

THE DYNAMICS OF INFLATION

Chapter Outline :

- Introduction
- What is Inflation?
- Calculating the Rate of Inflation
 - Consumer Price Index
 - GDP Deflator
 - Producer Price Index
 - Wholesale Price Index
- Degrees of Inflation
- Factors and Sources of Inflation
 - Inertial Inflation - The Starting Point of Inflation Analysis
 - Demand Pull Inflation
 - Cost-Push Inflation
 - Interaction between the Forces of Demand Pull and Cost Push: The Wage-Price Spiral
 - Demand Shift Inflation
 - Profit Push Inflation
 - Income Shares (or Distributive) Inflation
- Money Supply and Inflation: The Quantity Theory Framework
- Role of Expectations
- Effects of Inflation
 - Impact on the Household Sector
 - Impact on the Business Sector
 - Impact on Debtors and Creditors
 - Impact on Government
 - Impact on Macro-Environment
 - Output and Efficiency
 - Balance of Payments Effects
 - Currency Effects
- Tools of Inflation Control
- Restrictive Monetary Policy
- Restrictive Fiscal Policy
- Wage-Price Controls
- Deregulation and Privatisation
- Conclusion

INTRODUCTION

Inflation is a spectre that haunts a business manager. Inflation means not only rising prices of final products for sale but also of raw materials, intermediate products, components, capital goods and factors of production like land, labour, capital and entrepreneurial talents. Inflation requires a number of adjustments in a business organization. Inflation affects decisions concerning new investments, investors, working capital, product prices, wages and salaries and even dividend policy. Rising prices of capital goods in an inflationary period would require larger retained earnings for replacement of capital and making new investment. At a given level of profit it would mean lower dividends. Other firms may behave in an opposite direction. Firms may declare larger dividend to protect the real value (i.e. the purchasing power) of dividends paid. Nevertheless, these are subjective decisions of the top management, varying from firm to firm. Through its impact on production costs, inflation affects the relative competitive position of firms in the market. As product price increase becomes inevitable due to rising costs, the decline in demand is different for different firms, depending upon the elasticity of demand for the individual products of different firms. Inflation affects a number of other macro variables like rate of interest, exports, rate of exchange and even expectations with regard to future.

WHAT IS INFLATION?

As defined in **Chapter 2**, inflation is a process in which the general price level in a country records a sustained and appreciable increase over a period of time. The rate of increase (usually in % terms) in the price level is called the rate of inflation. Inflation is different from a price rise. Inflation is a sustained process whereas price rise in a one-time jump, which could be the result of upward, and discrete, price revision due to one-time increase in taxes, cost of production or some other factors like sudden disruption in supply or increase in demand. The broad characteristics of inflation may be listed as follows:

- It is a process and is not instantaneous.
- It involves a sustained increase in the general level of prices.
- The increase is significant or appreciable. Slow rate of increase (generally less than 2 per cent per annum) is considered consistent with price stability and usually is not termed as inflation.
- It has a time dimension i.e. the process of inflation occurs over a period of time generally taken as one year.
- It is based on observable and measurable changes in prices.
- It is a factor which is considered while formulating macroeconomic policies and is almost continuously monitored by national governments.
- It is a key indicator of the state of business environment and economic performance.

CALCULATING THE RATE OF INFLATION

Rate of inflation is simply the rate of increase in the general level of prices and can be denoted as:

$$\Pi_t = \frac{P_t - P_{t-1}}{P_{t-1}} \cdot 100$$

Where Π_t = rate of inflation over the year t; P_t = general price level in year t and P_{t-1} = general price level in the preceding year i.e. the year t-1.

Price level for a particular year is measured as the weighted average of prices of a large number of goods and services produced in the economy. Since different products have different units of measurement, price level is measured in terms of price index numbers, selecting a year in the past as the base year. A price index, therefore, measures the general level of prices. Construction of a price index involves the following:

- Selection of the goods and services to be included in the general price index.
- Selection of the points of time and places at which price statistics will be collected.
- Deciding the stage (ex-factory, wholesale or retail) at which the price statistics will be collected.
- Deciding the method of average to be applied.
- Determining the basis on which weights will be assigned to each set of prices.
- Deciding the base year.

Different countries have different bases and methods of computing the rate of inflation and as such their rates of inflation are not strictly or logically comparable. There are three important measures of inflation, which are described below.

THE CONSUMER PRICE INDEX (CPI)

It is the most widely used index to measure inflation. The index measures the cost of buying a standard basket of goods and services at different points of time. The standard basket is constituted to represent as closely as possible the consumption pattern of the population (or a particular population group in which case the inflation rate calculated is specific to the group) and may include food and clothing, housing, entertainment, electricity, telephone, fuel, transportation and other common items of consumption in day-to-day life. While calculating weighted average, weight given to an item is generally selected as the proportion of the item in the total consumer expenditure on the basket. To find out the proportion, extensive household surveys are conducted to find out the consumption of expenditure. The calculation of rate of inflation based on this method is illustrated in **Box 10.1**.

BOX 10.1**Calculating the Rate of Inflation Based on Consumer Price Index (CPI)**

For the sake of simplicity, assume that the standard consumer basket contains six product groups as shown in the table below. We wish to calculate the rate of inflation for the year 2003 with the year 2002 as the base year. The assumed share of each product groups in the total expenditure on the basket is shown in Column (2). Column (4) gives the price index of each product group for the year 2003.

Product Group	Share in basket Expenditure	Price Index		Weighted Index
		2002	2003	
1	2	3	4	5 = (2)x(4)
1. Food	0.10	100	110	11
2. Clothing	0.05	100	100	20
3. Housing	0.25	100	120	30
4. Fuel	0.10	100	110	11
5. Transportation	0.20	100	115	23
6. Education	0.30	100	90	27
Total	100			124

In this example, the weighted price index for the year 2002 is 100 and for the year 2003 is 124. So the rate of inflation in the year 2003 is 24 per cent. In real life, the number of items is very large but the method of computation is the same.

GDP DEFLATOR

GDP Deflator is the numerical factor (often expressed in per cent terms) by which GDP valued at current prices (called nominal GDP) must be discounted or deflated so that the impact of increased prices in the valuation of GDP is removed and in the process we obtain real GDP. Real GDP is the measure of aggregate output in real or physical terms. Growth rates of an economy are based on real, rather than nominal, GDP. The process of converting nominal GDP into real GDP is illustrated in Box 10.2. Obviously, GDP deflator for a particular year can be seen as the ratio between the nominal GDP and real GDP for the year and both these statistics are officially available in an economy. Real GDP is also called constant dollar or constant rupee (depending upon the currency of the country) GDP.

Real GDP is calculated by adding up the deflated values of the each component of GDP. Different components are deflated at different rates because the rates of price increase are different for different components (like consumption goods, investment goods, export and import items and government purchases). In other words, the values of the components in a particular year are valued at pre-selected base year prices. Since the value of the deflator is derived from the GDP data, (rather than calculated directly from market prices), it is also called implicit measure of inflation.

BOX 10.2**How is nominal GDP deflated to calculate real (or inflation-adjusted) GDP?**

Let the GDP of a country at current prices rise from \$300bn in 2002 to \$390bn in 2003. Also assume that general price level rises by 20 per cent during the period. If the year 2002 is selected as the base year, then the price index is 100 in 2002 and 120 in 2003.

In this case, GDP deflator is $120/100 (=1.2)$ and the real or inflation-adjusted GDP value for 2003 would be $390/1.2 = \$325b$. Thus, in nominal terms, (i.e. at current prices) GDP rises by 30 per cent (i.e. from \$300bn to \$390bn) but in real terms, it rises only by 8.3 per cent (from \$300bn to \$325bn).

