $1,500 forever, and there will never be an alternative use for the land. Under these assumptions, almost any reasonable approach would lead to the conclusion that the land is worth $5,000. Someone would be willing to pay $5,000 for the land if it were undeveloped, since they could develop it in Use A at a total cost (i.e., land plus structures) of $15,000 and then earn returns with a present value of $15,000. Similarly, someone would be willing to pay $15,000 for the land and structures. Under the extraction method, the assessor would assign a value of $10,000 to the structures and assign a residual value to the land of $5,000. Thus the extraction method and the direct valuation of the land offer the same, correct answer.

But now suppose that the market changes and suddenly it became possible to develop this parcel in Use B. In Use B, structures again cost $10,000 but the annual return is $1,600. Someone would now be willing to pay $6,000 for the land since they would immediately develop it in Use B and realize returns with a present value of $16,000. The extraction method, however, would continue to value the land at

$5,000. More generally, the extraction method can offer misleading estimates of land values whenever the highest and best future use of land is different from the current use.

The District also could explore the possibility of using regression techniques and its computer-assisted mass appraisal system to develop better estimates of land values. The International Association of Assessing Officers defines computer assisted-mass appraisal (CAMA) as "the systematic appraisal of groups of properties as of a given date using standardized procedures and statistical testing" (McCluskey, 1997, page 2). Using one of the many different variations of CAMA, assessors attempt to replicate a property market that allows them to project property values onto parcels that have not been sold within the relevant time period. Mass appraisal techniques have two goals: "to attain acceptable standards of predictive accuracy" and "to facilitate explainability of the assessed values" (McCluskey, 1997, page 5). CAMA evolved from econometric modeling and multiple regression techniques, where there exist well-established statistical tests for accuracy and where individual property characteristics can be valued, aiding in the explanation of total appraisal values.

The typical mass appraisal system has five stages:

- data collection, verification, and analysis;
- model development to reflect property type and location;
- examination of statistical validity and integrity of the model;
- incorporation of geographic information systems; and
- determination of final assessment values.

Numerous mass appraisal techniques exist, but the most commonly used method internationally is multiple regression analysis (MRA).

Multiple regression analysis seeks to develop a predictive relationship between property characteristics and property value, such that the assessor can determine value only from knowledge of characteristics (Mark and Goldberg, 1988). The models that are developed usually represent this relationship as linear, where the total property value is a sum of the values of the property characteristics. Property characteristics often include internal factors such as square feet of living space or number of bathrooms; external factors such as public services or economic conditions; and location factors such as neighborhood or accessibility. The chosen relationship, or regression equation, is estimated for properties with sales information. MRA techniques allow the assessor to decompose the total value of a property into components based on the property characteristics. Using these estimated implicit prices and knowledge of property characteristics, the assessor can estimate values for properties with no recent sales information and values for individual characteristics of interest, such as land value.[15]

Summary and conclusions

Like most U.S. cities, the District taxes improvements and land at the same rate. But as we argued at the beginning of this report, property can be taxed in many ways. Under a graded, or split-rate, tax, land is taxed more heavily than structures. A pure land tax is a special case of a graded tax; under a pure land tax, the tax rate on improvements is zero and all revenue is raised by taxing land.

Our goal in this chapter has been to set out some of the important issues the District would need to consider before shifting to a graded tax. Pittsburgh is the only major city in the United States that uses a graded tax, and we have summarized the impact of Pittsburgh's decision to sharply raise the tax on land in the late 1970s and early 1980s. We also have reviewed other U.S. examples of a graded tax and we have looked at some of the international experience on this question. Our report includes estimates of the incidence of land taxes and graded taxes in the District and a discussion of some important implementation problems.

The decision to shift to a graded property tax is a difficult question. Theory tells us that higher taxes on land are nondistorting but that taxes on structures are. Therefore, a graded tax could be expected to offer significant benefits. Given the District's tax rates, which currently vary significantly across classes of property, a pure land tax would shift the burden of the property tax onto homeowners. It would be possible to design a graded tax that addressed this issue, but the marriage of a graded tax and classification would not be easy. Administering a graded tax is far from straightforward since it would require the District to develop accurate estimates of land values that it quite likely would need to be able to defend in court. Moving to a graded tax would produce clear winners and losers; some property owners would gain and some would lose from such a change in tax policy. Thus a move to a graded tax could offer important advantages to the District, but it is a decision that needs to be considered carefully.

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Endnotes

[1] This example ignores the District's $30,000 homestead exemption.
[2] See Tideman (1994) for an excellent discussion of the history of thought on land taxation.
[3] This section of the report draws heavily on Oates and Schwab (1997) and Oates and Schwab (1998).
[4] There were at least three earlier studies of the effects of land value taxation in Pittsburgh. Henry Pollakowski (1982) was unable to find much in the way of "adjustment effects" as measured by the number of property transactions. However, his data extended only from 1976 through 1980. Steven Bourassa (1987) explored the effects of Pittsburgh's tax system on housing development. Using monthly data on the value of new residential building permits as his dependent variable, Bourassa

found that the tax rate on improvements, but not the rate on land, was a statistically significant determinant of the level of residential building activity. Bourassa's findings, while of some interest, are limited in scope, for as we shall see, the major impetus to development in Pittsburgh has been in the nonresidential sector.

[5] For a useful description of the historical evolution of Pittsburgh with a focus on the renewal efforts under Renaissance I and II, see Shelby Stewman and Joel Tarr (1982).

[6] The commercial building boom in Pittsburgh under Renaissance II has encompassed several major projects: PPG Place (six buildings, including a 40-story office tower), One Oxford Center (a 46-story office tower and retail complex), The Steel Plaza/One Mellon Bank Center (a 53-story office tower and retail complex that includes the main station of the Light Rail Transit system), Allegheny International's headquarters, Liberty Center, the Hillman Complex, and several others.

[7] The assessment-sales ratio in Pittsburgh is .25 so that the nominal tax rates appearing in Figure G-2 must be divided by four to obtain measures of effective tax rates.

[8] See Oates and Schwab (1997) for a more detailed description of the sources and nature of the data.

[9] Clearly, not everyone would agree with this assessment. Walter Rybeck (1991), for example, quotes the Pittsburgh City Council president as follows: "I'm not going to say the land tax is the only reason a second renaissance occurred, but it's been a big help" (pp. 4–5).

[10] Allentown adopted a split-rate tax in 1997. Two of the cities cited (Hazleton and Uniontown) rescinded the graded tax within a year after adopting it.

[11] As discussed in the text, there are five classes of property in the District and each has a different property tax rate. Some parcels have mixed uses (e.g., they are part residential and part commercial). For this analysis, the mixed use parcels were split into two or three smaller parcels. For example, a parcel with a land assessment of $100,000 that was 60 percent commercial and 40 percent owner-occupied would have been divided into a $60,000 Class 4 parcel and a $40,000 Class 1 parcel.

[12] Land represents roughly one-third of the total assessed valuation of Class 1 property. We therefore incorporate a homestead exemption of $10,000 for land and $20,000 for improvements in Alternative Three, Alternative Four, and Alternative Five.

[13] In DFR's modified classified split-rate tax, the tax rate on vacant property (i.e., Class 5) is left unchanged at 5 percent.

[14] We thank Minetta Coles, Philip Applebaum, and Randy Vinson of the District government for very helpful discussions about the District's assessment practices.

[15] A simple analogy might make this more clear. Suppose we did not know the prices of individual items in a grocery store but we knew how much each person spent at the grocery and how many of each item they purchased. MRA would relate expenditures to the quantities of goods in an effort to develop estimates of the prices of the individual items.