Subject – Macroeconomics

Notes Unit 4 Part A

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Okun's Law of GDP -

Okun's Law is an empirically observed relationship between unemployment and losses in a country's production. It predicts that a 1% increase in unemployment will usually be associated with a 2% drop in gross domestic product (GDP).

When economists are studying the economy, they tend to hone in on two factors: output and jobs. Because there is a relationship between these two elements of an economy, many economists study the relationship between output (or more specifically, gross domestic product) and unemployment levels.

Okun's Law looks at the statistical relationship between GDP and unemployment. Okun's Law can also be used to estimate gross national product (GNP).

Arthur Okun was a Yale professor and an economist who studied the relationship between unemployment and production. Okun was born in November 1928 and died in March 1980 at the age of 51. He studied economics at Columbia University, where he received his Ph.D. During his tenure at Yale, Okun was appointed to President John Kennedy's Council of Economic Advisors, and remained in this position under President Lyndon B. Johnson as well.

As a Keynesian economist, Okun advocated for using fiscal policy to control inflation and stimulate employment. He first proposed the relationship between unemployment and a country's GDP in the 1960s. In general, Okun's findings demonstrated that when unemployment falls, the production of a country will increase.

Many years later, the Federal Reserve Bank of St. Louis has defined Okun's Law like this: "[Okun's Law] is intended to tell us how much of a country's gross domestic product (GDP) may be lost when the unemployment rate is above its natural rate."

The logic is fairly straightforward. The amount of output that an economy produces depends on the amount of labor (or the number of people employed) in the production process; when there is more labor involved in the production process, there is more output (and vice versa).

In Okun's original statement of his law, an economy experiences a one percentage point increase in unemployment for every three-percentage point decrease GDP from its long-run level (also called potential GDP). Similarly, a three-percentage point increase in GDP from its long-run level is associated with a one percentage point decrease in unemployment. Potential GDP is the level of output that can be achieved when all resources (land, labor, capital, and entrepreneurial ability) are fully employed.

Predictions of Okun's Law -

Okun's Law might be better characterized as a "rule of thumb" because it is based on empirical observation of data, rather than a conclusion derived from a theoretical prediction. Okun's Law is an approximation because there are other factors that impact output, such as capacity utilization and hours worked. This also explains why there isn't a one-to-one relationship between changes in output and changes in unemployment.

For example, Okun also estimated that a three-percentage point increase in GDP from its long-run level corresponded to a 0.5 percentage point increase in the labor force participation rate, a 0.5 percentage point increase in hours worked per employee, and a one percentage point increase in labor productivity (output per worker per hour). This would leave the remaining one percentage point to be the change in the unemployment rate.

The relationship between unemployment and GDP (or GNP) varies by country. In industrialized nations with labor markets that are less flexible than those of the United States, such as France and Germany, the same percentage change in GNP has a smaller effect on the unemployment rate than it does in the United States.

Does Okun's Law Hold True?

While Okun's Law has proven to be true at certain times throughout history, there have also been conditions where it has not held true. The Federal Reserve Bank of Kansas City conducted a 2007 review of Okun's Law by looking at quarterly changes in unemployment and comparing that data to quarterly growth in real output.

According to their findings, Okun's Law was largely accurate, although there were many periods of instability where unemployment did not change as the formula predicted. The study concluded that "Okun's law is not a tight relationship," but that it "predicts that growth slowdowns typically coincide with rising unemployment."

The review found a negative correlation between quarterly changes in employment and productivity, although the coefficient of that relationship tended to vary.

In other examinations, Okun's law held up better than researchers expected. Although early GDP figures suggested that the Great Recession was a departure from Okun's Law, later revisions to those figures largely confirmed the law's predictions.

"Okun's law is a simple statistical correlation, yet it has held up surprisingly well over time," wrote researchers at the Federal Reserve Bank of San Francisco. Nevertheless, they concluded, "the relationship between output and unemployment suggested by Okun's law remained remarkably similar to previous deep recessions."

Shortfalls of Okun's Law -

While economists broadly accept that there is a relationship between productivity and employment as set out in Okun's law, there is no agreement on the exact magnitude of that

relationship. Moreover, there are many other variables that can also impact productivity or employment rates, making it difficult to set accurate forecasts using only Okun's law.

For this reason, some economists say that Okun's law has limited value as a forecasting tool, even if they accept the underlying relationship. An economic commentary by the Federal Reserve Bank of Cleveland found "rolling instability" in the accuracy of the law's predictions, with several time periods where the observed change was many times larger than what Okun's law would predict.

Moreover, this held true with several variations of Okun's law, suggesting that the problem is not merely one of measurement. Because of this instability, the Cleveland Fed concluded that "if a rule of thumb has a lot of exceptions, it's not much of a rule."

