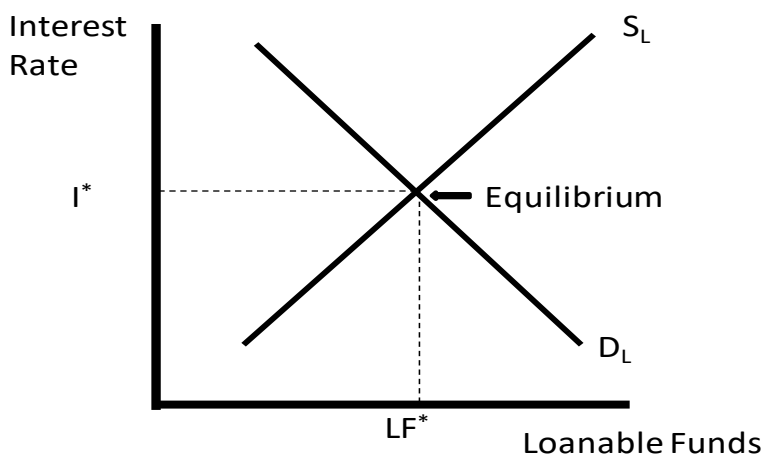


## Week #10 Notes – Loanable Funds Market ~ Classical vs. Keynesian

### 1. Credit Markets:

- **Credit:** the use of *loanable funds* supplied by lenders to borrowers who agree to pay back the borrowed funds according to an agreed upon schedule. The price for loanable funds is called *interest*.
- When you borrow money from a bank to buy a car, the bank is the *creditor*, and you are the *debtor* —you will pay monthly payments that include an interest rate
- **Interest:** *is a price and its level depends on the demand for and supply of loanable funds in financial markets where credit is available.* Interest is usually expressed as a percentage per dollar of funds borrowed. The amount of loanable funds supplied and demanded depends on interest rates.



$$\text{Real Interest Rate} = \text{Nominal Interest Rate} - \text{Inflation Rate}$$

### 2. Demand and Supply Analysis vs. Aggregate Demand and Supply Analysis:

- Demand and Supply Analysis:** In microeconomics, demand and supply analysis can be used to explain prices and quantities exchanged in individual markets.
- Aggregate Demand and Supply Analysis:** In macroeconomics, the basic tool of demand and supply are adapted to explain fluctuations in aggregate production (real GDP) and fluctuations in the price level.
  - Instead of trying to explain the quantity of an individual item produced over a certain period, macroeconomics tries to explain the forces that influence aggregate production.
  - Instead of trying to explain how the price of one good is established in a market, macroeconomics tries to explain how the price level, measured by a price index, such as the GDP deflator or the CPI, is established.

3. **Remember How the GDP is calculated:**

$$GDP = C + I + G + NE$$

$$GDP = \text{Income} = \text{Expenditure}$$

Since the expenditure part is demanded from the whole economy we can conclude.

$$AD = C + I + G + NE$$

4. **Aggregate Quantity Demanded:** is the amount of final products (measured as real GDP) that buyers will purchase at a given price level.

a. **Change in Aggregate Quantity Demanded:** is a change in the amount of nation's final product that will be purchased caused only by a change in the price level.

i. If the aggregate quantity demanded changes, this means a movement along the aggregate demand curve. NO SHIFT!

5. **Aggregate Demand:** is a relationship between aggregate quantity demanded and the economy's price level.

a. We depict this relationship using an aggregate demand curve which shows how aggregate quantity demanded varies with the price level of the economy.

b. *Aggregate demand is downward-sloping* which implies that the lower the price level, the greater the aggregate quantity demanded, other things being equal. There are 3 basic reasons for the inverse relationship between aggregate quantity demanded and the price level. (Note that these 3 effects are just for your information and I will not test you directly on these 3 effects, but it is always better to know the underlying reasons of concepts. However, you must know part 6 in this lecture notes.)

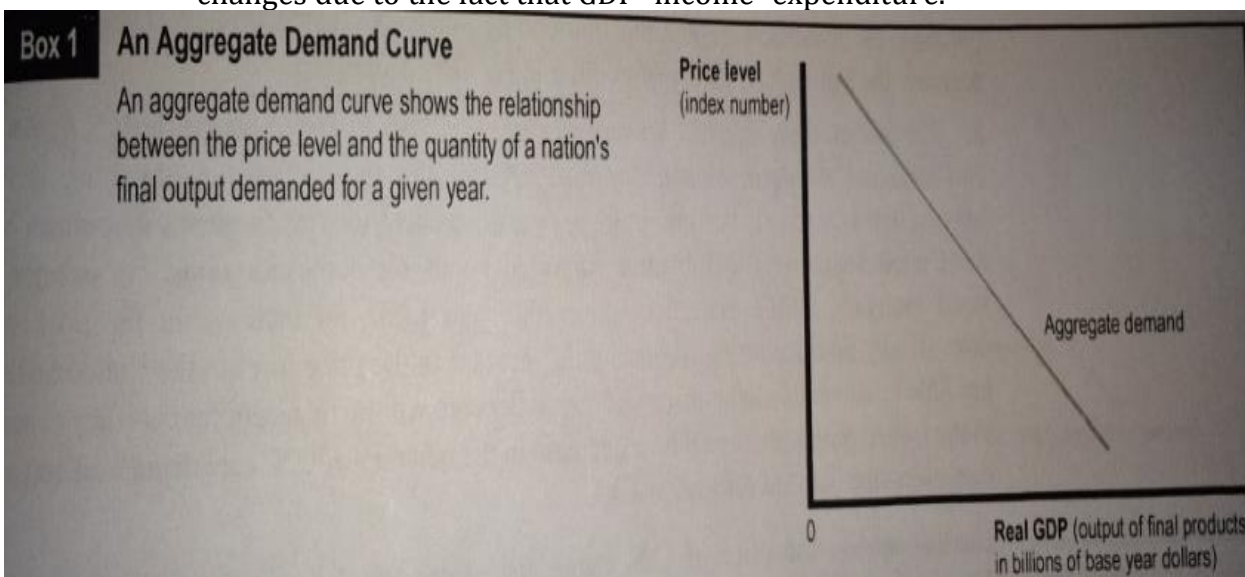
i. **The Real Wealth Effect:** A higher price level can decrease real wealth in a nation and reduce consumer spending on final products.

