

**JIMMA UNIVERSITY
COLLEGE OF BUSINESS AND
ECONOMICS
ECONOMICS DEPARTMENT**

INTRODUCTION TO ECONOMICS

**PREPARED BY
Gudina T (MSc)**

CHAPTER SIX

6. Fundamental concepts of macroeconomics

Introduction:

This chapter discusses major macroeconomic issues such as measurement of a country's economic performance, macroeconomic problems (fluctuations in economic system mainly reflected by inflation and unemployment), how budgetary deficit and trade deficit occur and macroeconomic policies applied to cure the macroeconomic problems.

6.1. Goals of macroeconomics

Macroeconomics studies the working of an economy in aggregation or as a whole. And it aimed at how;

- **To achieve high economic growth**
- **To reduce unemployment**
- **To attain stable prices**
- **To reduce budget deficit and balance of payment (BoP) deficit**
- **To ensure fair distribution of income**

In other words, the goals of macroeconomics can be given as ways towards full employment, price stability, economic growth and fair distribution of income among citizens of a country.

6.2. The National Income Accounting

National Income Accounting (NIA) is an accounting record of the level of economic activities of an economy. It is a measure of an aggregate output, income and expenditure in an economy.

Why do we need to study NIA?

- It enables us to measure the level of total output in a given period of time, and to explain the causes for such level of performance.
- It enables us to observe the long run trend of the economy.
- It provides information to formulate policies and design plans.

Gross Domestic Product (GDP)

- It is the total market value of currently produced final goods and services that are produced in a countries border during a given period of time, usually one year.
- It is products produced by the country with its own recourses.
- It measures current production only.
- We talk only newly produced final goods and services
- Any output produced last year will not be counted
- We take end (final) products of the production process.
- We don't talk about “**intermediate goods**” in GDP Calculation.

- In measuring GDP, we take the market values of goods and services ($GDP = \sum P_i Q_i$) where:\

P_i = series of prices of outputs produced in different sectors of an economy in certain period

Q_i = the quantity of various final goods and services produced in an economy.

- We use money as common unit of measurement.
- We take the market value of final produced goods and services

Gross National Product (GNP):

- It is the total value of goods and services currently produced by “**domestically owned**” factors of production in a given period of time, usually a year.
- Products are produced by resources owned by the citizens of the country.

- It measures the total output or income generated by domestic resident's factors of production irrespective of **where these resources are used** (i.e. regardless of the geographic location).

Example 1: Ethiopian labor lived in Saudi Arabia produced output in Saudi Arabia counted as part of Ethiopian GNP

Example 2: The value of Huawei mobile produced by a Chinese company in USA counted as Chinese GNP and USA GDP

GDP and GNP are related as follows:

$\text{GNP} = \text{GDP} + \text{NFI}$, where NFI means net factor income

$\text{NFI} = Y_1 - Y_0$, Where;

Y_1 = income inflow (income received from abroad by a country's citizens)

Y_0 = Income outflow (income received by foreigners which goes to abroad)

Thus, **NFI** could be negative, positive or zero depending on the amount of factor income received by the two parties.

- If $Y_1 > Y_0$ then, income from abroad is positive (**NFI > 0**) hence **GNP > GDP**
- If $Y_1 < Y_0$ then, income from abroad is negative (**NFI < 0**) hence **GNP < GDP**
- If $Y_1 = Y_0$ then, **NFI = 0**, hence **GNP = GDP**. This kind of Economy known as **Closed Economy**.

Similarity between **GDP & GNP** is that they are concerned with currently produced goods and services. Their difference is that a matter of ownership of this goods and services.

6.2.1. Methods of Measuring

GDP

We have 3 methods:

- **Product(output) value added approach**
- **Expenditure approach**
- **Income approach**

Product(output) value added approach

- It is the direct way of measuring GDP
- GDP calculated by adding only the market value of all goods and services produced by each sectors of the economy **to avoid double counting**. Sectors of the economy are agricultural, industrial and service sectors. In other word, GDP calculated by adding the market value of all goods and services produced by each sectors of the economy. Sectors of the economy

Double counting will arise when the output of some firms are used as intermediate inputs of other firms. For example, we would not include the full price of an automobile in GDP and then also include as part of GDP the value of the tires that were sold to the automobile producer. The components of the car that are sold to the manufacturers are called **intermediate goods**, and their value should not be included in GDP.