In general terms,

$$\text{Real GDP} = \text{Nominal GDP/GDP Deflator}$$

Or

$$\text{GDP Deflator} = \text{Nominal GDP/Real GDP}$$

PRODUCER PRICE INDEX (PPI)

It measures the general price level at the producer stage. These are generally the prices charged by the producers at the level of their first commercial transaction. These are of course the wholesale prices charged at the first link of the distribution chain. These prices are easy to obtain and monitor. The construction and interpretation of this index is broadly the same as that of the consumer price index. It is the weighted index. The weights are fixed but revised periodically to reflect changes in the composition of output. This index is of immediate and direct relevance to the manufacturers as it shows the trends in the product value realization by the business sector. The ratio between the CP_1 and the PP_1 shows burden of distribution costs borne by the consumers.

WHOLESALE PRICE INDEX (WPI)

It measures the general price index at the level of second or a subsequent commercial transactions but before the transaction at the retail level. Technically, this index stands very close to PP_1 , which is also based on wholesale prices but is at the first commercial transaction. WP_1 is based on the prices realized by the wholesalers. While constructing this index, the level or stage of wholesale transaction is first identified for collecting price statistics. In many countries PP_1 and WP_1 are considered synonymous, or more precisely, PP_1 itself is labelled as WP_1 . In most of the developed countries, PP_1 is separately constructed.

The choice of the measure of inflation depends upon the purpose for which it is needed. If we wish to know how consumers are impacted by rising prices, consumer price index would be suitable. Producer price index is more appropriate for the financial and profitability analysis of the business sector. Government taxes, like excise duties, are leviable on the basis of ex-factory prices. Wholesale price index is required when payments like dearness allowance are indexed (linked) to inflation rate based on this measure. Many governments construct consumer price indexes for specific population groups like urban consumers, landless labourers, agricultural workers and industrial workers to study the impact of inflation on these specific groups.

DEGREES OF INFLATION

Based on the rate of inflation calculated on the basis of any of the above methods, inflation can be classified into different categories. These are not standard classifications but they do provide an idea about the intensity of the problem.

- **Creeping Inflation.** It is basically slow inflation, the annual rate being 2-5 per cent. Inflation rate less than 2 per cent is generally believed to be consistent with the concept of price stability and is regarded as a healthy sign in any economy. Creeping inflation is not considered as a problem and governments prefer to only monitor the rate through suitable policies. Business sector often considers creeping inflation necessary for providing motivation for new investments. Under these conditions, business forecasting is relatively easy and risk is controllable. Business plans are also easier to make under stable price conditions.
- **Walking Inflation.** Again this is a loosely applied term for an inflation rate varying between 5-10 per cent per annum. This inflation causes concern and attracts the attention of the policy-making authorities. Business sector of course enjoys the fruits of rising prices of their products but it forces rising costs as well. A number of firms resort to hedging to control risk. This inflation rate has the potential to disturb the market equilibrium values of other macro variables like the rate of interest, rate of exchange and government revenues. This type of inflation is witnessed in most of the less developed countries.
- **Running Inflation.** It is double-digit inflation varying between 10-20 per cent per annum. This inflation is a clear and open problem which is sought to be solved through suitable market-based macroeconomic policies and direct control measures, though the proportion of the latter is relatively less in the overall policy mix. Speculation begins to rise and the business risk becomes substantial. In this situation, both production costs and finished product prices rise substantially and the firms start losing competitiveness in foreign markets. Wages and rate of interest show continuous up trend. Rising rate of interest attracts foreign portfolio investment but discourages foreign direct investment. Domestic currency tends to depreciate if this inflation tends to persist.
- **Galloping Inflation.** It can vary from 20 to 200 per cent or even more. Many advanced countries like Japan and Italy and a number of countries in Latin America like Brazil, Mexico and Argentina have experienced galloping inflation in the 1970s and 1980s. This situation on the price front is due to uncertain or unpredictable circumstances, intense speculation, natural calamities, abnormal circumstances or inappropriate designing or application of economic policies.

If galloping inflation persists, it can cause several distortions in an economy making the application of economic policy still more difficult. Business contracts tend to be indexed to the rate of inflation. The value or purchasing power of money depreciates fast and people prefer to hold their saving in non-monetary assets. There is a pronounced tendency on the part of the people to hoard physical goods. In these circumstances exports fall quickly and there is strong pressure on the domestic currency to depreciate. This period is often attended by massive outflow of capital.

- **Hyper-Inflation.** *It is the severest and the most dreaded form of inflation in which prices can rise even by a million per cent in a short period of time.* It signifies the virtual collapse of an economic system bringing untold economic hardships to millions of people and a complete loss of faith in the currency of a country. It creates chaotic conditions in an economy and business tends to come to a standstill till conditions improve or become clear. Such a situation, for example, can be created during a full-fledged war with economic mismanagement in which government resorts to reckless printing of currency and spends it. Hyperinflation prevailed in Germany during 1922-24 when the stock of money rose exponentially sending the prices sky-rocketing. From January 1922 to November 1923, prices rose 10 billion times. Such situations, however, are extremely rare.

FACTORS AND SOURCES OF INFLATION

A business manager must understand the factors and sources that generate or have the potential to generate inflation. These factors and sources arise at different points of time and singly, or severally, generate inflation at varying speeds. A proper understanding of the drivers of inflation equips the manager to have an advance idea of the time and magnitude of inflation and take suitable defenses at the firm level. Nearly all the factors are of macroeconomic nature, which act and react upon one another while determining the rate of inflation. The broad sources and factors affecting the general level of prices relate to demand, supply, production costs, money supply, future expectations, wages, profits and a number of similar variables. Based on these factors and sources, the inflation so generated has acquired different taxonomical nomenclatures as discussed in the following sections.

INERTIAL INFLATION - THE STARTING POINT OF INFLATION ANALYSIS

Inertial inflation, also known as the core or expected inflation, is generally a characteristic of mature and advanced market economies which tends to persist at a low level and does not change unless economic pressures or events cause it to change. The concept is best illustrated by Samuelson and Nordhaus (1998):

'...We can compare inertial inflation to a lazy old dog. If the dog is not "shocked" by the push of a foot or the pull of a cat, it will stay where it is. Once disturbed, the dog may chase the cat, but then it eventually lies down in a new spot where it stays until the next shock...'