ii. **The Real Interest Rate Effect:** A higher price level can increase interest rates, making credit more expensive and reducing the quantity of investment goods demanded.

iii. **The Foreign Trade Effect:** A higher price level reduces foreign demand for U.S. exports and increases domestic demand for imports.

c. If aggregate demand changes, this means aggregate demand curve shifts. SHIFT!

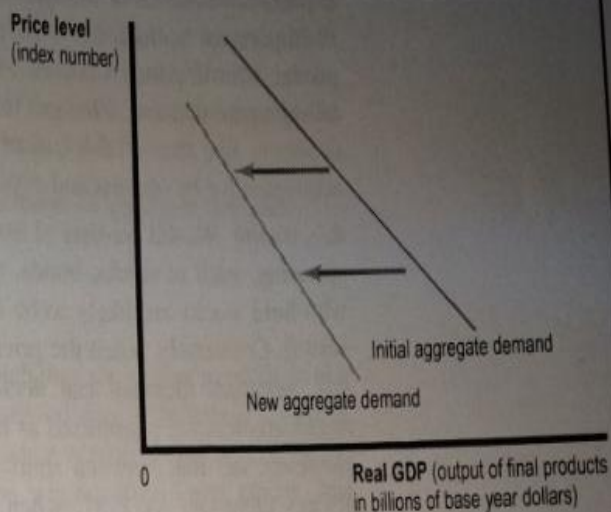
d. Note that income is not held constant as you move along an aggregate demand curve as it is held constant when you move along the market demand curve for a single product. WHY? → When real GDP changes, the income earned in the nation changes due to the fact that  $GDP = \text{income} = \text{expenditure}$ .



6. **Change in Aggregate Demand:** is a change in the amount of a nation's final product that will be purchased caused by something other than a change in the price level. SHIFT!
- a. **A Decrease in Aggregate Demand:** is represented by an inward shift of the entire aggregate demand curve. When the aggregate demand decreases, less output is demanded at each possible price level for the year.
  - b. **An Increase in Aggregate Demand:** is represented by an outward shift of the aggregate demand curve. When aggregate demand increases, a greater quantity of output is demanded at each possible price level for the year.
  - c. **Causes of Change in Aggregate Demand:**
    - i. **Real Interest Rate:** An increase (decrease) in real interest rate causes a decrease (increase) in aggregate demand. → A negative relationship.
    - ii. **The Quantity of Money in Circulation:** A decrease (increase) in the quantity of money would decrease (increase) aggregate demand. → A positive relationship.
    - iii. **Changes in the International Value of the Dollar:** A higher (lower) dollar decreases (increases) aggregate demand by decreasing (increasing) the demand for our exports and increasing (decreasing) demand for imports. → A negative relationship.
    - iv. **Wealth:** An increase (decrease) in wealth causes an increase (decrease) in aggregate demand. → A positive relationship
    - v. **Government Purchases, Taxes and Transfers:**
      - 1. An increase (decrease) in government purchases of goods and services increase (decrease) aggregate demand. → A positive relationship.
      - 2. An increase (decrease) in taxes decreases (increase) aggregate demand. → A negative relationship.
      - 3. An increase (decrease) in government transfers increases (decrease) aggregate demand. → A positive relationship.
    - vi. **Expectations about the Future:** A positive (negative) expectation about the future condition of the economy causes an increase (decrease) in aggregate demand. → A positive relationship
    - vii. **Income and Other Economic Conditions in Foreign Countries:** If income increases (decreases) in foreign countries, their demand for U.S. products increases (decreases) and therefore causes an increase (decrease) in aggregate demand. → A positive relationship.

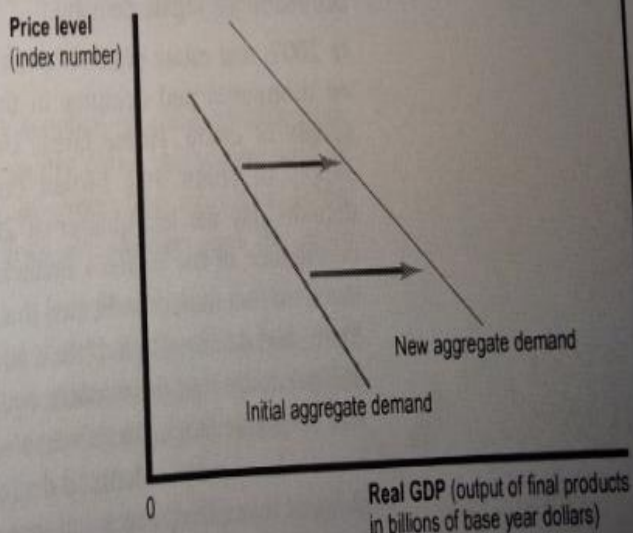
### Box 2 A Decrease in Aggregate Demand

A decrease in aggregate demand is represented by an inward shift of the entire aggregate demand curve. When aggregate demand decreases, less output is demanded at each possible price level for the year.



