AD-AS Model Part 2

Revision – Aggregate Demand

- AD is the total demand for final goods and services in an economy at a given time. It specifies the amounts of output that will be purchased at all possible price levels.

- Why is AD downward-sloping? It is due to “interest rate”.
- P↑ >> M/P↓ >> i↑ >> I↓ >> AE↓ >> Y↓

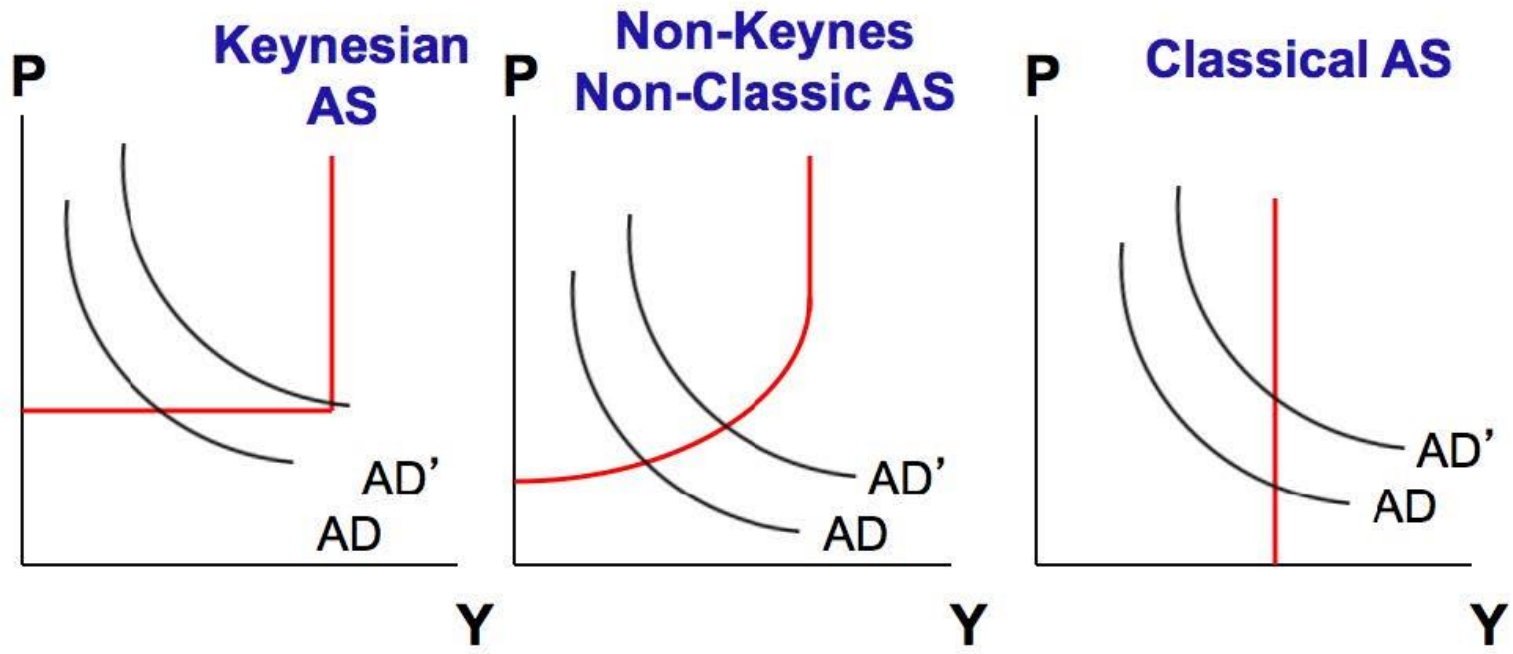
- What causes shifts in AD?
- Any “non-price” factor that shifts IS-LM, shifts AD.
  - Autonomous C and I
  - Fiscal Policy (G and T) and Monetary Policy (M)

Aggregate Supply (AS)

- AS is the total supply of output that firms in an economy plan to sell during a specific time period.
- It specifies the amounts of output that will be supplied at all possible price levels.

