
UNIT 9 FISCAL POLICY*

Structure

- 9.0 Objectives
- 9.1 Introduction
- 9.2 Effects of Fiscal Policy
 - 9.2.1 Counter-Cyclical Fiscal Measures
 - 9.2.2 Policy Lags
 - 9.2.3 Automatic Stabilisers
 - 9.2.4 Expectations in Economics
 - 9.2.5 Crowding-Out of Private Investment
- 9.3 Budget Deficit
 - 9.3.1 Components of the Budget
 - 9.3.2 Budget Deficit
 - 9.3.3 Impact of Budget Deficit
 - 9.3.4 Financing of Budget Deficit
- 9.4 Debt Sustainability
 - 9.4.1 Government Budget Constraint
 - 9.4.2 Debt Stabilisation
 - 9.4.3 Implications of High Debt-to-GDP Ratio
- 9.5 Ricardian Equivalence Proposition
- 9.6 Let Us Sum Up
- 9.7 Answers/Hints to Check Your Progress Exercises

9.0 OBJECTIVES

After going through this Unit, you should be in a position to

- describe the effects of fiscal policy;
- identify the policy lags and their role;
- explain why there could be crowding-out of private investment;
- describe the components of government budget;
- define the various measures of budget deficit;
- appreciate the importance of debt-to-GDP ratio;
- derive the condition of debt sustainability; and
- explain the concept of Ricardian equivalence.

*Prof. Kaustuva Barik, Indira Gandhi National Open University, and Dr. Krishnakumar, Sri Venkateshwara College, University of Delhi

9.1 INTRODUCTION

Policy makers always have certain goals in mind while framing policies. In the sphere of economics, these goals could be: (i) economic stability, (ii) acceleration in economic growth, (iii) increase in employment, (iv) reduction of poverty, and (v) better quality of life for people. Two prominent tools at the disposal of policy makers to achieve these goals are: (i) fiscal policy, and (ii) monetary policy. Fiscal policy refers to the use of public spending (i.e., government expenditure) and taxation to influence macroeconomic variables such as aggregate output and employment in an economy. Monetary policy refers primarily to the use of interest rate to influence macroeconomic variables. We will discuss about both these policies in the present course – fiscal policy in the present Unit and monetary policy in Unit 10.

In the aftermath of the Great Depression (1929-34), Keynes prescribed that the government should play an active role in the economy. About a decade back, during the global financial crisis of 2008-09, most countries resorted to fiscal stimulus packages to accelerate growth rate of the economy. Further, during the Covid-19 pandemic of 2020-21 fiscal policy played an important role. In India, for example, when there were phases of lock-down in most states due to the pandemic, the governments at the centre and the states came up with several fiscal measures to protect life and livelihood of people.

Governments have always tried to maintain public expenditure at a high level. In this pursuit government revenue has fallen short of government expenditure. Thus there has been a deficit budget of the government in most cases. Such deficit is funded usually by borrowing, which leads to public debt. In this Unit we will discuss about the sustainability of public expenditure in the presence of public debt.

9.2 EFFECTS OF FISCAL POLICY

The role of the government, particularly the fiscal aspect, has changed over time. Classical economists believed in the philosophy of ‘laissez faire’, which is a French term meaning ‘leave alone’ or ‘let you do’. According to this view, there should be minimal intervention from the government in business affairs. In fact, Adam Smith suggested that government should confine itself to three main duties, viz., (i) national defense, (ii) administration of justice (law and order), and (iii) establishing and maintaining certain public works (infrastructure, education, etc.). Keynesian economics, on the other hand, presents an altogether different view on the role of the government. Keynes believed that in case the economy is passing through bad times, it is the role of the government to intervene and help the economy to attain equilibrium. Thus the role of the government is much more than the maintenance of law and order, and defence. The government should enter into production of various goods and services. In fact, this point of view suited policy makers, and the size of the government kept on increasing.

Government is an important source of demand for goods and services. Through variation in government expenditure, the government can vary aggregate demand of the economy. Such variation in aggregate demand will lead to changes in aggregate output.

9.2.1 Counter-Cyclical Fiscal Measures

There are fluctuations in economic activity in an economy due to business cycles (see Unit 4). During recession there is a downturn in economic activities, while the economy may suffer from inflation during the expansionary phase. Government expenditure can be an important tool of countering business cycles. Keynes talked about pump-priming expenditure, i.e., a step taken by the government to increase public expenditure during and after recession. Public expenditure on infrastructure (better roads, railway network, uninterrupted power supply, etc.) would also act as a catalyst for private investment.

There are two main instruments of fiscal policy, viz., government expenditure and taxation. During recession, the government should increase its spending so as to compensate for the decline in aggregate demand. On the other hand, the government should decrease public spending when there is high inflation in the economy. Similarly, tax rates should be decreased during recession and increased during boom period.

You have already read about the effect of government expenditure on output, prices and interest rate. Apart from its effect on these three variables, fiscal policy influences two more variables in the long run: (i) redistribution of wealth, and (ii) growth of production capacity. Redistribution of wealth can be attained through the following three channels: (i) Taxation should be progressive in an economy. It means that tax rate is higher for people with higher income. As you know, people with higher income pay direct taxes (such as personal income tax) at a higher rate. (ii) Poor people are given various subsidies (such as old age pension, subsidized ration, etc.) to supplement their income. (iii) Government provides preferential treatment to certain sectors, which affects relative income of people (for example, free electricity or subsidized inputs for priority sectors). Such measures lead to redistribution of income and wealth in the long run.

Government produces certain goods and services, which are not necessarily 'public goods'. The government operates hospitals, educational institutions, banks, water supply, etc. It also builds roads, railway tracks, power plants and several infrastructural projects. Further, government produces many goods such as steel, coal, heavy machineries, etc. In the long run, all these production activities enhance the production capacity of the economy.

9.2.2 Policy Lags

We mentioned above that the government can vary its spending to moderate the effect of business cycles. Thus Keynesian economics suggests a lot of discretionary power to the government.

The effect of variation in public investment to counter business cycles, however, may not be effective because of certain policy lags.

When certain economic problem comes up in an economy, it takes some time to recognize it. For example, suppose inflation in the economy is about to increase. Policy makers may not be in a position to recognize the problem immediately. They may think the price rise to be temporary (seasonality, supply shock, etc.) and assume that market forces will be able to rectify it. Further, policy makers have to take due approval before taking any action. For example, tax rates are usually changed during the annual budget presentation. Policy makers have recognized the problem but they have to wait for implementation of appropriate policy measure! Finally, when the government takes action, its effect will be visible only after some time. For example, if the government comes up with certain relief package to counter the recession, the economy will respond with a lag. When the effect of the higher government expenditure is visible, the economy may be moving towards high inflation. Thus, government may be taking certain action, which is not needed or which may be negating the objective of the government.

We generally observe four types of policy lags, viz., (i) information lag, (ii) decision lag, (iii) implementation lag, and (iii) effect lag.

Information Lag: The Central Statistical Office collects data on various economic variables periodically. You may have observed that we do not have data on many variables on a regular basis. On some of the variables (for example, prices) we have data on a weekly basis, while for others on a quarterly basis. Data on employment, investment, consumption, etc. are not available so frequently. You should note that it takes long to plan a survey, collect data and carry out statistical analysis. Thus there is an information lag in an economy.

Decision Lag: Even when the state of the economy is known, the government has to wait for some time to take a decision. Policy makers have to seek due approval before taking any action. For example, tax rates are usually changed during the annual budget presentation. Thus, there is a decision lag.

Implementation Lag: Implementation of government policies take time. To implement an investment project, for example, a lot of time is required. The procedures of placing order for machineries, recruiting employees and purchasing raw materials are time consuming. Therefore, even when the policy makers have recognized the problem and decided to carry out certain projects, they have to wait for implementation of the projects. This leads to implementation lag.

Effect Lag: There is a lag in realizing the effect of the policy decisions. Effects of certain government projects are visible immediately. In other cases it takes somewhat longer. Cash transfer to the saving account of farmers or poor people can have immediate effect. Reduction of poverty in a region due to setting up of certain industry however will take time.