Components of GDP –

Hence, at a macro level, we can say that GDP is the sum of all the goods and services produced within a nation’s boundaries. However, not all goods are the same and not all producers are the same. Some types of goods benefit the economy more than the others and same is the case with producers. Hence, for a thorough analysis of GDP, it is essential to bifurcate the GDP into its component parts.

The first bifurcation happens between domestic trade and foreign trade. We first separate the goods produced for our own consumption from goods that were sent abroad. Then the next level of bifurcation happens within the domestic goods. Domestic goods are then segregated into goods produced by the private sector and goods produced by the public sector i.e. the government. Further the goods produced by the private sector are then subdivided into goods produced for immediate consumption and goods that will act as capital investment and aid the production of goods in the future.

The components of GDP can therefore be expressed in the form of this equation:

$GDP = C + I + G + (X - M)$

Wherein:

- C is the quantity of goods produced for consumption
- I is the quantity of investments made
- C + I together represent the private sectors contribution
- G is the quantity of goods produced by the government and
- X - M is exports minus imports i.e., the net contribution that exports have made to the GDP

Let's study each of these components in greater detail

Consumption:

Consumption represents all the goods and services that were purchased by households' i.e., individual consumers. This component of the GDP is the best indicator of the purchasing power in any given economy. A higher C number relative to the total GDP is considered a good sign. This means that the economy is driven by the market i.e., by consumer spending and is not artificially inflated.

Investment:

Investment, also referred to as fixed investment is the amount of capital goods added by a country in a given year. It is very important to segregate the goods produced for present consumption versus the goods that will aid in maximizing production in the forthcoming years. The I component gives a good idea about what the GDP of an economy in the future years will be. A higher investment in capital goods by the economy is a good sign implying that production is expected to take off in the forthcoming years. The "I" component is further divided into residential and non-residential investments. This is because residential investments do not necessarily mean higher production in the future whereas industrial investments do.

Government Spending:

The next component is government spending. This is the component that has been criticized in great detail in the past few articles. Government spending simply measures the amount of money spent by the government in any given year. This expenditure does not include transfer payments i.e., payments for social security or unemployment benefits.

A higher government spending has often been correlated with poorly managed economies. However, this does not necessarily have to be the case. Countries like China have become economic powerhouses despite the fact that a substantial part of their GDP still comes from the "G" component.

Net Exports:

The next component is the net exports i.e., X-M. Now just the fact that imports are being subtracted from the GDP often given imports a negative connotation. However, this is not true. Imports are subtracted from the GDP to avoid double counting. This is because imports have already been considered under the "C" component. Imports are not necessarily harmful to the country and may in fact aid in more judicious use of the natural resources that are available at a country's disposal.

It is important to segregate foreign trade from domestic markets. This gives economists an idea as to what drives the GDP. If the GDP of a nation is export driven, then a slowdown in other countries will have an adverse impact on the GDP. On the other hand, if an economy is driven by internal consumption and has less dependency on foreign markets, then the GDP will be less affected by a slowdown in other markets.

To sum it up, the analysis of the GDP can only be done by dividing it further into smaller and smaller categories. These components still provide only a macro level picture of the economy. Economic analyses go further into the details trying to find out exactly what goods, sectors or markets are driving the GDP number.

Consumption Function –

The consumption function is an economic formula that directly connects total consumption and gross national income. The process introduced by the British economist John Maynard Keynes indicates the relationship between income and expenditure and the proportion of income spent on goods.

Consumption Function Formula -

Below is the equation of the consumption function.

C = c + bY

C – Total Consumption

c – Autonomous Consumption (minimum consumption for survival when income is zero).

- **Autonomous consumption is not influenced by income –** We must understand that consumption can never be zero. If the **earnings** become zero, minimum consumption is never nullified. Such consumption is called autonomous consumption. If income is low, there is a minimum level of expenditure that is higher than the income. In such a case, consumption has to be maintained irrespective of income. The minimum level of consumption is said to be **autonomous consumption**.
- **Induced consumption (bY)** (influenced by income) – bY; **b** is the **marginal propensity to consume** (which means the consumption level increases for every rupee increase in the **revenue**). Induced consumption is influenced by income. **Y** indicates, i.e., income.
- **Break-even point –** When consumption expenditure reaches the income, it is called the **break-even point** stage if there is no concept of saving.

Meaning of Saving Function:

Saving is that part of income which is not spent on current consumption. The relationship between saving and income is called saving function.

Simply put, saving function (or propensity to save) relates the level of saving to the level of income. It is the desire or tendency of the households to save at a given level of income. Thus, saving (S) is a function (f) of income (Y).