- **AS is a relationship between P and Y.**
- **P is Price Level.**
- **Y is Real Output.**

Three "Original" AS Curves



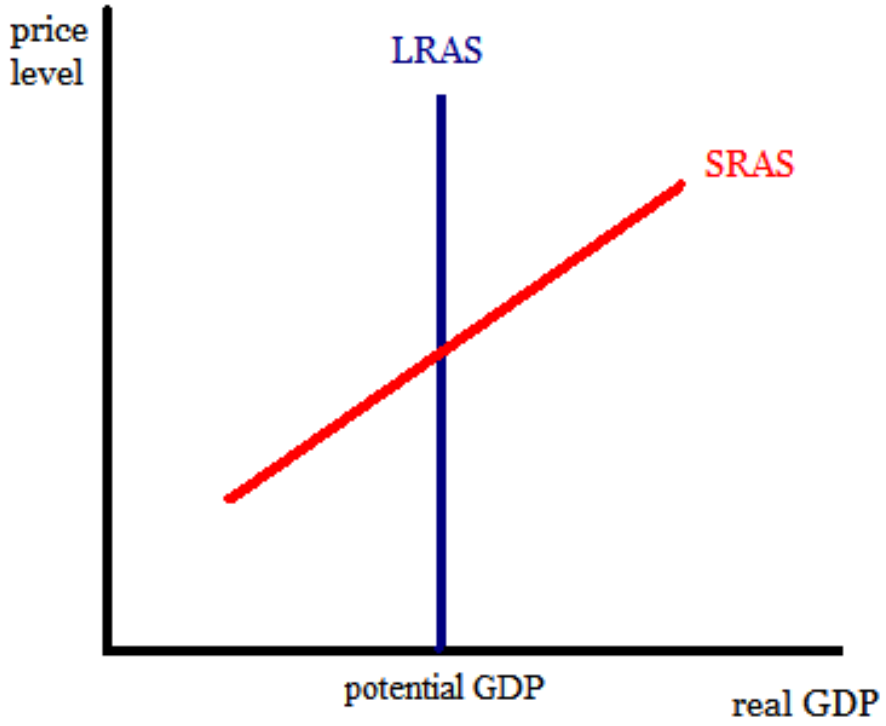
- To remove differences from these three concepts, economists have merged their ideas together to form **1) Short-run AS** and **2) Long-run AS**.

EXTRA – The Three AS Curves

- (LEFT DIAGRAM) The Keynesian AS curve assumes that prices and wages are fixed until full employment is reached. Over the 'Keynesian range', there is spare capacity in the economy, the price level is stable, and real output can expand as a result of increases in AD without any inflationary pressure (i.e. price level does not rise).

- (RIGHT DIAGRAM) The Classical view of real output was that it was fixed at a particular level. At this level, all the factors of production in the economy would be fully employed.

Two "current" AS curves



- **Note that LRAS = Classical AS.**

Short-run and Long-run

- In **Short Run**, at least one factor of production is fixed.
  - Output is NOT at the full-employment level.
  - Price and wage are sticky >> unemployment.

- In **Long Run**, all factors of production are variable
  - Output is at the full-employment level.
  - Price and wage can change.

Short-run Aggregate Supply

- There are three theories that can be used to derived the SRAS curve:
  - Sticky price theory
  - **Sticky wage theory** (we will study this one)
  - Misperceptions theory