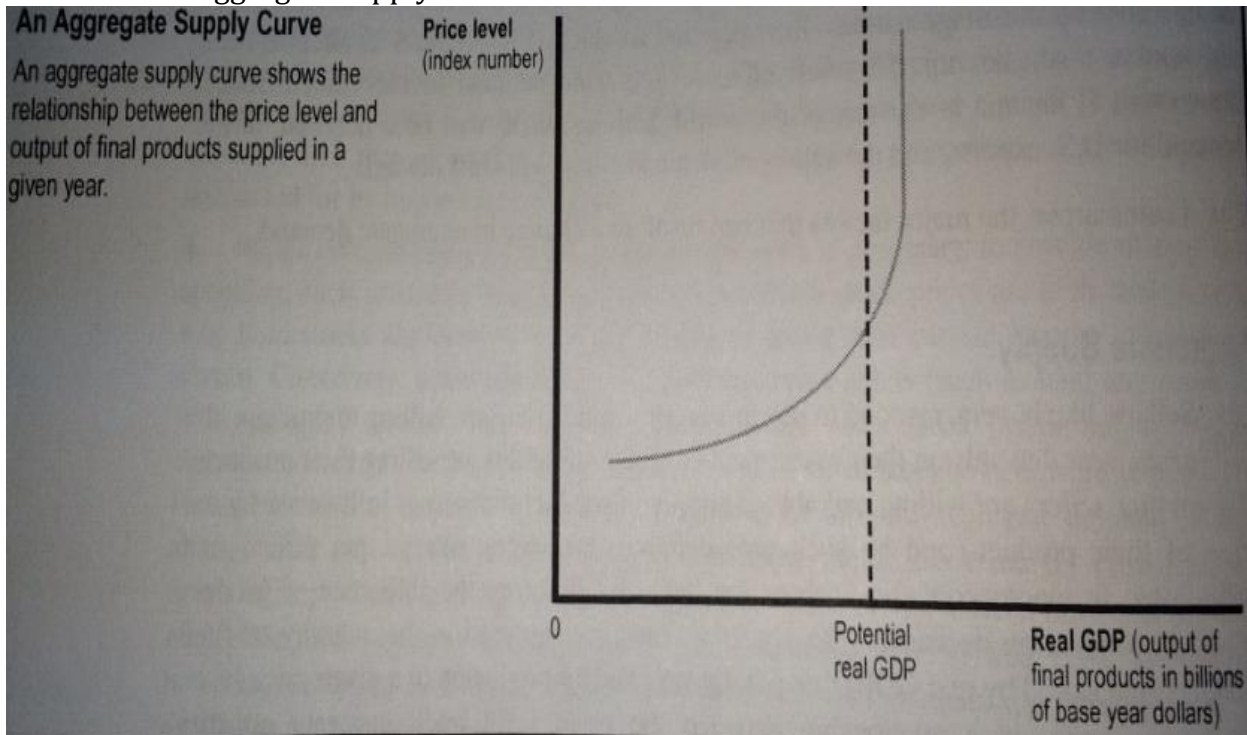
### Box 3 An Increase in Aggregate Demand

An increase in aggregate demand is represented by an outward shift of the aggregate demand curve. When aggregate demand increases, a greater quantity of output is demanded at each possible price level for the year.



7. **Aggregate Quantity Supplied:** is the quantity of final products (measured by real GDP) that will be supplied by producers at a given price level.
  - a. **Change in Aggregate Quantity Supplied:** is a change in the amount of a national production caused only by a change in the price level.
    - i. If the aggregate quantity supplied changes, this means a movement along the aggregate supply curve. NO SHIFT!
8. **Aggregate Supply:** is a relationship between aggregate quantity supplied and the economy's price level. **Important Note: Mateer and Coppock separate the aggregate supply curve into short-run and long-run aggregate supply curves. In this lecture notes, even though not labeled explicitly, the upward sloping aggregate supply curves are always short-run supply curves. The vertical Potential Real GDP line is the Long-run Aggregate supply. So, please know the difference.**
  - a. We depict this relationship using an aggregate supply curve which shows how aggregate quantity supplied varies with the price level of the economy.
  - b. When drawing an aggregate supply curve, we assume that all input prices and the general availability and quality of productive resources in the economy are fixed. We also assume that technology does not advance and number of sellers is fixed over the given period.

