Inflation

- **Inflation** refers to a continuous rise in the general price level.
- We calculate inflation by using price indexes. A price index (symbol P) is a measure of the average level of prices. The **rate of inflation** is defined as the rate of change of the general price level and is measured as :

$$Rate\ of\ inflation\ in\ year\ t = 100\ \times \frac{P_t - P_{t-1}}{P_{t-1}}$$

- The opposite of inflation is **deflation**.

Sources of Inflation

- Demand-Pull Inflation
- Cost-Push Inflation
- The behaviour of output is a signal to identify the source of inflation.

Demand-Pull Inflation

- Demand-pull inflation occurs when **aggregate demand (C+I+G+M) rises more rapidly** than the economy's productive potential, pulling prices up to equilibrate aggregate supply and aggregate demand.
- In effect, demand competes for the limited supply of commodities and bid up their prices.
- Budget deficit and inflation are closely linked. Inflation occurs when governments engage in deficit financing. The rapid money growth increases aggregate demand and finally increases the price level.

- The slope of the AS curve determines the impact of the BD.

➢ If $e_{AS} = 0, BD\ is\ 100\%\ inflationary.$
➢ If $e_{AS} = \infty, BD\ will\ not\ create\ inflation.$
➢ If $0 < e_{AS} < \infty, BD\ will\ increase\ price\ level.$