- **All of these theories explain why SRAS is upward-sloping.**

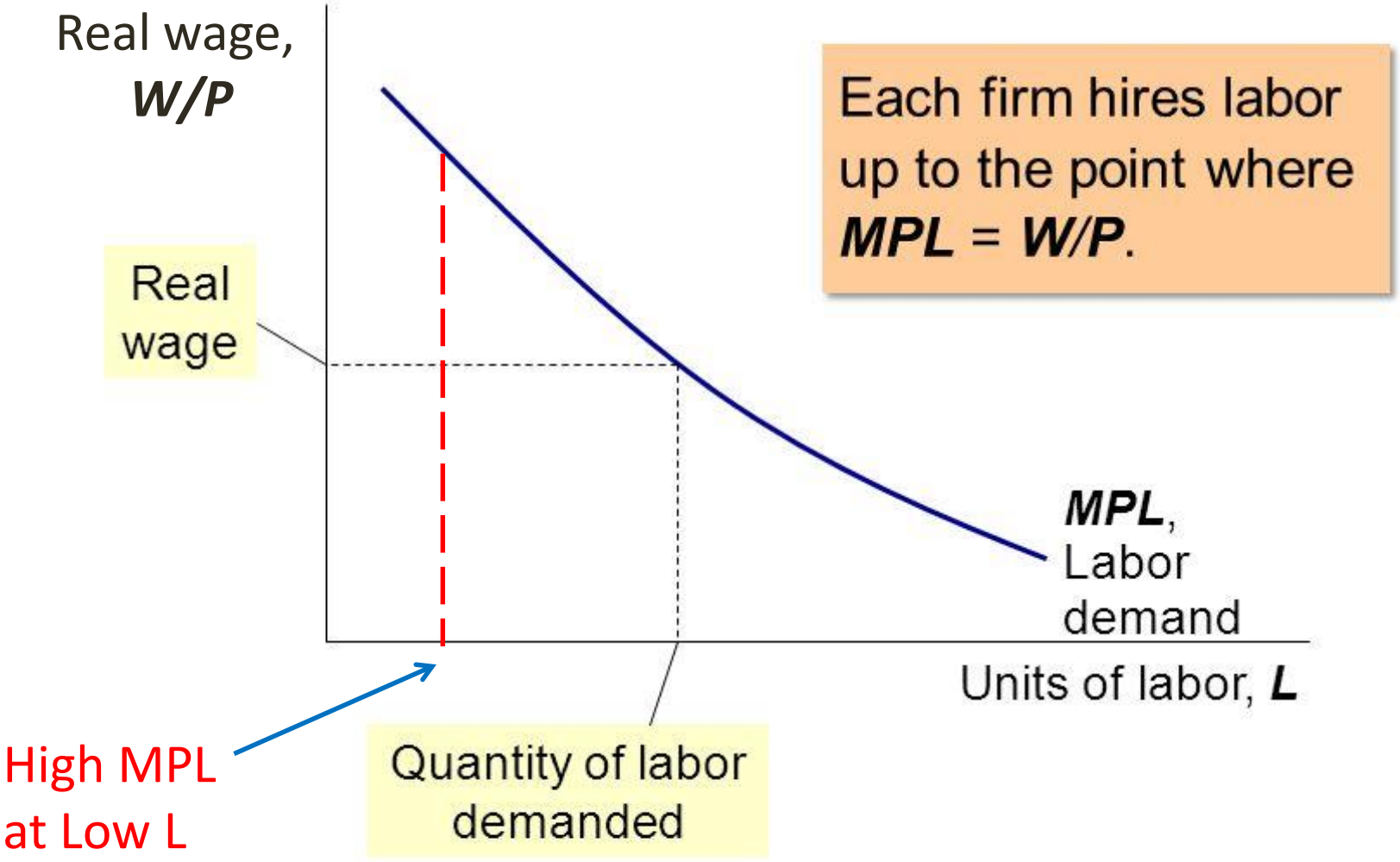
Deriving SRAS – Sticky Wage

- In short run, **"NOMINAL" wage** is sticky (due to labor contracts), and there is unemployment.
- How many people are employed depends on "**Labor Demand**" which is then determined by the profit-maximizing firms.

- Profit Maximization: **MC = MR**.
- Labor Demand: **W = P x MPL** or W/P = MPL
- W = Nominal Wage and MPL = Marginal Product of Labor

