Chapter Six

Fundamental Concepts of Macroeconomics

Introduction

Conventionally, economics is divided into microeconomics and macroeconomics. Microeconomics studies about the individual decision making behaviour of different economic units such as households, firms, and government at a disaggregated level. Whereas, macroeconomics, studies about overall or aggregate behaviour of the economy, such as economic growth, employment, inflation, distribution of income, macroeconomic policies and international trade.

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.

Chapter objectives

After completing this chapter, you will be able to:

- define GNP and GDP and able to measure national income by using the expenditure or income or product approach;
- differentiate between nominal GDP and real GDP and decide which is better to measure economic performance;
- explain the concept of business cycle;
- briefly discuss the types of unemployment;
- understand about inflation, causes of inflation and its impact on the economy and
- explain budgetary deficit and its ways of financing;

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.

6.2.1. Approaches to measure national income (GDP/GNP)

Before discussing different approaches of national income, it is important to understand about the measure of the economic performance of a given country at large. Generally it is named as GDP or GNP.

Gross Domestic Product (GDP): it is the total value of currently produced final goods and services that are produced within a country's boundary during a given period of time, usually one year. From this definition, we can infer that:

- It measures the current production only.
- It takes in to account final goods and services only (only the end products of various production processes) or we do not include the intermediate products in our GDP calculations. Intermediate goods are goods that are completely used up in the production of other products in the same period that they themselves are produced.
- It measures the values of final goods and services produced within the boundary/territory of a country irrespective of who owns that output.
- 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

Gross National Product (GNP): is the total value of final goods and services currently produced by domestically owned factors of production in a given period of time, usually one year, irrespective of their geographical locations.

GDP and GNP are related as follows:

GNP=GDP + NFI

NFI denotes Net Factor Income received from abroad which is equal to factor income received from abroad by a country's citizens less factor income paid for foreigners to abroad. Thus, NFI could be negative, positive or zero depending on the amount of factor income received by the two parties.

- **If NFI >0, then GNP > GDP**
- **If NFI<0, then GNP < GDP**
- **If NFI =0, then GNP =GDP**

Basically, there are three approaches to measure GDP/GNP. These are:

I. Product/value added approach,
II. Expenditure approach and
III. Income approach

Product Approach: In this approach, GDP is calculated by adding the market value of goods and services currently produced by each sector of the economy. In this case, GDP includes only the values of final goods and services in order to avoid double counting.

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 is not 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 valued added by all firms at each stage of production

We can illustrate the two scenarios using some hypothetical examples as follows.

I. Taking only the value of final goods and services.

Example:

Sectors	**Value of Output (in million birr)**
Agriculture and allied activities	**9309**
- Agriculture	7000
- Forestry	1000
- Fishing	1309
Industry	**147413**
- Mining & quarrying	9842
- Large & medium scale manufacturing	91852
- Electricity & water	13717
- Construction	32002
Service	**357 872**
- Banking insurance and real estate	121704
- Public administration & defense	36605
- Health	20000
- Education	32509
- Domestic & other services	147054
4. Net factor income from abroad	87348

GDP = 9,309+147,413+357,872 = 514,594

GNP = GDP + NFI = 514,594 +87,348 = 601,942

II. Taking the sum of the valued added by all firms at each stage of production

Example:

Stages of production	Values of output (in birr)	Cost of intermediate inputs	Value added
Farmer	500	0	500
Oil factory	2000	500	1500
Retailers	2500	2000	500

Note: If all values in the economy were added, GDP would be 5000= (2500+2500). The problem of double counting is 2500, because of considering intermediate input in the calculation.

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).

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.

Gross private domestic investment 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 inventory investment (the change in inventories of firms).

Note that gross private domestic investment differs from net private domestic investment in that the former includes both replacement and added investment whereas the latter refers only to added investment. Replacement means the production of all investment goods, which replace machinery, equipment and buildings used up in the production process. In short, net private domestic investment = gross private domestic investment minus depreciation.

Government purchases of goods and services include 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 refer 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.

Example: GDP at current market price measured using expenditure approach for a hypothetical economy.