There are two possible ways of avoiding double counting.

- Taking only the value of final goods and services
- Taking the sum of the value added by all firms at each stage of production

Example

Stages of production	Value of output	Cost of intermediate inputs	Value Added
farmer	5000	0	5000
factory	15000	5000	10000
retailer	18000	15000	3000
Total sales	38,000	-	18000

Note: If all values in the economy were added, GDP would be **38,000** = (18,000 + 15,000 + 5000). The problem of double counting is 20,000, because of considering intermediate input in the calculation.

Income Approach

- It measures GDP in terms of income earned.
- It is not necessary to include all personal incomes.
- All transfer payments are excluded

Here GDP measured by adding **all incomes of factors of production of;**

- Domestic labor(**wage**)
- Land(**rent**)
- Capital (**interest**)
- Entrepreneur ability (**profit**)
- Major components in income approach includes the following: -
 - a) Compensation of employers(**wages and salaries of workers**)
 - b) Rental income (**reward for land**)
 - c) Interest income(**reward for private capital**)
 - d) Properties income (**profits or reward for Entrepreneur**)
 - e) Indirect Business tax(**sales and exercise tax**)
 - f) Depreciation

Mathematically, $GDP = Y = W + R + I + II + IT - D$. where,

GNP = Y = gross national product

W = Wages of all workers (compensations of employees)

R = Rents paid to property owners (reward for services)

I = Interest on borrowed capitals

II = Profit of business organizations

Profits (II) include dividends and retained earnings of corporate organizations; proprietors' income = Depreciation (Capital consumption allowance) and so on. Indirect taxes (IT) are said to

be indirect because consumers pay it indirectly.

When we calculate total national output or GDP or GNP, we take different taxes as positive as it is

income of the government. The following table shows us how to calculate GDP using income approach.

Income components	Value (in million Birr)
Compensation of employees (W)	14,750
Rents paid to property owners (R)	1,090
Interest on borrowed capital (I)	2,180
Proprietors' incomes	2,040
Pertained earnings	1,800
Dividends	1,720
Corporate income taxes	1,670
Indirect taxes	2,500
Depreciation allowances	(2,750)
Total income = GDP = Y	<u>25,000</u>

The above values are calculated by summing up all values given above, except deprecation that is deducted from the total.

$$\begin{aligned}
 \text{GDP} &= y = W + R + I + II + IT - D \\
 &= 14,750 + 2,180 + 1,090 + 2,180 + (2,040 + 1,800 + 1,720 + 1,670 + 2,500) - 2,750
 \end{aligned}$$

$$\text{GDP} = 25,000 \text{ (In million birr)} = 25 \text{ billion Birr}^{14}$$

Expenditure approach

Here GDP is measured by adding all expenditures on final goods and services produced in the country by all sectors of the economy. Thus, GDP can be estimated by summing up personal consumption of households (C), gross private domestic investment (I), government purchases of goods and services (G) and net exports (NE).

In closed economy:- an economy which has no economic transaction with the rest of the world

$$\mathbf{GNP=GDP=C+I+G}$$

In an open economy :-an economy which has economic relations with the rest of the world

$$\mathbf{GDP=C+I+G+-NX}$$

$$\mathbf{GNP=GDP+NFI}$$

Personal consumption expenditure:

Includes expenditures by households on **durable consumer goods** (automobiles, refrigerators, video recorders, etc), **non-durable consumer goods** (clothes, shoes, pens, etc) and **services (haircut, health, education)**.

Gross private domestic investment :

It is defined as the sum of all **spending of firms** on plants, equipment, and inventories, and **the spending of households** on new houses. Investment is broken down into **three categories**:

- **Residential investment** (the spending of households on the construction of new houses).
- **Business fixed investment** (the spending of firms on buildings and equipment for business use), and

Note that gross private domestic investment differs from net private domestic investment. In short, net private domestic investment = gross private domestic investment minus depreciation.