- **Note that <u>W is CONSTANT</u>.**

MPL and the demand for labor



EXTRA – MPL

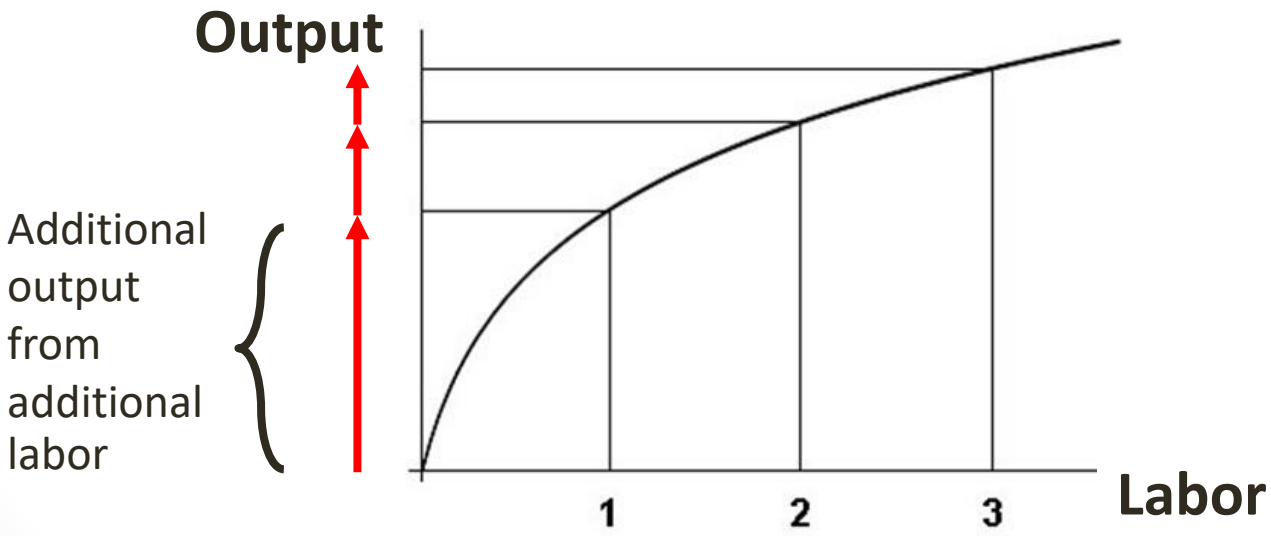
- MPL or Marginal Product of Labor tells us about the "productivity" of labor.
- It is the change in output that results from employing an additional unit of labor.

- When few workers is hired, adding one extra worker gives a lot of additional output.
- That is, at low L, we have high MPL (**see Previous Page**).

- MPL is characterized by the "Law of Diminishing Return".