Thus the effect of government policy needs to be evaluated on a case to case basis. In most cases, however, there is a lag in realizing the desired effects.

9.2.3 Automatic Stabilizers

Taxes are considered to be automatic stabilizers in an economy. As you may know, the government is not in a position to vary tax rates at times due to several factors – there could be resistance from people, policy makers have to wait till the parliament approves it, the government may not want to increase tax rates keeping forthcoming election in mind, etc. Even in those cases the tax revenue will have a stabilizing effect. Let us see how. Let us assume that the economy is experiencing rapid economic growth. It implies that more workers are employed, turnover of firms is growing, and income of people is growing. This leads to payment of higher taxes by individuals and firms, even if the government does not increase tax rates. Consequently, there is increase in tax revenue of the government. As government expenditure does not depend on the size of GDP, the government can go for a surplus budget, if needed. In times of recession, on the other hand, there is a dip in the level of employment, income of people and turnover of firms. During such times there is a decline in taxes paid by people and firms, even if the tax rates are unchanged. Thus, direct taxes such as income tax work as automatic stabilizers; they soften the impact of business cycles.

9.2.4 Expectations in Economics

Keynes recognized the importance of expectations in economics. However, he did not introduce expectations explicitly into his analysis. There are two reasons for the above: (i) Expectations are volatile and bringing it into analysis is difficult. (ii) Keynes focused his analysis on the short run – there may not be much change in expectations in the short run.

As you know from BECC 106: Intermediate Macroeconomics-I, expectations formation could be according to two important theories: adaptive expectations and rational expectations. In Unit 3 of BECC 106, we discussed the effects of fiscal policy. In Table 3.2 we presented the short run and long run impact of fiscal expansion (i.e., an increase in government expenditure and decrease in tax rates). As a result of expansionary fiscal policy, in the short run, there will be (i) an increase in output, (ii) price level will rise, and (iii) rate of interest will rise. In the long run, aggregate output will revert back to its natural level (i.e., potential output), while price level and interest rate will remain at higher levels. We assumed that expectations formation is according to adaptive expectations. Thus, there is a discrepancy between expected price and actual price in the short run. If we assume rational expectations, aggregate output will not increase. Under rational expectations, there is no difference between expected price level and actual price level even in the short run.

9.2.5 Crowding-Out of Private Investment

Keynes favoured fiscal policy measures, primarily government spending on public works. Most of the debate over economic policy at that time focused on the desirability of government spending on public works as a cure for unemployment. Those arguing against Keynes's view primarily drew attention towards the financing of the government expenditure. Many economists and

observers got distressed about the persistent increase in the budget deficit and they viewed it as harmful.

Suppose there is a tax cut. This will result in lower revenue of the government. Public expenditure, however, is likely to remain unchanged. The budget deficit needs to be financed by government borrowing. According to Keynesian point of view, a tax cut would increase disposable income of consumers. Higher disposable income will increase the demand for goods and services, which in turn will enhance consumption expenditure. Increased consumption expenditure will lead to increase in aggregate demand. An increase in aggregate demand will lead to an increase in output and employment.

Let us look into the neoclassical point of view. Due to the tax cut, there is an increase in disposable income of households. Part of this income would be spent on consumption (depending upon the value of the mpc), while the remaining part will be saved. Total saving of the households (private saving) will increase as a result of higher disposable income. Such increase in private saving, however, will be lower than the decrease in public saving. Therefore, there is a decrease in the desired aggregate saving of the economy. As aggregate saving falls short of aggregate investment, there is an increase in the real interest rate. This higher interest rate would *crowd out* the domestic private investment. Such crowding out of private investment will result in smaller stock of productive capital in the long run.

Check Your Progress 1

1. Explain why government expenditure should be counter-cyclical.

.....
.....
.....
.....

2. What are policy lags and how do they affect fiscal policy?

.....
.....
.....
.....

3. Explain why income tax can be considered as an automatic stabilizer in an economy.

.....
.....
.....
.....

9.3 BUDGET DEFICIT

Budget is the annual financial statement of a government. It gives us the details of revenue and expenditure of the government. As you know, in the case of India, every year budget of the central government is presented before the Parliament for its approval. Similarly, budget of the state governments are presented before the respective state legislature. When we talk of public sector, it includes central, state and local governments.

9.3.1 Components of the Budget

The budget is prepared by the Finance Minister in consultation with economists, entrepreneurs, state governments, etc. There are two accounts in the budget: (i) revenue budget, and (ii) capital budget. The revenue budget includes revenue receipts or current receipts of the government and the expenditure that can be carried out from that receipt. The capital budget consists of capital receipts and capital expenditure. You should note that revenue budget consists of items that are recurring in nature and do not create any asset or liability for the government. Further, revenue receipts of the government are such receipts that are not required to be repaid. Transactions in the capital budget, on the other hand, create assets and liabilities for the government.

There are two sources of revenue receipts: (i) tax revenue, and (ii) non-tax revenue. Taxes are the most important source of revenue of the government (around 53 per cent of the total revenue and capital receipts). There are of two types of taxes, viz., direct tax and indirect tax. Direct taxes are levied on the incomes of individuals (such as personal income tax) and net income or profit of corporations (such as corporate income tax). Indirect taxes are levied on the purchase and sales of goods and services (such as Goods and Services Tax (GST)). Apart from taxes, the other sources of revenue receipts are fines and fees. There is a subtle difference between fee and tax. The government collects fee for rendering certain services. Taxes, on the other hand, are compulsory payments by individuals and firms to the government, for which there is no *quid pro quo* (that is, the government does not provide any service or return to the tax payer). The major source of capital receipts is borrowings by the government (about 36 per cent of total receipts).

On the expenditure side, there are three types of expenditure the government incurs: (i) government purchase of goods and services, (ii) transfer payments, and (iii) subsidies. The government produces goods and services, including capital goods. For such production, it has to employ labour, procure capital, and purchase intermediate inputs. Some of the expenses of the government are recurring in nature (for example, wages and salaries) while others are one time (for example, fighter planes). Transfer payments are unilateral payments to individuals, for which there is no *quid pro quo* (for example, old age pension), in the sense that the receiver does not pay anything in return to the government. Note that transfer payments are the opposite of taxes – in the case of taxes there

is a flow of money from individuals and firms to the government. In the case of 'transfer payments' the flow of funds from the government to the individual. 'Subsidies' are the supply of certain goods and services at a price that is lower than the market price. For example, the government provides food grains at subsidized prices to poor households. Another example of subsidies could be the supply of water to households at a much lower price than its cost of production. It implies that subsidies involve certain costs to the exchequer.

In the budget, government expenditure are placed under two categories: revenue expenditure and capital expenditure. The major heads of expenditure from revenue budget are wages and salaries, defence expenditure, transfers on account of interest payments, pensions and unemployment allowances. As mentioned earlier, revenue expenditure does not lead to creation of assets. Expenditure that results in an addition to the capital stock of the economy such as roads, buildings, factories, dams, etc. are referred to as capital expenditure.

9.3.2 Budget Deficit

We mentioned earlier that revenue receipts do not have to be repaid by the government while capital receipts have to be repaid. Thus in simple terms revenue receipts are the income while capital receipts are the debt for the government. In the context of budget, if the total expenditure (both revenue and capital) is equal to revenue receipts of the government, the budget is said to be *balanced*. If total expenditure is less than revenue receipts, it is called a *surplus budget*. If total expenditure, on the other hand, is more than revenue receipts, it is called a *deficit budget*.

You would have heard of three concepts of deficit, viz., fiscal deficit, revenue deficit and primary deficit during the talks that follow the presentation of the budget. Before we move forward, let us define these concepts.