Government purchases of goods and services:

It includes all government spending on finished products and direct purchases of resources less government transfer payments because transfer payments do not reflect current production although they are part of government expenditure.

Net exports:

It refers to total value of exports less total value of imports. Note that net export is different from **the terms of trade** in that the latter refers to the ratio of the value of exports to the value of imports.

Table 6.3. GDP using expenditure approach
Components

Value in Birr

Personal consumption expenditure (c)	-----
11.400	
Gross private domestic investment (I)	-----=-----
6.5000	
Government expenditure (G)	-----
7.300	
Exports (X)	-----900
Imports (M)	-----
(1,100)	
Total Expenditure (equivalent to national income/output, GDP)	----- 25.000

The value of the GDP in the above example is calculated by summing up the first four items and by deducting the fifth item that is imports (M). Thus:

$$GDP = Y = C + I + G + X - M$$

6.4. Limitation of GDP measurement:

- **Underground economy:** no imputation is made for the value of goods and services sold in the illegal market.
- **Inadequate data:** in all most all the countries, difficulty has been faced in the calculation of national income due to lack of adequate data. Sometimes, the data are not reliable.
- **Non-monetized sector:** this difficulty is special to developing countries where a substantial portion of the total produce is not brought to the market for sale. It is either retained for self-consumption or exchanged for other goods and services.

- **Transfer payments:** it is not included in GDP calculation since it creates a great difficulty in calculating the national income.
- **Changes in price levels:** since the national income is in terms of money whose value itself keeps on changing, it is difficult to make a stable calculation which is assessed in terms of prices of the base year.
- **No focus on quality:** it is difficult to account correctly for improvements in the quality of goods. This has been the case for computers, whose quality has improved dramatically while their price has fallen sharply. It also applies to other goods such as cars whose quality changes over time.

6.2.2. Other income accounts

Apart from GDP and GNP, there are also other social accounts which have equal importance in macroeconomic analysis. These are:

- **Net National Product (NNP)**
- **National Income (NI)**
- **Personal Income (PI)**
- **Personal Disposable Income (PDI)**

Net National product (NNP) :

GNP as a measure of the economy's annual output may have defect because it fails to take into account capital consumption allowance, which is necessary to replace the capital goods used up in that year's production. Hence, net national product is a more accurate measure of economy's annual output than gross national product and it is given as:

Net National product = Gross National product - Capital consumption allowance
(NNP) (GNP)

National income (NI):

National income is the income earned by economic resource (**input**) suppliers for their contributions of **land, labour, capital and entrepreneurial ability**, which are involved in the given year's production activity. However, from the components of NNP, indirect business tax, which is collected by the government, does not reflect the productive contributions of economic resources because government contributes nothing directly to the production in return to the indirect business tax

National Income = Net National Product - Indirect Business Tax
(NI) (NNP)

Personal Income (PI):

It refers to income earned by persons or households. Persons in the economy may not earn all the income earned as national income.

$$\text{PI} = \text{NI} - [\text{social security contribution} + \text{corporate income tax} + \text{retained corporate profit}] + [\text{Public transfer payments (e.g. Subsidy)} + \text{net interest on government bond}]$$

Personal Disposable Income:

It is personal income less personal tax payments.

$$\text{PDI} = \text{PI} - \text{Personal taxes}$$

$$\text{DI} = \text{C} + \text{S} \text{ where, } \text{C} = \text{personal consumption expenditure, } \text{S} = \text{Personal savings}$$

6.3. Nominal versus Real GDP

Nominal GDP :

It is the value of all final goods and services produced in a given year when valued at the **prices of that year**. That is, **nominal GDP** = $\sum P_i Q_i$ where, P is the general price level and Q is the quantity of final goods and services produced. Therefore, any change that can happen in the country's GDP is due to changes in price, quantity or both. For example, if prices are doubled over one year, then GDP will also double even though exactly the same goods and services are produced as the year before. Hence, GDP that is not adjusted for inflation is called **Nominal GDP**.

