MORE ON THE NEUTRALITY OF LAND TAXATION

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ABSTRACT

The recent conclusions about the non-neutrality of land value taxation are shown not to invalidate the neutrality result for per unit land taxation (or even use-independent *land value taxation, as in Vickrey's standard state scheme). Also the neutrality of current rental income taxation is shown to depend on time-invariant tax rates; if tax rates change over time, the timing of land development can be distorted in a way similar to that which occurs under current market value land taxation.*

I. Introduction

A recent paper by David Mills (1981) elaborates and extends a discussion by Brian Bentick (1979) on land value taxation. They reach the interesting and perhaps initially surprising conclusion that land value taxation is non-neutral with respect to the timing of land development; more generally, it is non-neutral as between uses of land for which the time patterns of net returns differ.[1] They also conclude that a tax on current rental income (CRI) from land *is* neutral.

In this note I will begin by restating and re-establishing, in a simple model, the basic proposition that *per unit* taxes on land that are fixed at rates independent of land use are neutral, whether these rates are variable over time or not. As a corollary, if one defines some *use-independent* measure of land value, what for definiteness I shall call *standard value,* a tax on this standard value will be equivalent to a use-independent per unit tax, and thus neutral. This does not contradict the Bentick-Mills conclusions because these authors consider taxes on the *current market value* of land and because, as I will explain, physically homogeneous units of land will in general have values that differ over time depending on use. In fact, from this simple observation, the Bentick-Mills results on value taxation can be readily understood, since it implies that value taxation at *non-differential* rates amounts to per unit taxation (or standard value taxation, if one prefers) at *differential,* and hence distortionary, rates.

Additionally, I will further consider CRI taxation, showing that it is not neutral if the rate of tax varies over time, and, further, that it in general requires *subsidies* or negative taxes to be paid for some uses at some times, a fact that renders it even more politically infeasible than Bentick originally noted.

II. Analysis

Consider some physically homogeneous land[2] which, as a whole or in parts, can be used for alternative projects, say P and Q. These yield streams of net returns[3] $\{p\} = (p_1, \ldots, p_{T*})$ and $\{q\} = (q_1, \ldots, q_{T*})$ per unit of land, where there are $T^* + 1$ periods, where a return p_t or q_t is realized at the beginning of period t, and where r_t is a one-period discount rate applying to a return realized at the beginning of period t.

Suppose that we denote the time zero present value of a stream $\{p\}$ or $\{q\}$, given the tax policy γ_i, as $V_0(p, \gamma_i)$ or $V_0(q, \gamma_i)$. Let γ_0 be a policy of zero taxation. Then we can determine $V_0(p, \gamma_0)$, and more generally the present value, as of time t, of the stream $(p_{t+1}, \ldots, p_{T*})$, by the formula

$$V_t(p, \gamma_0) = \sum_{\tau=t+1}^{T^*} \prod_{s=t+1}^{\tau} \left(\frac{1}{1 + r_s}\right) p_\tau. \qquad (1)$$

This is the period-t market value of land used in project P, after p_t has been paid.

At time 0 a decision is to be made on land use between P and Q. Whatever policy γ_i is in effect, landowners at that time will be indifferent between the projects if and only if

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$$V_0(p, \gamma_i) = V_0(q, \gamma_i). \quad (2)$$

Now suppose that (2) holds for i = 0—that is, in the absence of taxation, the two projects are equally valuable. Tax policy γ_i is then neutral if (2) holds for γ_i.

Case (1): Per Unit Land Taxation

Suppose γ_1 defines a uniform tax per unit of land, independent of the land's use or state of development. Let g_t^1 be the amount of tax per unit of land in period t, paid at the beginning of the period. In general, this rate may vary from period to period. Then we have, by straightforward discounting,

$$\begin{aligned} &V_0(p, \gamma_1) - V_0(q, \gamma_1) \\ &= \sum_{t=1}^{T^*} \prod_{s=1}^{t} \left(\frac{1}{1 + r_s}\right)(p_t - g_t^1) \\ &\quad - \sum_{t=1}^{T^*} \prod_{s=1}^{t} \left(\frac{1}{1 + r_s}\right)(q_t - g_t^1) \\ &= V_0(p, \gamma_0) - V_0(q, \gamma_0) \end{aligned} \quad (3)$$

so that (2) holds for i = 1 if and only if it holds for i = 0. In other words, the per unit tax is neutral.

