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# Assessment Lags and Property Tax Impacts

By JEROME F. HEAVEY

**ABSTRACT.** A major administrative problem of the *property tax* is the difficulty of maintaining *current assessments*. If *real estate* is not reassessed as market values change, then the *real tax rates* on market value will diverge from the *statutory rates*. Within any taxing jurisdiction those properties with the highest rate of increase in *market value* will be taxed at the lowest real rate, while those with the lowest (including negative) rate of increase in market value will be taxed at the highest real rate. This investigation develops a straightforward method for calculating *differentials in effective tax rates* and describes the *economic impacts* of these differentials.

## I

### INTRODUCTION

IF REAL PROPERTY VALUES never changed, then reassessment for tax purposes would never need to be performed. Property values do change, and so reassessments are necessary. For discrete changes in value, such as that accompanying the improvement of a property, reassessment should occur between the date of improvement and the next tax levy, and is generally facilitated by the building permit which is issued on the occasion. For continuous changes such as those accompanying general inflation or rising property values in a particular neighborhood, reassessment needs to be performed on a periodic basis, and ideally, should occur as frequently as taxes are levied. If taxes are levied annually, then reassessment should be performed annually to keep the tax base consistent with market values.

Principally because of the cost of assessment, common practice allows considerable time lags between assessments. At least eight states have statutorily enacted lags ranging from three to eight years in length (1). In such states each property is to be reassessed every  $n$  years, with  $1/n$  of the properties being reassessed in any given year. Even three years may, in a period of rapid change in property values, be a lag of considerable consequence. In many jurisdictions there is no mandated periodicity for assessments. Even in large cities, where the expense of a professional staff of assessors has, presumably, long been affordable, lags of twenty to twenty-five years are reported (2).

Reassessment lags are one of the major administrative problems, or failures, of the property tax. Moreover, no matter how well a tax may be designed, unless this defect in implementation is corrected, the tax will have undesirable effects of significant magnitude. Just

as the foregoing is true for a tax on real estate as a whole—the land value plus improvement value—so would it be true for a tax on land values alone or on any other tax base. The problem of lags is obviated for taxes on realized income or sales by the frequency of transactions, but taxes on wealth, because they involve a tax base which passes through the market infrequently, are critically susceptible to the effects of assessment lags.

The intrajurisdictional differentials in effective tax rates which are produced by assessment lags may be of a greater magnitude than commonly is realized. The allocative and distributive consequences of these differentials likewise may not be appreciated. In the succeeding sections of this paper calculations of effective tax rate differentials are generated, and the economic impacts of these differentials are explored.

## II

### ASSESSMENT LAGS AND REAL TAX RATES

THE EFFECT of assessment lags on effective, or real, tax rates can be demonstrated by reference to a situation wherein, given rates of changes in property values, real tax rate differentials can be attributed solely to the lags. The following assumptions are involved:

- 1) A single taxing jurisdiction.
- 2) All properties within the jurisdiction are taxed at the same statutory or nominal rate on assessed value.

Table 1

Ratio of Real to Nominal Tax Rate for Selected Rates  
of Property Value Change and Assessment Lags

$\frac{t}{a}$	1	3	5	7	10	15	20
-0.05	1.051	1.162	1.284	1.419	1.649	2.117	2.718
-0.03	1.031	1.094	1.162	1.234	1.350	1.568	1.822
-0.01	1.010	1.031	1.051	1.073	1.105	1.162	1.221
0.01	0.990	0.970	0.951	0.932	0.905	0.861	0.819
.03	0.970	0.914	0.861	0.811	0.741	0.638	0.549
.05	0.951	0.861	0.779	0.705	0.607	0.472	0.368
.07	0.932	0.811	0.705	0.613	0.497	0.350	0.247
.09	0.914	0.763	0.638	0.533	0.407	0.259	0.165

Source: Equation (4) using hypothetical values of  $a$  and  $t$ .

- 3) In the initial time period all properties are accurately assessed at 100 percent of market value.

Many persons would take these conditions as defining a properly administered tax.

