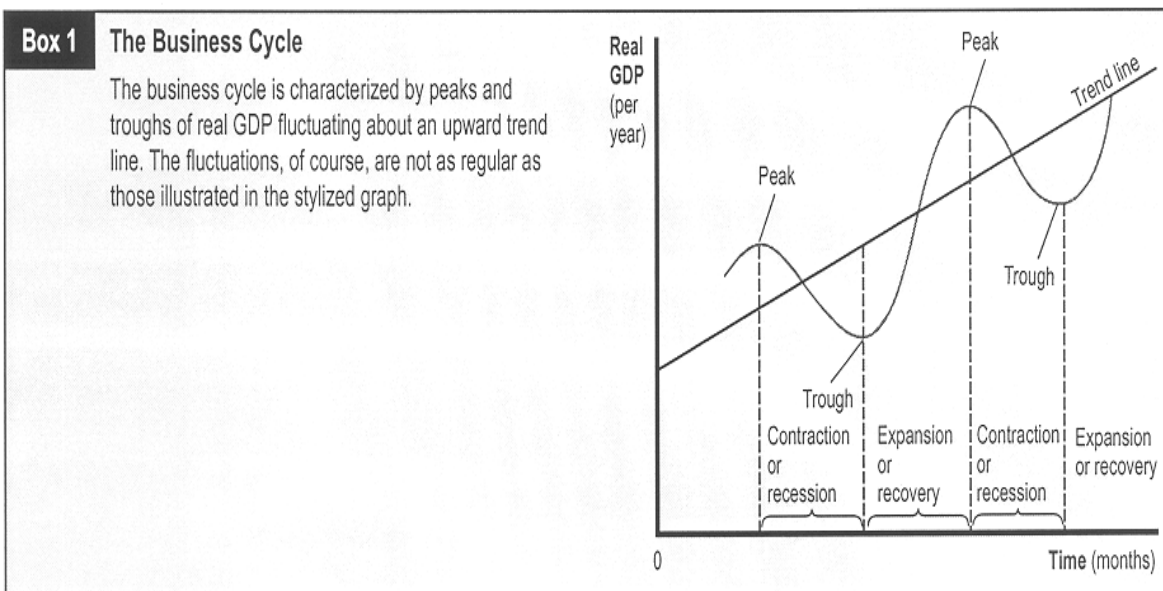


Week #9 Notes – Uses of GDP Data ~ Cost of Inflation

*Remember that a change in real GDP implies a change in income, employment opportunities, and the standard of living, on average, in a nation as output per person changes in the economy. For example, a decline in real GDP implies a decline in income, employment opportunities, and the standard of living on average.

1. **Business Cycle:** is the term used to describe the fluctuations in the aggregate production as measured by the ups and downs of real GDP. Or in other meaning fluctuations in real GDP around its long-term growth trend. The business cycle is characterized by peaks and troughs and period of contractions or expansions.
 - a. **Peak:** is the highest level of real GDP in the cycle. Each peak indicates an economy operating at close to full capacity. → Likely to have a shortage of labor and materials; low unemployment.
 - b. **Contraction or Recession:** is a period of declining or abnormally low real GDP (when real GDP declines for two consecutive three-month reporting periods). → Income, business profits, business demand for investment goods decline in recessions.
 - c. **Trough:** is the lowest level of real GDP observed over the business cycle. → High unemployment, low demand for goods.
 - d. **Recovery:** is used to describe an expansion in economic activity after a trough if the expansion follows a period of contraction severe enough to be classified as a recession. → Income, business profits, business demand for investment goods increase in recovery.



2. Unemployment:

- a. **Labor Force:** is the number of people over the age of 16 who are either employed or actively seeking a job. By definition, full-time students, retired people, people unable to

work because of disability, people in mental institutions and house workers are not part of the labor force.

b. Unemployed Person: A member of the labor force available for work who has actively sought employment during the previous 4 weeks. This time span might change from country to country

c. Unemployment Rate: The percent of the labor force unemployed.

$$\text{Unemployment Rate} = \frac{\# \text{Unemployed People}}{\text{Labor Force}} * 100$$

d. Discouraged Workers: is one who leaves the labor force (stops actively seeking a job) after unsuccessfully searching for a job. Discouraged workers are not considered as unemployed. For this reason, the official unemployment statistics tend to underestimate actual unemployment. For example, in March 2009, the official unemployment rate was %8.5; however, if the discouraged workers were to be considered for calculation the unemployment rate would be %15. You are not responsible from “Discouraged Workers in exams/problem sets. It is for curious reader.

e. Frictional Unemployment: results from employees leaving jobs they are unsuited for and people entering or re-entering labor force. → It is not quite possible to change frictional unemployment → unavoidable.

f. Structural Unemployment: is unemployment resulting from permanent shifts in the pattern of demand for goods and services or from changes in technology such as automation and computerization. → It is not quite possible to change frictional unemployment → unavoidable.

g. Cyclical Unemployment: is the amount of unemployment resulting from declines in real GDP during periods of contraction or recession or in any period when the economy fails to operate at its potential. → It is viewed as controllable → avoidable.

h. Natural Rate of Unemployment: is the summation of structural unemployment and frictional unemployment. → Unavoidable part of actual unemployment. Natural unemployment is currently estimated to be %6.

$$\text{Natural Unemployment} = \text{Structural U.} + \text{Frictional U.}$$

i. Actual Unemployment: is the unemployment which is actually seen in a given period.

$$\text{Actual Unemployment} = \text{Frictional U.} + \text{Structural U.} + \text{Cyclical U.}$$

$$\text{Actual Unemployment} = \text{Natural U.} + \text{Cyclical U.}$$

j. When the actual unemployment is equal to the natural unemployment, the economy is said to be at “full” employment, in other meaning economy is on Potential Real GDP.