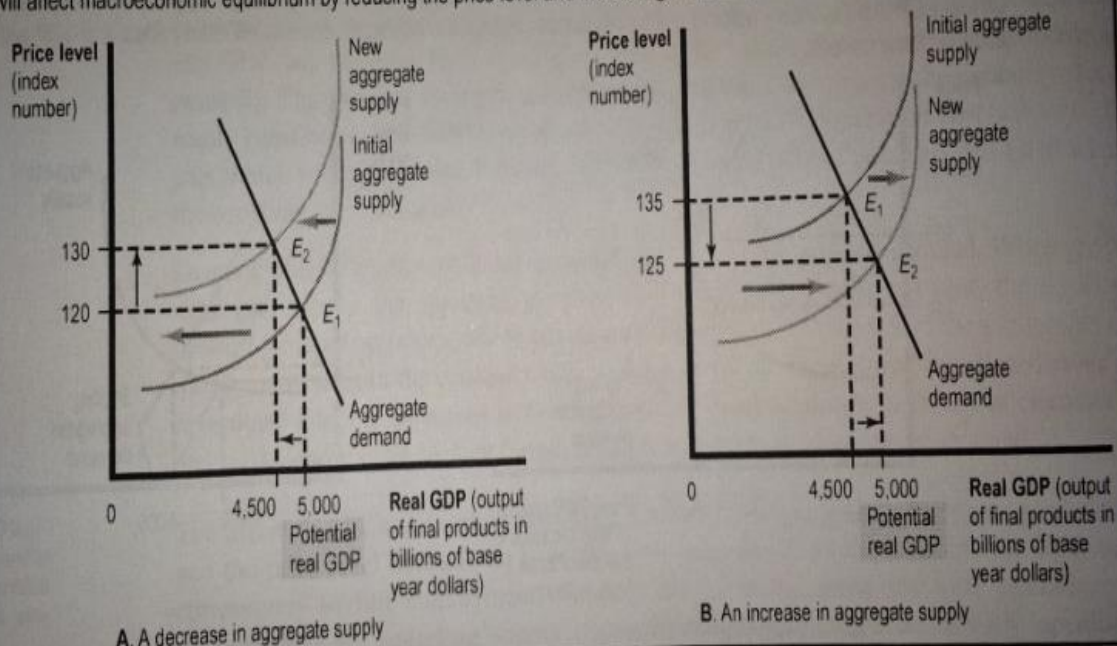
- c. *Aggregate supply is upward-sloping* which implies that the higher the price level, the greater the aggregate quantity supplied, other things being equal.
  - i. The positive relationship between aggregate quantity supplied and price level can be explained by the following relationship: “An increase in the price level generates profit opportunities which lead to an increase in aggregate quantity supplied”.
- d. If aggregate supply changes, this means aggregate supply curve shifts. SHIFT!
- e. Please see part 10 to understand the non-linear shape of the aggregate supply curve. Note that in some books Aggregate Supply curve is called short-run aggregate supply curve and drawn as linear.



- 9. **Change in Aggregate Supply:** is a change in the amount of a national production resulting from something other than a change in the price level. SHIFT!
  - a. **A Decrease in Aggregate Supplied:** is represented by an inward of the entire aggregate supply curve. When the aggregate supply decreases, less output is supplied at each possible price level for the year.
  - b. **An Increase in Aggregate Supply:** is represented by an outward shift of the aggregate supply curve. When aggregate supply increases, a greater quantity of output is supplied at each possible price level for the year.

### Box 15 Changes in Aggregate Supply

A decrease in aggregate supply will raise the price level and reduce equilibrium real GDP. An increase in aggregate supply will affect macroeconomic equilibrium by reducing the price level and increasing real GDP, other things being equal.



#### c. Causes of Change in Aggregate Supply:

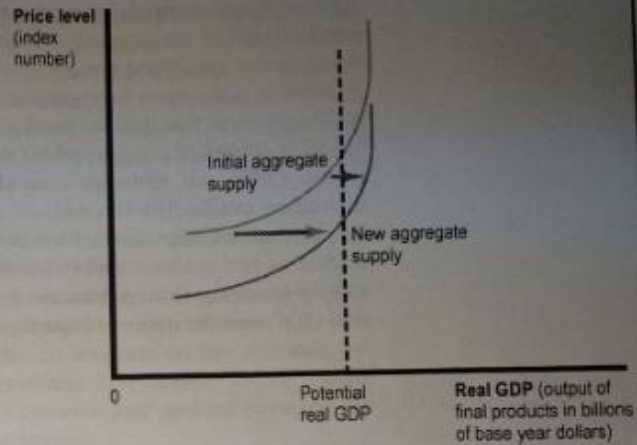
- i. **Change in Input Prices:** An increase (decrease) in input prices causes a decrease (increase) in aggregate supply. Note that changes in input prices neither affect the economy's potential real GDP nor the level of output corresponding to the economy's physical limit production. Therefore, even after a change in input prices the vertical "Potential Real GDP" line stays the same. (Remember that the Potential Real GDP is the full employment output and the economy's long-run GDP if there is no change in the amount of resources or in the level of technology. So this means in the long run, we can draw a vertical Potential Real GDP line. This vertical Potential Real GDP line can be called Long-run Aggregate supply in some books.)