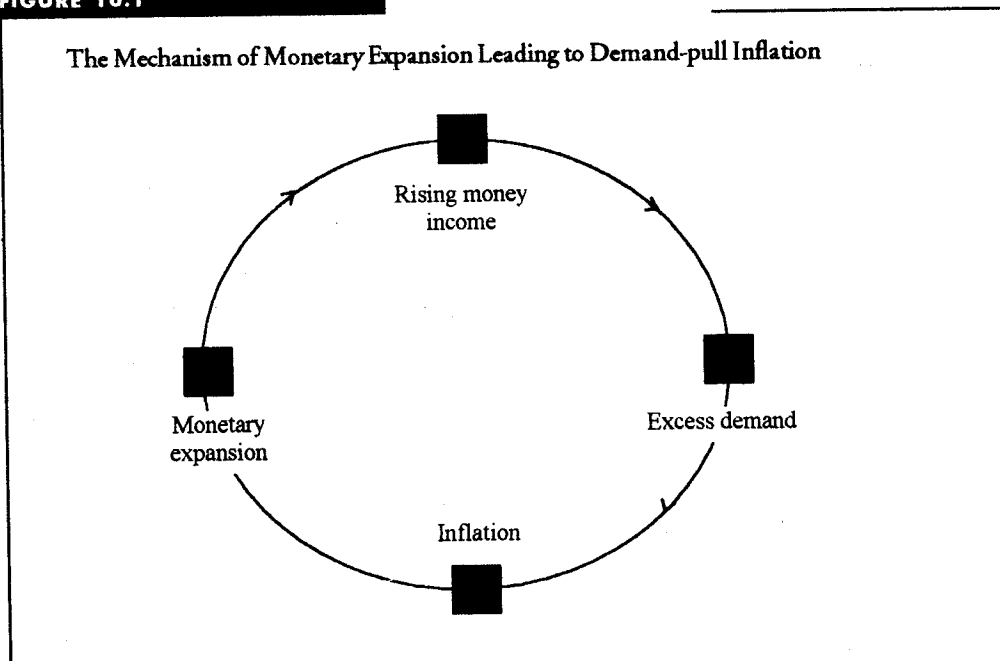
In the absence of any significant disturbance to the economy, inertial rate of inflation is expected to prevail in the long run. This is the rate which is taken into account while formulating government plans and budgets, preparing business plans, and signing future contracts and agreements and negotiating wage settlements. It resembles very much an equilibrium rate of inflation in that it has no tendency to change in normal circumstances. Sudden shocks like significant shifts in demand and supply, technological breakthroughs, financial crisis, wars, crop failures, sudden changes in productivity, balance of payments disequilibria and sharp movements in exchange rates may upset the rate for some time but as the circumstances stabilize and get normal, the rate again settles at a new level. This rate is generally so low that it is considered consistent with price stability.

It is for this reason that it serves as the starting or initial reference point for further inflation and its analysis.

DEMAND-PULL INFLATION

Demand-pull inflation occurs when the aggregate demand in the economy rises faster than the available output or supply so that the excess-demand situation is maintained. For this reason, it is also called excess-demand inflation. The larger the magnitude of excess demand (over supply), the higher is the rate of inflation. This is basically a case of too much spending chasing limited output. Rising aggregate demand can be the result of increasing consumption, investment or government expenditure or all of these. The increasing demand could be the result of rising income, favourable changes in common tastes and preferences, increased investment activity induced by falling rate of interest or other factors or expansionary fiscal policy of the government. Demand-pull inflation is often supported by increase in money supply, which sustains and fuels the inflationary process. Money supply increases when government resorts to borrowing from the central bank or deficit financing through printing of new currency and when banking sector expands credit. The mechanism is that increased money supply leads to increase in money income. It causes aggregate demand to rise and under conditions of excess-demand inflation is generated. Examples of monetary expansion leading to demand-pull inflation are amply available in countries like Russia, Brazil, Argentina and Mexico. The causation is shown in **Figure 10.1**.

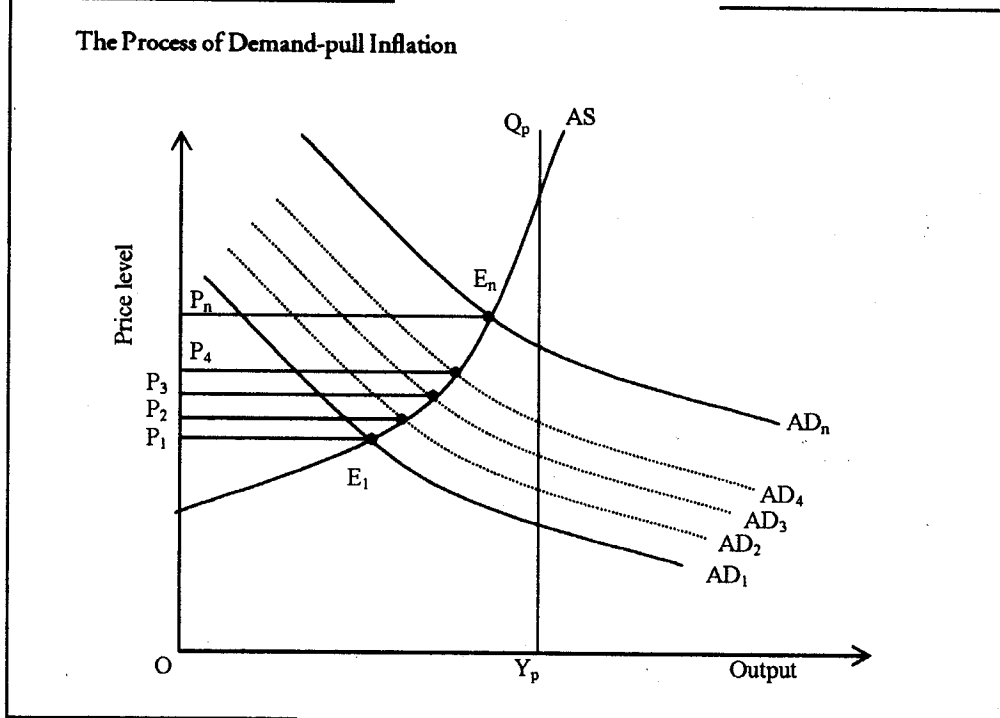
FIGURE 10.1



The process of demand-pull inflation is illustrated in **Figure 10.2**. The figure shows that as the economy approaches its potential output level, aggregate supply function AS becomes less

elastic with reference to the price level. It shows that rising price level evokes a limited supply response as the economy is already close to its potential level and further increases in output are difficult to realize due to cost escalation and bottlenecks like availability of labour and infrastructure. At this stage as aggregate demand rises from AD_1 to AD_n through successive shifts, price level rises generating inflation. Inflation rate tends to rise as aggregate supply becomes less elastic.

FIGURE 10.2



It is worth emphasizing again that the pull of demand cannot be sustained if money supply does not increase to support it. In the absence of monetary supply demand pull caused by any of the factors mentioned above will have a short-lived burst of rising prices (called transitory inflation) which like a spark, burns itself out soon rather than generating an inflationary process.

COST-PUSH INFLATION

Cost-push inflation occurs when there is a sustained increase in production costs. Production costs rise when there is increase in wages, prices of raw materials, rate of interest, electricity charges and user charges of other infrastructure services. Costs also rise when taxes on industrial inputs rise. Firms using imported materials face increasing costs in terms of domestic currency when the exchange rate rises (i.e. domestic currency depreciates) or when import duties imposed by the government are hiked (**Box 10.3**). Firms may experience rising costs when foreign exporters increase their prices either because they themselves experience rising costs or because of their

monopolistic position in the world market. In this case, cost-push inflation in a country becomes a part of the process of global transmission of inflation. The larger the degree of globalization of a country the larger is the impact of global inflation on the country.

Among the endogenous factors, increase in wages or labour cost is the most common force behind the cost-push. The greater the proportion of staff cost in the total cost of firms, the greater is the importance of the factor in generating cost inflation. Perhaps this is one of the major reasons that firms try to keep the labour cost minimum by employing capital-intensive techniques of production. Where the labour unions are strong, labour is highly protected through legislation or where wages are linked to the length of service and the general price index, increase in wage bill becomes unavoidable and is passed on partly or fully to the consumers in the form of higher prices. This type of inflation is termed as **wage-push inflation**.

