Discussion of the Hausman Paper

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Jerry Hausman's paper makes major contributions to both the labor supply and taxation literatures. His paper provides the most reliable labor supply estimates to date since he takes account of the nonlinear budget constraint created by federal and state income taxes. His work also helps rectify the misleading approach taken by politicians, the popular press, and many economists which stresses the revenue effects of tax cuts: the relevant question is the welfare effect of tax cuts. Hausman is able (amazingly enough!) to rigorously calculate the deadweight loss imposed by a tax.

Of great policy importance is his conclusion that an across-the-board tax cut of the Kemp-Roth variety would lower welfare (and tax revenues), while a reduction in the progressivity of the tax could raise welfare. As Head argued in 1966, a progressive tax will have greater disincentive effects than a proportional tax so long as the economy is not in the prohibitive range where a reduction in the proportional tax rate would raise revenues.[1]

If (as Hausman defines it) the progressive tax differs from the proportional tax in that some level of income is exempted from the tax, then revenues collected under the progressive tax system will be less than under the proportional system for any marginal tax rate, as shown in Figure 1. Holding revenues fixed at $\bar{R}$, so long as the economy is not in the prohibitive range (as Hausman's estimates show), the marginal tax rate which corresponds to the proportional tax, t^*, will be less than that under the progressive tax, t^{**}. As a result, the proportional tax will have less of a disincentive effect, as shown in Hausman's estimates.

While Hausman's research is destined to become one of the classics of applied econometrics, I have a few minor quibbles. First,

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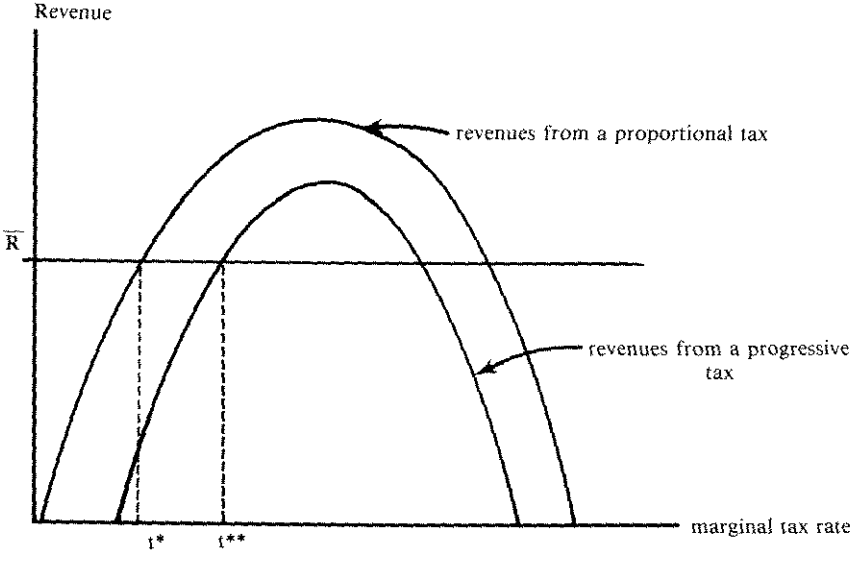
[1]Head, J. G., "A Note on Progression and Leisure: Comment," *American Economic Review*, V. 56, 1966, pp. 172-179.

FIGURE I



the effects of taxation on the amount of education people undertake may be pronounced. This effect, however, is likely to reinforce the distortions Hausman estimates.[2] Second, the estimation process used assumes that the income effect is always normal, which seems unreasonable in general.

Third, these estimates presume individuals know their marginal tax rates. There is some justification for this approach, however, according to Harvey Rosen and some of Hausman's other papers, so this potential problem is probably not serious.[3] Fourth, Hausman assumes that women are the secondary workers in a family, while it would have been more reasonable to assume that the lower wage family member was the secondary worker. Hausman is currently working on a model where the family makes a joint decision so that this problem will be eliminated in the future. In any case, in his sample, few if any households had women earning more than their spouses.

[2]Perhaps some handle on this effect can be obtained by examining people who made their education decisions before WWII when income taxation was relatively unimportant.

[3]Rosen, Harvey S., "Taxes in a Labor Supply Model with Joint Wage-Hours Determination," *Econometrica*, V. 44, N. 3, May, 1976, pp. 485-508.

One should show care in interpreting some of Hausman's results (though he is fairly careful about pointing out these limitations). Because utility levels are different across experiments, one cannot compare deadweight losses directly. Moreover, his implicit social welfare function, which is not very egalitarian, favors the policy prescription which he favors. Finally, his experiments where he compares progressive and proportional taxes are (necessarily) relatively arbitrary. A more reasonable experiment might be to reduce the number of kinks in the progressive tax constraint rather than eliminating all but one kink. That is, an intermediate policy might be even more favorable to Hausman's argument.

Hausman also argues that his results, while partial equilibrium in nature, are likely to be close to the general equilibrium effects. Since this proposition was not immediately obvious to me, I tried a few "back of the envelope" calculations to confirm this conjecture.

A tax on labor income will have complicated general equilibrium effects. While the taxes are likely to influence capital, energy, output prices, and wages, Hausman's partial equilibrium analysis implicitly treats these variables as constants. The calculations reported here are actually less partial equilibrium than Hausman's rather than fully general equilibrium results, since capital and other variables are still treated as constants: only wages are allowed to adjust. In some sense, these results may be viewed as "short-run" general equilibrium ones, where the labor market has time to adjust, but the other markets have not yet adjusted.

