AD shifts and the AE model

The aggregate demand curve expresses the relationship between equilibrium real GDP and the price level. As explored in math note 29A.1, this relationship can be expressed as

$Y = \left(\frac{1}{1-b}\right) \cdot [a(P) + b(Y - T) + I_g(P) + G + X_n(P)]$ where $a(P)$ is autonomous consumption expenditure, b is the MPC, T is total tax collections, $I_g(P)$ is gross investment, G is government expenditure, and $X_n(P)$ is net exports. Autonomous consumption, investment, and net exports are all assumed to be inversely related to the price level owing to the real balances effect, the interest-rate effect, and the foreign purchases effect, respectively.

What impact will a change in autonomous consumption, investment, or any other component of aggregate expenditure have on the position of the AD curve? This is equivalent to asking the extent to which equilibrium GDP will change when aggregate expenditures change, *holding the price level constant*. This change in GDP will measure the magnitude of the horizontal shift in the AD curve brought about by a change in one of the components of expenditures.

Shifts in the AD curve that result from changes in aggregate expenditures are computed from the expression for GDP:

$$\frac{\Delta Y}{\Delta a(P)} = \frac{\Delta Y}{\Delta I_g(P)} = \frac{\Delta Y}{\Delta G} = \frac{\Delta Y}{\Delta X_n(P)} = \left(\frac{1}{1-b}\right);$$

$$\frac{\Delta Y}{\Delta T} = \left(\frac{-b}{1-b}\right).$$

These shifts of the AD curve precisely reflect the multipliers from the aggregate expenditures model. To find the impact of any change in a component of aggregate expenditure, simply multiply that change by the appropriate multiplier. For example, suppose the MPC is .75. An increase in investment expenditure of \$100 billion will shift the aggregate demand curve to the right by $\left(\frac{1}{1-.75}\right) \cdot 100 = 4 \cdot 100 =$ \$400 billion. Similarly, a \$100 billion increase in taxes will shift the aggregate demand curve to the left by \$300 billion ($= \left(\frac{-.75}{1-.75}\right) \cdot 100 = -3 \cdot 100$).