Real GDP:

It is the value of final goods and services produced in a given year when valued at the prices of a reference **base year**. By comparing the value of production in the two years at the same prices, we reveal the change in output. Hence, to be able to make reasonable comparisons of GDP overtime we must adjust for

Example: Consider an economy producing two goods, inflation and X.

Year	Product	Quantity	Unit price (\$)
2017 (base year)	X	20	5
	Y	8	50
2018	X	25	20
	Y	10	100

Given the above information, we can calculate the real and nominal GDP in both years as follows:

In 2017:

Nominal GDP = $(20 \times 5) + (8 \times 50) = \$500$

Real GDP = $(20 \times 5) + (8 \times 50) = \$500$

Note that both the real and nominal GDP

values are exactly the same in the base year.

In 2018:

The outputs of 2018 valued at the prices of 2017(the base year).

Nominal GDP = $(25 \times 20) + (10 \times 100) = \$1500$

Real GDP = $(25 \times 5) + (10 \times 50) = \$625$

6.4. The GDP Deflator and the Consumer Price Index(CPI)

The GDP Deflator: The calculation of real GDP gives us a useful measure of inflation known as the GDP deflator. The GDP deflator is the ratio of nominal GDP in a given year to real GDP of that year. It reflects what's happening to the overall level of prices in the economy.

$$\text{GDP deflator} = \frac{\text{nominal GDP}}{\text{real GDP}} * 100$$

We can calculate the GDP deflator based on the

$$\text{GDP deflator (2017)} = \frac{\text{nominal GDP}}{\text{real GDP}} * 100 = \frac{500}{500} * 100 = 100$$

As both the real and nominal GDP values are exactly the same, the GDP deflator in the base year is always 100.

$$\text{GDP deflator (2018)} = \frac{\text{nominal GDP}}{\text{real GDP}} * 100 = \frac{1500}{625} * 100 = 240,$$

which shows the price in 2018 was 140% higher than the price in base year.

The Consumer Price Index:

The Consumer Price Index (CPI) is an indicator that measures the average change in prices paid by consumers for a representative basket of goods and services. It compares the current and base year cost of a basket of goods of fixed composition. If we denote the base year quantities of the various goods by $\mathbf{q}'_0$ and their base year prices by $\mathbf{p}'_0$ then..

The cost of the basket in the base year is $= \sum \mathbf{q}'_0 * \mathbf{p}'_0$. And The cost of a basket of the same quantities but at today's prices is $= \sum \mathbf{q}'_0 * \mathbf{p}'_t$, where $\mathbf{p}'_t$ is today's price. Thus, the CPI is the ratio of today's cost to the base year cost.

$$\text{CPI} = \frac{\sum \mathbf{q}'_0 * \mathbf{p}'_t}{\sum \mathbf{q}'_0 * \mathbf{p}'_0}$$

The CPI versus the GDP Deflator

There are three key differences between the two measures.

- GDP deflator measures the prices of all goods and services produced, whereas the CPI measures the prices of only the goods and services bought by consumers. Thus, an increase in the price of goods bought by firms or the government will show up in the GDP deflator but not in the CPI.

- GDP deflator includes only those goods produced domestically. Imported goods are not part of GDP and do not show up in the GDP deflator. However imported goods can be show up in CPI as long as they are consumer goods.
- The CPI assigns fixed weights to the prices of different goods, whereas the GDP deflator assigns changing weights. In other words, the CPI is computed using a fixed basket of goods, whereas the GDP deflator allows the basket of goods to change over time as the composition of GDP changes.