Suppose, for simplicity, the labor supply equation is written as

$$i = ((1 - t_i)w_i)^{d_i} I^{b_i}, \tag{1}$$

where i represents the hours worked by the i^{th} group, t_i is their marginal tax rate, w_i is their wage, d_i their after-tax wage elasticity, and I is the nonearned income. The tax-supply elasticity is

$$\eta_i = \frac{\partial i/i}{\partial t_i/t_i} = \frac{-t_i}{1-t_i} d_i. \tag{2}$$

The demand for each demographic group is derived from an aggregate translog production function (assuming competition):

$$w_i = \frac{Q}{i}(\alpha_i + \sum_j \gamma_{ij} \ln j) \equiv \frac{Q}{i} M_i, \tag{3}$$

where Q is aggregate output and M_i is the factor share of the i^{th} group ($M_i = w_i i$/total cost).

Combining (2) and (3) and differentiating, we obtain

$$(4)\quad \varepsilon_{ii} = \frac{\partial i/i}{\partial t_i/t_i} = \frac{t_j}{1-t_i}\, d_i \,\frac{1}{\left((M_i+\gamma_{ii}/M_i)d_i - (d_i+1)\right)}$$

$$\equiv \eta_i\theta_{ij},$$

$$(5)\quad \varepsilon_{ij} = \frac{\partial i/i}{\partial t_j/t_j} = \frac{t_j}{1-t_j}\, d_i \times$$

$$\frac{\gamma_{ij}/M_i + M_j}{\left((M_i+\gamma_{ii}/M_i)d_i-(d_i+1)\right)\left((M_j+\gamma_{jj}/M_j)d_j - (d_j+1)/d_j\right)}$$

$$\equiv \eta_i\theta_{ij},$$

and, if $t_i = t_j = t$,

$$(6)\quad \varepsilon_i = \frac{\partial i/i}{\partial t/t} = \frac{t}{1-t}\, d_i \times$$

$$\frac{1-(\gamma_{ij}/M_i+M_j)/M_j+\gamma_{jj}/M_j-(d_j+1)/d_j)}{\left((M_i+\gamma_{ii}/M_i)d_i-(d_i+1)\right)}$$

$$\equiv \eta_i\theta_i.$$

If the production function uses a single labor index, then only equation (6) is relevant. Using an aggregate production function with aggregate labor, capital, and energy factors, then in 1977 fourth quarter:[4]

d_i	θ_i
0.1	0.9748
0.2	0.9508
0.3	0.9279
0.5	0.8854
1.0	0.7944
2.0	0.6589

[4]This production function, the estimated coefficients, and a description of the data is contained in Jeffrey M. Perloff and Michael L. Wachter, "A Production Function-Nonaccelerating Inflation Approach to Potential Output: Is Measured Potential Output Too High?" Carnegie-Rochester Conference Series Vol. 10, 1979, *Journal of Monetary Economics*, pp. 113-163.

That is, the supply elasticity η_i is only likely to deviate substantially from the equilibrium elasticity, ε_i, if d_i is relatively large. For example, if

$d_i = .1$, then $\varepsilon_i = 0.9748\eta_i$; while if $d_i = 1.0$, $\varepsilon_i = 0.7944\eta_i$.

There is substantial evidence, however, that it is inappropriate to aggregate labor into a single index. Grant and Hamermesh, using 1969 cross-sectional manufacturing data in a translog production function, have shown that it is reasonable to aggregate youths and white females, but that it is not reasonable to aggregate all of labor. Using time series data, Michael L. Wachter and I have estimated a comparable production function for the private economy using inputs of capital, energy, prime age males (M), and all other labor (0).[5] Using our estimated coefficients, the following adjustment factors can be calculated using equation (6):

d_O	d_M	θ_O	θ_M
0.1	0.1	0.982	1.000
0.1	0.5	0.991	0.907
0.1	1.0	0.999	0.813
1.0	0.1	0.832	1.192
1.0	0.5	0.839	1.082
1.0	1.0	0.846	0.969

Thus, if d_M is approximately 0.1 and d_O is approximately 1.0, then $\varepsilon_M \cong 1.192\eta_M$ and $\varepsilon_O \cong 0.832\eta_O$. That is, the equilibrium elasticity for prime age males would be almost 20 percent higher than the supply elasticity, while the supply elasticity would be almost 20 percent higher than the equilibrium elasticity. Of course, even if Hausman's estimates were off by as much as 20 percent, it would make no difference to most of his conclusions.

Hausman's analysis is very useful in determining the costs of our income tax system. This cost must be balanced against the benefits of government goods and services and transfer programs. It should be noted, however, that a substantial part of funds collected at

[5] A similar model is described in "Productivity Slowdown: A Labor Problem?" in *The Decline in Productivity Growth*, Federal Reserve Bank of Boston Conference Series No. 22, June, 1980, pp. 115-142. The only difference in that model is that one labor series consists of young people (under 25 years) and the other of older workers. The coefficients are: $M_O = .23465$, $M_M = .49218$, $\gamma_{OO} = .13152$, $\gamma_{MM} = .12096$, $\gamma_{OM} = -.10972$

some levels of government go to collecting taxes. Small U. S. counties (populations under 100,000) spent 7.4% of their tax revenues, on average, on financial administration; while the federal government spent only about 0.7%. These figures are low, since they include only central fiscal operations (which reached $1,798 million for the federal government in 1976). The U. S. government spent 6.22% of tax revenues on general administration (which includes the cost of tax collection and all administration costs not directly attributable to specific programs).[6]

[6]These statistics are discussed in Dick Netzer, "State-Local Finance and Intergovernmental Fiscal Relations," in *Economics of Public Finance*, (Washington, D. C.: The Brookings Institution, 1974) and Jeffrey M. Perloff "Economies of Scale in Tax Collecting: Evidence for the U. S. and Abroad," Working Paper.