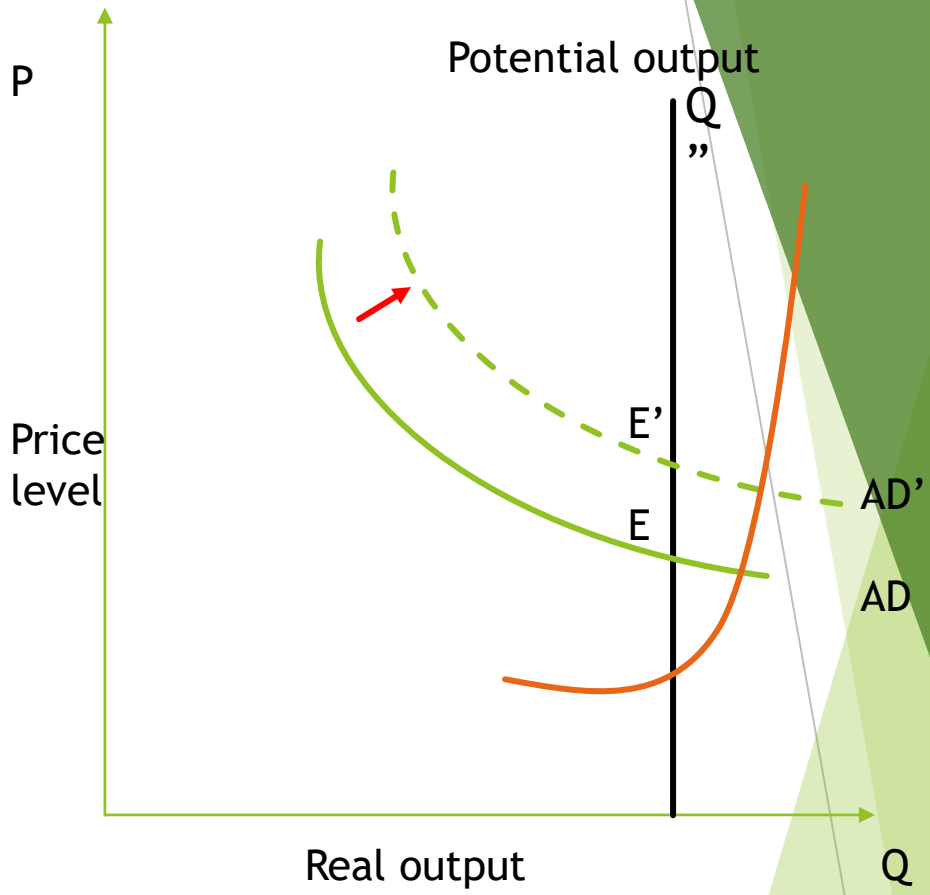
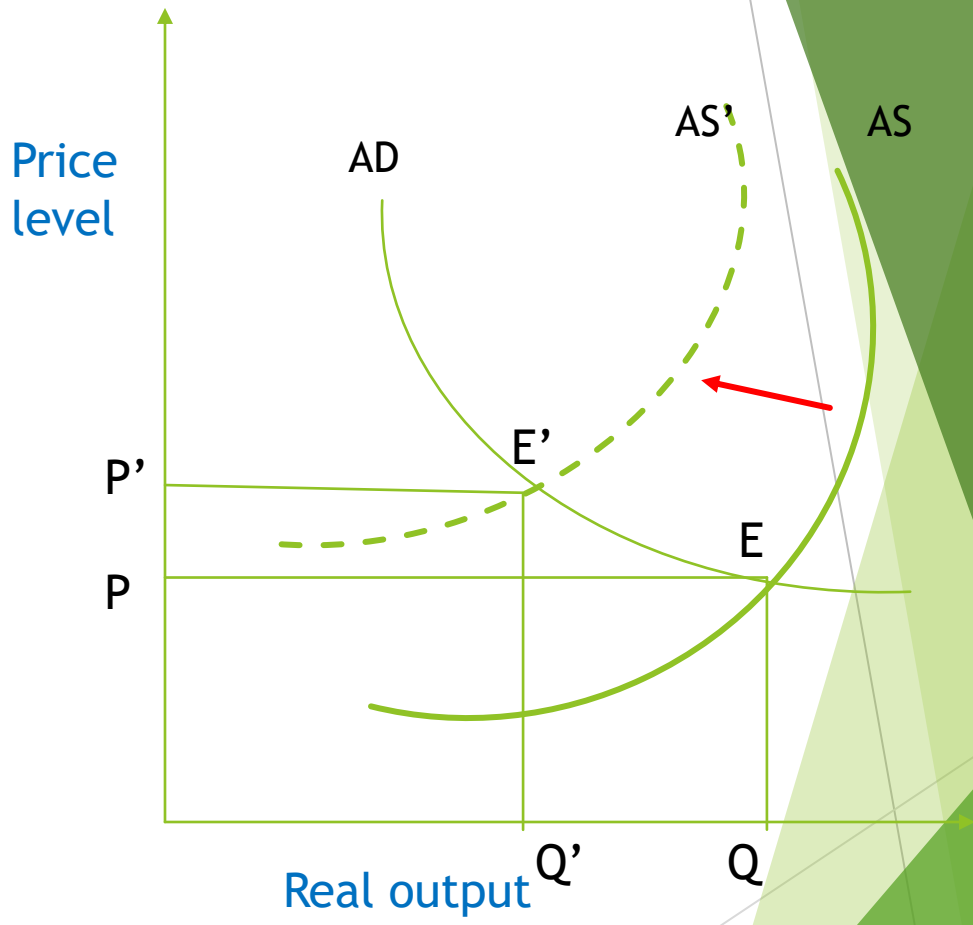


Fig: Demand-pull inflation occurs when too much spending chases too few goods

Cost-Push Inflation

- Inflation resulting from rising costs during periods of high unemployment and slack resource utilization is called *cost-push or supply-stock* inflation.
- Often it leads to economic slowdown and to a syndrome called '*stagflation*' or stagnation with inflation.
- In periods marked by rapid increases in production costs (money wages), adverse supply shocks such as with the oil-price shocks, countries can experience the dilemma of rising inflation along with falling output, the combination of which is called stagflation.
- Policies to affect aggregate demand can cure one problem or the other but not both simultaneously.



Cost-Push Inflation through Mark-up Pricing

- Price includes a mark-up upon the estimated average cost of production.
- Assume that labour is the most important factor.
- Firms set P to cover unit cost of labour and a mark up on it to cover non-labour costs.
- $Per\ unit\ cost\ of\ output\ =$
  $No.of\ labour\ hours\ to\ produce\ one\ unit\ of\ output\ (d)\ x\ wage\ per\ hour\ (w)$
- Suppose $d = 8, w\ =\ 50, unit\ labour\ cost\ =\ 8x50 = 400$
- d and labour productivity (z) are inversely related $z = \frac{1}{d}$
- Mark up pricing $P = (1 + m)dw$ where $m > 0$ ……..(1)
- Where $dw = unit\ cost\ of\ output;\ m =\ constant\ mark\ up\ fixed\ by\ the\ firm$
- With $m = 0.2, d = 8, w = 50, P = 480$

Cont….

