Week #8 Notes – Defining GDP ~ Equation of Real GDP

Introduction to Macroeconomics

*Macroeconomics is the study of the overall performance of the economy and the way various sectors of the economy relate to one another. What you hear on the news are often about macroeconomics such as recession, growth, unemployment, interest rates, exchange rate, international trade and aggregate supply and demand.

1. **Gross Domestic Product (GDP):** is the total market value of *all final goods and services* produced within a country in one year.
    a. **What is included?**: The goods and services whose values are included in GDP are the nation's final products that are sold to final users and not used as materials, parts, or services to be incorporated in the value of other items that are to be resold. Included in GDP is the value of domestic output produced by foreign workers with jobs in U.S. and by foreign-owner property located within the borders of the nation. Ex: The cars produced in a Japanese-owned Toyota factory located in Kentucky.
    b. **Why is it important?**: GDP is a key economic variable that is closely watched in gauging the performance of the economy. More production means greater use of inputs; and as more inputs are used, the earnings of those who supply them goes up. So GDP and income are positively related.
    c. **The following items are not included in GDP:**
        i. Sales of intermediate products.
        ii. Sales of used goods.
        iii. Purely financial transactions.
        iv. Nonmarket activities.
        v. Imported products and services.
        vi. Increases in the value of existing assets.
        vii. The underground economy.
    d. **How is it calculated?**: GDP is calculated by multiplying the quantity of each individual type of final product by its market price. There are technically two ways to measure GDP: the expenditure and income components of GDP.
        i. **Expenditure (Sometimes Output) Side of GDP:** Aggregate expenditure covers the cost of producing products and profit of sellers. So, $Expenditure = GDP$. Expenditure side of GDP has several components.
            1. Consumption (C) ➔ Largest part of expenditure
            2. Investment (I)
            3. Government Purchases (G)
            4. Net Export (NE) ➔ Export (E) – Imports (IM) ➔ NE sometimes is called trade balance.

            *Therefore; $GDP = Expenditure = C + I + G + NE$

        ii. **Income Side of GDP:** Whatever is spent on domestic production end up as domestic income. So, $Income = GDP$. Remember that when GDP goes up so does the aggregate income. The income side of GDP has several components. * You don't need these in exams/problem sets, these are just for curious readers.
            1. Compensation of employees.
            2. Net interest.
            3. Rental income.
            4. Profits.

a. Taxes on production and imports
b. Consumption of fixed capital.

*Therefore; $GDP = Income = C + S + T$ ➔ C: Income used for consumption; S: Household and Business savings; T: net taxes.

** We will mostly use the following equation: $GDP = Expenditure = C + I + G + NE = Income$. *Knowing this equation and the meaning of C, I, G and NE is enough for this course*.

2. **Nominal vs. Real Variable:**
   a. **Nominal Variable:** A variable which is measured without adjustment for the dollar's changing value (i.e., without adjustment of inflation). ➔ Nominal income, nominal wage, and nominal interest rate.
   b. **Real Variable:** A variable adjusted for changes in the dollar's value (i.e., with adjustment of inflation). ➔ Real income, real wage and real interest rate.
   c. We will talk about inflation later on this course. For now, just know the difference between nominal and real variable.

3. **Nominal GDP vs. Real GDP:**
   a. **Nominal GDP:** is the market value of nation's final output (GDP) on current prices. ➔ i.e., the GDP in current dollars. Nominal GDP can go up and down due to changes in prices.
   b. **Real GDP:** is an estimate of the value of nation's final products adjusted for changes in prices since a certain base year. ➔ i.e., the GDP in the base year dollars or the inflation adjusted GDP. Real GDP is more accurate measure than Nominal GDP because it removes the effect of rising prices (inflation) when valuing output. See the Week #8 Slides for calculation of Real GDP and more.