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## Confirmations and Contradictions

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### The Incidence of a Tax on Pure Rent: The Old Reason for the Old Answer

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The purpose of this note is to clarify the formal identities linking the problems analyzed by Barro (1974), Feldstein (1977), and Calvo, Kotlikoff, and Rodríguez (1979) (henceforth CKR) and to reaffirm the traditional proposition that in both the short run and the long run a tax on pure rent is *never* shifted, provided one adopts the traditional procedure in tax theory of analyzing the incidence of a compensated tax. Any uncompensated tax is equivalent to a compensated tax together with a lump-sum redistribution of income, and there is really nothing “surprising” about the fact that lump-sum redistributions of income may alter relative prices, as the literature on the “transfer problem” in international trade theory demonstrates. Actually, situations can be found (e.g., Gorman 1953; Barro 1974; Calvo et al. 1979, p. 874, n. 7) in which lump-sum redistributions of income do *not* affect relative prices. Even when they do, the incidence effect is often small relative to the size of the redistribution.

The analyses of CKR and Feldstein give the impression that the classical proposition on the incidence of a tax on pure rent does not apply in a dynamic economy: “As Feldstein points out, the classical proposition that a tax on pure rent is unshifted requires that the supplies of nonland factors of production are unaltered by the introduction of the tax on land rents. This static assumption of fixed factor supplies is inappropriate to the analysis of tax incidence in a dynamic economy in which the supply of capital reflects the economic choice between consumption and saving” (Calvo et al. 1979, p. 869).

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In fact, the proposition that a compensated tax on pure rent is not shifted does apply in a dynamic economy and does not require any static assumption of fixed supplies of nonland factors. In all the cases analyzed by Feldstein and CKR in which the tax on pure rent is shifted, the shifting occurs only because these authors never analyze the case of a fully compensated tax on pure rent. An uncompensated tax on pure rent will of course generally be shifted in a static model, as in a dynamic model.

Barro (1974) analyzed an overlapping-generations model in which each generation's utility depends on the utility of their children to a sufficient extent to induce positive bequests from parents to children. In this model a switch from financing government expenditure by taxing the current generation to financing it by bond sales to the current generation, with the principal and interest to be financed by increased taxation of future generations, has no effect on the levels of consumption or utility of any generation. The switch represents a transfer by the government to parents from their children, which the parents can and would exactly offset by raising the bequests they make to their children.

Feldstein (1977) analyzed the effects of a tax on land rents in an overlapping-generations model in which bequests are not made. The young work, consume, and save; their savings finance the acquisition of land and capital, the earnings from which are used to finance consumption in retirement. Feldstein assumed that the revenue from the land rent tax is wasted (or, equivalently, "used to finance some additional government expenditure that does not increase utility vis-à-vis the no-tax situation" [Feldstein 1977, p. 349]) and showed that in general some of the tax will be shifted. That is, the introduction of a land rent tax at rate  $\theta$  will not in general reduce the value of land to a fraction  $(1 - \theta)$  of its original value. In fact, the value of land may even rise.

CKR changed two of Feldstein's assumptions: first, they assumed that the revenue from the tax on the rent of the land held by the older generation is not wasted but returned period by period either to the younger generation or to the older. Second, they analyzed this amended tax in the context of a Barro-type overlapping-generations model *with* bequests and no inheritance taxes. They showed that under these revised assumptions the tax will *not* be shifted.

CKR also noted that Feldstein had been wrong to assert (Feldstein 1977, p. 352, n. 10) that the tax will not be shifted in his no-bequest model if the revenue is returned to the older generation: "While we [i.e., CKR] discuss the case of a compensated tax on land rents in which the government returns the tax revenues in a lump-sum fashion to either the young or old, Feldstein analyzes an uncompensated

tax on land rents. *However, his result for his model holds for a compensated tax as well.* The traditional practice in incidence analysis is to consider compensated taxes” (Calvo et al. 1979, p. 870; emphasis added).

