6.3 From Income to Disposable Income

Taxes and Disposable Income

- Recall that disposable income is income minus taxes, so:
  - \( Y_D = Y - T \)
- The tax function for the AE models also consists of an autonomous portion (existing when income \( Y \) is zero) and an induced portion (rising and falling with income):
  - Total taxes = autonomous taxes + induced taxes
- Induced taxes can be determined by finding the marginal tax rate, which is the ratio of the change in taxation as a result of a change in income.
  - \( \text{MTR} = \frac{\Delta \text{taxes}}{\Delta \text{income}} \)
  - Karinia example:

If total taxes = autonomous taxes + induced taxes, and induced taxes are expressed using the MTR, then the algebraic formula for total taxes is:
  - Total taxes = autonomous taxes + (MTR x Y) (where \( Y \) is national income)
  - Karinia example:

If disposable income (\( Y_D \)) = income (\( Y \)) – taxes (\( T \)), and the formula for taxes is total taxes = autonomous taxes + (MTR x Y), then the algebraic formula for disposable income is:
  - \( Y_D = Y - \left[ \text{autonomous taxes} + (\text{MTR} \times Y) \right] \)
  - Karinia example:

Consumption and Disposable Income

- To understand aggregate expenditures, we need to see the connection between consumption and disposable income, not just between consumption and income).
- To find the value of autonomous consumption, we must look at consumption that is autonomous to disposable income (that is, at what level is consumption when disposable income is zero?).
- To understand what happens to consumption as disposable income changes, we must find the marginal propensity to consume of out disposable income.
  - \( \text{MPC}_D = \frac{\Delta \text{consumption}}{\Delta \text{disposable income}} \)
  - Just as consumption consists of both an autonomous and induced portion, so too does the consumption function out of disposable income:
    - \( C = \text{autonomous consumption to disposable income} + \left( \text{MPC}_D \times Y_D \right) \)
    - \{Where \( Y_D = Y - \left[ \text{autonomous taxes} + (\text{MTR} \times Y) \right] \)}
    - Karinia example:

- We can derive an algebraic expression for the consumption function directly from a table (if provided) or indirectly if the tax function and the consumption function out of disposable income are known.
- We know that while income increases, so too do taxes, disposable income, saving, imports, and aggregate expenditures, while net exports decline; however, it’s the relationship between income and aggregate expenditures that is key because it determines employment and economic wellbeing.
• The marginal tax rate (MTR), marginal propensity to consume out of disposable income (MPC\textsubscript{D}), the marginal propensity to save out of disposable income (MPS\textsubscript{D}, which is simply 1-MPC\textsubscript{D}), and the marginal propensity to import (MPM) help us understand what happens to every additional dollar of income earned in a country.
  o Karinia example: Out of every additional $200 earned
    Leakage →  MTR = 0.2, so $\_\_\_\_\_\_\_\_\_\_ is spent on taxes.
    Therefore, leftover disposable income = $\_\_\_\_\_\_\_\_\_.
    MPC\textsubscript{D} = 0.75 so of this leftover income, $\_\_\_\_\_\_\_\_\_\_ is spent on consumption.
    Leakage →  MPS\textsubscript{D} = 0.25 so of this leftover income, $\_\_\_\_\_\_\_\_\_\_ is spent on savings.
    Leakage →  The MPM = 0.1, so of the $\_\_\_\_\_\_\_\_\_\_ spent on consumption, $\_\_\_\_\_\_\_\_\_\_ is spent on imported goods.
    If we subtract the $\_\_\_\_\_\_\_\_\_\_ spent on imported goods from the $\_\_\_\_\_\_\_\_\_\_\_ spent on consumption overall, we get $\_\_\_\_\_\_\_\_\_. which is the amount spent on domestically produced goods. (Thus, we know the value of disposable income spent on domestically produced goods.)
    If we subtract the $\_\_\_\_\_\_\_\_\_\_\_ spent on domestically produced goods from the $200 additional dollars initially earned, the value of earnings that leaks into taxes, savings, and imports is $\_\_\_\_\_\_\_\_. (We could also find this value by adding up all the leakages above).
  
• Draw figure 6.6 (page 212) into your notes:

• The relationship between the marginal propensity to consume from disposable income (MPC\textsubscript{D}) and the marginal propensity to consume (MPC) thus is:
  o MPC = (1-MTR) x MPC\textsubscript{D} (Where 1-MTR is the amount of income left over after taxes)

• Knowing that the marginal propensity to expend (MPE) depends on the tax rate, the marginal propensity to consume (and the marginal propensity to save), and the marginal propensity to import, the MPE thus can be expressed as:
  o MPE = MPC – MPM
  o In expanded form: MPE = [(1-MTR) x MPC\textsubscript{D}] – MPM
  o The greater the leakages noted above, the smaller the value of the MPE will be, and vice versa.