

M.A. Economics (Semester-II)
Macroeconomics-II: ECON4007

INFLATION

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Nominal and Real GDP and Price Index

In general, an economic variable that is measured in terms of current market prices is called a **nominal variable**. Specifically, **nominal GDP**, also called current-rupee GDP, measures the physical volume of the economy's final production using the current market prices.

An economic variable that is measured by the prices of a base year is called a **real variable**. Specifically, **real GDP**, also called constant-rupee GDP, measures the physical volume of the economy's final production using the prices of a base year.

A **Price Index** is a measure of the average level of prices of some specified set of goods and services, relative to the prices in a specified base year.

GDP Deflator is a price index that measures the overall level of prices of goods and services included in GDP. It is defined as

$$\text{GDP deflator} = \text{nominal GDP} / \text{real GDP}$$

The Consumer Price Index (CPI) measures the price level of a basket of consumer goods.

Inflation, Deflation and Disinflation

Inflation refers to the persistent increases in the general level of prices. It causes devaluation of the worth of money. (Bannock & Baxter, 2011)

Deflation refers to a decrease in the general price level.

Disinflation refers to a decrease in the rate of inflation.

Inflation is measured by the **proportional changes over time in some appropriate price index**, commonly a consumer price index or a GDP deflator. (Black, 2005)

If P_t is the price level in period t and P_{t+1} is the price level in period $t+1$, the rate of inflation between t and $t+1$, or π_{t+1} , is

$$\pi_{t+1} = \frac{P_{t+1} - P_t}{P_t} = \frac{\Delta P_{t+1}}{P_t}$$

Causes of Inflation

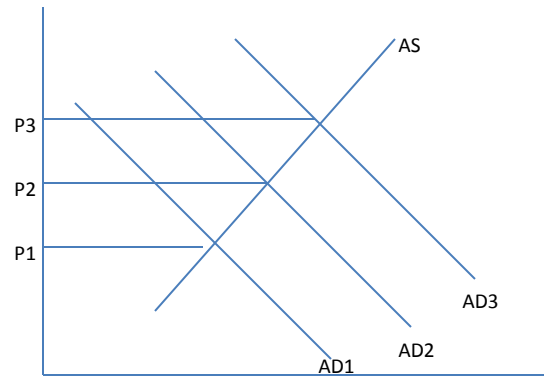
The major causes of inflation are

- Excess demand in the economy (Demand-pull inflation)
- High costs (Cost-push inflation)
- Excessive increase in the money supply (Monetarism)

These causes often amount to the same thing. (Bannock & Baxter, 2011)

Demand-Pull Inflation

Any increase in autonomous Consumption, Investment, Government Expenditure, or Import shifts the Aggregate Demand (AD) to the right. If Aggregate Supply (AS) slopes up, P (and Y) will go up as a result.



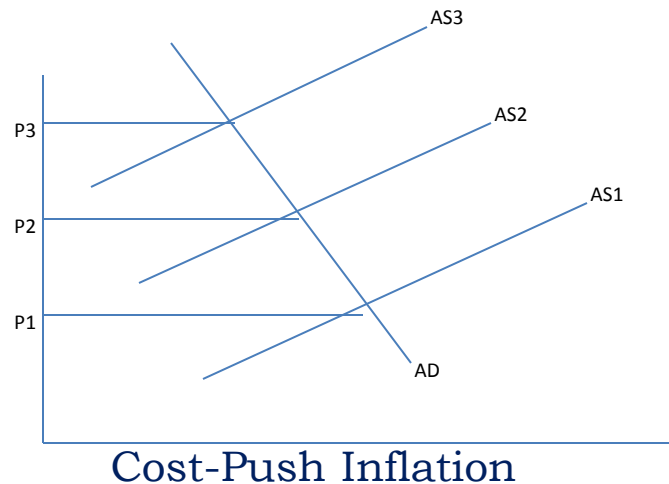
Demand-Pull Inflation

A one-time increase in P is not inflationary. If AD keeps shifting rightward, the rise in P is sustained and it becomes inflationary. If government continues to raise G period after period and finance it through money creation (i.e. borrowing through the central bank, AD keeps shifting rightward. This is the link between budget deficit and inflation. (Sikdar, 2009)

The inflationary impact of deficit financing depends on the slope of the AS curve. The steeper the AS curve, the more pronounced will be the inflationary impact.

Cost-Push Inflation

A rise in money wage from a fixed level to a higher one will shift the AS curve to the left. With AD unchanged, the effect is to raise P.