One may note that this per unit tax is equivalent to a tax on the use-independent *standard value* of land. To see this, suppose a parcel is valued, according to some convention, at V_t^s in period t, regardless of the use to which this land is put. If this standard value is taxed at rate τ_t, the equivalent tax per unit of land is $g_t^1 = \tau_t V_t^s$, regardless of use. The neutrality of this standard value tax follows directly from (3).

While this is not a particularly sophisticated analysis, it serves to demonstrate what is certainly well-known and can be established more rigorously, namely, that a use-independent per-unit or standard value land tax is nondistortionary. It may seem redundant, at the least, to recall this result. However, neither Mills nor Bentick do so, and a casual reader of those papers may be left wondering whether, contrary to intuition, all forms of land taxation other than the CRI type are non-neutral. It is therefore important to stress that the non-neutralities they discuss arise not from Case 1 taxes but from

Case (2): Current Market Value Land Taxation at Uniform Rates

Suppose that policy γ_2 is a policy of taxing, at the beginning of each period t, the current market value of land carried over from period t − 1, that is, suppose the tax is paid at the same time the return is received. If[4] g_t^2 is the tax rate in period t, we have

$$\begin{aligned} V_{T^*-1}(p, \gamma_2) &= \frac{p_{T^*}}{1 + r_{T^*}} - g_{T^*}^2 V_{T^*-1} \\ &= \frac{p_{T^*}}{(1 + g_{T^*}^2)(1 + r_{T^*})} \end{aligned} \quad (4)$$

and, working backwards,

$$V_0(p, \gamma_2) = \sum_{t=1}^{T^*} \prod_{s=1}^{t} \frac{p_t}{(1 + r_s)(1 + g_s^2)}. \quad (5)$$

As Bentick and Mills observe, this is like discounting the stream {p} at the higher rates $r_t + g_t^2 + r_t g_t^2 \simeq r_t + g_t^2$. Thus it follows immediately that if two projects P and Q satisfy (2) for i = 0, and if the returns to P are unambiguously earlier than the returns to Q—for instance, if, as in Mills–Bentick, $p_t = \bar{p}$ all t, $q_t = 0$ for t = 1, ..., T, and $q_t = \bar{q}$ for t = T + 1, ..., T*—we will have

$$V_0(p, \gamma_2) > V_0(q, \gamma_2). \quad (6)$$

That is, the value tax is non-neutral.

How does this relate to Case (1)? What must be observed, and what may be initially surprising, is that two identical parcels of land, each committed at time 0 to projects of equal present value at that time, will in general have different market values at future times if the time patterns of returns to each project differ. To see this in a particular case, imagine that P yields $\bar{p}$ each period, while Q yields nothing until period T*, when it yields q_{T^*}, and suppose $V_0(p, \gamma_0) = V_0(q, \gamma_0)$.

Then, as $t \to T^*$, the market value of the land committed to Q will rise with the discount rate as its return gets closer in time. Meanwhile, the value of land committed to P will be declining, or will not be rising as quickly, because some of its return has already been realized in earlier periods. To tax these two parcels on the basis of their market values, then, is obviously to tax them at different rates per *unit* of land, and we know that in general this will be non-neutral.

It is worthwhile to note the immediate corollary of this conclusion, namely that regressive assessment practices may reduce the non-neutrality of land value taxation; or rather, to be more accurate, neutral land value taxation would have to be characterized by regressivity relative to current market value. This should not be confused with, nor taken as an endorsement of, *arbitrary* regressive assessment of land, of course.[4]

Case (3): Current Rental Income Taxation

Now consider the policy γ_3 where the tax paid at the beginning of period t is the proportion g_t^3 of current rental income, i.e., of the net return realized in that period. We have in general that

$$V_0(p, \gamma_3) - V_0(q, \gamma_3) = \sum_{t=1}^{T^*} \prod_{s=1}^{t} \left(\frac{1}{1 + r_s}\right)(1 - g_t^3)(p_t - q_t)$$

$$= \begin{cases} V_0(p, \gamma_0) - V_0(q, \gamma_0) - \sum_{t=1}^{T^*} \prod_{s=1}^{t} \left(\frac{1}{1 + r_s}\right) g_t^3(p_t - q_t) & \text{in general} \\ (1 - \bar{g}^3)[V_0(p, \gamma_0) - V_0(q, \gamma_0)] & \text{if } g_t^3 = \bar{g}^3, \text{ all t.} \end{cases} \tag{7}$$