Symbolically,

$S = f(Y)$

Two noteworthy features of saving function are:
(i) Saving can be negative (-) at zero or low level of income and (ii) As Income increases, savings also increase but more than the increase in income

Remember, saving is residual income of households that is left after consumption.

Algebraically:
$S = Y-C$

Relationship between Income and Saving:
(i) There is direct relationship between income and saving, i.e., if income increases, saving also increases but by less than increase in income. It means as income increases, proportion of income saved increases (because proportion of income consumed decreases).

(ii) At lower level of income, saving is negative. In the initial stages when there is very low level of income, consumption expenditure is more than income leading to negative saving [i.e., dissaving). For instance, if income is, say, Rs 5,000 and consumption expenditure is, say 6,000, then saving will be negative, i.e., -1000 (= 5000 – 6000). It is called dissaving. Here average propensity to save is negative.

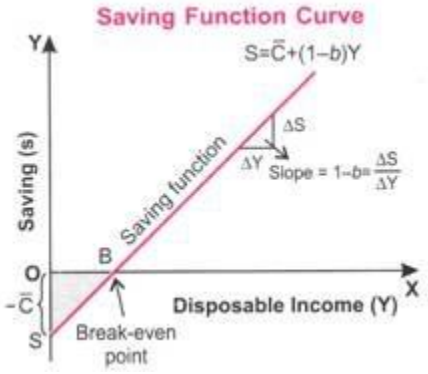
APS = -1000/5000 = -0.2.

Saving Function Curve:

A diagrammatic representation of relationship between income and savings level gives the saving function curve. In Fig. 8.6 saving function curve is a straight line because slope of saving is constant.

The curve slopes upward which depicts direct relationship between income and saving. The savings functions line SS cuts the income line at point B which is called Break-even point because at this point consumption expenditure is equal to income (or savings are zero).

To the left of break-even point, savings are negative (-) indicating consumption being more than income whereas to the right of break-even point, savings are positive (-K) indicating consumption expenditure being less than income. The shaded area reflects dissaving which is equal to the area of autonomous consumption shown as in Figure below -



Meaning of investment

The term investment means purchase of stocks and shares, debentures, government bonds and equities. According to Keynes, it is only financial investment and not real investment. This type of investment does result in an addition to the stock of real capital of the nation.

In the views of **Keynes**, Investment includes expenditure on capital investment.

Types of investment -

Autonomous Investment and Induced Investment

Autonomous Investment

- Investment that is not dependent on the national income
- Mainly done with the welfare motive and not for making profits
- Examples : Construction of road, bridges, School, Charitable houses

- Not affected by rise in raw materials or wages of workers
- Essential to development of nation and out of depression

i) Autonomous investment: Autonomous investment is the expenditure on capital formation, which is independent of the change in income, rate of interest or rate of profit.

This investment is independent of economic activity. Autonomous investment is income-inelastic, the volume of autonomous investment is the same at all levels.

The autonomous investment curve is horizontal, parallel to X axis.