Types of expenditure	**Amount (in million Birr)**
1. Personal consumption expenditure	**4500**
Durable consumer goods	1500
Non-durable consumer goods	2000
Services	1000
2. Gross private domestic investment	**600**
Business fixed investment	250
Construction Expenditure	300
Increases in inventories	50
3. Government expenditure on goods and services	**250**
Federal government	100
State government	150
4. Net export	**-50**
Exports	150
Imports	200
GDP at current market price	**5300**

Income approach: in this approach**,** GDP is calculated by adding all the incomes accruing to all factors of production used in producing the national output. It is crucial, however, to note that some forms of personal incomes are not incorporated in the national income. For instance, transfer payments (payments which are made to the recipients who have not contributed to the production of current goods and services in exchange for these payments) are excluded from national income, as these are mere redistribution of income from taxpayers to the recipients of transfer payments. Transfer payments may take the form of old age pension, unemployment benefit, subsidies, etc.

According to the income approach, GDP is the sum incomes to owners of factors of production plus some other claims on the value of output (depreciation and indirect business tax) less subsidies and transfer payments.

GDP = Compensation of employees (wages & salaries)

+ Rental income

+ Interest income

+ Profits (proprietors' profit plus corporate profit)

+ Indirect business taxes

+ Depreciation

- Subsidies

- Transfer payments

Example:

Items	**Value (in million Birr)**
1) Compensation of Employees	**45623.71**
2) Rental Income	**1249.32**
3) Proprietor's Income	10561.21
4) Corporate Profits	16960.33
Subtotal (corporate and proprietor's)	**27521.54**
5) Net interest	**5189.73**
6) Depreciation	**503.84**
7) Indirect Business Taxes	**476.51**
8) Subsidy	(**11368.95)**
Gross Domestic Product	***69195.70***
9) Income from abroad	2036.20
10) Payments to abroad	(11231.90)
NFI	**(9195.70)**
Gross National Income	***60000.00***

Limitation of GDP measurement:

The calculation of national income is not an easy task. We face a number of problems in the estimation of national income, especially in under-developed countries like Ethiopia.

- *Definition of a nation*: while calculating national income, nation does not mean only the political or geographical boundaries of a country for calculating the value of final goods and services produced in the country. It includes income earned by the nationals abroad.
- *Stages of economic activities*: it is also difficult to determine the stages of economic activity at which the national income is determined i.e. whether the income should be calculated at the stage of production or distribution or consumption. It has, therefore, been agreed that the stage of economic activity may be decided by the objective for which the national income is being calculated. If the objective is to measure economic progress, then the production stage can be considered. To measure the welfare of the people, then the consumption stage should be taken into consideration.
- *Transfer payments*: this also creates a great difficulty in calculating the national income. It has generally been agreed that the best way is to consider only the disposal income of the individuals of groups.
- *Underground economy:* no imputation is made for the value of goods and services sold in the illegal market. The underground economy is the part of the economy that people hide from the government either because they wish to evade taxation or because the activity is illegal. The parallel exchange rate market is one example.
- *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.
- *Valuation of depreciation:* the value of depreciation is deducted from the gross national product to get net national product. But the valuation of such depreciation is full of difficulties.
- *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 (NNP) = Gross National product (GNP) – Capital consumption allowance (D)

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. Hence, to get the national income, we must subtract indirect business tax from net national product.

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

Personal Income (PI): refers to income earned by persons or households. Persons in the economy may not earn all the income earned as national income.

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

Personal Disposable Income: it is personal income less personal tax payments.

DI = PI – Personal taxes

DI = C + S where, C = personal consumption expenditure, S = Personal savings

6.3. Nominal versus Real GDP

Nominal GDP 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 = $\sum PiQi$ 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 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 inflation.

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

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:	**In 2018:**
Nominal GDP = (20 x 5) + (8 x 50) = $500 Real GDP = (20 x 5) + (8 x 50) = $500 Note that both the real and nominal GDP values are exactly the same in the base year.	The outputs of 2018 valued at the prices of 2017(the base year). Nominal GDP= (25 x 20) + (10 x 100) = $1500 Real GDP = (25 x 5) + (10 x 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.

$$\textbf{GDP deflator} = \frac{\textbf{Nominal GDP}}{\textbf{Real GDP}} * 100$$

We can calculate the GDP deflator based on the example above.

