Chapter 6: Aggregate Expenditures

6.6 The Multiplier

Remember: Y represents national income.

• An increase in any of the factors affecting aggregate expenditures (aggregate spending) will result in an even bigger effect on national income.
• For example: if a country were to increase autonomous spending (i.e. consumption) by $100, there would be an immediate increase of autonomous expenditure by $100 also. This increase in AE would create a shortage of goods/services at the original level of income, since the AE$_1$ curve would shift upward (becoming AE$_2$ and running parallel to AE$_1$) and graphically is depicted above the 45° line (where Y=AE). The economy would increase production to meet this increase in demand, thereby increasing income. A modest increase in income would still result in a shortage, so income must increase further until it reaches the point where AE = Y. A new equilibrium would result from the point where the AE$_2$ curve now crosses the 45° line.
  o The fact the increase in a factor of aggregate expenditure (in this case, consumption spending) resulted in an even bigger increase in income is the result of the multiplier phenomenon (introduced in chapter 5).

The Multiplier Derived

• An increase in investment (or any other determinant of AE) will lead to an increase in income, which will in turn lead to an increase in consumption.
• The value of this increase is dependent on the marginal propensity to expend (MPE).
  o Recall from section 6.3: MPE = MPC– MPM
  o In other words, an increase in consumption of, say, $10 million will not cause an immediate increase in consumption of an equal $10 million because some of the $10 million in income resulting from the $10 million investment will be spent on taxes, savings, and imports (the amount lost to these avenues is the MLR, or the marginal leakage rate). Instead, consumption will increase by the MPE.
• An increase in investment (or any other determinant of AE) will lead to an increase in income, which will in turn lead to an increase in consumption, which then renews the cycle.
  o Example: Karinia makes a $10 million investment in a new bicycle plant. The economy has an MPE of 0.5 (and therefore an MLR of 1 – MPE = 0.5 as well).
    ▪ From this initial $10 million investment, $5 million becomes income for those who helped produce the new building and it can be spent on consumption. This $5 million now becomes income for the producers of whatever products the initial group consume, but since the MLR is 0.5, they spend $2.5 million on taxes, savings, and imports, and the remaining $2.5 million is spent of domestic consumption. The cycle continues (keep assuming MPE = 0.5):
      • Initial round $10 million
      • Second round $10 million X 0.5 = $5.0000 million
      • Third round $5 million X 0.5 = $2.5000 million
      • Fourth round $2.5 million X 0.5 = $1.2500 million
      • Fifth round $1.25 million X 0.5 = $0.6250 million
      • Sixth round $0.625 million X 0.5 = $0.3125 million
      Total = $20 million
• In terms of an equation the multiplier is equal to: Multiplier = \[\frac{\Delta \text{ income}}{\Delta \text{ autonomous expenditures}}\]
• To calculate the multiplier, the formula is:
  o Multiplier = \[\frac{1}{(1 - MPE)}\] or Multiplier = \[\frac{1}{MLR}\]
• Recall that $MPE = MPC - MPM$ or $MPE = (1-MTR) \times MPC_D - MPM$

• The multiplier thus can be expanded into its individual elements:
  o $Multiplier = \frac{1}{1 - (MPC - MPM)}$, or
  o $Multiplier = \frac{1}{1 - MPC_D \cdot (1 - MTR) + MPM}$

• A country with a high MPE will have a bigger multiplier than a country with a low MPE.

• Using fractions can help simplify the MPE, MLR, and multiplier.
  o If the MPE is $\frac{3}{4}$, then the MLR is $\frac{1}{4}$, and the multiplier is 4 (which is the inverse of the MLR).