

Eco 214 Intermediate Macroeconomics

Balanced budget requirement and business cycle effects.

Consider an economy with only consumers and a government.

The government taxes income ($Y = \text{GDP} = \text{income} = \text{output}$) as a fixed percentage (t) of income.

The government spends a fixed amount G_0 , which is not related to income (think of military expenditure, Medicare expenditure etc.) and the government's expenditure is also negatively related to income ($-g$) which captures how unemployment benefits and Medicaid payments change in response to changes in GDP.

1. Given how the government taxes and spends,
 - a) write the algebraic equation for the tax revenues collected by the government.
 - b) write the algebraic equation for the government's expenditure.
2. Recall from chapter three that the government's budget is simply public savings. Use the tax and the expenditure equations from (1) to write the budget equation (and simplify it as much as you can). How is the budget going to be affected if the economy enters into a recession (take the derivative of the budget equation with respect to income)? Explain the intuition.
3. Suppose the economy is initially at full employment income and the budget is balanced. The economy then goes into a recession (consumption may have fallen because of lower consumer confidence, for example) and, consequently, income falls.
 - a) Show the change in income using either the IS-LM or AD-AS diagram.
 - b) Now that the economy is in a recession, explain whether the government has a budget deficit or a surplus? What must the government do to correct that? Show the effects of that in your diagram in (a). Is the government's action going to lessen the effect or amplify the effects on income from the recession? Is a balanced budget requirement a good idea (when thinking about the business cycle effects)?
4. Let's redo question 3 but now we are going to use a simple economic model to support our intuitive analysis.
 - (I) $Y = C + G$ we only have consumers and government in this economy. Y is income, C is consumption and G is government expenditure.
 - (II) $C = C_0 + C_y (Y - T)$ where C_0 is autonomous consumption, C_y is marginal propensity to consume and T is income taxes.
 - (III) $T =$ your equation from (1a)
 - (IV) $G =$ your equation from (1b)
 - a) Derive this multiplier: $\partial Y / \partial C_0$. Use equation (I) above and substitute out all the endogenous variables (C , G and T) with the appropriate equations. Then solve for Y (which would be the only endogenous variable now) as a function of exogenous variables only. Then take the derivative to get an algebraic expression for the multiplier.
 - b) Derive the same multiplier as in (a) but now assume a balanced budget requirement. First you need to make $G = T$ (or $T = G$) and then proceed in the same way you did in (a).
 - c) Compare the multipliers in (a) and (b). Which one is larger? If it is not obvious to you which one is larger plug some numbers into the multipliers and then compare them. Does this confirm your intuitive answer in (3b)?