1. Note that inputs prices in the production process are nominal wages and the nominal price of raw materials.

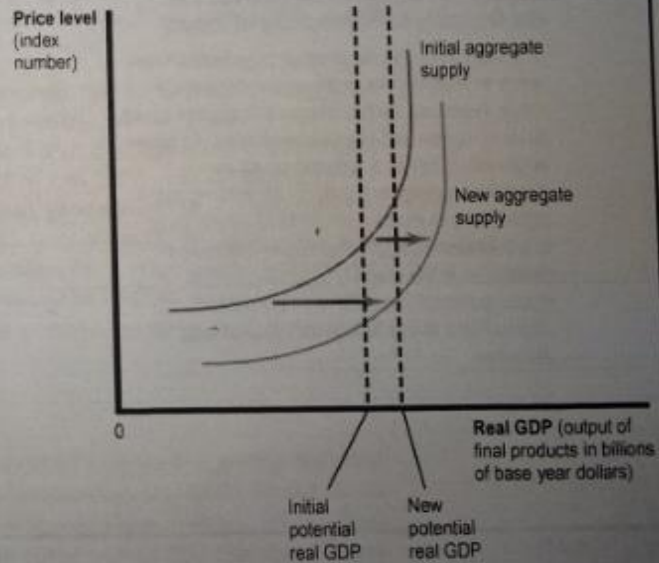
- ii. **Change in the Quality, Productivity and Availability of Inputs and Technology:** An increase (decrease) in the quality, productivity and availability of inputs and technology causes an increase (decrease) in aggregate supply. Note that the above changes also cause a change in the levels of output corresponding to potential real GDP. In another meaning, an increase (decrease) in the quality, productivity and availability of inputs and technology cause a right (left) shift in the vertical "Potential Real GDP" line.

**Box 8****Impact of a Decrease in Input Prices on Aggregate Supply**

A decrease in nominal wages or a decrease in other input prices shifts the aggregate supply curve outward without affecting potential real GDP or the level of real GDP corresponding to the physical limit to production during the year.

**Box 9****An Increase in Aggregate Supply Resulting from an Increase in the Quantity or Productivity of Inputs**

When the nation's productive potential increases over time because of more resources or increased productivity of resources, the aggregate supply curve shifts outward, also increasing potential real GDP and the level of real GDP corresponding to the point at which the aggregate supply curve becomes vertical.

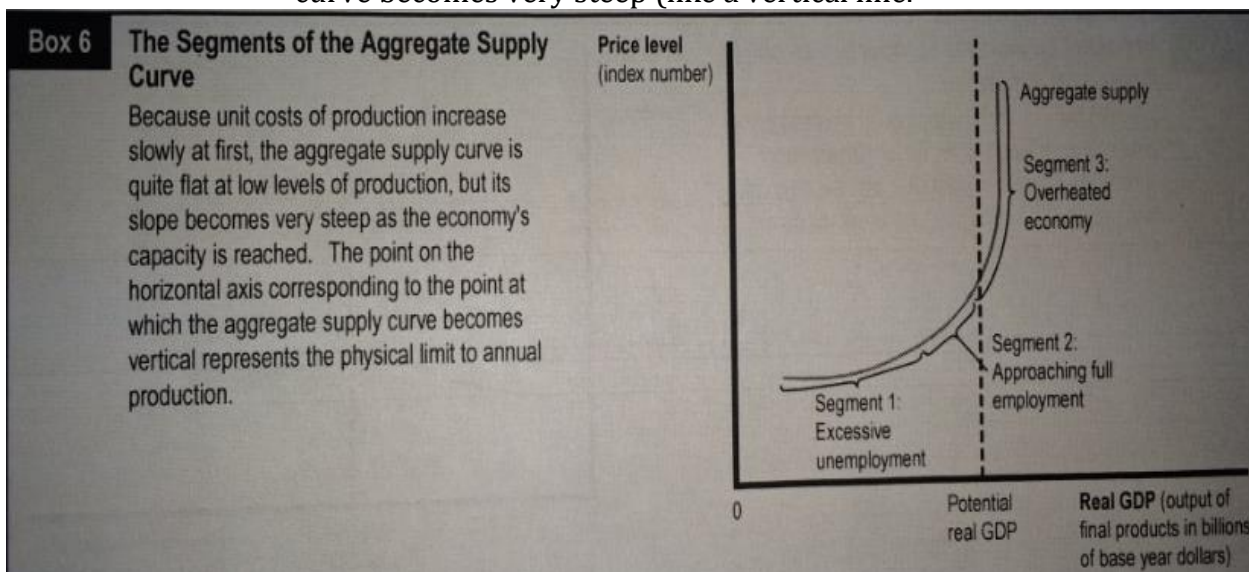
**10. Non-linear shape and Segments of Aggregate Supply, and Potential Real GDP Line:**

- a. **Potential Real GDP:** Remember that potential real GDP is the level of real GDP that would be produced if the economy were at the full employment in the long run.
- b. **Segments of the Aggregate Supply:** In the below graph you can see the vertical "Potential Real GDP" line as given. Note: This part is just for your information and will not be on exams/problem sets.
  - i. The very left side of the vertical "Potential real GDP" line tells us the actual rate of unemployment is higher than the natural rate of unemployment due to the positive cyclical unemployment. (Remember that when the real GDP is lower than the potential real GDP, there is positive cyclical unemployment in the economy and actual rate of unemployment is larger than the natural rate of unemployment). So, there is excessive unemployment and resources are not fully employed in the economy. Therefore, unit costs of production are low and increase slowly on the left side of vertical "Potential Real GDP" line. This part of the aggregate supply curve is called "segment 1"
  - ii. When the economy's capacity reaches the vertical "Potential Real GDP" line, the actual rate of unemployment will be lower and lower and the unit costs of production become higher and higher; and therefore, aggregate supply curve becomes steeper and steeper. (WHY?→Increasing production causes firms to hire even the unskilled workers which causes an increase in the unit cost of production.) This part of the aggregate supply curve is called "segment 2".

- iii. The right side of the vertical “Potential Real GDP” line tells us the actual rate of unemployment is lower than the natural rate of unemployment due to the negative cyclical unemployment. In another meaning, the economy is overheated and firms are using more and more unskilled workers to produce more which causes an increase in unit cost of production. This part of the aggregate supply curve is called “segment 3”.