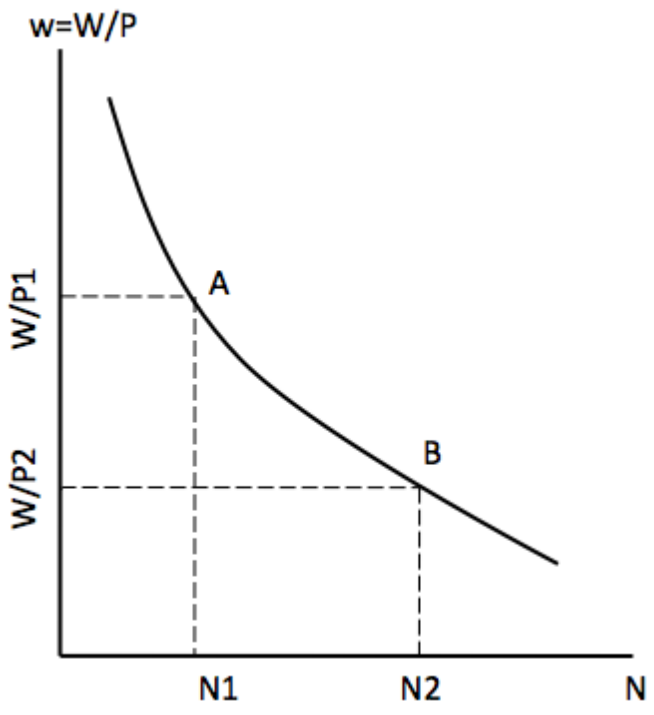
EXTRA – MPL

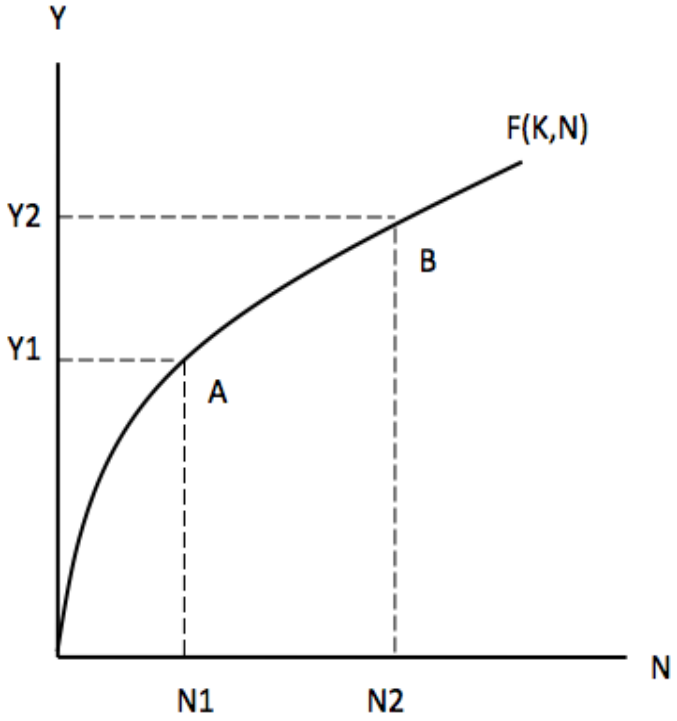
- MPL is characterized by the “Law of Diminishing Return”.
- Law of Diminishing Return states that
  - In short run (where capital is fixed), when additional labor is hired, the addition output from the extra labor will increase at the decreasing rate.



Deriving SRAS – Sticky Wage

- The profit-maximizing firms choose how many people to employ according to W/P = MPL.
- Given the FIXED capital (due to being in Short Run), the number of labor determines output of the economy.