Revenue Deficit: It shows the gap between revenue expenditure and revenue receipts of the government. It draws attention to the extent to which the government cannot meet its revenue expenditure from its revenue receipts. You should note that

$$\text{Revenue Deficit} = \text{Revenue Receipts} - \text{Revenue Expenditure}$$

Fiscal Deficit: It is the difference between total expenditure (both revenue and capital) and the revenue receipts. You should note that

$$\text{Fiscal Deficit} = \text{Revenue Receipts} - \text{Total Expenditure (Revenue + Capital)}$$

Fiscal deficit gives an estimate of the borrowing requirements of the government.

Primary Deficit: Interest payments (servicing of debt) constitute a large share of the revenue expenditure (about 25 per cent of revenue receipts). In this context, you should remember that interest payments are on the borrowings in the previous periods. Thus, to assess the fiscal health of an economy, we look at primary deficit. We obtain primary deficit by subtracting interest payments from fiscal deficit.

Primary Deficit = *Fiscal Deficit – Interest Payments*

Fiscal Policy

= *Revenue Receipts – Total Expenditure – Interest Payments*

A part of the revenue expenditure is spent on payment of interest. This in fact reduces the debt burden of the country. Deficits and surplus, as well as taxes and expenditure, are flow variables. These variables are defined over a period of time. Public debt is a stock variable and it is defined at a point of time.

9.3.3 Impact of Budget Deficit

Fiscal deficit leads to borrowings by the government. Such borrowings over the years accumulate in the form of public debt. The government has to pay interests on existing public debt on a regular basis. If the level of public debt is high, interest payment also is high. If revenue budget is surplus, the government can repay part of its existing debt (so that there is a reduction in the level of public debt). On the other hand, if the revenue budget is deficit, there is an increase in public debt due to further borrowings. Servicing of public debt takes away a substantial part of revenue receipts. Thus, very little is left for productive use of public funds. Now you can understand why there is a clamour from every quarter – political leaders, researchers and general public – to reduce fiscal deficit. Fiscal deficit is often expressed as a percentage of GDP.

9.3.4 Financing of Budget Deficit

There are three sources of financing the budget deficit as mentioned below.

- (i) **Borrowing from the Domestic Market:** The government issues bonds of certain maturity period to mobilise funds. Borrowing from the market leads to accumulation of public debt as mentioned earlier. The government can borrow from the domestic market or from the rest of the world. Borrowing from the domestic market does not lead to an increase in money supply. However, payment of interest and principal amount from revenue receipts is often a problem for the country. In this context the concept 'Debt-to-GDP ratio' is important. If debt-to-GDP ratio is high, a major part of revenue receipts has to be diverted towards servicing of public debt. In the case of India in 2019-20, for example, public debt (state and centre combined) as a percentage of GDP is about 76 percent.
- (ii) **Borrowing from the Rest of the World:** External borrowing could be in the form of (i) soft loans from international organisations such as IMF and World Bank, (ii) borrowing from commercial markets, or (iii) deposits by international emigrants (for example, non-resident Indians). You should note that external borrowings lead to accumulation of foreign debt. Debt servicing (i.e., payment of interest as well principal amount) of such external debt has to be made from current account receipts. In this context, the concept 'debt-service ratio' is very important. Debt-service ratio is defined as the ratio of debt service to current account receipts of the country. Debt service ratio of India in 2019-20 was about 6.5 per cent.

- (iii) **Monetisation of Deficit:** When the government borrows from the market, there is a decrease in money supply in the hands of people. In the case of monetisation of deficit, there is an increase in money supply in the economy. It is a two-step process where the government issues government bonds to cover its spending and the central bank purchases the bonds. The central bank holds the bonds until it matures. This process leaves the system with an increased supply of high powered money. Thus, monetisation of deficit can be inflationary. In view of the above, the FRBM Act, 2003 prescribes that the Reserve Bank of India should not buy government bonds, except under exceptional circumstances.

9.4 FISCAL SUSTAINABILITY

A government should be able to maintain its public finances (taxation, expenditure and debt) in such a manner that fiscal policy is credible and sustainable in the long run. The government should be in a position to estimate its future revenue and expenditure correctly. It should carry out the projects committed in the budget. Also it should not fail to repay its debt.

There is always a budget constraint for the government. While the scope of raising revenue receipts is limited, there is a demand from the public for an increase in public expenditure. This puts the government in a difficult position and the government usually operates with a deficit budget. Budget deficit is financed usually through public borrowing. The government repays part of the debt every year, but a deficit budget over the years leads to an escalation in public debt.

Deficit budget appears to be a soft option for the government. The government does not want to alienate its voters by increasing taxes. For several years during the 1980s and 1990s fiscal deficit of the Indian government remained very high. In order to bring in transparency in fiscal management, the government came up with the Fiscal Responsibility and Budget Management (FRBM) Act in 2003. The act prescribed that (i) revenue deficit should be eliminated completely, (ii) fiscal deficit should be brought down to 3 per cent of GDP, and (iii) debt-to-GDP ratio should be less than 60 per cent (40 per cent for centre and 20 per cent for states). These targets have not been fulfilled entirely and the targets have been revised over the years. However, the Act has been able to apply brakes on fiscal deficit and public debt in India.

9.4.1 Government Budget Constraint

Let us assume (for simplicity) that taxes (T_t) are the only source of public revenue. Let us assume that government expenditure (net of interest payments) in the current period is G_t . Suppose existing debt of the government is D_{t-1} . If the rate of interest on existing debt of the government is r , then interest payment during the current time period will be rD_{t-1} .

The net change in the stock of public debt in time period (t+1) will be

$$\Delta D_t = (G_t - T_t) + rD_{t-1} \quad \dots(9.1)$$

The **government budget constraint** says that the net change in government debt ($D_t - D_{t-1}$) = ΔD_t during the year (t) is the sum of *primary deficit* and the interest payments during the year (t).

The debt in time period (t) will be

$$D_t = D_{t-1} + (G_t - T_t) + rD_{t-1} \quad \dots(9.2)$$

We can re-arrange terms in (9.2) to obtain

$$D_t = (1 + r)D_{t-1} + (G_t - T_t) \quad \dots(9.3)$$

Equation (9.3) implies the manner in which public debt will evolve over time. Remember that we add primary deficit, not fiscal deficit to existing debt (D_t). This is due to the fact that total government expenditure, by definition, includes interest payments as well. Recall that fiscal deficit takes into account government expenditure on interest payments also.

9.4.2 Debt Stabilization

As mentioned earlier, government has to pay interest on past debt and repay the principal amount. It is observed that the government does not repay all its debt at any point of time – it repays part of the debt every year. In the process, there is a change in the amount of public debt over the years. There is a regular increase in the GDP of the country, which leads to increase in revenue collection and therefore, the repayment capacity. The growth in public debt and the growth in GDP, however, need to be balanced. Fiscal sustainability suggests that the debt-to-GDP ratio should be at a manageable level and should not increase over time.

Let us define debt-to-GDP ratio as $d_t = \frac{D_t}{Y_t}$.

Let us divide both sides of equation (9.3) by Y_t so that we obtain

$$\frac{D_t}{Y_t} = (1 + r) \frac{D_{t-1}}{Y_t} + \frac{G_t - T_t}{Y_t} \quad \dots(9.4)$$

We can rewrite D_{t-1}/Y_t as $(D_t/Y_{t-1})(Y_{t-1}/Y_t)$. In other words, we multiply the numerator and the denominator by Y_{t-1} .

$$\frac{D_t}{Y_t} = (1 + r) \left(\frac{Y_{t-1}}{Y_t} \right) \frac{D_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t} \quad \dots(9.5)$$

Note that all the terms in equation (9.5) are now in terms of ratios to output, Y . To simplify the above equation, we assume that output growth is constant and we denote the growth rate of output by g , so Y_{t-1}/Y_t can be written as $1/(1 + g)$.

$$[\text{Since } 1/(1 + g) = \frac{1}{1 + \frac{Y_t - Y_{t-1}}{Y_{t-1}}} = \frac{1}{\frac{Y_{t-1} + (Y_t - Y_{t-1})}{Y_{t-1}}} = \frac{Y_{t-1}}{Y_t}]$$

Thus, equation (9.5) can be written as

$$\frac{D_t}{Y_t} = (1 + r)/(1 + g) \frac{D_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t} \quad \dots(9.6)$$

Let us use the approximation $(1 + r)/(1 + g) = (1 + r - g)$.