**c. Nonlinear Shape of Aggregate Supply Curve:**

- i. In segment 1, unit cost of production is low so the aggregate supply curve will be flat → like a horizontal line.
- ii. In segment 2, unit cost of production increases, so the aggregate supply curve becomes steeper.
- iii. In segment 2, unit cost of production increase a lot, so the aggregate supply curve becomes very steep (like a vertical line).



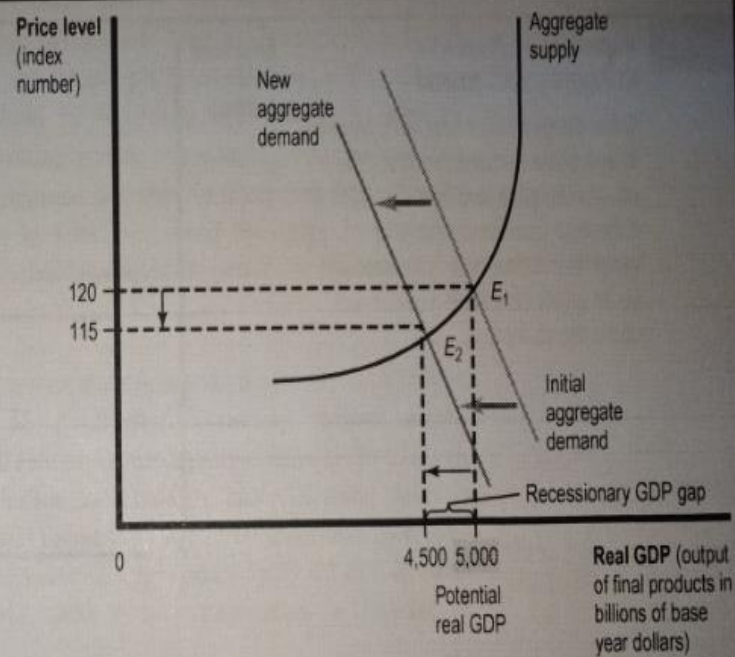
**11. Macroeconomic Equilibrium:** is attained when the aggregate quantity demanded equals the aggregate quantity supplied.

- a. When a macroeconomic equilibrium is achieved, the aggregate production made available for sale over a given period is, on average, willingly purchased in markets at prevailing price level. The phrase “on average” is important when discussing macroeconomic equilibrium because the price level and real GDP are aggregates. Some individual markets can be out of equilibrium even when a macroeconomic equilibrium is attained.
- b. If it occurs at the level of potential real GDP, it is called equilibrium at full employment.
- c. **Recessionary GDP Gap:** is the difference between the equilibrium level of real GDP and the potential real GDP when the economy is operating at less than full employment.



**Box 12****Impact of a Decrease in Aggregate Demand**

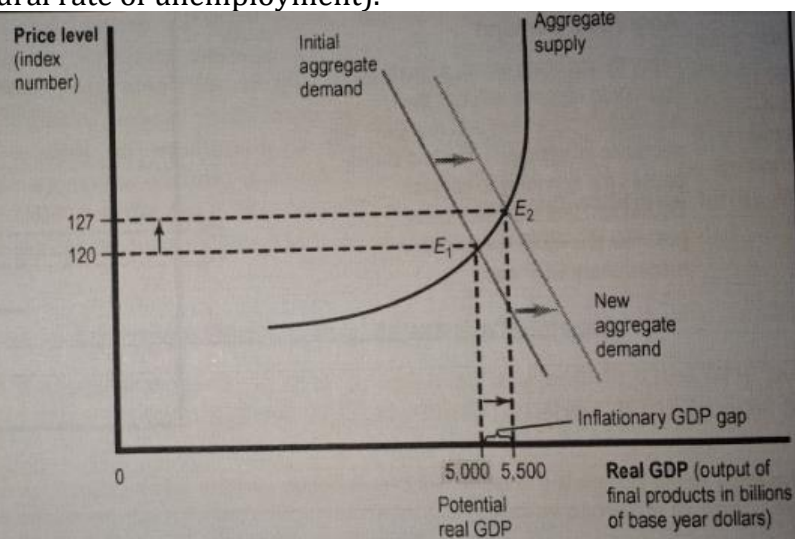
Other things being equal, a decrease in aggregate demand reduces the equilibrium price level and real GDP. The decrease in aggregate demand shown causes the economy to contract. Equilibrium real GDP falls below potential real GDP, opening up a recessionary GDP gap.



- d. **Inflationary GDP Gap:** is the difference between equilibrium real GDP and potential real GDP when the economy is overheated (actual rate of unemployment is less than the natural rate of unemployment).

**Box 13****Impact of an Increase in Aggregate Demand**

Other things being equal, an increase in aggregate demand increases the equilibrium price level and real GDP. If the new equilibrium real GDP exceeds potential real GDP, there will be an inflationary GDP gap opened up for the economy.



- e. Inflation can be explained by either an increase in aggregate demand or a decrease in aggregate supply.
- f. Recessions can be caused by either a decrease in aggregate supply or a decrease in aggregate demand.
- i. A recession caused by a decrease in aggregate supply is likely accompanied by both inflation and excessive unemployment.
  - ii. A recession caused by a decrease in aggregate demand will result in both excessive unemployment and some downward pressure on the price level.

**12. The Classical Model of Macroeconomic Equilibrium:** implied that an increase or a decrease in aggregate demand would set up market forces that would eventually put the economy in Potential Real GDP (full employment output) and eliminate cyclical unemployment in the long run.

