IN PRAISE OF WASTEFUL SPENDING

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Abstract. In the presence of distortionary taxation, the destruction of wealth — either by an act of government or an act of God — can be welfare improving, because it increases the supply of labor and therefore (holding government spending constant) allows distortionary taxes to be lowered. We show that this under reasonable assumptions, there must be tax rates at which this effect occurs.

Taking the level of government spending as given, what fraction of that spending should be wasteful? We show that — for reasons that have nothing to do with wage or or price stickiness, nothing to do with redistribution, and nothing to do with capital accumulation — the answer is not always zero.

That's because waste (or anything else that makes agents poorer) increases the supply of labor, which (holding government spending fixed, and assuming the economy is on the rising side of the Laffer curve) means that distortionary tax rates must fall. The corresponding efficiency gain can outweigh the cost of the initial waste.

For exactly the same reasons, a destructive hurricane can be welfare improving if the labor supply response allows a sufficiently large reduction in distortionary tax rates. Indeed, a destructive hurricane is nothing but a machine for converting useful spending to wasteful spending.

It is of course unsurprising, as a general proposition, that two deviations from a Pareto optimum can be better than one. But the particular case of distortionary taxes and wasteful spending seems to have been largely overlooked. One partial exception is Pelloni and Waldmann [PW], which tells a story where waste can improve welfare through its effect on the labor supply, which in turn affects capital accumulation, which in turn affects (endogenous) growth. By contrast, in our much simpler story, growth plays no role.

To emphasize this, we illustrate the effect in a straightforward one-period model (emphasizing that the effect is not only possible, but possible under reasonable hypotheses on parameter values), though (as was shown in earlier versions of this paper) one can derive similar results in a multi-period model with capital accumulation.

The Model. A representative agent maximizes a utility function $U(C, 1-L)$ where C and L represent consumption and leisure. The government taxes production at a rate θ and transfers an amount X to the representative agent. Total government expenditures (including the transfer) are fixed. Anything that's not transferred is wasted.

More precisely, the individual, taking X and θ as given, maximizes $U(C, 1-L)$ subject to the constraint

$$C = f(L)(1-\theta) + X \tag{1}$$

and therefore sets

$$(1-\theta)f'(L)U_1((1-\theta)f(L) + X, 1-L) - U_2 = 0 \tag{2}$$

Meanwhile, the government chooses X and θ subject to the budget constraint

$$\theta f(L) = G \tag{3}$$

where G is the exogenously determined level of government spending.[1]

We say that the economy is *paradoxical* if $dU/dX < 0$, with L and θ varying as functions of X to preserve (2) and (3).

We say that the economy is on the *rising side of the Laffer curve* if $d(\theta f(L))/d\theta > 0$, where the derivative is computed with X (but not G!) held fixed and L varying as a function of θ to preserve (2).

Note that if leisure is a normal good, then a paradoxical economy must be on the rising side of the Laffer curve. Proof: If the economy is *not* on the rising side of the Laffer curve then an increase in X reduces labor supply, which reduces government revenue, which the government must restore to its original value by *reducing* the tax rate, leaving agents unambiguously better off.

Conversely, we have:

Theorem. Suppose that leisure is a normal good and the economy is on the rising side of the Laffer curve. Suppose that the production function is of the form $f(L) = L^\alpha$. Then the economy is paradoxical if and only if

$$\theta > \frac{1+\eta-\alpha\eta}{1+\eta}$$

where θ is the tax rate and η is the *compensated* elasticity of labor supply with respect to the after-tax wage.

Proof. Differentiating equations (2) and (3) with respect to X and solving for for $d\theta/dX$ and dL/dX gives

$$\frac{dL}{dX} = -\frac{P}{A} \tag{4}$$

$$\frac{d\theta}{dX} = \frac{\theta W P}{fA} \tag{5}$$

where

$$P = (1-\theta)WU_{11} - U_{12} \tag{6}$$

$$A = \frac{\theta U_1 W^2}{f} + (1-\theta)U_1 f'' + (1-\theta)W^2 U_{11} - (2-\theta)WU_{12} + U_{22} \tag{7}$$

and $W = f'(L)$ is the pre-tax wage rate.

[1] If the production function f exhibits decreasing returns to scale, a tax on output is, in effect, a tax on both wages and profits. We've assumed that labor supply responds to the full burden of the tax, as if the agent (call her Alice) owns an individual small business. An alternative assumption is that the agent (now called Bob), both works for and receives the profits from a large enterprise, treating both his wage rate and the level of profit as given.

Our analysis of Alice applies equally to Bob. Taxing Alice's output at the rate θ and then returning a transfer of X is equivalent to taxing Bob's wages at the the same rate θ and returning a transfer of $X - \Pi\theta$, where Π represents profit. ("Equivalent" means that in equilibrium, Bob and Alice supply equal amounts of labor, enjoy equal amounts of consumption, and achieve equal utilities.) So the analysis of Bob's world is identical to the analysis of Alice's, subject to redefining the transfer X.