Their comment is misleading; what CKR presumably mean is that if the revenue from the land rent tax, which is collected in each period from the currently older generation (who happen to hold all the land under the particular institutional assumptions of both Feldstein and CKR), is returned in a lump-sum fashion in each period to the currently older generation, the tax will, in general, be shifted to some extent. This is correct, and Feldstein’s apparent denial of it was an error, as CKR note. However, it is wrong to describe this case as a compensated tax. To follow “the traditional practice in incidence analysis” of considering compensated taxes, it is necessary to assume that at the time of announcing and introducing the new tax on land rent the government simultaneously issues infinitely dated bonds, uses the land rent tax revenue to meet the interest payments on these bonds period by period, and uses the proceeds from the sale of the bonds to finance a once-over lump-sum handout to the owners of the land on the day that the land rent tax is announced. This procedure fully compensates the original landlords, while the procedure assumed by CKR (of paying the entire land rent tax revenue, period by period, to the older generation) clearly fails to do so.

In the case of a fully compensated tax on land rents, as described above, the entire incidence of the tax will be exactly reflected in a fall in land values, even in Feldstein’s no-bequest model. This conclusion, that a compensated tax on pure rent is never shifted, remains true when one considers Feldstein’s second reason (namely, the portfolio effect) for asserting that the uncompensated tax that he analyzed will be shifted: the uncompensated tax on land rents changes the proportions by value of land to capital in portfolios, and attempts by asset holders to restore the initial proportions will generally tend to raise the price of land. However, this portfolio effect will also be inoperative in the case of the fully compensated land rent tax, since the newly issued bonds would substitute for the reduced value of land in portfolios.

If land rents are stochastic, full compensation would require the interest payments on the bonds to be stochastic also, since full compensation would require the land rent tax revenue and the interest payments to be exactly equal period by period. Under these arrangements the bonds would be a *perfect* substitute for the reduced value of land in portfolios. An arrangement in which the newly issued bonds offered a sure interest payment each period, even though land rents (and therefore land rent tax revenues) were stochastic, could not be described as full compensation, since the government would need to

raise additional revenue (e.g., by a poll tax) in periods when rents were low and would have a surplus to distribute in periods when rents were high. To the extent that the resulting poll taxes and subsidies involved uncompensated intergenerational transfers, the proposition that the land rent tax is not shifted would no longer in general be exactly true. However, in a model with fully operative intergenerational bequests, these uncompensated, stochastic, intergenerational transfers, induced by the government, would be fully offset by changes in intergenerational bequests for reasons that are formally equivalent to those analyzed by Chan (1983).

The cases considered by CKR (and by Feldstein 1977, p. 352, n. 10) are therefore equivalent to (i) the introduction of a fully compensated land rent tax together with (ii) a switch from bond finance to tax finance of the type analyzed by Barro (i.e., the imposition of a lump-sum tax on the particular generation who are old at the time of the introduction of the tax, with the tax revenue being used to finance bond purchases by the government). In every model, both in the short run and in the long-run steady state, the incidence of  $i$  falls entirely on land values with no shifting. In CKR's model, with bequests, the transfer involved in ii is exactly offset for the reasons analyzed by Barro. This is the underlying explanation for CKR's "no shifting" result. The no shifting result holds both in the long-run steady state (which CKR analyze) and in the short run (cf. Calvo et al. 1979, p. 874, n. 7), since Barro's analysis is not restricted to the steady state. However, in Feldstein's model, *without* bequests, the transfer involved in ii will generally affect relative prices, thus modifying the incidence of the tax. Even with bequests eliminated, this modification may well be relatively small.

Finally, the analysis above can be viewed as providing an extension of the list of cases in which the Ricardo-Barro proposition (that bonds are not net wealth) is valid. Barro established this proposition for the overlapping-generations model *with* bequests, but it clearly also applies in the model *without* bequests if the principal and interest payments on newly issued bonds are to be met by new taxes on the future rents of assets (e.g., land) currently owned by the individuals who are to benefit from the once-over lump-sum tax cut that the bond sale finances.

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