BOX 10.3

The Link between Currency Depreciation and Industrial Costs

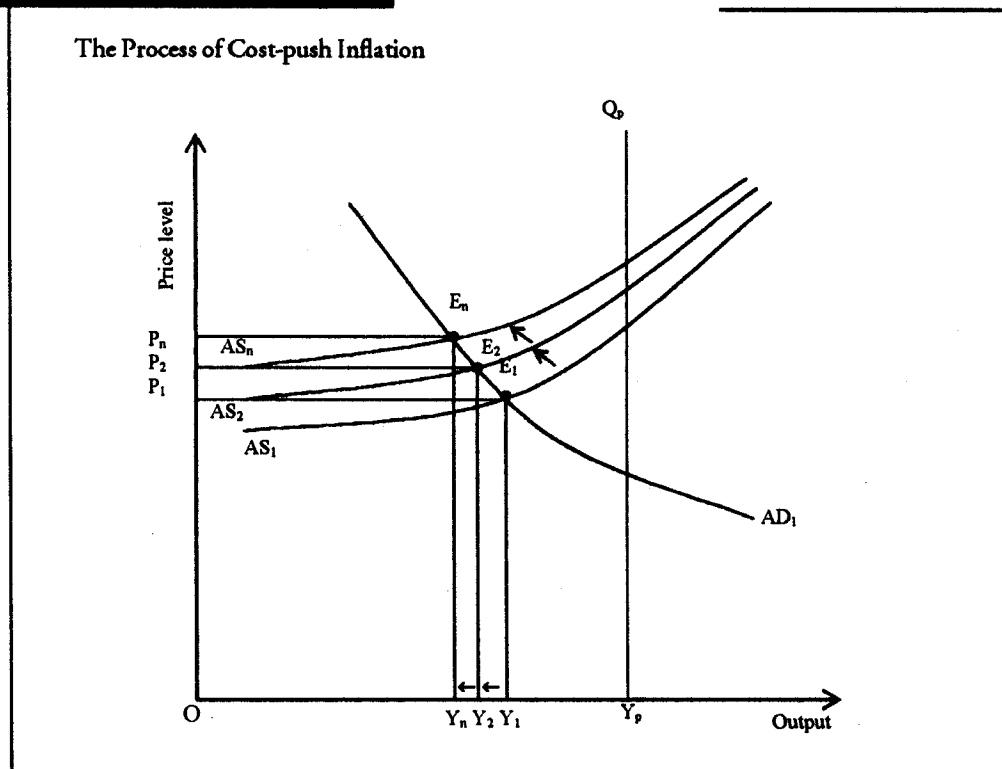
Domestic currency of a country is said to depreciate when more units of it are needed in exchange for one unit of a foreign currency. Rupee, for example, is said to depreciate vis-à-vis US dollar if the rate increases from Rs. 46 = \$1 to, say, Rs. 47 = \$1. Depending upon the forces of demand and supply of foreign exchange and the exchange rate system, the exchange rate keeps on changing and is reported on a daily basis in media.

A firm depending upon imported materials will face rising rupee cost of imports when rupee depreciates; import price in dollars remaining constant. An import consignment priced \$1 million will cost the firm Rs. 46 million before depreciation and Rs. 47 million after depreciation. The larger the depreciation, the greater is the rise in industrial costs. In case of sustained depreciation, firms experience sustained rise in industrial costs leading to cost-push inflation. If the firms switch from imported inputs to domestically produced ones, the cost-push from this source can be prevented.

In a number of cases, the government itself induces cost-push. There could be increases in such taxes as import tariffs, excise duty, sales tax and octroi from time to time and withdrawal of subsidies. In most countries, particularly the less developed ones, there is widespread public ownership and control of industries the products of which are used both by the industries and the public. The prices of these products are administered and are increased periodically in view of rising costs and other market-related factors. Rising inefficiency is itself one of the major factors particularly in less developed countries, which accounts for increasing costs and prices generating cost-push inflation.

Most of the individual elements of cost-push are discrete variables creating shocks on the supply side from time to time. However, these occur at different points of time and together these tend to produce a sustained impact on prices. Graphically, the combined effect of the cost-push factors is to shift the supply curve upward and leftward. A continuous movement of this type generates cost-push inflation as shown in **Figure 10.3**.

FIGURE 10.3

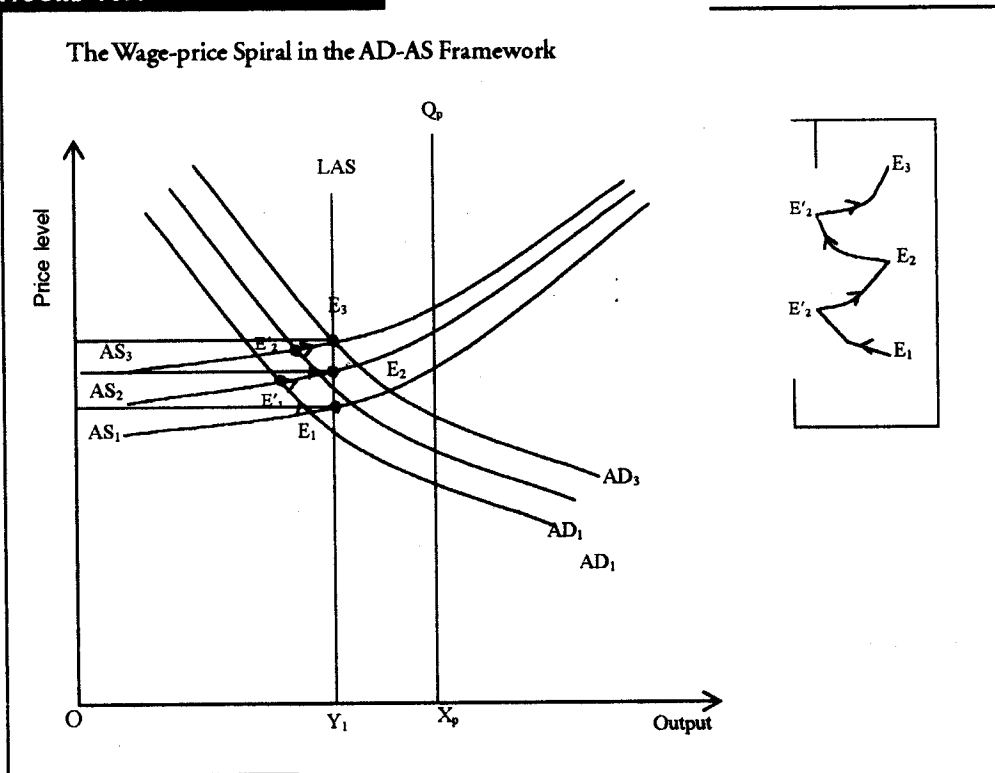


INTERACTION BETWEEN THE FORCES OF DEMAND-PULL AND COST-PUSH : THE WAGE PRICE SPIRAL

The forces of demand-pull can continue on their own for quite some time but these often induce or activate cost-push forces which complement the demand-pull forces to give sustained effect to inflation and make it last longer. A series of initial demand shocks increases the price level improving profitability of individual firms. These firms expand production and new firms attracted by better profitability make entry. This increases the demand for factors of production and material inputs that puts upward pressures on their prices raising costs of production. So the forces of cost-push subsequently support inflation initially triggered by demand-pull factors.

Similarly, inflation triggered by cost-push factors, say, repeated increases in wages, obtains the support of demand-pull in the subsequent time periods. A rise in wages created, for example, by the trade union pressure, which is not accompanied by matching rise in productivity reduces demand for workers (some workers may be laid off), reduces output and shifts aggregate supply function upward and leftward from AS_1 to AS_2 in the initial stage. It causes some rise in the price level and some fall in output (and employment) as shown in **Figure 10.4**. Increase in wages supported by monetary expansion by the banking sector raises aggregate demand from AD_1 to AD_2 .