6.5. The Business Cycle

Business cycle refers to the recurrent ups and downs in the level of economic activity. Countries usually experience ups and downs in the level of total output and employment over time. For some period of time the total output level may increase and other times it may decline. With the fluctuation in the overall

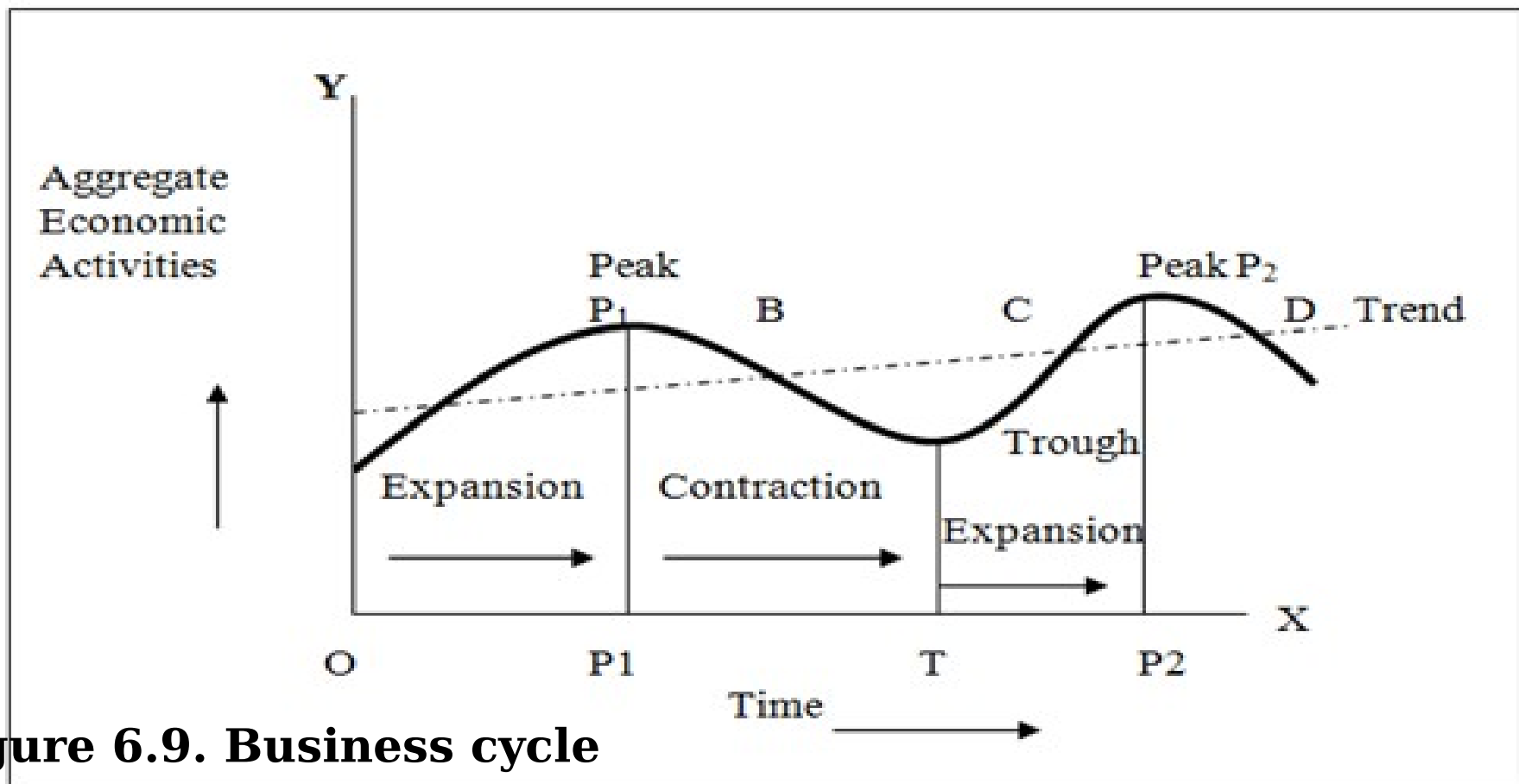


Figure 6.9. Business cycle

We can identify **four phases** in the business cycle:

- **Boom/peak**
- **Recession/contraction**
- **Trough/depression**
- **Recovery/expansion**

Boom/peak:

- It is a phase in which the economy is producing the highest level of output in the business cycle.
- The economy's output is growing faster than its long-term (potential) trend and is therefore unsustainable.
- Due to very high degree of utilization of resources, unemployment level is low; business is good; and it is a period of prosperity.