The real tax rate on market value in the initial period ( $TRM_0$ ) is the same as the nominal tax rate ( $TR$ ), since assessed value ( $AV_0$ ) and market value ( $MV_0$ ) are initially equal.

$$1) \quad TRM_0 = TR = \frac{TR \cdot AV_0}{AV_0} = \frac{TR \cdot AV_0}{MV_0}$$

Now assume that no change in the nominal tax rate is enacted over a period of years, and that no reassessments are performed. If market values in the jurisdiction change, then the real tax rate will diverge from the nominal tax rate. The magnitude of the divergence is shown by an elementary compounding formula. Assume that market values change by the same rate,  $a$ , for each of  $t$  years. Where  $e$  is the base of the natural logarithms, the market value at the end of  $t$  years will be,

$$2) \quad MV_t = MV_0 \cdot e^{at}$$

and the real tax rate will be,

$$3) \quad TRM_t = \frac{TR \cdot AV_0}{MV_t} = \frac{TR \cdot AV_0}{MV_0 \cdot e^{at}} = \frac{TR \cdot AV_0}{AV_0 \cdot e^{at}} = \frac{TR}{e^{at}}$$

The ratio of real tax rate at time  $t$  to nominal tax rate is

$$4) \quad \frac{TRM_t}{TR} = \frac{1}{e^{at}}$$

If there are no assessment lags ( $t = 0$ ), or if there is no change in market value ( $a = 0$ ), then there will be no divergence between nominal and effective rates. If  $a \neq 0$  and  $t > 0$ , they interact.

When market values in a taxing jurisdiction change, they may not all change at the same rate. Particularly in large jurisdictions such as cities it will usually be the case that in some neighborhoods market values are increasing rapidly while in others they are increasing slowly or even decreasing. The differential rates of change will produce differentials in real tax rates within the same jurisdiction. Illustrative values of the ratio of real rate to nominal rate are shown in Table 1 for selected rates of market value change and lengths of assessment lag.

The differences in real tax rates between two properties in the same jurisdiction can be calculated by dividing their respective tabular values (or any other value calculated by equation [4]). For example, if the market value of a property has been decreasing at a rate of 5

percent ( $a = -0.05$ ) for five years, during which time no reassessment has occurred, then the real tax rate on that property will be 1.284 times the nominal rate. As an example of the relative effects on two pieces of real estate, let properties A and B have experienced rates of increase in market value of 3 percent ( $a = 0.03$ ) and 7 percent ( $a = 0.07$ ) per year, respectively, with no reassessment in either case for ten years. At the end of that time the ratio of real tax rate to nominal tax rate will be 0.741 for property A and 0.497 for property B. The nominal tax rate is the same for two properties in the same jurisdiction. The ratio of the two real tax rates is therefore

$$\frac{0.741 \times \text{nominal tax rate}}{0.497 \times \text{nominal tax rate}} = 1.491.$$

Thus property A, which has experienced the slower rate of increase in value, will be taxed at a real rate which is 49.1 percent higher than the real rate levied on property B.

### III

#### *ECONOMIC EFFECTS OF TAX RATE DIFFERENTIALS*

THE *de facto* PREFERENCES produced by assessment lags are likely to be of greatest importance in cities. In a small homogeneous taxing jurisdiction, such as a residential suburb, all properties are likely to experience very similar rates of change in market value. In cities, and particularly in larger cities, it is likely that different neighborhoods will experience very dissimilar rates of change. Several intrajurisdictional effects will arise, which will be of greater consequence the greater are the differences in property value rates of change, and the longer are the assessment lags.

The first of these is the effect on income distribution.

In a homogeneous community such as a small residential suburb, property values and their rates of change, and incomes, show little intrajurisdictional variation. Though assessment lags cause property to be undervalued, the effect is proportionately the same for all residents. Hence in such a situation the distribution of income is unaffected.

In the heterogeneous community the effects demonstrated in Table 1 will generally cause tax rates to be higher in poorer neighborhoods. For example, it was found in Philadelphia that in poor neighborhoods assessments on single family homes ranged from 42 percent to 67 percent of market value, while in middle class neighborhoods they ranged from 31 percent to 37 percent of market value (3). Overassessment

of slum properties is spectacular in such cities as Chicago and Baltimore as well (4).

The incidence of the property tax is clearly not a settled issue. Netzer, though, argues that "In most large metropolitan areas . . . its residential component probably is significantly regressive for purposes of current tax policy decision making" (5). In poorer areas of a city most of the houses are likely to be occupied by renters, and Black has demonstrated that the tax on rental properties is shifted forward to the tenant (6). Whatever the incidence of the tax would be in the absence of assessment lags, the pattern of effective rates produced by those lags contributes to regressivity.