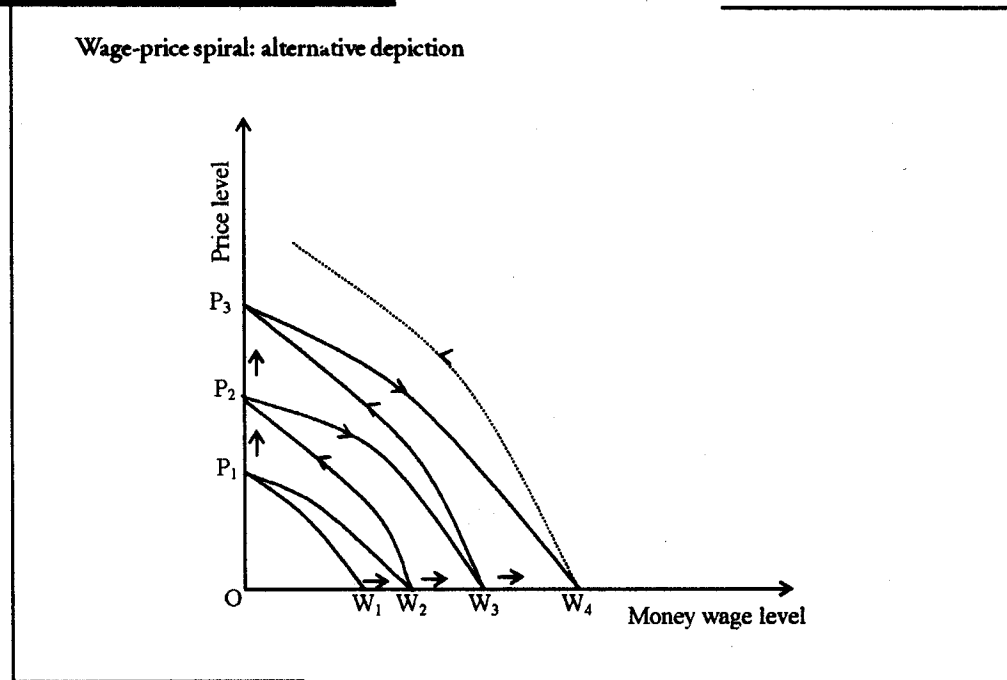
FIGURE 10.4



This restores initial loss of output and employment and the economy returns to the original output level. If the labour shock is repeated, AS_2 shifts to AS_3 and AD_2 to AD_3 establishing new equilibrium to E_3 . The process continues if the workers, through their unions or otherwise, keep receiving higher wages as inflation proceeds, generating what is called a wage-prices, spiral. In this spiral, as wages increase, price level increases; and, as price level increase wages increase as they are linked to inflation. The spiral is enabled and supported by matching increase in money supply by the banking sector.

The path traced by the successive equilibrium points, each representing a higher combination of wage level and general price level, is called long run aggregate supply (LAS) function and is also separately highlighted in the figure. The long run supply function is shown as perfectly inelastic (vertical) in this case. It can, however, be positively or negatively sloped, depending upon the location of equilibrium points. The wage-price spiral with wage level on the x-axis and price level on the y-axis is alternatively depicted in Figure 10.5. In initial equilibrium, wage level is OW_1 and general price level OP_1 . As wage level rises to OW_2 , prices rise to OP_2 , which induce the wage push to OW_3 . This raises price level to OP_3 leading to further wage rise. The process continues till it is interrupted by macroeconomic policy or other factors.

FIGURE 10.5



A vital factor in the wage spiral is that the increased wages must lead to increase in aggregate demand. Further, money wage level in the economy would rise if there is matching expansion in money supply affected by the monetary authorities. The spiral would taper off if any of these factors is weak or missing. Again, the spiral would be weak if the structure of the economy is such that the share of wages in national income is low. Government can break the spiral through wage freeze or weaken it considerably by restricting monetary expansion or formulating income policies in which workers are under-compensated against inflation in the form of dearness allowance.

DEMAND SHIFT INFLATION

This is the type of inflation which is caused by shifting pattern of demand in an economy. The shift in the demand pattern can be the result of changing consumer needs or tastes and preferences. The basic argument is that as demand shifts from industry segment A to industry segment B, prices in segment B rise but prices in segment A do not fall so that there is an overall increase in the general level of prices. Some possible reasons as to why prices in segment A may not fall in spite of fall in demand can be:

- The prices are administered by the government and hence are subject to government decision rather than market forces.
- Cost conditions do not permit the producers to lower prices.
- Producers association require all the firms to sell the products at the pre-decided prices.

- Producers do not reduce the price for fear of a possible oligopolistic reaction by other firms; and
- Some firms quit industry A so that falling demand is accompanied by falling supply and prices remain more-or-less unchanged.

However, the above conditions are possible only in a limited number of industries so that demand shift offers a weak and partial explanation of the inflationary phenomenon.

PROFIT-PUSH INFLATION

Most firms enter business with the objective of long-term profit maximization, though there can be short-term non-profit objectives as well. Profit push inflation occurs when firms raise prices at frequent or regular intervals by expanding their mark-up over costs. Such price increases are possible under imperfectly competitive market situations in which firms enjoy significant monopoly power (**Box 10.4**). The firms raise prices in successive rounds to achieve a target rate of return. Similarly, there could be frequent upward revisions of prices, which are administered by government, public corporations, large multinational companies, multi-plant firms, cartels or industry associations. Profit-push inflation is the result of such prices rising faster than the production costs so that the profit margins are widening.

BOX 10.4

What is Monopoly Power?

The monopoly power of a firm exists under imperfect conditions. It is reflected in the ability of the firm to increase price of its product without causing a fall in profits. The power increases as competition decreases. However, the power is circumscribed by demand conditions in the market. The smaller the number of substitutes of the product of a firm, the larger is its monopoly power. Threat of entry by new firms also reduces the monopoly power of an existing firm.

In standard managerial economics, a number of alternative measures exist to quantify monopoly power. According to A.P. LERNER, the power can be measured in terms of difference between price (P) and marginal cost (MC) or more precisely, monopoly power is measured as $(P-MC)/P$. Robert Tiffin measures the degree of monopoly power in terms of the price cross elasticity of demand. The closer the elasticity value to zero, the greater will be the monopoly power. A.D. Bain and the average cost of production. The different measures, however, have their own assumptions and limitations.

Firms resorting to rising mark-up have to be sure that they do not suffer the demand backlash through the law of demand. If profit maximization is the goal, demand has to be fairly less elastic with respect to price so that aggregate sales increase with rising prices. Firms enjoying good brand reputation and loyalty among customers face relatively less elastic demand and it is easier for them to push price increases in regular doses. A characteristic feature of profit-push inflation is that it is initiated by the business enterprises themselves.

INCOME SHARES (OR DISTRIBUTIVE) INFLATION

This is the kind of inflationary process that is set off by more egalitarian changes in income distribution in an economy. This distribution of income, which reduces income and wealth inequalities, could be the result of market forces or deliberate public policy with the goal of distributive justice. The logic is that even if aggregate income in an economy is not rising, aggregate demand can increase if incomes in the lower classes increase and those in the upper classes fall as a result of changes in the distribution of national income. This can happen in any one or more of the following ways:

- Government follows progressive taxation of income in which higher incomes are subjected to higher rates of tax than lower incomes;
- Government spends heavily on employment-generating poverty reducing and welfare promoting programmes;
- Small scale and tiny enterprises grow faster than large industries;
- There is wider dispersal of industries particularly in industrially backward areas;
- There is progressive ownership of the means of production by the state and the surplus so earned is spent for the economic betterment of the low-income groups.

When income expands among the low-income groups at the cost of the upper income groups, the increase in demand in case of the former is larger as compared to the fall in demand in case of latter. This follows from the basic macroeconomic postulate that the average propensity to consume (ratio of consumption to income) is lower for higher income groups and higher for lower income groups (see, Chapter 7). The argument is illustrated in Box 10.5.