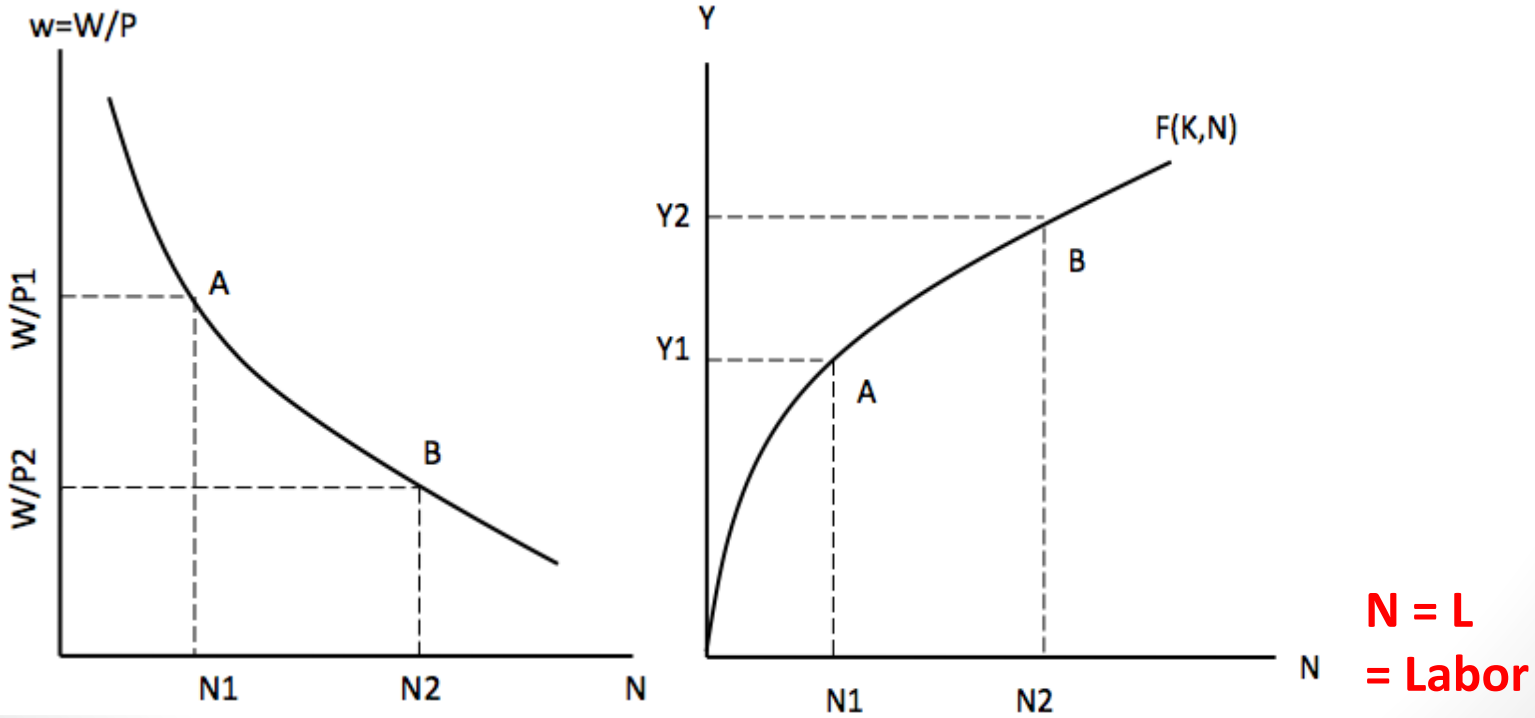




N = L = Labor

Deriving SRAS – Sticky Wage

- As Price increases, Real Wage falls, inducing firms to hire more labor and increase Output.
- **P↑** >> W/P↓ >> Labor Demand↑ >> L↑ >> **Y↑**
- Thus, SRAS shows the positive relationship P and Y.



N = L
= Labor

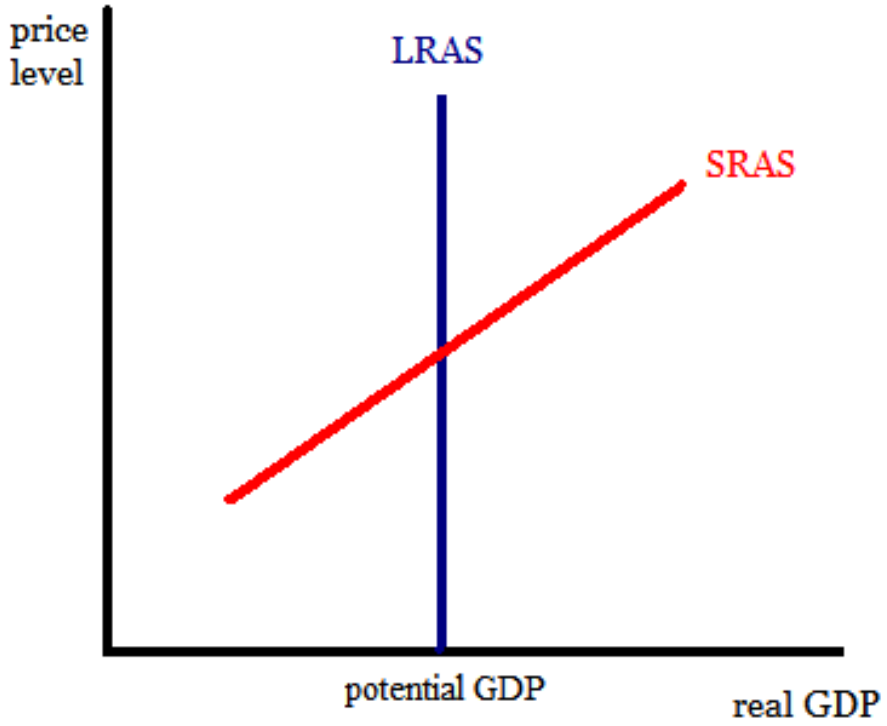
Shifts in the SRAS

The SRAS can shift from the following factors:

- Nominal Wage (higher W >> SRAS shifts left)
  - W↑ >> W/P↑ >> Labor Demand↓ >> L↓ >> Y↓
- Capital Stock (including human capital)
- Natural Resource
- Technology (i.e. higher productivity of labor raises demand for labor)

Long-run Aggregate Supply

- In long run, output is at the full employment level.
- LRAS does not depend on Price, and hence is vertical.



Long-run Aggregate Supply

- In long run, wage is no longer sticky.
- Wage adjusts to clear the labor market.

- When price increases, nominal wage also increases (workers can negotiate for higher wages), leaving the real wage and hence demand for labor unchanged.
- Given that the firms do not hire additional labor, the output remains the same.
- **Thus, Price Level does not affect Output.**

Shifts in the LRAS

The LRAS can shift from the following factors:

- Population and Labor
- Capital Stock (including human capital)
- Natural Resource
- Technology

Equilibrium of AS-AD Model