Note that leisure is a normal good if and only if $P < 0$ and that the economy is on the rising side of the Laffer curve if and only if $A < 0$. (The latter can be confirmed by computing the derivative with respect to θ of $\theta f(L)$ with X held fixed.) Thus our assumptions imply

$$P < 0 \qquad \text{and} \qquad A < 0 \tag{8}$$

From (1), (4) and (5), we get

$$\begin{aligned} \frac{dU}{dX} &= U_1 \frac{dC}{dX} - U_2 \frac{dL}{dX} \\ &= U_1 \left(1 - f(L)\frac{d\theta}{dX}\right) \\ &= U_1 \left(1 - \frac{\theta W P}{A}\right) \end{aligned} \tag{9}$$

Because U_1 is positive, (9) says that the economy is paradoxical if and only if

$$1 - \theta W P / A < 0 \tag{10}$$

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In view of (8), (10) is equivalent to

$$A > \theta W P \tag{11}$$

or equivalently

$$LU_1 \left(\frac{\theta W^2}{f} + f''(L)(1-\theta)\right) > D \tag{12}$$

where

$$D = -(1-\theta)^2 W^2 U_{11} L + 2(1-\theta) W U_{12} L - U_{22} L \tag{13}$$

is the denominator of the compensated labor supply elasticity

$$\eta = \frac{(1-\theta) W U_1}{D} \tag{14}$$

Because D is unambiguously positive, (12) is equivalent to

$$\eta > \frac{(1-\theta) W U_1}{LU_1 \left(\frac{\theta W^2}{f} + (1-\theta) f''\right)} > 0 \tag{15}$$

When $f(L) = L^\alpha$, (15) becomes

$$\eta > \frac{1-\theta}{\alpha - (1-\theta)} > 0 \tag{16}$$

or equivalently

$$\theta > \frac{1 + \eta - \alpha\eta}{1+\eta} \tag{17}$$

as advertised.

q.e.d.

Corollary. If the Laffer curve peaks at a tax rate of θ_0, then (holding fixed the level of useful government spending), the economy is paradoxical for all tax rates in a non-empty open inteval of the form $(\theta_0 - t, \theta_0)$

Proof. With everything evaluated at θ_0, and with P and A still defined by (6) and (7) we have $A = 0$ (this being the condition for the Laffer curve peak) and $\theta W P = -Z$ for some constant $Z > 0$ (the negativity of P being the condition for normality of leisure). Thus at θ_0, we have $A - \theta W P = Z > 0$.

Then for θ close to, but less than, θ_0, we have:

- the Laffer curve is rising and
- $A - \theta W P$ is close to Z, hence positive.

From (11), this is precisely what we need for the economy to be paradoxical.

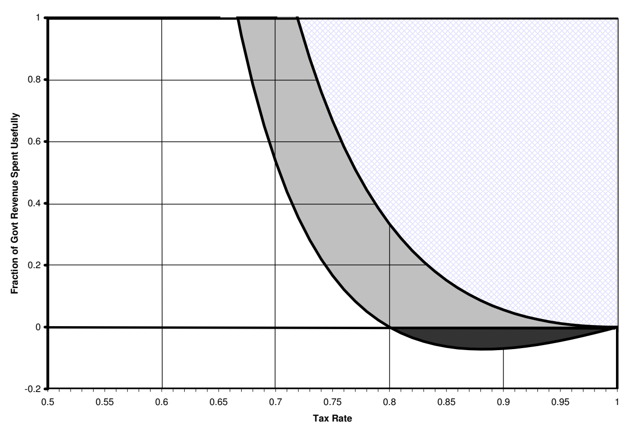
q.e.d.

Examples. If we have $\alpha = .67$, and if $\eta = .5$, and if the tax rate is above about 78% (but below the rate at which the Laffer curve peaks) then the economy is paradoxical.

If we consider the specific utility function

$$U(C, L) = \text{Log}(C) + \frac{1}{2} Log(1 - L)$$

then η varies with X and θ, but straightforward computations show that the economy is paradoxical for $(X/G, \theta)$ combinations in the shaded region of the following graph:



Here the left-hand boundary of the shaded region is the locus of equality for (17). In the cross-hatched region to the right, the Laffer curve is falling.

In particular, consider the more darkly shaded region below the X-axis, where useful spending is negative, i.e. the government imposes a head tax and discards the revenue. In this region, an increase in the head tax (or equivalently a destructive hurricane) is welfare- improving *even though 100% of the revenue is used to finance additional wasteful spending* — because a higher head tax leads to increased labor supply and allows the income tax rate to fall.

References

[PW] A, Pelloni and R. Waldmann, "Can Waste Improve Welfare?", *J. Pub. Econ.* 77 (2000), 45- 79.

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