BOX 10.5

How Income Redistribution in Favour of the Lower Income Classes can Raise Aggregate Demand and Prices

For the sake of simplicity, imagine there are six representative individuals with monthly income and average propensity to consume APC shown in columns (2) and (4) respectively. Total consumption expenditure is shown in column (5). Column (3) shows re-distribution of income in favour of lower income groups and the new expenditures are shown in column (6).

Representative Individual	Monthly income (Rs. '000)		Average propensity to consume (APC)	Consumption expenditure (Rs. '000)	
	Before Redistri-bution	After Redistri-bution		Before re-distribution	After re-distribution
(1)	(2)	(3)	(4)	(5)	(6)
A	100	70	0.4	40.0	28.0
B	60	50	0.5	30.0	25.0
C	40	45	0.6	24.0	27.0
D	20	35	0.7	14.0	24.5
E	10	15	0.8	8.0	12.0
F	5	7	0.9	4.5	6.3
Total	235	222		120.5	122.8

This illustration shows that consumption expenditure increases even with lower total income if income is redistributed more equitably. A continuous movement in the direction of more equal distribution has the potential to increase aggregate demand and generate inflation.

The example shows that as income distribution become more equitable, aggregate demand tends to rise, sometimes in spite of fall in aggregate income. However, as changes in income distribution are slow to take place, the inflation so generated is quite mild and socially acceptable.

MONEY SUPPLY AND INFLATION: THE QUANTITY THEORY FRAMEWORK

The relationship between money supply and inflation has always been a contentious issue among economists as well as managers. From this debate two major schools of thought have emerged - the Keynesian School and the Monetarist school. The Keynesian School following the tradition of Keynesian macroeconomics believes that money is only one of the many variables affecting aggregate demand and prices whereas Monetarists hold that changes in money supply are the primary cause of changes in output and general price level. However, it is a fact that most inflationary processes are accompanied by expanding money supply but the strength of correlation between the two varies from one inflationary period to the another.

Historically and traditionally, relationship between money and prices has been captured by what is called the Quantity Theory of Money. Various approaches to the theory have been developed which seek to explain how changes in money supply affect the general level of prices. According to the classical quantity theory, under conditions of full employment, the relationship between money supply and the price level is proportionate so that a 20 per cent rise in money supply would raise the general price level by 20 per cent (see, **Box 10.6**).

BOX 10.6

How the Relation between Money and Price Level is Proportional under the Classical Quantity Theory

The relationship of proportionality is given by the equation (or, more precisely identity) of exchange:

$$MV = PY$$

Where M = quantity of money in calculation; V = velocity of money, defined as the average number of times the typical unit of money changes hands to complete the sale and purchase transactions of national output; P = general level of prices; and Y = physical volume of output or GDP. The relation is a definitional identity, which is true under all circumstances of an economy. Left hand side shows the amount spent on output and right hand side is the monetary value of the output and the two must be equal.

V is regarded as a behavioural factor which changes very slowly and is considered to be constant, at least in the short run. Under full employment, when the output is close to the potential level, Y is also constant so that any increase in M must raise P in the same proportion to preserve the identity. Thus, doubling of M would lead to doubling of P. This is the crux of the classical quantity theory.

Keynesian approach takes a more realistic view. It recognizes that there is always some degree of unemployment in an economy so that actual output is lower than the potential or full employment level. A given increase in quantity of money in the Keynesian approach raises both output and price via increase in monetary income and aggregate demand (**Box 10.7**). If the economy is far away from full employment level, the impact of monetary expansion is more on output than on prices. If the economy is already close to the full employment level, then increase

in quantity of money is more inflationary than expansionary. Experts generally agree that inflation results when the rate of monetary expansion is greater than the growth of real output, the difference between the two approximating to the rate of inflation. The approach recognizes that, apart from monetary factors, aggregate demand can also increase due to increased investment, government expenditure and exports so that all bouts of inflation are not sourced in money supply.

As a critique of Keynesianism, modern Monetarism emerged under the leadership of Chicago economist Milton Friedman after World War II. The contention of this approach is that the growth of money is a major determinant of nominal GDP in the short run and inflation in the long run. Monetarists argue that the velocity of money has been empirically found to be stable so that increases in money supply affect prices directly when the economy operates near its potential output level. This proposition comes very close to the classical quantity theory described but there are important differences in the process of causation. The approach trivializes the role of fiscal policy in affecting output and prices. The theory has its own critics but a detailed criticism of the theory is beyond the scope of this book.

BOX 10.7

Keynesian Quantity Theory Relationship between Money and Prices

How money supply changes impact output and prices in the Keynesian approach to quantity theory, can be illustrated by the following sequence chain:

$\uparrow\text{MS} \rightarrow \downarrow r \rightarrow \uparrow\text{I} \rightarrow (\uparrow\text{Y}, \text{O}, \text{E}) \rightarrow \uparrow\text{CP} \rightarrow \uparrow\text{P}$

An increase in money supply ($\uparrow\text{MS}$) lowers rate of interest ($\downarrow r$). It stimulates investment ($\uparrow\text{I}$) which via multiplier action (as described in chapter 7) brings about a multiple increase in the level of income, output and employment ($\uparrow\text{Y}, \text{O}, \text{E}$). Increasing output raises demand for various inputs like labour and materials due to which cost of production rises ($\uparrow\text{CP}$). Increased investment and income further cause aggregate demand to rise ($\uparrow\text{AD}$). Increasing demand and production costs raise the general level of prices creating inflation.

ROLE OF EXPECTATIONS

Expectations with regard to future have an important role in the process of inflation. Expectations are built on the basis of past and present trends of the price level and its determinants as well as on the information currently available. Household units, business firms as well as the government have their price expectations for future and the bases of expectations may differ substantially. Governments estimate future revenues, expenditures and borrowings in their annual budgets on the basis of an assumed rate of inflation. Similarly, an anticipated rate of inflation is integrated into economic plans of the government to keep these as close to future conditions (that may actually prevail) as possible. Business firms also construct their investment and other future plans on the basis of an expected rate of inflation. Their borrowing decisions, purchase budgets and compensation structures over the period of their business plans are generally based on an expected inflation rate. The nature of expectations is that they are self-fulfilling i.e. the expectations tend to become reality through the impact of the future expectations on present behaviour. Households and firms, for example, may advance their purchases to avoid future price increases.

This would immediately push up aggregate demand and the expected inflation may be realized much sooner.

There are many indicators of future inflation and these may be given different weights by different individuals, firms as well as government and the intensity of reaction may also differ accordingly. Future inflationary expectations may be directly read off from the business contracts, assumed inflation rate behind government budgets, policy documents and economic plans or from the economic forecasts made by professional research organizations and business associations. These may also be determined on the basis of trend projections and past and present data. Additionally, there are leading indicators, which point to future price trends. Some of the indicators are the following:

- Increase in money supply
- Currency depreciation
- Increase in taxes
- Credit expansion by banks
- Deficit financing
- Global inflation
- Sustained increase in exports
- Resource exhaustion
- Increase in wages and salaries
- Transportation bottlenecks
- Swings in consumer tastes and preferences
- Declining labour relation and disruption in production and
- Natural calamities (like earthquakes, flood or droughts) and national emergencies (wars, political upheavals and internal law and order problems).

These indicators require careful analysis for their inflationary implications. Sharp movements in any of these indicators generate speculation, which makes the task of inflation prediction difficult. Nevertheless, an over-reaction to these variables may convert expected inflation into actual inflation at an accelerated pace and an under-reaction may prove an opposite result.