3. Potential Real GDP: is the level of real GDP that would prevail if the economy achieved the natural employment = actual unemployment over a period of one year. Potential real *GDP* is the benchmark against which actual performance of the economy is measured.

- a. If the real GDP is equal to potential real GDP, cyclical unemployment is zero and the economy is at the full employment.
- b. When the economy operates below potential real GDP, there will be cyclical unemployment. → the actual unemployment will be larger than the natural unemployment.
- c. If the real GDP exceeds potential real GDP, the economy overheats. When the economy is overheated, upward pressures on wages and prices occur and real GDP falls. (Economy overheated → Inflation ↑ → real GDP ↓).
- d. Potential real GDP grows over time with growth in resources, and improvement in resource quality and in technology.

4. Price:

- a. **Price Level:** is an indicator of how high and low prices are in a given year compared to prices in a certain base period.
- b. **Price Index:** is a number used to measure the price level. The value of the index is set at 100 in the base year or period.
- c. **Consumer Price Index (CPI):** is the price index most commonly used to measure the impact of changes in prices on households. The index is based on a standard market basket of goods and services purchased by a typical urban family.

$$CPI = \frac{\text{Cost of Market Basket at Current prices}}{\text{Cost of Same Market Basket at Base year prices}} * 100$$

- i. The CPI is computed monthly and since 1988 an average of prices for the period 1982-1984 has been used as the base.
- ii. Ex: CPI as of August 2013 is 233.9, which means that prices for the CPI market basket in 2012 were 133.9% higher than they were in 1983.

5. **Inflation:** is the rate of upward movement in the price level for an aggregate of goods and services.

- a. Pure inflation rarely exists because not all prices rise at the same rate of increase of the CPI. → Pure inflation is the same rate of inflation for all goods in the basket. However, the inflation rate we use represents the average price change (inflation rate) for the basket.
- b. Inflation is measured by the percentage change in a price index, such as the CPI, over a year.

$$\text{Ex: Inflation in Current Year} = \frac{CPI \text{ Current Year} - CPI \text{ in Base Year}}{CPI \text{ in Base Year}} * 100\%$$

6. **Using the CPI to Compare \$ Values Across Time in General:** Prices from different time periods can be confusing so you can use the following formula to convert values between years. In other meaning, you can compare two values by adjusting for inflation.

$$Value\ in\ Year\ B = Value\ in\ Year\ A \times \frac{CPI\ in\ Year\ B}{CPI\ in\ Year\ A}$$

7. **Purchasing Power of a Current Dollar (Compared to Base Year):** tells the purchasing power of a current dollar after adjusting for inflation since the **base year**. This part is optional and please note that below formula is a modified version of formula above.

$$Purchasing\ Power\ of\ a\ Current\ Dollar = \frac{\$1}{CPI/100}$$

Ex: Suppose the 2008 CPI is 215.3 then the above formula tells us that each dollar in 2008 bought what could have been purchased for only 46 cents at the prices that prevailed, on average, over the period 1982-84 (base year).

8. Income:

- a. **Nominal Income:** is the actual number of dollars of income received in a year.
- b. **Real Income:** is the nominal income adjusted for changes in the purchasing power (inflation) of a dollar since a certain **base period**.
- c. **Using a Price Index to Deflate Nominal Values to Real Values (Compared to Base Year):**

$$Real\ Income = \frac{Nominal\ Income}{Current\ CPI/100}$$

Ex: Using the current CPI of 233.9 to deflate a current \$30,000 income to 1983 base year dollars:

$$Real\ Income = (\$30,000/233.9)*100 = \$12,826\ measured\ in\ 1983\ dollars.$$

- d. When a person's annual rate of increase in nominal income lags behind the annual rate of increase in the price level (inflation rate), the person's real income declines.
- e. This part is optional and please note that formula in part c is a modified version of formula in part 6.

9. Interest Rate:

- a. **Nominal Interest Rate:** is the annual % amount of money earned on a sum loaned by or deposited in a bank.
- b. **Real Interest Rate:** is the actual annual % change in purchasing power of interest income earned on a sum loaned by or deposited in a bank. OR in another meaning; the real interest rate is the nominal rate of interest less the rate of inflation.

$$Real\ Interest\ Rate = Nominal\ Interest\ Rate - Inflation\ Rate$$

- c. When lending money, creditors estimate the rate of inflation for fixed interest loans, if they underestimate the inflation, their real interest rate will be less than anticipated.

10. Wages:

- a. Real wages depend on both nominal wages and the price level.
- b. When inflation increases, real wages will decline unless nominal wages rise at least as fast as the price level.
- c. Nominal wages tend to be set by contract at the beginning of a year. If there is unanticipated inflation, real wages will decline that year.

11. Effects of Inflation on the Economy:

- a. When inflation increases unexpectedly, real wages decline and employers gain at the expense of workers while debtors gain at the expense of creditors.
- b. Inflation can impair incentives to save and invest by reducing the real interest rate and increasing uncertainty.
- c. Please see the explanations for “Money Illusion”, “Uncertainty About Future Price Level” and “Wealth Distribution” in lecture slides.