A second effect of the lags is to understate the community's fiscal capacity, unless the average rate of change is zero or less. If assessments were kept current, the property tax would be a growing revenue source (7). When the tax base is not kept current, the local fisc has several possible responses. It may limit spending to what the understated tax base will produce with current nominal tax rates, plus grants, or it may increase nominal tax rates, or it may borrow. In the homogeneous community a tax rate increase would affect all residents proportionately the same and could be a valid and inexpensive alternative to frequent reassessment. In the heterogeneous community, however, the increase in the nominal tax rate will be as regressive on market value as is the existing rate. Therefore any increase in statutory rates will represent a further drain upon incomes in the poorer sections of the community.

The third effect of tax rate differentials is to redirect the allocation of resources away from areas experiencing low rates of property value increase and towards areas experiencing high rates of increase. At the level of the aggregate economy a tax which functioned in this way would be seen to be clearly procyclical. The effect is the same at the local level, for the differentials act to accelerate the decline of lagging areas within a city (8).

In the sections of a city where property values are increasing, lagging tax rates favor speculation rather than improvement. By steadily lowering the tax rate on appreciating land, the costs of holding the land are reduced. Building on the land is more likely to occasion reassessment than is maintaining the land in an unimproved status (9). In these parts of the city income is redistributed from the community at large to the land speculator.

Agapos and Dunlap have suggested the adoption of a system of inverse *ad valorem* property taxation, *i.e.*, a system under which the tax

rate is negatively correlated with the rate of increase in property value (10). They have argued that such a policy would have numerous beneficial effects. Assessment lags produce, inadvertently, a system of inverse taxation, but the present analysis suggests that the effects are not salutary.

## IV

## SUMMARY

A MAJOR DIFFICULTY in the administration of the existing property tax is keeping the tax base up to date. Any lag in assessment is likely to produce differential tax rates within the taxing jurisdiction. These differentials are likely to be of greatest magnitude in large cities, where they will have significant distributional and allocational effects. Included in the latter is acceleration of decline in lagging areas and the fostering of land speculation in growing areas. These effects are due not to the design of the tax, but to its implementation. Any tax on a component of wealth will encounter this same practical problem, though some taxes, such as that on land, may be expected to facilitate diminishing the lag through the use of a less complex and therefore more readily measurable base. Unless assessment lags are eliminated, however, the effective tax rate structure may bear little resemblance to *de jure* rates.

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1. Pennsylvania requires reassessment at least every three years, Illinois, Iowa, and South Carolina every four years, Utah every five years, Indiana and Ohio every six years, and North Carolina every eight years. "Better Assessments for Better Cities," *Nation's Cities*, Vol. 8, No. 5 (May, 1970), p. 40.

2. E.g., Robert F. Engle, "De Facto Discrimination in Residential Assessments: Boston," *National Tax Journal*, Vol. 28, No. 4 (December, 1975), pp. 445-51.

3. Gunter David, "City Tax Hurts Poor, Blacks," *Philadelphia Bulletin*, March 14, 1976, Section 1A, p. 3.

4. Dick Netzer, "The Incidence of the Property Tax Revisited," *National Tax Journal*, Vol. 26, No. 4 (December, 1973), p. 531.

5. *Ibid.*, p. 515.

6. David E. Black, "The Incidence of Differential Property Taxes on Urban Housing: Some Further Evidence," *National Tax Journal*, Vol. 27, No. 2 (June, 1974), pp. 367-69.

7. Perry Prentice, "Broader Issues in Property Tax Reform," *American Journal of Economics and Sociology*, Vol. 36, No. 1 (January, 1977), p. 67.

8. Benjamin Barlev, "Location Effects of Intra-Area Tax Differentials," *Land Economics*, Vol. 49, No. 1 (February, 1973), pp. 86-89.

9. Walter Rybeck, "Can the Property Tax Be Made to Work for Rather Than Against Urban Development," *American Journal of Economics and Sociology*, Vol. 33, No. 3 (July, 1974), p. 267.

10. A. M. Agapos and Paul R. Dunlap, "Elimination of Urban Blight Through Inverse Ad Valorem Property Taxation," *American Journal of Economics and Sociology*, Vol. 32, No. 2 (April, 1973), pp. 143-52.