- Equation (1) states that P is higher if
  - $w\ is\ higher$
  - $Non-labour\ costs\ are\ higher\ (rise\ in\ m)$
  - $d\ is\ higher\ (lower\ labour\ productivity)$
- Mark up pricing provides a cost-push explanation to inflation.
  - Constant increase in prices of inputs (or decline in labour productivity) leads to inflation.
  - This occurs even if m remains constant.
  - Denoting average productivity of labour, $z = 1/d$
  - Equation (1) can be re-expressed as

$$P = (1 + m)(w/z)$$

  - Assuming m as constant, this gives the rate of inflation as

$$gp = gw - gz$$

$$Proportionate\ change\ in\ P\ is\ equal\ to$$

$$rate\ of\ wage\ inflation - rate\ of\ growth\ of\ labour\ productivity$$

Quantity Theory of Money

- Inflation is a monetary phenomenon.
- The general price level is determined by the demand for and supply of money balances in an economy.
- Money supply (M) is exogenously controlled by the central bank.
- Demand for money (M_d) involves only transaction demand.
- Demand for nominal money balances

$$M_d = kPY \qquad (1)$$

  - Demand for real money balances $\frac{M_d}{P} = kY$

- At equilibrium

$$M_s = M_d \text{ or } M_s = kPY \qquad (2)$$

$$P = \frac{M_s}{kY} \qquad (3)$$

- Behaviour in P in response to change in money stock (M_s) depends on the behavior of real income Y.

Cont…

- If $Y = Y_f$, P is proportionately related to M_s (Neutrality of Money)
- As price is proportional to money supply, rate of inflation is equal to the rate of growth of money supply.

$$gP = gM$$

  - Let $k = 1/10$
  - $M_s = 200$
  - $Y = 100$
  - Hence, $P = \frac{M_s}{kY} = 20$
  - $If M_s = 300, with\ Y\ unchanged\ at\ 100$, P=30
  - Leading to money demand $(\frac{1}{10} x30x100) = Money\ supply\ (300)$

Cont…

- The proportionality can hold good even if $Y \neq Y_f$
- If Y is constant and does not respond to the change in Ms.
- Y may be fixed in the short-run (due to given technology, fixed input supply, etc.)
- In the long-run, Y may rise (due to improvement in technology, capital, increase in labour force, etc.)
- If Y changes, the equation (3) predicts

$$gP = gM - gY \qquad (4)$$

Where

$$gM = Rate\ of\ growth\ of\ money$$

$$gY = Rate\ of\ growth\ of\ real\ output$$

$$gP = Rate\ of\ inflation$$

Modern Quantity Theory of Money

- Money is treated as a luxury good.
- Increase in income will lead to more than proportionate increase in the demand for money.
  - $e_{md} > 1$
  - If $M_d is\ propotional\ to\ income, e_{md} = 1$
- In this case,

$$gP = gM - \beta gY \qquad (5)$$

Where $\beta > 1$, which represents the income elasticity of demand for money.

- For maintaining price stability, $(gP = 0), gM$ should be greater than gY.
- Equation (5) suggests that money supply and real income exert opposite pressure on the price level.
- Net impact depends on the relative strength of the two effects.

Cont…

- Rising real income causes demand for real balances to rise and this reduces inflation potential of rising money supply.
- To put it differently,
- Inflation Rate= Growth rate of nominal money supply-growth rate of real money demand
- Real money demand depends on
- Real Income
- Cost of holding money (interest rate)
- Financial Innovation or institutional changes
- Expectation of future inflation
- If r rises, real money deambd falls, with given nominal money growth, inflation rises.
- New financial instruments (credit cards)decreases the need for holding cash for transaction and hence raises prices.
- If inflation is expected to rise, real balance decreases, hence inflation rises.