Bentick and Mills have confined their discussions to the case of a uniform rate of CRI tax over time, and their neutrality result for this case is valid. But, as can easily be seen, this result is upset if the rate of tax varies over time. For instance, generally increasing rates over time would tend to work against "later" projects, while falling rates would favor them. I believe this is important as a practical matter, since revenue requirements, particularly at the local level, may well fluctuate substantially over time. Notice that this presents no difficulty for per unit land taxation, as can readily be seen from (3).

Finally, notice that p_t or q_t may well be negative in some time periods, as for instance when one expends resources tending an immature forest, undertakes exploratory drilling, or clears land and builds structures. Even if the CRI tax rate is certain to be constant over time, the tax will be non-neutral if subsidies are not paid to those landowners whose projects are generating negative current income. In fact, failure to pay such subsidies would favor early projects over late, just as taxes on current market value do. It is hard to see how such a tax could ever be implemented.

III. Conclusion

It is important to realize that current market value land taxation is distortionary, as Bentick and Mills have shown. No one should be misled into questioning the basic intuition about the potential for non-distortionary taxation of land, however. What is crucial, to avoid non-neutralities, is that tax liabilities, in present-value terms, be independent of the use to which the land is put. A per-unit land tax has this property. So also would a tax on *standard* land value defined *not* in terms of current market value, but, say, in terms of the value of a "*physically* defined standard state" as Vickrey (1970) proposed.[5] As long as two initially identical pieces of land are treated identically for tax purposes over time, regardless of use—and Vickrey's "standard state," by ignoring use, would have this characteristic—neutrality will be preserved. Whether a land value tax of the Vickrey type is administratively feasible can be

left to the reader's judgment. On the face of it, such a tax would certainly seem far simpler to administer than the non-neutral tax on current market value, since the latter would require *use-dependent* imputations of current values, and in many cases, the market will not aid the assessor with a convenient separation of ownership of land and structures, with the land ownership frequently traded and valued in the marketplace. Perhaps in the case of land value taxation, there is a happy complementarity between neutrality and ease of administration. For an extended discussion of the practical problems of a Vickrey standard state approach, see Holland (1970).

FOOTNOTES

[1]This result can be traced to the Skouras-Bentick interchange following an earlier paper by Bentick. See Bentick (1972, 1974) and Skouras (1974).

[2]By physically homogeneous, I mean that no two units of the land can be distinguished from one another in any way that may be economically relevant, including, for example, quality of soil, likely mineral reserves, water rights, type and extent of prior development, etc.

[3]Much of the prior discussion has concentrated on the case where p_t is fixed or stradily growing over time, while q_t is zero up to some time T and fixed or steadily growing thereafter, corresponding to the cases of "use" and "speculation." We do not impose such restrictions, except by way of illustration, in the present discussion. Incidentally, {p} and {q} are of course streams of returns net of all costs *except* taxes.

[4]One need hardly add that this does not constitute a defense of regressive *property* value assessment. For some discussion of differential assessment, see, for instance, Aaron (1975). Also the discussion of Peterson (1973) is of some interest in this regard.

[5]The quote, with emphasis added, is from Vickrey (1970, p. 27). Mills cites Vickrey in passing (n. 4), but evidently is not persuaded of the neutrality of a Vickrey land value tax. Interestingly, Vickrey is aware of the Bentick-Mills problem, as revealed by a somewhat opaque arithmetic example involving the choice between current and delayed development of identical parcels of land (pp. 33–35). Vickrey himself seems to waver from the standard-state method here because he assumes that the tax on the "delayed" use will rise with its rising *market* value (he considers "a tax at 7 percent on a value that is to increase at 12 percent" (p. 34), the "value" being the rapidly increasing market value of land held for later use).

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