Economics 214: Intermediate Macroeconomics

Simple macroeconomic model to illustrate multipliers algebraically (Ch. 10 Mankiw).

• Assumptions: Price level and interest rates are fixed.
The first assumption is applicable in the short run, thus, the multiplier should be viewed as a short-run phenomenon.
The second assumption does not really hold in reality but allows us to illustrate the multiplier in a very simple form.

• Economic Model:
Y=C+I+G
$C=C_0 + C_y(Y-T)$
Where Y is output, C is consumption, I is investment, G is government expenditure, C_o is autonomous consumption, C_y is marginal propensity to consume and T is (lump sum) taxes. For simplicity we assume I, G and T are all exogenous.

Substitute C equation into Y=C+I+G and solve for Y:

$$Y = \frac{1}{1-C_y}(C_0 - C_y T + I + G)$$

- The government expenditure multiplier is:
$\frac{\partial Y}{\partial G} = \frac{1}{1-C_y}$ which is positive. Higher G means higher Y.

- The tax multiplier is:
$\frac{\partial Y}{\partial T} = \frac{-C_y}{1-C_y}$ which is negative. Higher T means lower Y.

Notice that $\frac{\partial Y}{\partial G} > \left|\frac{\partial Y}{\partial T}\right|$ which implies higher G increases Y more than a Tax cut of same magnitude.

- Balanced budget multiplier is (which means G=T or $\partial G = \partial T$):
$\frac{\partial Y}{\partial G} + \frac{\partial Y}{\partial T} = \frac{1}{1-C_y} + \frac{-C_y}{1-C_y} = \mathbf{1}$
which implies increasing G and T by the same amount will increase Y exactly by that amount.

• Recall that we have assumed fixed price level and interest rates. When we relax those assumptions the multipliers become smaller.