Thus we can write (9.6) as

$$\frac{D_t}{Y_t} = (1 + r - g) \frac{D_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t} \quad \dots(9.7)$$

Finally, we reorganize equation (9.7) to get

$$\begin{aligned} \frac{D_t}{Y_t} - \frac{D_{t-1}}{Y_{t-1}} &= (r - g) \frac{D_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t} \\ (d_t - d_{t-1}) &= (r - g) d_{t-1} + \frac{G_t - T_t}{Y_t} \end{aligned} \quad \dots(9.8)$$

From equation (9.8) we find that the change in the debt ratio over time (the left side of the equation) is equal to the sum of two terms, viz., (i) the difference between the real interest rate and the growth rate times the initial debt ratio, an (ii) primary deficit as a ratio of GDP. The second term is the ratio of the primary deficit to GDP. From equation (9.8) we find that the increase in the debt-to-GDP ratio will be larger if

- (i) the rate of interest is higher,
- (ii) growth rate of the economy is lower, and
- (iii) the ratio of primary deficit to GDP is higher.

9.4.3 Implications of High Debt GDP Ratio

Suppose that large deficits have led to a high debt-to-GDP ratio. What should the government do then? Simply trying to stabilize the debt at this high level is not adequate. High debt-to-GDP ratio can lead to a situation of ‘debt trap’ – in order to repay the debt the country borrows further. Such situations make the conduct of fiscal policy extremely difficult.

Let us look at equation (9.8) more closely.

$$\frac{D_t}{Y_t} - \frac{D_{t-1}}{Y_{t-1}} = (r - g) \frac{D_{t-1}}{Y_{t-1}} + \frac{G_t - T_t}{Y_t} \quad \dots(9.8)$$

Let us assume that a country has a very high debt-to-GDP ratio, say, 100%. Suppose the real interest rate is 3% and economic growth rate is 2%. Suppose the government is conscious of the difficult fiscal position and it is running a surplus budget with primary surplus of 1% of GDP. If we apply these figures in equation (9.8), The first term on the right hand side of equation (9.8) is $(3\% - 2\%)$ times $100\% = 1\%$ of GDP. Since the government is running a primary surplus of 1% of GDP (i.e., $\frac{G_t - T_t}{Y_t} = 1\%$ of GDP), there is stability in the debt-to-GDP ratio.

Let us consider another scenario. Suppose financial investors start to worry that the government may not be able to fully repay the debt. Further borrowing by the government is possible, only if the rate of interest rate is increased.

Any increase in interest rate, however, will make debt stabilisation more difficult. Suppose, for example, that the interest rate increases from 3% to, say, 5%. Then, just to stabilize the debt, the government needs to run a primary surplus of 3% (the right hand side of equation (9.8) is then equal to $(5\% - 2\%) \times 100\% = 3\%$ of GDP.

Suppose the government indeed takes measures to increase the primary surplus to 3 per cent. This necessitates cuts in government expenditure. It may prove politically costly, as it may alienate voters. Further, decrease in government expenditure may lead to further decline in growth rate. Increase in interest rate and decrease in growth rate may require a still higher primary surplus. At some point, the government may be unable to increase the primary surplus further. Such a situation will lead to an increase in debt-to-GDP ratio. The result is a debt explosion. The lesson is clear. When a government inherits a high debt-to-GDP ratio, it should aim at decreasing it over time. Such an objective can be achieved through a combination of primary surplus, high growth rate, and low real interest rate.

Check Your Progress 2

- 1) Bring out the factors that cause an increase in the debt to GDP ratio.

.....

- 2) Explain why debt stabilisation is necessary for a government.

.....

9.5 RICARDIAN EQUIVALENCE PROPOSITION

A deficit budget allows a government to spend more than its revenue. In the process the government accumulates debt, which has to be repaid later. Such repayment has to be made by imposing higher taxes on individuals. Thus a deficit budget implies a trade-off between present consumption and future consumption on the part of the consumers.

While dealing with the inter-temporal consumption function in Units 5 and 6 we assumed that consumers are rational and forward looking. They take into account the future stream of income while deciding on the amount of current consumption. In this framework, the Keynesian consumption function is not realistic in the sense that there is no simple and stable relationship between current consumption and current income. In this section we will discuss how the budget deficit of the government influences consumption decision of people and aggregate output of the economy.

One extreme view is that neither fiscal deficit nor public debt has an effect on aggregate output. It implies that an increase in government expenditure may not have the desired effect of increase in aggregate demand and consequent increase in aggregate output. In other words, counter-cyclical measures by the government may be ineffective. This argument is known as the *Ricardian Equivalence Proposition*. The new classical economists (to be discussed in Unit 12) question the effectiveness of Keynesian fiscal measures on the ground of Ricardian equivalence. The Ricardian equivalence proposition is mainly associated with Robert Barro (1974).

The *neoclassical economists* criticized Keynesian fiscal policy on the ground that the latter ignored crowding out effect. An expansionary fiscal policy will lead to a rise in the interest rate (see Sub-Section 9.2.3). An increase in interest rate will adversely affect private investment. In an open economy the rise in interest rate will attract inflow of foreign capital which will lead to appreciation of the domestic currency. Such appreciation in value of domestic currency will adversely affect exports, thereby deteriorating the current account situation of the country (see Unit 12 of BECC 106).

New classical economists, led by Robert Barro, criticized Keynesian fiscal policy at another level. In fact, Barro brought forward the point of view put forth by David Ricardo in the early 20th century. Ricardo had argued that financing of government expenditure by taxes or by issuing bonds would have no impact upon aggregate demand if people were forward looking. According to Barro if expectations formation is according to rational expectations, fiscal policy would be ineffective.

Let us take an example. Suppose the country is passing through a recession and the government plans to increase its expenditure; the objective is to increase aggregate demand so that there is an increase in aggregate output. There are two options before the government: (i) increase tax rates so that revenue receipts increase; and (ii) maintain taxes at the existing rate (or, decrease it), but increase government expenditure so that there is a deficit budget. Let us look into the first option. Increase in taxes during recession will lead to reduction in consumption expenditure. Increase in revenue receipts will enable the government to increase public expenditure. The decline in consumption is compensated by increase in government expenditure. On the whole, aggregate demand will remain unchanged. Now let us look into the second option. The deficit budget entails increase in public debt. People are rational enough to expect that they have to pay higher taxes in future as the government starts repayment of the debt. Therefore, people will start saving from the very beginning and this will lead to a decrease in consumption expenditure. Thus, the increase in government expenditure is compensated by reduction consumption expenditure. On the whole, there is no change in aggregate demand. Note that both the policy options (increase in taxes or deficit financing) have equivalent impact on aggregate output.

The term Ricardian equivalence comes up for the above. According to the new classical view, reduction in tax rates does not make us richer.

Does the Ricardian equivalence proposition hold when the economy is passing through a boom period? Let us consider the case when the government resorts to a contractionary fiscal policy (there is a surplus budget; revenue is less than

expenditure). People expect that there would be a reduction in tax rates in future because of the surplus budget. They will not bother about current saving; they will increase consumption expenditure. Thus, in this case also, there would be no change in aggregate demand.

There are certain limitations of the Ricardian equivalence proposition.

Uncertainty: If the consumers expect with certainty that the current tax cut will lead to an increase in future tax, they would save most of the incremental income. Tax cut policies however are not accompanied by an announcement that taxes will be increased in future. There are some elements of uncertainty associated with future policy of the government. The more distant the repayment the repayment schedule of the government appears, the more uncertain is the future date of tax increase. Therefore, it is likely that consumers would ignore the possibility of tax increase in future and they would increase current consumption.

Selfishness: Consumers have a finite life time. They may expect that they will die before the future tax increase, if tax increase is expected to be in distant future. Usually people do not care much about the tax levied on the next generation after their death. In that case the Ricardian equivalence will not work.