EFFECTS OF INFLATION

The effect of inflation depends on its speed and the nature of the economy in which it occurs. As already pointed out above, a modest inflation works like a tonic creating a conducive climate for growth. When it crosses its limits, it becomes dangerous and injurious. Inflation may be likened to a fire. A small fire gives light and warmth. When it gets out of control, it produces havoc and massive destruction. The multi-dimensional impact of inflation may be seen in terms of the various segments of the economy.

IMPACT ON THE HOUSEHOLD SECTOR

Inflation directly reduces the purchasing power of the household sector and consumers are compelled to reduce and readjust expenditures according to their needs and priorities. First, of all, non-essential and luxury expenditures are axed. These are the products for which the price elasticity of demand is generally greater than unity. As real income (in terms of purchasing power) falls, there is some reduction in essential or needed products as well. This may lower the general standard of living. In inflationary times, people are generally discouraged from cash savings and their real value gets eroded. They may be motivated to stock physical goods (like gold), advance their future purchases, real-estate properties or hold savings in non-monetary form and this behaviour may spread inflation to these areas as well. Within the household sector, people receiving fixed incomes suffer the most. The impact on the people, whose income is positively linked to the price level, is relatively less.

IMPACT ON BUSINESS SECTOR

Business sector is impacted by inflation in several ways. As already pointed out, a modest inflation creates a healthy environment for business as it leads to expanding profit margins. But does this argument apply when inflation gets more severe? A high rate of inflation is not only a problem for the government and challenge for the macroeconomic policy but is also a problem for the business sector.

Initially, a large number of firms would experience rising revenues as prices are rising but quite soon the tide is stemmed as demand receives a setback as consumers reduce the consumption under inflation. However, depending upon the price-elasticity of demand, the fall in demand is different for different firms. At the same time, production costs increase due to rise in wages which are generally indexed to inflation and rise in the prices of industrial inputs. The cost trends squeeze profits and some firms could be marginalized and driven to losses in the process. The firms which marginalize faster are those the demand for whose products has high price elasticity and which face sharp cost escalation. In such a situation, management strategy generally tends to revolve around cost cutting and efficiency building.

New investments are regarded as risky under inflationary times when profit levels are uncertain. However, firms, which gain during this period, tend to invest more in spite of higher rate of interest which tends to prevail. New investment generally follows the trend of re-allocation of consumer expenditure. Much, of course, depends upon other factors like changes in government policies, availability of funds and state of competition. As inflation affects firms differently and firms have different abilities to cope with inflation, inflation does bring about a change in the competitive environment. This helps some firms and industries to make more profit as compared to others and this factor plays an important role in bringing about a change in the composition of industrial output. There can even be a flight of capital from one industry to the other. Export firms are typically hit by inflation. As domestic costs and prices rise, the competitiveness of such firms in the foreign market goes down. The resulting loss of foreign exchange tends to build pressure for depreciation against the domestic currency. If this materializes, import costs rise pushing the inflation further.

IMPACT ON DEBTORS AND CREDITORS

Inflation redistributes income not only from the fixed income groups to the business sector but also from creditors to debtors. If a firm borrows Rs. 100 million at the rate of interest of 10 per cent for one year, it would pay Rs. 110 million at the end of the year. If, however, during the year prices rise by 20 per cent, it in fact returns only Rs. 88 (=110-22) million in terms of purchasing power. So this inflation would transfer Rs. 22 million from the creditor to the debtor. In the same way, banks lose vis-à-vis borrowers and gain vis-à-vis depositors or lenders. The same position is for the government which lends as well as borrows on an almost continuous basis. Inflation can, therefore, swing fortunes for financial institutions that borrow as well as lend as the main part of their business. The economic entities that are able to anticipate inflation and hedge against it remain unhurt from inflation to that extent.

IMPACT ON GOVERNMENT

Effect of inflation on government as an economic entity is multi-dimensional. First, government expenditure on various projects and activities increases in tandem with increase in the price level. It may also necessitate austerity measures and re-ordering of priorities. Governments most often anticipate a rate of inflation and build it into the revenue and expenditure estimates for the budget period. If inflation does not affect economic growth adversely, government's revenue flow (through direct and indirect taxes) tends to rise, tax rates remaining the same. The net effect on the fiscal deficit can be positive or negative, depending upon how revenue and expenditure are affected. If inflation widens the deficit, deficit financing through printing of fresh currency may become expedient and to the extent it happens, it will sustain or further fuel inflation. Inflation often induces the government to adopt contraction or restrictive fiscal and monetary policies, which are designed to contain demand and ease pressure on industrial costs. In addition, direct controls may be applied which may take such forms as wage freeze, a cut on perks, ban on new recruitment and offer of voluntary retirement schemes to employees, price controls and rationing.

IMPACT ON MACRO-ENVIRONMENT

The above analysis shows the impact of inflation on different economy segments. Inflation affects the overall economy and its environment in the following main ways.

Output and Efficiency

As pointed out earlier, a modest inflation is not a problem; rather, it acts as a growth-booster. As in the case of inertial inflation, if inflation is anticipated, a number of ill-effects of inflation can be dealt with as individuals and business firms can take suitable inoculative or defensive measures. The various economic units should, therefore, be able to understand the leading indicators of inflation. Generally, wage increases follow price increases after some lag so that the resulting expansion in profits during the lag induces the firms to invest and produce more. The industries, which experience faster increases in prices, are expected to grow faster than others. This, of course, tends to alter the product composition in the economy.

In this process, however, there are a number of industries, which stagnate or contract during a period of general inflation. These are often the industries the prices of which remain, by and

large, invariant because of high price elasticity of demand or because of the reason that their prices are sticky (under competitive oligopolies), regulated or administered. During inflation, these industries receive industrial inputs (from other inputs) at high prices as a result of which their profit margins get squeezed. Inflation can throttle some of the inefficient firms even to death. These opposite trends cause reallocation of resources. The reallocation is healthy if it brings the economy closer to its comparative advantage areas; it would be adverse if the economy moves away from its areas of competitive strength. The efficiency of the economy is negatively impacted to the extent that it moves resources from more productive to less productive areas affecting overall competitiveness of the economy.

Balance of Payments Effects

Under inflationary conditions, firms face increasing costs and loss of competitiveness in foreign markets. This adversely affects exports which moves balance of payments in the direction of a deficit. Imports tend to rise as they appear relatively cheap, sometimes even after an increase in import duties. This reinforces the deficit. Not only that, foreign firms usually shy away from inflationary economies so that the inflow of foreign direct investment is adversely affected. This loss could be partly compensated by increased flow of foreign portfolio investment, which becomes likely in the wake of increase in the rate of interest that generally follows rising rate of inflation. The balance of payments effects are larger for economies with higher global linkages.

Currency Effects

Inflation is often attended by expanding supply of money and credit, which further sustain inflation. As already pointed out, a high rate of inflation increases government expenditure in nominal terms and this may force the government to print fresh currency as a part of deficit financing exercise and to meet the additional expenditure. Similarly, banks and financial institutions expand credit to meet demands for new investment. Increased supply of domestic currency against declining foreign exchange reserves generally builds up a pressure for devaluation. If it results, it reinforces the inflationary pressure.

The macroeconomic effects are not limited merely with respect to the above points. Variations in these key macro variables induce further chain reactions and impact on other key macro-variables. The adjustment in macroeconomic policies and that of the firms and individuals affect the economy in subsequent rounds. Determination of overall effect requires continuous monitoring of the economy through realistic econometric modelling incorporating both quantitative and behavioural variables affecting inflation and growth.