Recession/contraction:

- During a recession phase, the level of economic performance generally declines.
- Total output declines, national income falls, and business generally decline. As a result, unemployment problem rises.

- When the recession becomes particularly severe, we say the economy reaches depression or trough. This period can cause hardship on business and citizens.

Trough/Depression: -

- This phase is the lowest point in a business cycle.
- It marks the end of a recession and the beginning of economic recovery/expansion.
- During this period, there is an excessive amount of unemployment and idle productive capacity.

Recovery/Expansion: -

- During this phase, the economy starts to grow or recover, i.e. there is an upturn of economic activity between a trough and a peak.

- In this phase, more and more resources are employed in the production process; **output increases, unemployment level diminishes and national income rises.**
- When this expansion of the economy reaches its maximum, the economy once again comes to another boom or peak.

Note that:

- One business cycle includes the point from one peak to the next peak or from one trough to the next.
- Business cycle is a short-term fluctuation in economic activities.
- The trend path of GDP is the path GDP would take if factors of production were fully employed.

6.6. Macroeconomic Problems

6.6.1. Unemployment

Problem of **unemployment** is one of the major issues dealt in macroeconomics. **Unemployment** refers to group of people who are in a specified age (labour force between 15-65 age group), who are **without a job** but are **actively searching for a job**. Labor force includes a group of working age population (between 15—65 age) who are employed who are actually employed and those who are without a job but are actively searching for a job.

Therefore, the labour force does not include:
Children <15 and retired people age >65, and also people in mental and correctional institutions, and very sick and disabled people etc.

Labour force = Employed + Unemployed

Types of unemployment

1. Frictional unemployment:

It refers to a brief period of unemployment experienced due to.

- Seasonality of work E.g. Construction workers
- Voluntary switching of jobs in search of better jobs
- Entrance to the labor force E.g. A student immediately after graduation
- Re-entering to the labor force

2. Structural unemployment:

It results from mismatch between the skills or locations of job seekers and the requirements or locations of the vacancies. **E.g. An agricultural graduate looking for a job at —Piassa.** The causes could be **change in demand pattern or technological change.**

3. Cyclical unemployment:

It results due to absence of vacancies. This usually happens due to deficiency in demand for commodities/ the low performance of the economy to create jobs.

Note: ~~Frictional~~ ^{E.g. During recession} and **structural unemployment** are more or less unavoidable; hence, they are known as ***natural level of unemployment.***

Measurement of rates of unemployment

Total unemployment = Frictional + Structural + Cyclical unemployment

Natural level of unemployment = Frictional unemployment + Structural unemployment = Total unemployment - Cyclical unemployment

Natural rate of unemployment = Natural unemployment / labor force

When the unemployment rate is equal to the natural rate of unemployment, we say the economy is at **full employment**. Therefore, full employment **does not** mean zero unemployment.

6.6.2. Inflation

It is the sustainable increase in the general or average price levels commodities. Price index serves to measure inflation. **Two points** about this definition need emphasis. First, the increase price must be a **sustained one**, and it is not simply once time increase

Second, it must be the general level of prices, which is rising; increase in individual prices, which can be offset by fall in prices of other goods is not considered as inflation.

$$\text{Rate of inflation} = \frac{P_t - P_{t-1}}{P_{t-1}} * 100$$

Where, P_t is price index (eg. CPI) at time t and P_{t-1} is price index at time t-1.

Causes of inflation

The causes of inflation are generally classified into two major groups: **demand pull and cost push inflation.**

A. Demand pull inflation: according to demand pull theory of inflation, inflation results from a rapid increase in demand for goods and services than supply of goods and services. This is a situation where —*too much money chases too few goods.*³⁸

B. Cost push or supply side inflation: it arises due to continuous decline in aggregate supply. This may be due to bad weather, increase in wage, or the prices of other inputs.

Economic effects of inflation

- Generally inflation reduces the purchasing power of money. This will in turn reduce the welfare of individuals.
- Banks charge their customers nominal interest rate for their loans. Nominal interest rate however is determined based on inflation rate as it is represented by Fisher's equation. $I = r + \Pi$ where, I is nominal interest rate, r is real interest rate and Π is inflation rate.