Myopia: Ricardian equivalence is based on the assumption that people have complete information and perfect foresight. When the government borrows to pay for its current spending, rational consumers look into the increase in taxes in future. Such behavior on the part of consumers is rare. People suffer from myopia (short-sightedness) and they do not fully understand the mechanism of the government’s debt management. Therefore, the current tax cut can make them think that their life time income has increased. Such perception is likely to increase current consumption.

Check Your Progress 3

1. What does Ricardian equivalence mean?

.....

2. Explain why tax cuts by a government may not make us richer.

.....

9.6 LET US SUM UP

Policy makers need to consider several factors while framing fiscal policy. The extent of fiscal deficit is very important in this respect, as it adds to public debt. The debt-to-GDP ratio should not be very high. For stabilisation of public debt, economic growth rate should be greater than the rate of interest.

In this Unit we have explored the views of Keynes and new-classical economists on fiscal policy. Ricardian equivalence proposition suggests that fiscal policy may be ineffective.

9.7 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) Government expenditure is an important component of aggregate demand. It can moderate the fluctuations in aggregate demand due to business cycle. See Section 9.2 for details.
- 2) There are four types of policy lags. Refer to Sub-Section 9.2.2.
- 3) Income tax collection varies with the changes in the level of economic activity in an economy. Refer to Sub-Section 9.2.3.

Check Your Progress 2

- 1) Three factors that influence debt-to-GDP ratio are: interest rate, growth rate and the ratio of primary deficit to GDP. For further details see Section 9.4.
- 2) High debt-to-GDP ratio necessitates larger interest payments. It may require cutting down on public expenditure. See Sub-Section 9.4.3 for details.

Check Your Progress 3

- 1) Ricardian equivalence proposition suggests that fiscal policy of a government may be ineffective. See Section 9.5 for details.
- 2) If expectations formation is according to rational expectations, tax cut may not increase consumption expenditure. Households may increase their saving so as pay higher taxes in future.

UNIT 10 MONETARY POLICY*

Structure

- 10.0 Objectives
- 10.1 Introduction
- 10.2 Quantity Theory of Money
 - 10.2.1 Neutrality of Money
 - 10.2.2 Effect of Change in Interest Rate
 - 10.2.3 Monetary Transmission Mechanism
- 10.3 Rules versus Discretion
 - 10.3.1 Policy Lags
 - 10.3.2 Reputation and Credibility
 - 10.3.3 Taylor Rule
- 10.4 Loss Function
 - 10.4.1 Taylor Rule
- 10.5 Quantitative Easing
- 10.6 Limits to Monetary Policy
- 10.7 Let Us Sum Up
- 10.8 Answers/Hints to Check Your Progress Exercises

10.0 OBJECTIVES

After going through this unit, you will be able to

- discuss the underlying ideas behind the quantity theory of money;
- identify the various tools (or instruments) of conducting monetary policy;
- elucidate the objectives of monetary policy;
- explain why policy rules are better than discretionary policies;
- explain the Taylor rule on determination of interest rate;
- describe the usefulness of quantitative easing;
- identify the limitations of monetary policy.

10.1 INTRODUCTION

In Unit 6 of BECC 103: Introductory Macroeconomics we had a brief introduction to the objectives and instruments of monetary policy. In this context, we discussed about inflation targeting and quantitative easing. In the present Unit, we will recapitulate some of those issues and extend it further towards the policy formulation aspect. Monetary policy refers to the use of a set of

* Dr. Kaustuva Barik, IGNOU and Dr. Krishnakumar, Sri Venkateshwara College, University of Delhi

instruments by the central bank to influence the level of money supply in an economy. There are two types of tools or instruments of monetary policy, viz., (i) quantitative, and (ii) qualitative. Quantitative instruments are also known as general instruments. They relate to the quantity or volume of money supply in the economy. Thus these policy instruments do not discriminate across sectors of the economy or social groups. The important tools in this category are a) interest rate, b) open market operations, c) cash reserve ratio, and d) statutory liquidity ratio. Qualitative instruments are also called selective tools. They are used for discriminating between different uses of credit. The important selective credit control instruments are a) selective credit controls, b) margin requirements, c) credit rationing, d) moral suasion, and e) direct actions. We have elaborated on all these instruments in Unit 6 of BECC 103.

Monetary policy as practiced by countries has evolved over time. These days, the main instrument at the disposal of central banks is the interest rate. You may have seen people in the business as well as bankers waiting for the announcement of monetary policy by the Reserve Bank of India (RBI). In an open economy, the challenges before the central bank are too many. In fact, in the modern era, financial stability has become an important consideration of the central banks.

Till the 1970s, it was believed that the central bank would be able to control the supply of money in the economy. Even then, there were economists who expressed doubts on the ability of the central bank to do so. However, during the period 1986-2006, there was stability in 'economic growth and inflation' in most developed countries. This period is often termed as the 'great moderation' as it was somehow believed that we have mastered the art of controlling the economy. Extreme economic volatility was thought to be a thing of the past, till the world encountered the global financial crisis during 2007-2009. Subsequent to the financial crisis, since 2010, many countries have resorted to 'protectionism', which has influenced globalisation adversely.

The importance of monetary policy worldwide has resulted in heads of the central banks (for example, Governor of RBI in the case of India) receiving importance. Most of the central banks are governed by their legal mandates, not just to control the level of inflation, but also maintain a lower level of unemployment. In fact, in earlier days (up to 1980) most central banks were pursuing multiple objectives including price stability, employment and economic growth. Since the 1980s, however, the focus has been more on inflation targeting.

This focus on inflation targeting to the exclusion of other priorities is usually ascribed to the Federal Reserve System of the United States (US) for its role played in the 1980s. In the aftermath of the oil crisis during the 1970s, United States was witness to an unprecedented inflation of sorts. Paul Volcker, the then President of the Federal Reserve System, administered a large hike in the interest rate. Even though the level of output contracted as a result of the increase in interest rate, the rate of inflation declined. It is in this context that inflation targeting gained acceptability in the policy circles of central banks. Volcker's disinflation strategy of hiking interest rate towards reducing price levels gained wide recognition. Since the 1980s, the focus among central bankers has been more on inflation targeting to the exclusion of the objective of employment

generation. You should note that the increase in interest rate in the United States resulted in a number of Latin American countries (such as Brazil, Argentina and Mexico) defaulting on their international debt obligations. Many Latin American countries had borrowed huge amounts during the 1960s and 1970s for industrialization of their countries. When the rate of interest increased during the 1980s these countries had to pay huge sums to service their debts. Students of economics and history would know that the international debt crisis in the 1980s had a harmful effect on the economic growth in Latin America. This had much to do with the disinflation strategy pursued by the United States and European Countries. In the recent years too, you would have noticed that developing economies witnessed capital flights (outflow of foreign capital) from financial markets in response to increases in interest rate by the developed economies.

10.2 QUANTITY THEORY OF MONEY

The lineage of the quantity theory of money (at times called classical quantity theory of money as it is based on classical assumptions) can be traced to the writings of the Scottish philosopher David Hume. He mentioned about the same in his classic work, *Treatise of Human Nature*. In his model of ‘Price-Specie Flow Mechanism’ in 1749, he developed an explanation of the functioning of the Gold Standard. Gold Standard, as you know, was a monetary system in which a country’s currency had a fixed value in terms of gold. According to Hume, if a country had a positive balance of trade (means exports is greater than imports), gold would flow into the country. Thus, money supply would increase which would lead to inflation. Similarly, if the country had deficit in balance of trade, gold equivalent to the value of deficit would flow out of the country. If there is no counter measures by the government, money supply will decrease, which in turn will lead to decrease in price level.

Quantity theory of money was put forth in its current version by Irving Fisher in the early twentieth century as an equation of exchange. It is given as $MV = PY$, where M is the money supply, V is velocity of circulation of money, P is price level and Y is the level of output produced in the economy. The classical economists assumed that because of flexibility in prices and wage rate, there is full employment in the economy. Thus, Y is fixed at the full employment level, and V (the number of times a unit of money, say, a currency note, changes hand) is usually constant. Thus, any increase in money supply will increase the price level.