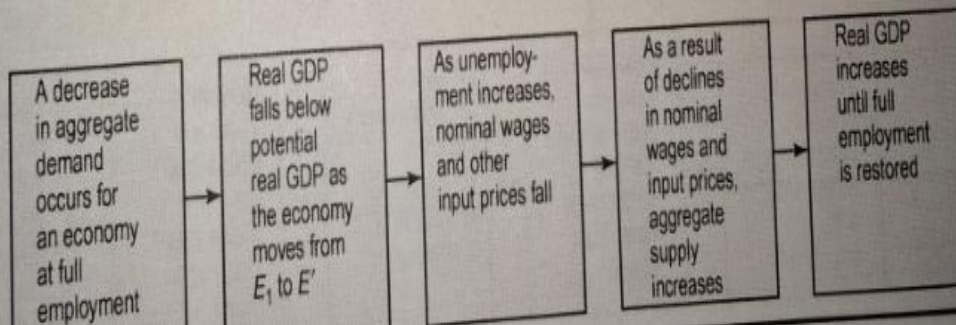
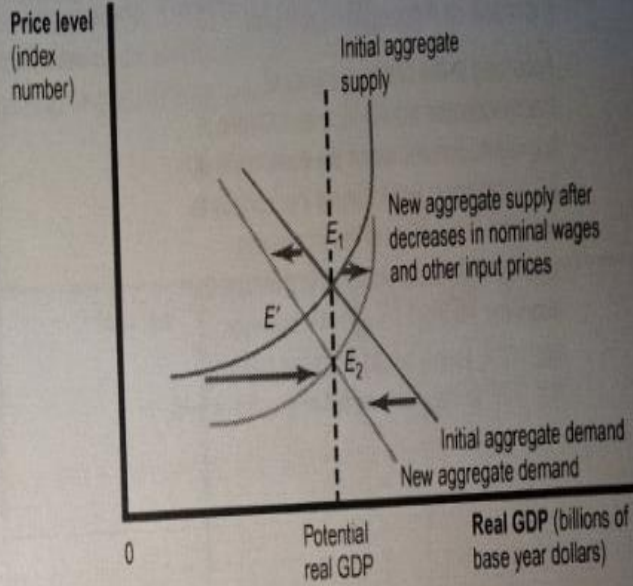
- a. The economy has a self-correcting mechanism that keeps it working at full employment most of the time.
- b. Note that **wage and price flexibility** assure that economy will return to full employment in the long run after a change in aggregate demand.

- c. A key assumption of the classical model is that in response to a decrease (increase) in aggregate demand → causing positive (negative) cyclical unemployment, nominal wages and other input prices fall (rise) sufficiently to shift the aggregate supply outward (inward) enough to restore full employment quickly.

**Box 1**

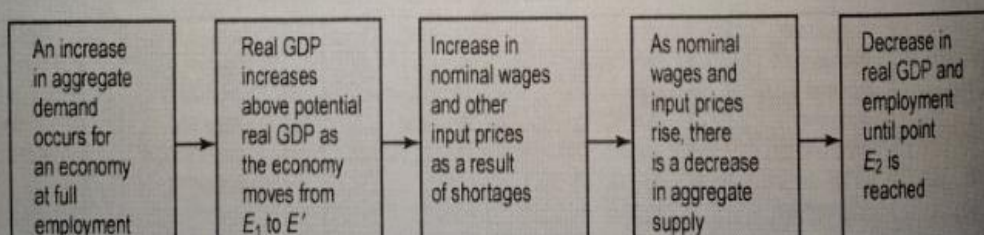
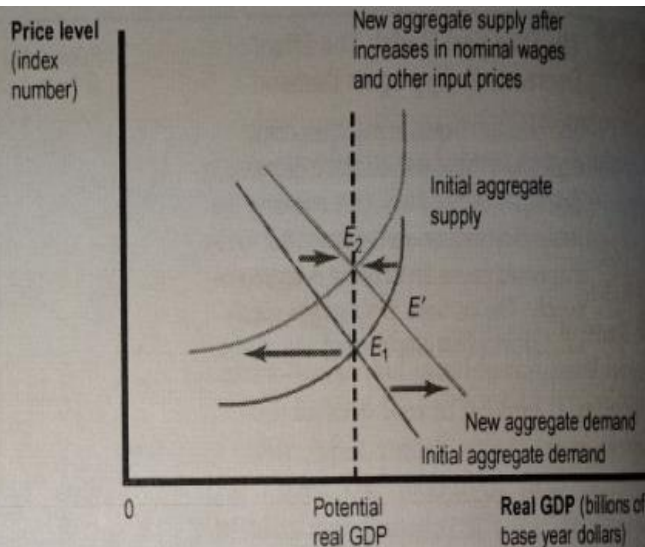
**The Classical Model: The Effect of a Decrease in Aggregate Demand**

The classical model of macroeconomic equilibrium hypothesized that a decrease in aggregate demand when the economy is at full employment would set up market forces that would cause an increase in aggregate supply. The increase in aggregate supply would restore full employment after a while.



