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Economic Adjustment and Public Policy in Canada

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Comment

A central feature of the Norrie-Percy analysis of the effects of taxes on natural resources and capital is the hypothesis that such taxes lower the marginal tax price of public goods provided by the province. This hypothesis is reflected in an equation in which the perceived price of a unit of the provincial public good is defined as

$$p'_6 = \frac{t_L}{q_6}, \quad (1)$$

where t_L is the head-tax rate and q_6 is the amount of public good being provided. Since increases in resource and capital taxes allow the government to lower the head-tax rate, such taxes lower p'_6 . This reduction in turn increases the demand for the public good and induces the extra public expenditures that are such an important feature of the Norrie-Percy simulations.

It is important to realize, however, that the hypothesis is based on a fiscal illusion that is not compatible with fully rational household behaviour, and in fact is incompatible with basic accounting identities. This is intuitively straightforward. For any *given* level of resource and capital taxes, the household always faces the choice of consuming one more unit of public good that is head-tax financed. The cost of this marginal unit to the province is always the actual cost per unit, p_6 in the Norrie-Percy notation, and, with head-tax financing, this always entails an extra cost per person of p_6 per capita, or p_6/L . This is the cost to each household of a marginal unit of the public good no matter how much or little revenue is raised through resource or capital taxes – *i.e.*, the marginal tax price is

invariant with respect to resource and capital taxes. Thus, each household, if well-informed, should actually face a marginal tax-price of

$$p''_6 = \frac{p_6}{L} \quad (2)$$

rather than p'_6 , as assumed by Norrie and Percy.

To derive (2) formally in the context of the Norrie-Percy model is simple. We only need the household budget constraint

$$\sum_{i=3}^5 p_i q_i + t_L + s_p = y_d, \quad (3)$$

the government budget constraint solved for the head tax rate

$$t_L = \frac{p_6 X_6 + H - (\sum_i t_i r_i R_i + \sum_i t_{ki} r_i K_i)}{L}, \quad (4)$$

and the definition of $y_d = Y_d/L$ from

$$Y_d = wL + \sum_i (1 - t_{ki}) r_i K_i + \sum_i (1 - t_{Ri}) s_i R_i, \quad (5)$$

where s_p is household savings, $\sum_{i=3}^5 p_i q_i$ is private goods expenditure, X_6 is the amount of public good provided, H is money paid into the heritage trust fund, $\sum_i r_i K_i$ and $\sum_i s_i R_i$ are capital income and resource rents respectively, and t_{ki} and t_{Ri} are sector-specific tax rates on capital income and resource rents. Substituting to eliminate t_L and using (5) to eliminate y_d , one finds that the household is constrained by

$$\sum_{i=3}^5 p_i q_i + \frac{p_6 X_6 + H}{L} + s_p = w + \frac{\sum_i r_i K_i + \sum_i s_i R_i}{L}. \quad (6)$$

From (6) it is clear that one more unit of X_6 entails having p_6/L fewer dollars' worth of private expenditure, as shown in (2).

Now it is, of course, perfectly possible that households consistently make decisions as if they faced the illusory marginal tax-price p'_6 assumed by Norrie and Percy. If so, however, they must also consistently fail to note that an incremental unit of government expenditure leaves them with less private expenditure than they had expected. Whether households do make these consistent errors, and make 'as if' utility-maximizing decisions based on (p'_6) , is an empirical question, amenable in principle to

refutation or confirmation by the data. In the absence of such testing,¹ it is important for the interpretation of the Norrie-Percy paper to realize that the authors' simulations are based on a behavioural hypothesis of mixed rationality and irrationality, and that different and perhaps equally plausible hypotheses would substantially change their results and conclusions.

¹It is interesting to note that empirical estimation of demands for local public expenditures in the U.S. seems to indicate that an extra dollar's worth of lump-sum transfers from higher level (state or federal) governments results in a greater increase in local public expenditure than an extra dollar's worth of private sector net income, and yet theories of the Norrie-Percy type predict that they will result in equal-sized effects. In the U.S. context, the apparent propensity to spend more out of marginal grant dollars has been felicitously labelled the 'flypaper effect', because grant money 'sticks where it hits' and is not rebated to households in the form of lower local taxes. In trying to explain this effect, some authors have hypothesized that voters confuse *average* tax prices of public goods, which *are* lowered by lump-sum grants, with *marginal* tax prices, which are *not* so reduced, so that a dollar in lump-sum transfers has a price as well as an income effect. This is precisely the kind of fiscal illusion that is built into the Norrie-Percy model. Thus, the assumption of such illusions is not unique to Norrie and Percy, and may, according to some, have empirical support. This is, however, a controversial hypothesis. For a discussion of the flypaper effect, see P. Mieszkowski and W. Oakland, eds. (1979) *Fiscal Federalism and Grants-in-Aid* (Washington: Urban Institute).