TAX STRUCTURES WHOSE PROGRESSIVITY IS INFLATION NEUTRAL

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It is the purpose of this paper to formalize mathematically the effect of inflation on the progressivity or vertical equity of individual income tax using some standard measures of vertical equity. As an application, we produce tax structures whose progressivity is inflation neutral.

Suppose that $T(y)$ is the tax liability for an individual with income y. Then the effective tax rate $A_T(y)$ is defined by the formula $A_T(y) = T(y)/y$. A tax is generally recognized as progressive if the effective rate of taxation is an increasing nonconstant function of income. If the tax function T is differentiable, then A_T is strictly increasing if and only if the marginal tax rate $T'(y)$ exceeds the effective tax rate at each income level. If the marginal tax rate is an increasing function of income, then the tax is progressive. The converse is of course invalid. A differentiable tax function T is called *confiscatory* at income level y if $T'(y) \geq 1$.

Musgrave and Tun Thin [4] present several methods of describing the degree of progressivity of a tax, but none are universally accepted. Frequently, the vertical equity of a tax is measured by the steepness of its effective tax rate curve, and tax function T_1 is called more progressive than tax function T_2 if at each income level y,

$$A'_{T_1}(y) > A'_{T_2}(y).$$

Surely it is not the size of the effective rate but its rate of increase which determines the relative progressivity of the tax. For example, a 75 percent effective tax rate on each taxpayer is not progressive at all, although the effective rate is high. Analogously, comparative progressivity can be gauged with reference to the steepness of the marginal tax rate curve: tax function T_1 is more progressive than T_2 if $T''_1(y) > T''_2(y)$ for all y. Alternatively, one can measure progressivity in terms of the elasticity of tax liability to pre-tax income at each level of income or the elasticity of post-tax income to pre-tax income.

Since the basic goal of progressive taxation is to ensure an equitable distribution of income, many economists favor indices of vertical equity that indicate the tax structure's performance of this task. In general, a numerical index is assigned to an income distribution representing the