10.2.1 Neutrality of Money

According to the proponents of the classical economics, money is neutral in the sense that it affects monetary variables such as prices, wage rate and exchange rate. It does not affect real variables such as output and employment. Output is not affected by money supply as, by assumption, there is always full employment in the economy. Prices and wage rates are assumed to be flexible.

If supply of labour is more than demand for labour, wage rate will decline. On the other hand, if demand for labour is more than its supply, wage rate will increase. Similarly, prices are determined by the market forces such as supply and demand. Certain studies, based on empirical data, have established that

money is neutral in the long run. Thus, it could be a long run phenomenon. In the short run, however, neutrality of money does not get much support from empirical studies. Thus, in the short run, money may not be neutral.

An increase in money supply leads in the long run to a proportionate increase in the level of prices with no change in the level of allocation of resources or in the value of the output produced. As long as the rise in prices is fully anticipated, an increase in the total amount of money leads to a proportionate increase in all money prices. This would have no effect on any real variable in the long run. For a long period of time, the monetarist policies (inspired by the restatement of the quantity theory of money) continued to be of powerful influence in central banking circles. Milton Friedman once observed that inflation is always and everywhere a monetary phenomenon. In fact, till before the global financial crisis, the focus of the central banks has been to restrict the rate of growth of money supply. As per Friedman's postulate in this regard, money supply should grow only at the same rate of growth of nominal GDP.

In addition to neutrality of money, there is another concept called 'super neutrality of money'. Being a stronger proposition than the neutrality of money, it says that changes in the growth rate of money supply have no effect on real variables. Suppose money supply in a country is increasing at the rate of 3 per cent per annum. Suddenly, the central bank decides to increase it by 5 per cent per annum. Will it have any effect on output growth? Empirical results on this, however, are ambiguous.

10.2.2 Effect of Change in Interest Rate

By taking into account the expectations (see Units 4 and 5 of this course) about inflation rate and growth rate in the economy, the central bank sets the interest rate.

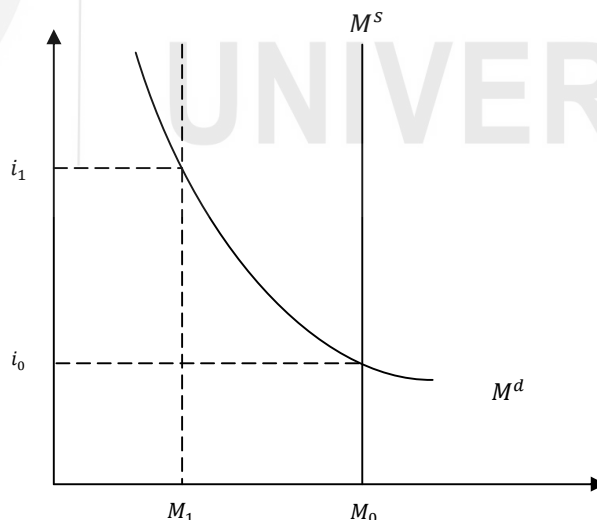


Fig. 10.1: Effect of Rise in Interest Rate

You may recall from the quantity theory of money that 'nominal interest rate = real interest rate + the expected rate of inflation'. Monetary authorities worldwide set the interest rates and let the money stock adjust to the demand. A policy

induced rise in the interest rate, say, from i_0 to i_1 , results in the money stock contracting from M_0 to M_1 (see Fig.10.1).

How does this work? The increase in interest rate results in a reduction in investment spending as well as consumption spending. This results in a decrease in the level of income, and hence, there would be reduction of money demand (M^d). The stock of money supply (M^s) would adjust to the new money demand.

10.2.3 Monetary Transmission Mechanism

Let us assume that the central bank increases money supply. This will increase liquidity in the economy and interest rate will decrease. A decrease in interest rate can affect several macroeconomic variables in the economy. These effects are often called ‘transmission channels’ or ‘transmission mechanisms’. Monetary transmission mechanism tells us how the effect of a monetary variable transmits or passes on to other variables. The important channels are as follows:

- (i) **Credit Channel:** A decrease in interest rate will lead to an increase in the demand for credits. Those projects which were considered unviable earlier could now become viable because of the lower cost of capital. Households which did not take a loan from the bank because of higher interest rate may now think of taking a loan. Such actions would put purchasing power in the hands of firms and households. Firms and households would spend this additional money on various goods and services. As a result of the increase in demand, equilibrium output will increase (if the economy is operating below the equilibrium output level). Thus, the classical position that increases in money supply would lead to increases in price level only, may not be true.
- (ii) **Exchange Rate Channel:** Apart from the credit channel, another channel of monetary transmission mechanism is through the ‘exchange rate channel’. As interest rate is reduced, there will be outflow of capital – foreign investors will pull out their money to invest in other countries offering higher rate of interest. This will lead to shortage of foreign exchange and the domestic currency will depreciate. Due to the depreciation of the exchange rate, however, there will be an increase in the competitiveness of the exports. Simultaneously, imports will become costlier. The increase in net exports will lead to increase in aggregate demand, which in turn will lead to increase in equilibrium level of output. For this to happen, domestic price levels should not increase with depreciation. However, note that elasticity of demand for exports and imports should be greater than unity. Thus, the exchange rate channel works only if these conditions are fulfilled.
- (iii) **Cost of Capital:** Yet another channel is through the cost of capital. As the interest rates are reduced, the ease of financing the purchase of shares increases. This leads to an increase in the price of shares (i.e., stock prices) of firms. In other words, the market value of the firm increases in comparison to the replacement cost. This encourages firms to expand

further by carrying out new investments. This results in an increase in the level of output. The same also has a spinoff effect in consumption expenditure.

As the value of shares increase, households stand to benefit in the form of increase in the value of the shares they possess. This results in a wealth effect enhancing the level of consumption expenditure.

These are some of the routes of monetary transmission mechanism. These channels, however, do not always work due to several reasons. In particular, when there is a large demand for liquidity in the economy, and the economy is in liquidity trap, monetary policy ceases to be effective. A monetary variable (money supply) affects a real variable (output) but this need not happen always. Even after the interest rate has been reduced, there need not necessarily be an increase in demand for credit from households and firms. For instance, firms may not increase the demand for money if the expectations about future earnings are uncertain. Similarly, households may not require additional money if incomes in the near future are not certain. Further, even when the central bank reduces interest rate, it is not necessary that the same will be passed on to the borrowers by the commercial banks. Commercial banks would be reluctant to do so, particularly when the banks have a large volume of non-performing assets (bad debts).

Check Your Progress 1

- 1. Outline the concept of neutrality of money.

.....
.....
.....
.....

- 2. State the various channels of monetary transmission mechanism.

.....
.....
.....
.....

10.3 RULES VERSUS DISCRETION

As you are aware, Keynesian economics prescribed an activist role for the government. When the economy is passing through a recession phase, the government should increase public investment. Increase in investment would lead to increase in aggregate demand, which in turn will increase aggregate output. On the other hand, if the economy is over-heated (economy is operating at the full employment level and aggregate demand is still on the increase), the

government should reduce public investment so that aggregate demand is stabilised. Thus, Keynesian economics visualizes that the government can moderate the effect of business cycles. Keynesian economics advises that the government should have a discretionary power so far as government spending is concerned.

Keynesian economics, proposed an activist role of the government. The new-classical economists, however, advocated that government policy should be on the basis of certain rules, and not by the discretion of the policy makers (We will learn about various schools of macroeconomic thought in Units 11 and 12 of this course).

10.3.1 Reputation and Credibility

The government policy should be credible in the sense that the government is committed to its policy measures. The credibility of an announced policy depends on two factors: (i) past experience regarding a government's ability to adhere to commitments, and (ii) expectations of people that the government will adhere to the policy. Investment decisions by firms and saving decisions by households are taken on the basis of credibility. In this context, you can observe that certain governments have built their reputations over the years regarding good governance.