**Box 2 The Classical Model: The Effect of an Increase in Aggregate Demand**

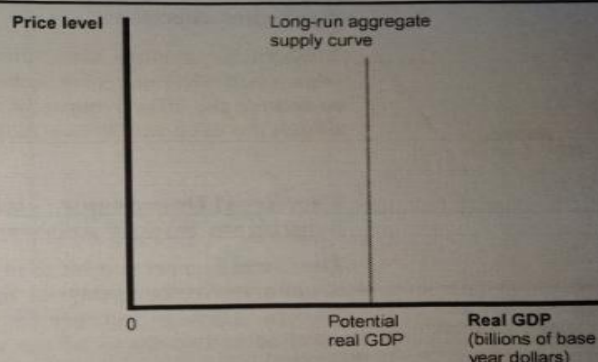
According to the classical model of macroeconomic equilibrium, an increase in aggregate demand when the economy is at full employment would cause input prices to rise. The initial effect of the increase in aggregate demand would be to overheat the economy. As input prices rose, however, aggregate supply would decrease, causing real GDP to decline to its full-employment level.



- d. **Classical View of Long Run Aggregate Supply:** According to the classical economists, equilibrium real GDP can deviate from potential real GDP only temporarily. Any recessionary and inflationary real GDP gaps are quickly eliminated through changes in aggregate supply that eliminate the discrepancy between equilibrium and potential real GDP. Therefore, except for short-lived periods, the economy could be expected to achieve equilibrium at full employment.
- e. **Long-run Aggregate Supply Curve:** shows the relationship between the aggregate quantity supplied and the price level that would be observed if nominal wages and other money prices were flexible enough to allow the classical self-correction mechanism to work.
  - i. **Despite shifts in aggregate demand influence year-to-year performance, ultimately the growth of an economy depends on the expansion of productive capacity (aggregate supply).**

**A Long-Run Aggregate Supply Curve**

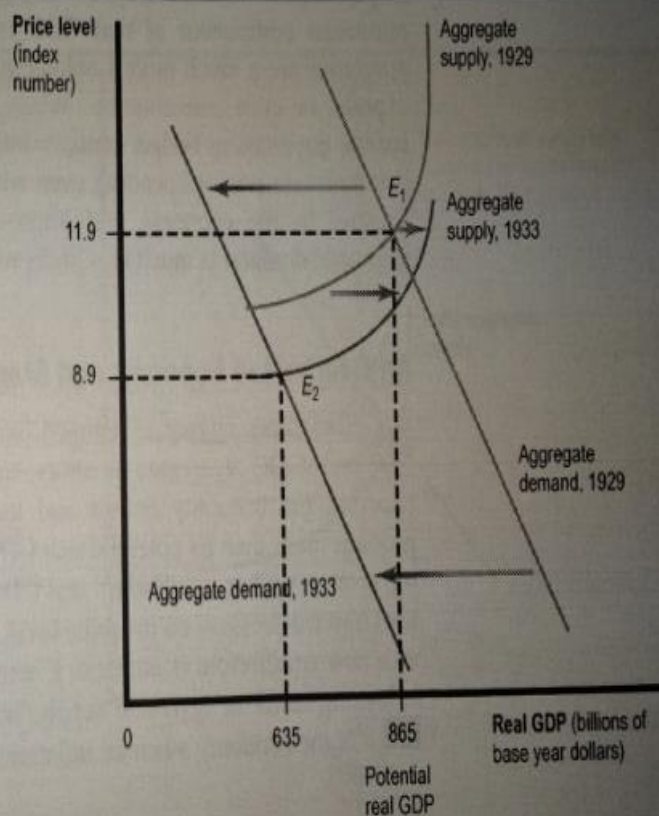
A long-run aggregate supply curve shows the relationship between the price level and real GDP that would prevail if wages and prices adjusted so as to eliminate any recessionary or inflationary GDP gaps.



- f. The Classical Model prevailed until the Great Depression. During this time, macroeconomic equilibrium was stuck at a level of real GDP much lower than the potential real GDP and cyclical unemployment was very high.

**Box 4****Using Aggregate Demand–Aggregate Supply Analysis to Understand the Great Depression of the 1930s**

There was a massive decline in aggregate demand between 1929 and 1933. Nominal wages and other input prices did decline as the classical model suggested. However, the decline in nominal wages was not sufficient to restore full employment. The aggregate supply curve did not shift outward enough to eliminate the enormous recessionary GDP gap, and the economy stagnated in equilibrium well below potential real GDP.



**13. Keynesian Model of Macroeconomic Equilibrium:** assumes that, because of rigid nominal wage (downwards), the economy's self-correction mechanism (proposed by Classical Theory) can't be expected to automatically restore full employment when aggregate demand declines. This model implies that corrective measures (government policy—purchases, tax cuts and transfers) need to be taken to restore aggregate demand to a level that ensures full employment and to avoid declines in aggregate real income and employment opportunities.

- a. The key to this model is the idea of rigid nominal wages and prices in the downward direction. The classical model seemed logically correct, but the evidence suggested that nominal wage and price levels are semi-flexible in the period of one year. → This does not mean input prices (or prices in general) do not fall—just that they do not fall enough to increase the profitability of production (outward shift in aggregate supply) to restore full employment when the economy is operating below potential real GDP.
- b. **In the Long-run, we are all dead:** this relates to Keynes's idea that decreases in aggregate demand may never decrease the price level enough to reach points on the long-run aggregate supply curve. Recessions often require short-run action to increase aggregate demand because long run self-correction mechanism of the economy does not work well in the downward direction.

**14. Noninflationary Growth:** When the rate of growth of aggregate demand keeps pace with but does not exceed the rate of growth of potential real GDP, the economy enjoys noninflationary growth.