For P to be inflationary, wage must keep rising to higher and higher levels. The **wage-price spiral** ignites and sustains a process of inflation because as P rises, the gain in real wage (w/P) is eroded and workers demand another hike in wage.

In case of demand-pull inflation, output Y rises along with P; however, in case of cost-push inflation, the rise in P is accompanied by a fall in Y.

Cost-Push Inflation through Mark-up Pricing

According to the **Mark-up Pricing** rule, price includes a mark-up, which takes care of non-labour costs of capital and other complementary inputs, on estimated average cost or unit cost of production.

Symbolically,

$$P = (1+m)dw, \quad m > 0$$

where ***d*** is the number of labour hours it takes to produce one unit of output, ***w*** is the wage per hour, ***dw***, thus, is the unit labour cost and ***m*** is the constant mark-up chosen by the firm. The ***mdw*** ensures that non-labour costs are accounted for.

Now, we can conclude that **P is higher if**

- ***w* is higher**
- non-labour costs are higher, which call for a **higher *m***
- labour productivity is lower, i.e., ***d* is higher**

If average labour productivity, $\mathbf{z(=1/d)}$, we have

$$\mathbf{P = (1+m)w/z, \quad m > 0}$$

If m is constant, the rate of inflation will be given by

$$\mathbf{g_p = g_w - g_z}$$

This means **the proportionate change in P, i.e., the rate of inflation, equals the rate of wage inflation minus the rate of growth of labour productivity.** (Sikdar, 2011)

Thus, when money wages rise in excess of the rise in the productivity of labour, prices rise.

Mark-up pricing provides a direct link between increase in costs of production and resulting increase in price and, thus, provides a cost-push explanation of inflation.

Monetarism

Excessive increase in money supply causes inflation by creating excessive demand. It makes monetarism compatible with the demand-pull argument.

If the money market is in equilibrium, the supply of real balances (M/P) must equal the quantity of real balances demanded. Thus, **$M/P = L(Y, r)$**

Milton Friedman claims that inflation is a monetary phenomenon. Once wages and prices have had time to adjust, the economy will always be at full-employment output. A rise in the money supply will cause a rise in prices to restore the real money supply to its full-employment level, which is equal to the full-employment demand for real money balances. On the other hand, if something else makes the price level increase, and the government accommodates this price increase by printing money, again money and prices will be higher. (Begg, Fischer & Dornbusch, 1994)

Costs of Inflation

- Inflation entails a **loss in the purchasing power of money** but this loss of purchasing power is not uniformly distributed over the entire population.
- The **real rate of interest (i.e. the nominal rate – the rate of inflation)** is adversely affected by inflation and lenders suffer. On the other hand, the burden of debt and its repayment gets lighter in real terms.
- Inflation increases the cost of holding money balances . As a result people try to economize on holding cash. However, making more frequent trips to banks, which reduces the time available for leisure and other productive works, and disutility arising out of other efforts for managing with less cash in daily affairs entail a cost known as **shoe-leather costs** of inflation.
- The interaction between inflation and the tax system entail a cost known as **bracket creep**. It arises because the income levels corresponding to different income tax rates are not revised systematically with inflation.

- Due to the existence of lags in collection, tax revenue fails to keep pace with inflation and the real value of tax revenue declines. On the other hand, by reducing the load of the national debt and interest payments in real terms, rising prices work to the government's advantage. To calculate the real burden of government borrowing, fiscal deficit is adjusted for inflation. (Sikdar, 2006)

$$\text{Adjusted Fiscal Deficit} = \text{Fiscal Deficit} - \pi B$$

where π is the rate of inflation and B, the stock of outstanding public debt.

- Through its monopoly power of printing money, the government can create command over real resources for itself simply through deficit financing. Addition to money supply raises the level of P. This reduces the purchasing power of households and raises the purchasing power of the government without the government having recourse to higher taxation. This is known as **inflation tax or seignorage**. The purchasing power of extra money creation at current prices or seignorage is

$$\text{Seignorage} = \Delta M/P = (\Delta M/M) \cdot (M/P) = g_M (M/P)$$

Thus seignorage is the product of the growth rate of money supply times the stock of real balances held by the public.

Reading List

- i. Abel, A. B. & B. S. Bernanke (2006). Macroeconomics, Pearson, Delhi.
- ii. Begg, D., S. Fisher & R. Dornbusch (1994). Economics, McGraw-Hill, Berkshire.
- iii. Shapiro, E. (2005). Macroeconomic Analysis, Galgotia, New Delhi.