Increase in inflation rate will raise the nominal interest rate and the opportunity cost of holding money. If people are to hold lower money balances on average, they must make more frequent trips to the bank to withdraw money. This is metaphorically called the ***shoe-leather cost of inflation***.

- Inflation reduces investment by increasing nominal interest rate and creating uncertainty about macroeconomic policies.
- Inflation redistributes wealth among individuals. Most loan agreements specify a nominal interest rate, which is based on the rate of inflation expected at the time of the agreement

If inflation turns out to be higher than expected, the debtor wins and the creditor loses because the debtor repays the loan with less valuable dollars. If inflation turns out to be lower than expected, the creditor wins and the debtor loses because the repayment is worth more than the two parties anticipated.

- Unanticipated inflation hurts individuals with fixed income and pension.
- High inflation is always associated with variability of prices which induces firms to change their price list more frequently and requires printing and distributing new catalogue. This is known as **menu cost of inflation**.

6.6.3. Trade deficit and budget deficit

6.6.3.1. Budget deficit

When a government spends more than it collects in taxes, it faces a budget deficit, which it finances by borrowing from internal and external borrowing.

When we see **Ethiopian case**, to augment available domestic financing options, the government opted to finance its fiscal deficit from external sources on **concessional terms**. As a rule of thumb, non-concessional loans cannot be used to finance the budgetary activities rather it is used to finance projects that are run by State Owned Enterprises (SOEs).

6.6.3.2. Trade deficit

The national income accounts identity shows that net capital outflow always equals the trade balance. Mathematically, $S - I = NX$

Net Capital Outflow = Trade Balance

Net cash out flow is Saving(S) - Investment (I)

Balance of Trade = Merchandize Exports - Merchandize Imports

- If this balance between $S - I$ and NX is positive, we have a **trade surplus**. In this case, we are exporting more goods than we are importing.
- If the balance between $S - I$ and NX is negative, we have a **trade deficit**. *In this*, we are importing more goods than we are exporting.
- If $S - I$ and NX are exactly zero, we are said to have **balanced trade** because the value of imports equals

6.7. Macroeconomic policy instruments

We have two major macroeconomic policies that a given country can use to achieve sustainable economic growth and development.

6.7.1. Monetary policy

Monetary policy refers to the adoption of suitable policy regarding the **control of money supply** and the **management of credit** which is important measure for **adjusting aggregate demand** to control **inflation**. It is concerned with the **money supply**, lending rates and **interest rates** and is often administered by a **central bank**. For instance, during economic recession where output falls with a fall in aggregate demand, **monetary policy aims** at increasing demand and hence production as well as employment will follow the same pattern of demand.

In contrast, at the time of economic boom where demand exceeds production and tend to create inflation, the monetary policy instruments are utilized that could offset the condition and achieve **price stability** by counter cyclical action upon **money supply**. Central Bank controls the money supply to control nominal interest rates.

6.7.2. Fiscal policy

Fiscal policy involves the use of government spending, taxation and borrowing to influence both the pattern of economic activity and also the level and growth of aggregate demand, output and employment.

Most governments use fiscal policy to promote stable and sustainable growth while pursuing its income redistribution effect to reduce poverty.

The most important tools of implementing the government fiscal policy are **taxes, expenditure and public debt**.

Major functions of fiscal policy

- **Allocation:** The first major function of fiscal policy is to determine exactly how funds will be allocated. This is closely related to the issues of taxation and spending, because the allocation of funds depends upon the collection of taxes and the government using that revenue for specific purposes. The budget allocation is done on the basis of aggregated development objectives such as **recurrent vs capital expenditures** or **sectoral allocation** (economic and social developments).

- **Distribution:** The distribution functions of the fiscal policy are implemented mainly through progressive taxation and targeted budget subsidy. the distribution function of fiscal policy is to determine more specifically how those funds will be distributed throughout each segment of the economy.
- **Stabilization:** Stabilization is another important function of fiscal policy in that the purpose of budgeting is to provide stable economic growth.
- **Development:** The fourth and most important function of fiscal policy is that of promoting development.