TOOLS OF INFLATION CONTROL

Control of inflation generally requires a public policy action designed basically to bridge demand-supply gap and control costs of production. The policy kit of a government includes standard, traditional as well as innovative tools designed to deal with the specific factors and sources of inflation. Governments often employ a mix of tools and decide the timing depending upon its own economic philosophy and wisdom. Inflation can be controlled through the following measures.

RESTRICTIVE MONETARY POLICY

A restrictive monetary policy seeks to control aggregate demand by reducing the rate of growth of money supply and credit, increasing rate of interest and applying selective credit controls. As a part of anti-inflationary policy, a central bank may increase cash reserve and liquidity ratio requirements of commercial banks, which would restrict their lending base. Similarly, a central bank may resort to sale of government securities. If the terms of sale are attractive and public response is good, people would withdraw from banks and invest in the securities. This again has the effect of reducing the size of loanable funds of the banks, which will restrict credit expansion. Credit expansion is further restricted when the central bank hikes the bank rate. This is often followed by increase in prime lending rates of individual commercial banks. As the interest rates for different credit schemes are linked to the prime lending rates, the broad interest rate structure in the economy rises which discourages both investment and consumption (credit-based) expenditure. The success of monetary policy depends greatly on the sensitivity of consumption and investment to interest rate and profitability conditions in the business sector and the effectiveness of its implementation.

RESTRICTIVE FISCAL POLICY

A restrictive fiscal policy seeks to reduce government expenditure and reduces purchasing power in the hands of the people. Under this policy, government cuts or postpones expenditure on new projects, reduces subsidies, increases rates of direct and indirect taxes and undertakes massive borrowing programmes. Expenditure cuts directly reduce aggregate demand. Taxes reduce disposable income and raise prices further dampening the growth of demand though these raise cost of industrial inputs. Government borrowings transfer purchasing power from public to the government. It reduces private demand and if the resources so collected are spent productively aggregate production increases, which dampens inflation. The overall effect of restrictive fiscal policy is generally contractionary, which may be regarded as the cost of inflation control.

WAGE-PRICE CONTROLS

This measure is a part of direct controls under which government controls prices of products which are sensitive or which command a substantial weight in the overall production structure. Similarly, wages could be controlled or, in an extreme case, frozen over a certain period of time. Such measures can break the wage-price spiral and begin a process of disinflation. Price controls, however, are easier to apply in public sector than in the private sector. Such controls are difficult to sustain over long periods as these tend to be evaded and might encourage flight of capital from regulated to unregulated sectors.

DEREGULATION AND PRIVATIZATION

Measures in this direction seek to liberate investment and private enterprise from government controls and extend the areas of private enterprise operations. Such measures are generally not reversible and their basic objective is to accelerate growth. Deregulation and privatization bring increased competition, which is instrumental in bringing in more efficiency and higher productivity thereby helping to reduce prices. These measures seek to operate on the supply side rather than the demand side to control inflation.

CONCLUSION

A business manager must understand the process, extent and effects of inflation. Inflation affects both macroeconomic and sectoral environment with implications for the competitiveness of individual firms. Inflation brings in expanding profit margins and the firms have to develop strategies to ensure that these are not neutralized by rising costs at subsequent stages. The ability to contain costs in periods of inflation is one of the major challenges. Firms that are able to control costs can let their prices to rise more slowly as compared to competitors and can expect their market shares to rise. In economics where government sector plays a major role, firms have to monitor the situation arising from the adjustment of monetary fiscal and exchange rate policies to inflation. An imminent inflation throws a number of early warning signals which if read appropriately enable the firms to take advance strategic position to deal the upcoming opportunities and challenges. International costs and price structures significantly affect the inflation rate of a country that has a high degree of globalisation.

Key Terms

Bank rate	Exchange rate system	Inertial inflation
Central bank	Excise duty	Inflation
Consumer price index	Expansionary fiscal policy	Money supply
Core (or expected) inflation	Fiscal deficit	Monopoly power
Cost-push inflation	Foreign direct investment	Price elasticity of demand
Deficit-financing	Foreign exchange reserves	Prime lending rate
Demand-pull inflation	Foreign exchange reserves	Producer price index
Demand-shift inflection	Foreign portfolio investment	Productivity
Devaluation	GDP deflator	Profit-push inflation
Disinflation	Government securities	Purchasing power of money
Disposals income	Hyper inflection	Retained earnings
Dividend policy	Import tariff	Subsidy
Excess-demand inflection	Income-shares inflation	Velocity of money
Exchange rate	Indexation	Wage-price spiral

Supplementary Readings

- Chattopadhyay, A and Pradipta Banerjee (2002), 'Stock Returns, Inflation and Foreign Exchange Rate in India: An Empirical Examination of their 'Interrelations', *Management Account*, Vol. 37, No.8, August.
- Dornbusch, Rudiger, Stanley Fischer and Richard Startz (2001), *Macroeconomics* (New Delhi: Tata McGraw Hill)
- Gowland, David (1985), *Money, Inflation and Unemployment* (Brighton, Sussex: Wheatsheat Books)
- Gupta, Ambrish (2000), *Inflation Accounting: The Indian Context* (New Delhi: Kanishka).
- Hahn, F H (1982), *Money and Inflation* (Blackwill: Oxford)
- Laidler, D E W and J M, Parkin (1975), 'Inflation: A Survey', *Economic Journal*, Vol. 8.5 (December).
- Samantaraya, A and A Prasad (2001), 'Detecting the Threshold Level', *Asian Economic Review*, December.

Savage, D (1978), 'The Channels of Money Influence: A Survey of the Empirical Evidence', *National Institute Economic Review*, Vol. 8.3 (February).

Shapiro, Edward (1984), *Macroeconomic Analysis* (New Delhi: Galgotia)

Tobin, J (ed.) (1983), *Macroeconomics, Prices and Qualities* (Oxford: Blackwell).

Long Questions

1. What is inflation? How does inflation affect business decisions?
2. Distinguish between demand-pull and cost-push inflation. What are the opportunities and threats contained in these types of inflation for business firms?
3. What is demand-shift inflation? What are its causes? How does it affect sectoral environment of business?
4. What is the relation between money supply and inflation in the Quantity Theory? Is reduction in the growth rate of money supply a sure recipe to control inflation?
5. Discuss the effects of inflation on:
 - (a) The household sector;
 - (b) The business sector;
 - (c) The government sector.

What are the alternative macroeconomic policies to control inflation? Does the selection of the tool to control inflation depend upon the type or source of inflation?

Short Questions

1. Give major characteristics of inflation. How is 'inflation' a process?
2. How is rate of inflation calculated?
3. What is consumer price index? What is its use?
4. Compare the relative merits of consumer Price Index and Producer Price Index as measures of inflation.
5. Why do inflation rates based on consumer Price Index and wholesale Price Index diverge?
6. When is inflation considered a 'problem'? Do you think that a small degree of inflation is good for the health of an economy?
7. What is inertial inflation? Why is it called the starting point of inflation analysis?
8. Explain the link between money supply and inflation.
9. Give three leading factors of demand-pull and cost-push inflation.
10. What is wage-price spiral? How is it triggered?
11. What does the Quantity Theory of Money state?

Practical Assignments

1. Collect data on the national and sectoral rates of inflation in recent years from the latest issue of the Economic Survey and analyse it in terms of the factors discussed in the Chapter.
2. Select a medium or large corporate organisation in your region and find out how the current and anticipated rates of inflation affect its business decisions in different areas.
3. Collect price index data of Indian Economy since 1991 and attempt to find out the inertial inflation. Make a presentation to the class to discuss the matter and reach a conclusion.
4. Hold a group discussion on 'The Impact of Inflation on the Investment of a Firm'.
5. Conduct direct personal interviews of 10 business managers to find out how do they anticipate inflation and adjust their business to it.