A government optimizes on its objectives. Suppose, the government announces that it will give tax holidays (i.e., no taxes) for five years to certain sector, say, tourism. This will act as an incentive for firms to invest in the tourism sector. After two years, if the government thinks that investments have been made, and now the government can increase tax revenue by imposing taxes on the tourism sector. This leads to loss of credibility.

10.3.2 Monetary Policy Rule

In order to maintain stability in the economy, economists suggest certain 'policy rules'. In simple words, it means that government actions should be according to certain rules. Let us take an example from real life. You might have seen that there are illegal constructions on the fringes of cities.

These houses are constructed in clandestine manner. These house owners subsequently plead before the government to legalise these constructions. Before elections, political parties compete with one another to promise that if they come to power, they will regularize these illegal constructions. Similarly, political parties often promise to waive agricultural loans after coming to power. Such promises work as incentives for people to go for houses in illegal colonies. Similarly, people take agricultural loans and do not repay with a hope that the government will waive it. Suppose there is a law of the land that under no

circumstances, illegal construction will be regularized or loan will be waived. Such rules will work as disincentives for people against such behaviour.

Let us take an example from economics. Under an agreement between the central government and RBI, the RBI will have to maintain inflation rate in India at 4 per cent per annum, with an allowable range of 2 per cent to 6 per cent. Thus, RBI will take such measures that inflation rate does not go beyond the 2 per cent to 6 per cent range.

Thus ‘monetary policy rule’ can be seen as a reaction function of the government. It is a mathematical function that describes how the central bank decides interest rate in response to certain macroeconomic variables. As you know, higher interest rate discourages investment; thus slows down economic growth. If inflation rate is high, interest rate should be high. If actual growth rate is higher than potential growth rate, interest rate should high. We will discuss the Taylor rule, which is a specific case of monetary policy rule, later in this Unit.

Check Your Progress 2

1. Elaborate on the need for policy rules.

.....
.....
.....
.....

2. What is the importance of credibility and reputation for an economy?

.....
.....
.....
.....

10.4 LOSS FUNCTION

The main objective of monetary policy is inflation targeting but control of inflation should not be at the cost of economic growth and employment. You are aware of the concept of ‘natural rate of unemployment’. It says that a small fraction of the labour force is usually unemployed as they are in the process of changing job. The potential output of a country takes into consideration such natural rate of unemployment.

Let us assume that y_e and π^T are output at natural rate of unemployment and targeted rate of inflation respectively. We assume that the economic welfare of the country is the maximum when the economy is operating at y_e and π^T . It implies that the economy is at a ‘point of bliss’ when it achieves (y_e, π^T) and any

deviation from the same would reduce welfare. Suppose actual output and inflation are y and π respectively. Thus, if targeted inflation is 4 per cent and actual inflation is 2 per cent the deviation is $(\pi - \pi^T) = (2 - 4) = -2$ per cent. There is a loss of welfare if inflation is higher than 4 per cent or lower than 4 per cent. Thus, the central bank would like to minimize the function $(\pi - \pi^T)^2$. Similarly, the central bank would like to avoid deviation in actual output (y) from potential output (y_e). Thus it will minimize the function $(y - y_e)^2$.

If we combine both the terms, we obtain a *loss function* of the central bank, given by

$$L = (y - y_e)^2 + (\pi - \pi^T)^2 \quad \dots(10.1)$$

The central bank would minimize the loss in welfare by minimizing equation (10.1) arising out of deviations in actual output and actual inflation from respective targets. In equation (10.1) we give equal emphasis on output gap $(y - y_e)$ and deviation in inflation $(\pi - \pi^T)$. Many a times, a central bank gives unequal weightage to output (which represents employment) and inflation. For that purpose we re-formulate (10.1) as

$$L = (y - y_e)^2 + \beta(\pi - \pi^T)^2 \quad \dots(10.2)$$

In (10.2), if $\beta = 1$, we have a situation same as (10.1). If $\beta > 1$, the central bank puts more emphasis on maintaining inflation target (i.e. it perceives a greater loss if inflation deviates from its target). Such an approach is considered as ‘inflation-averse’. On the other hand, if $\beta < 1$, the central bank perceives that there is greater loss of welfare if people remain unemployed. This type of a position by the central bank is termed as ‘unemployment-averse’.

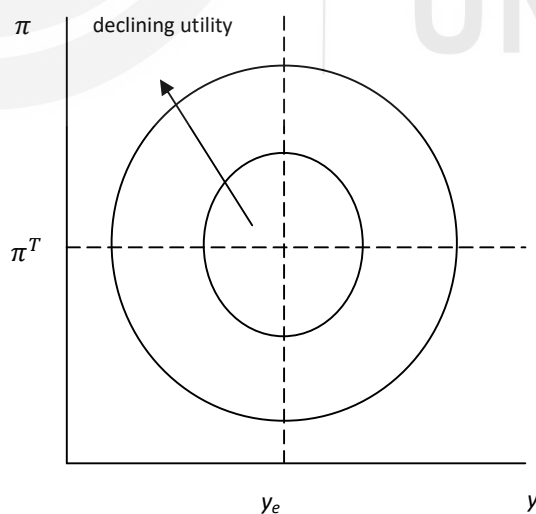


Fig. 10.2: Balanced Approach ($\beta = 1$)

We depict the loss function diagrammatically through the ‘loss circles’. These circles are quite similar to the indifference curve you have studied in microeconomics.

Let us take output on the x-axis and inflation on the y-axis (see Fig. 10.2). The bliss point is given by the inter-section of the lines representing the point (y_e, π^T) .

Let us consider the first quadrant of Fig. 10.2 (top right segment of the diagram) where we consider position deviations in output and employment ($y > y_e$; $\pi > \pi^T$). If the economy deviates from the bliss point, there is a loss of welfare. If the approach of the central bank is balanced (i.e., $\beta = 1$) there is equal emphasis on unemployment and inflation. An implication of the above is that an 1 per cent deviation in actual output from potential output means the same amount of welfare loss as 1 per cent deviation in actual inflation from target inflation. Both the evils can be represented by an indifference curve (concave to the origin), indicating various combinations of inflation deviation and output gap. In the second quadrant, we consider the situation where actual output is less than potential output ($y < y_e$) and actual inflation is more than target inflation ($\pi > \pi^T$). Since this also involves a loss of economic welfare for the country, we represent it by an indifference curve. You can develop a similar logic and find that the indifference curve in this case is actually a circle! We call it the ‘loss circle’. Following the manner in which we have drawn a loss circle for 1 per cent deviation in both output and inflation, we can draw another loss circle for 2 per cent deviation. Thus, we can draw a series of concentric loss circles, with (y_e, π^T) at the centre. It looks like a bull’s-eye; the objective of the central bank is to hit the bull’s-eye; and deviation away from the bull’s-eye implies declining utility for the economy.

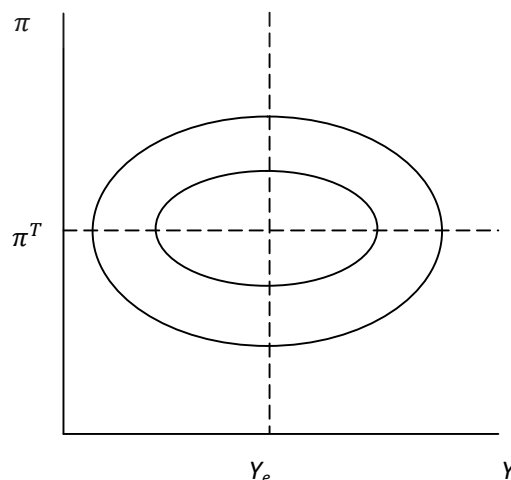


Fig. 10.3: Inflation-Averse ($\beta > 1$)

The shape of the loss circles would depend on the approach of the central bank towards inflation and unemployment. In Fig. 10.2 we have depicted perfect circles because the central bank is equally concerned about deviation from output and inflation ($\beta = 1$).