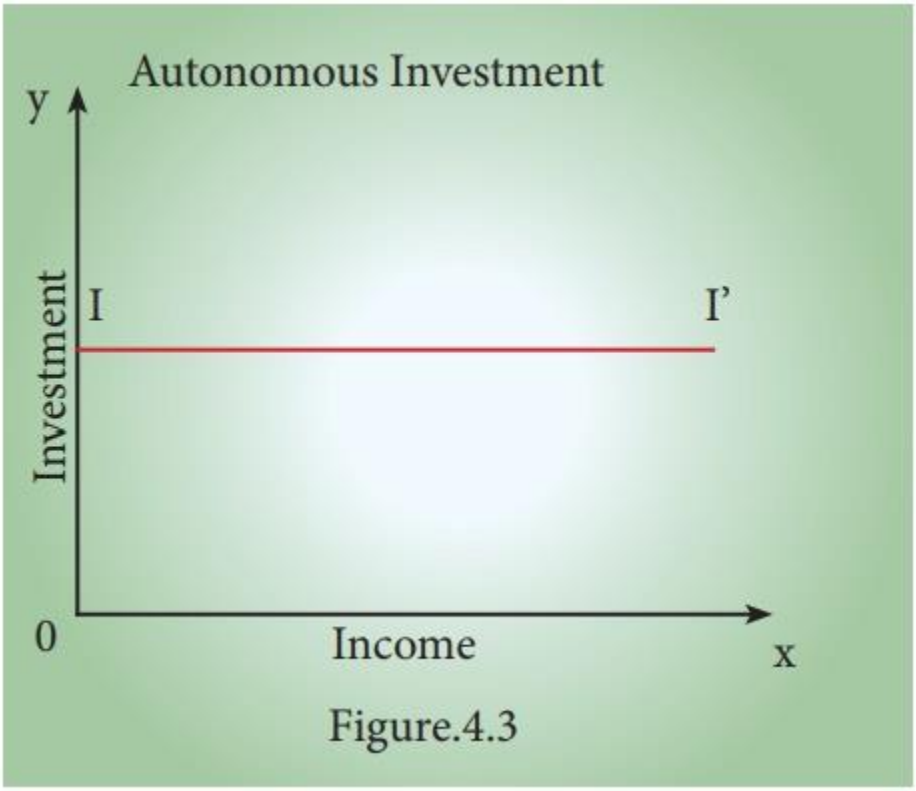


Figure.4.3

In the times of economic depression, the governments try to boost the autonomous investment. Thus, autonomous investment is one of the key concepts in welfare economics.

Generally, Government makes autonomous investment because of the welfare consideration.

ii) Induced investment:

Induced investment is the expenditure on fixed assets and stocks which are required when level of income and demand in an economy goes up.

Induced investment is profit motivated. It is related to the changes of national income. The relationship between the national income and induced investment is positive; decreases in national income leads to decrease in induced investment and vice versa. Induced investment is income elastic. It is positively sloped as shown here.

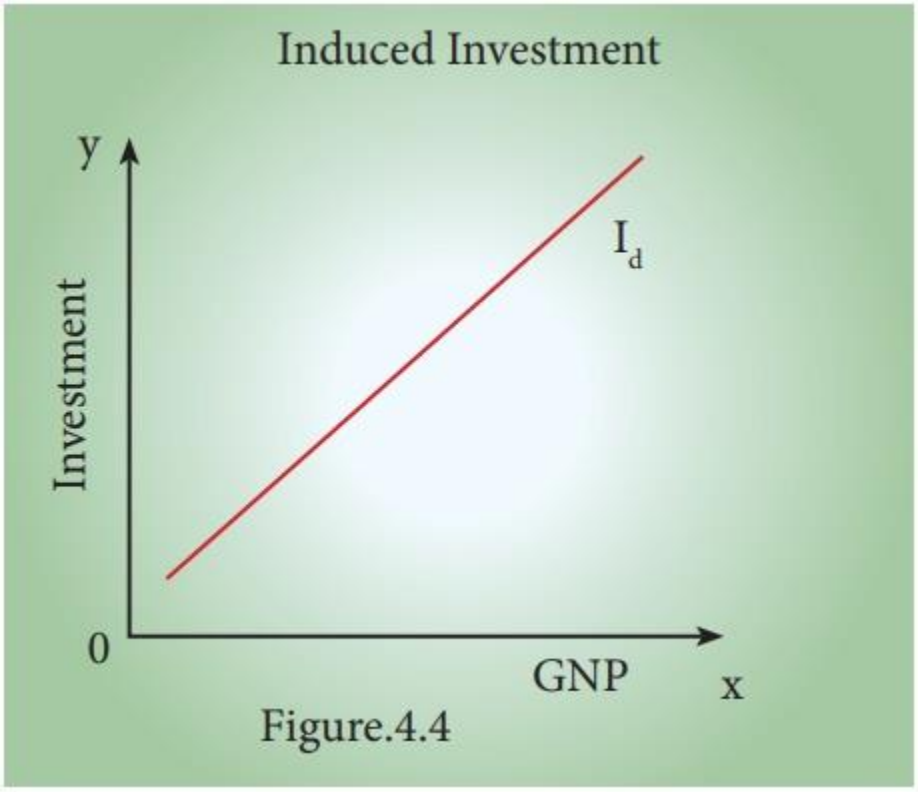


Figure.4.4

Investment Function -

The investment function refers to investment -interest rate relationship. There is a functional and inverse relationship between rate of interest and investment. The investment function slopes downward.

$I = f(r)$

I= Investment (Dependent variable)

r = Rate of interest (Independent variable)

References -

Books -

1. Branson W A, Macroeconomics: Theory and Policy, 3rd Edition, New York.
2. N. Gregory Mankiw, Macroeconomics, 7th Edition, Cengage Learning India Pvt Ltd, New Delhi.
3. Karl E. Case and Ray C. Fair, Principles of Economics, Pearson Education Inc., 8th Edition, 2007.
4. Lipsey R.G. and K A Christal, Principles of Economics, 9th Edition, Oxford University Press.
5. Shapiro E., Macroeconomics: Analysis, Galgotia Publication, New Delhi.

Websites –

1. An Elusive Relation between Unemployment and GDP Growth: Okun's Law (clevelandfed.org)
2. Okun's Law: Economic Growth and Unemployment (investopedia.com).
3. Okun's Law - Definition, Formula, How to Calculate? (wallstreetmojo.com).