

Econ 402
Fall 2007

Problem Set #2
Suggested solutions

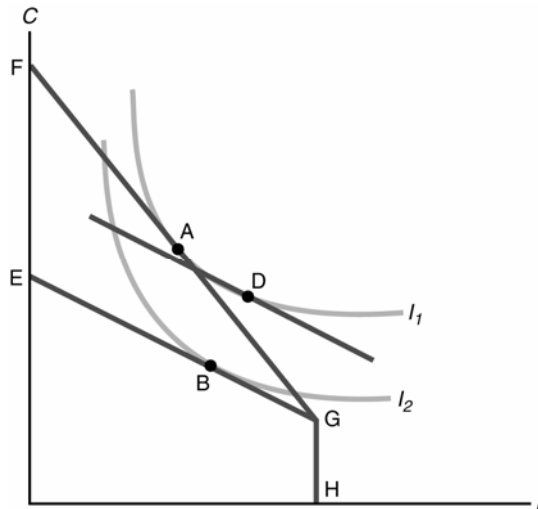
5. Government expenses in the cycle.
- (a) Difficult to tell: government expenses are clearly more variable in the first half of the sample, but they are less variable in the second half.
 - (b) No clear comovement emerges here. This can be explained by changing policies or by the fact that government expenses take a while to plan, pass the legislature, and execute.
 - (c) Sometimes it leads, sometimes it lags. But lags may be so large that they could be falsely interpreted as leads of the next cycle, see (b).

3. When the government imposes a proportional tax on wage income, the consumer's budget constraint is now given by:

$$C = w(1-t)(h-l) + \pi - T,$$

where t is the tax rate on wage income. In the figure below, the budget constraint for $t = 0$, is FGH. When $t > 0$, the budget constraint is EGH. The slope of the original budget line is $-w$, while the slope of the new budget line is $-(1-t)w$. Initially the consumer picks the point A on the original budget line. After the tax has been imposed, the consumer picks point B. The substitution effect of the imposition of the tax is to move the consumer from point A to point D on the original indifference curve. The point D is at the tangent point of indifference curve, I_1 , with a line segment that is parallel to EG. The pure substitution effect induces the consumer to reduce consumption and increase leisure (work less).

The tax also makes the consumer worse off, in that he or she can no longer be on indifference curve, I_1 , but must move to the less preferred indifference curve, I_2 . This pure income effect moves the consumer to point B, which has less consumption and less leisure than point D, because both consumption and leisure are normal goods. The net effect of the tax is to reduce consumption, but the direction of the net effect on leisure is ambiguous. The figure shows the case in which the substitution effect on leisure dominates the income effect. In this case, leisure increases and hours worked fall. Although consumption must fall, hours worked may rise, fall, or remain the same.



7. Leisure represents all time used for nonmarket activities. If the government is now providing for some of those, like providing free child care, households will take advantage of such a program, thereby allowing more time for other activities, including market work. Concretely, this translates in a change of preferences for households. For the same amount of consumption, they are now willing to work more, or in other words, they are willing to forego some additional leisure. On the figure below, the new indifference curve is labeled I_2 . It can cross indifference curve I_1 because preferences, as we measure them here, have changed. The equilibrium basket of goods for the household now shifts from A to B. This leads to reduced leisure (from l_1^* to l_2^*), and thus increased hours worked, and increased consumption (from C_1^* to C_2^*) thanks to higher labor income at the fixed wage.