In case the central bank is inflation-averse (i.e., perceives inflation to be a greater concern than unemployment), then it would require smaller deviation in inflation than in unemployment for certain loss of welfare. In this case, the loss circles would be like ellipsoid (as shown in Fig. 10.3). Here the central bank would trade off a small rise in inflation with large fall in unemployment.

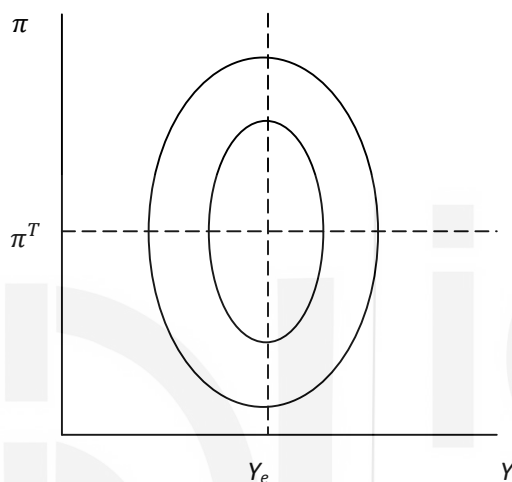


Fig. 10.4: Unemployment-Averse ($\beta < 1$)

In case the central bank is unemployment-averse (i.e., perceives unemployment to be a greater concern than inflation), then it would trade off a small decline in unemployment for a large rise in inflation. In this case, the loss circles would be like ellipsoid as in Fig. 10.4.

10.4.1 Taylor Rule

Taylor rule of interest rate setting sets the inflation rate at a higher level compared to the benchmark interest rate. This is in case inflation is expected to be higher than the targeted inflation rate and output is expected to be higher than the output at the natural rate of employment.

On the other hand, in case, inflation is lower than the targeted level of inflation or output is lower than at the natural rate of employment, the level of interest rate is set at a lower level compared to the benchmark interest rate.

The guiding principle of interest rate determination among central bankers worldwide has been the Taylor rule. In simple terms, it recommends changes in interest rates from its benchmark rate on the basis of the deviation from the natural rate of employment and targeted rate of inflation. As inflation exceeds targeted rate of inflation, the interest rate is increased. Likewise, if output is above the full employment level, the level of interest rate is increased. The

interest rate is decreased if inflation is lower than the targeted level of inflation, or output is lower than the targeted level of output. Therefore, there are no limits to using interest rates for controlling inflation and output, in general, but it is different during periods of deflation and unemployment. In fact, in the aftermath of the global financial crisis, as per the Taylor equation, the rates of interest had to be reduced to negative nominal rates, which was unsustainable.

We can write the Taylor rule of interest rate setting it as

$$i_t = i' + \gamma_1(\pi - \pi^T) + \gamma_2(y - y_e) \quad \dots(10.3)$$

where

i_t is operating target interest rate (the rate decided) for short-term;

i' is existing interest rate (benchmark interest rate);

$(\pi - \pi^T)$ is the gap of inflation from the inflation target;

$(y - y_e)$ is the output gap ; and

γ_1 and γ_2 are parameters of the model representing the weights assigned to unemployment and inflation.

If there is a positive output gap (actual output is more than full capacity output) in the economy, the central bank should raise interest rate according to equation (10.3). On the other hand, if output gap is negative (actual output is less than full capacity output), there is spare capacity in the economy and interest rate should be reduced. If actual inflation rate (π) is higher than target inflation rate (π^*), the central bank should raise interest rate. On the other hand, if actual inflation rate is lower than target inflation rate, the central bank would decrease interest rate.

Suppose, for an economy the following information is given:

$$\gamma_1 = 0.5, \gamma_2 = 0.5, \pi^T = 0.04, \text{ and } i' = 0.02$$

The Taylor rule will become

$$r = 0.02 + 0.5(\pi - 0.04) + 0.5(y - y_e) \quad \dots(10.4)$$

By applying equation (10.4), the central bank can determine interest rate.

10.5 QUANTITATIVE EASING

When the rates of interest are very close to zero, the economy enters the liquidity trap region where monetary policy is completely ineffective. People are willing to hold whatever amount of money is supplied to them. In such a scenario, a different strategy has to be adopted by the central bank to boost economic activity. Money is directly pumped into the financial system through a process known as 'quantitative easing', which is also known as *asset purchase scheme*. The central bank starts purchasing asset-backed securities.

Quantitative easing is incorrectly referred to as money printing since no hard cash is actually printed. Instead of printing money, the central bank creates electronic or digital money which is used for purchase of bonds. The central bank issues credit to the central bank's reserves to buy bonds. As a result, commercial banks get more than what they require as reserves. Commercial banks make a profit by lending out the excess reserves.

With quantitative easing, there is an increase in demand for bonds or safe assets. The market price of these bonds increases. Banks and financial institutions have more funds resulting in increased lending, higher business investment, and a boost to economic activity. When the economy recovers, the central bank sells these assets and sterilizes the cash it receives from the sales. So there is no additional money remaining in the system.

Hence, the goal of quantitative easing is to inject liquidity into the banking system, so that banks are able to lend money to boost economic activity. It is a deliberate expansion of the central bank's balance sheet and the economy's monetary base. However, there is a danger of increased inflation through this process.

You may be aware of the global financial crisis of 2007-08. During that time, a cut in interest rates was implemented by many central banks such as Federal Reserve, European Central Bank, Bank of Japan and Bank of England. Such measures were coupled with practices of unconventional monetary policies, i.e., purchases of bonds. In the aftermath of the global financial crisis, there has been large scale purchase of assets on the part of central banks worldwide.

10.6 LIMITS TO MONETARY POLICY

As per the Taylor rule of setting interest rates, in case the economy is on an inflationary mode or if the level of output exceeds the potential output, the interest rate should be increased from the benchmark interest rate. But, when it comes to level of inflation lower than the target rate of inflation, or levels of output lower than the potential output, the central bank has to reduce the interest rate in comparison to the benchmark rate. Interest rate setting is not that simple at times.

This is because interest rate in developed economies is much lower than that in developing economies. As per the Taylor rule of interest rate setting, the central bank may not be in a position to decrease the benchmark rate further if it is close to zero or in the negative zone. In Japan, for example, interest rate has been in the negative zone since 2016 (current rate on interest, as of May 2021, in Japan is (-) 0.10 per cent per annum). After the global financial crisis of 2007-2009, many countries went through such situations of zero interest rate. This suggests that there are limits to monetary policy but expansionary stimulus (through fiscal spending and unconventional purchases of bonds), i.e., quantitative easing can help in such situations.

Check Your Progress 2

1. Explain the concept of loss function.
.....
.....
.....
.....
.....

2. Describe the loss function for an inflation-averse economy through diagrams.
.....
.....
.....
.....
.....

3. State the Taylor rule for determination of the interest rate in an economy.
.....
.....
.....
.....
.....

10.7 LET US SUM UP

In this unit we discussed the quantity theory of money. In this context we dealt with the concept of neutrality of money in the short run and the long run. The unit has briefly discussed the Taylor rule which describes how, for each one-percent increase in inflation, the central bank tends to raise the nominal interest rate to stabilize the economy. In a liquidity trap like situation, monetary policy instruments may not work. The central bank can adopt quantitative easing which injects liquidity into the banking system lowering the lending rates of banks.

10.10 ANSWER/ HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

- 1) The quantity theory of money states that there is a direct relationship between the quantity of money in an economy and the level of prices. Thus money should be neutral. However, money is not neutral in the short run. See Section 10.2 for details.

- 2) It is the link between monetary policy and aggregate demand. There are various channels of transmission mechanism. See Section 10.2 for details.

Check Your Progress 2

- 1) See Section 10.3 for details.
- 2) Refer to Section 10.3.1 and answer.

Check Your Progress 3

- 1) Refer to equation (10.1) and explain.
- 2) Refer to Fig. 10.3 and explain.
- 3) Refer to equation (10.3) and explain.



ignou
THE PEOPLE'S
UNIVERSITY