GDP *deflator* (2017) $= \frac{\text{GDP}n}{\text{GDPr}}$ x 100 $= \frac{500}{500}$ x 100 = 100

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

GDP *deflator* (2018) $= \frac{\text{GDP}n}{\text{GDPr}}$ x 100 $= \frac{1{,}500}{625}$ x 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 q'_0 and their base year prices by p'_0, the cost of the basket in the base year is $\sum p'_0 * q'_0$, where the summation is over all the goods in the basket. The cost of a basket of the same quantities but at today's prices is $\sum p'_t, q'_0$, where p_t is today's price. The CPI is the ratio of today's cost to the base year cost.

$$CPI = \frac{\Sigma P_t^{'} * q_o^{'}}{\Sigma p_o^{'} * q_o^{'}}$$

The CPI versus the GDP Deflator

The GDP deflator and the CPI give somewhat different information about what's happening to the overall level of prices in the economy. There are three key differences between the two measures.

1) 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.
2) GDP deflator includes only those goods produced domestically. Imported goods are not part of GDP and do not show up in the GDP deflator.
3) 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 economic activity, the level of unemployment also moves up and down.

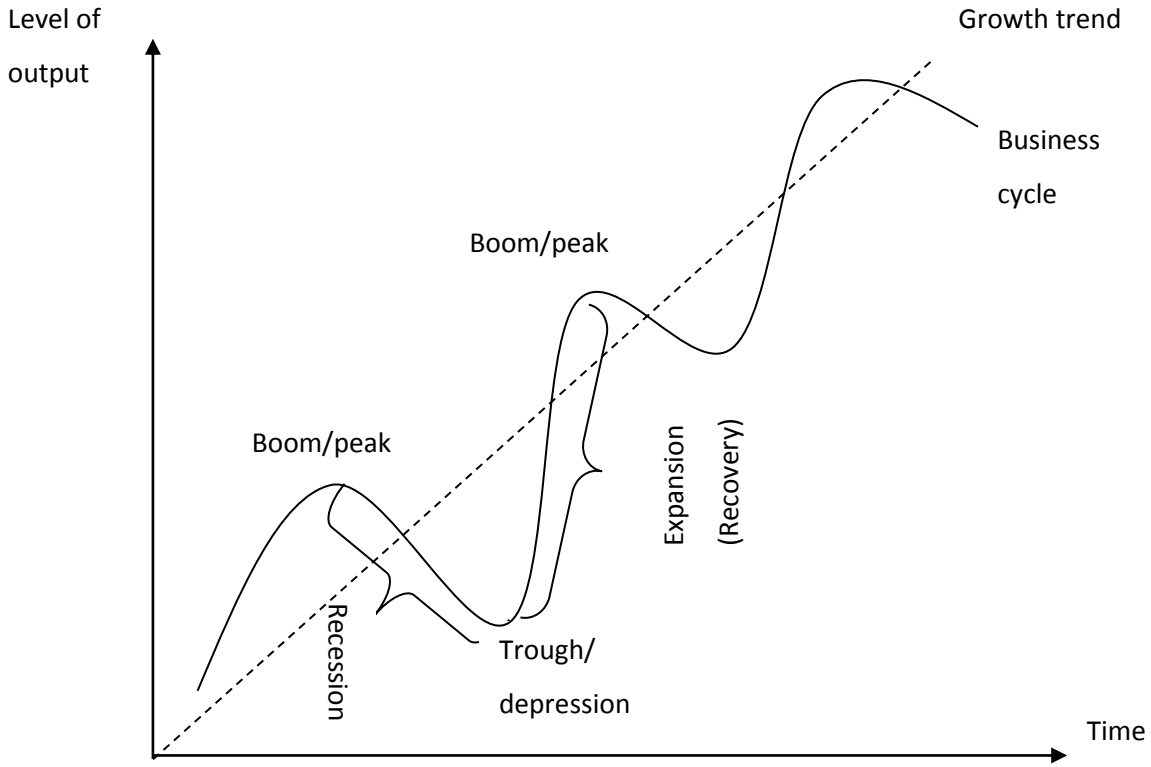


Figure 6.9: The business cycle

A business cycle is a fluctuation in overall economic activity, which is characterized by the simultaneous expansion or contraction of output in most sectors. We can identify four phases in the business cycle.

Boom/peak: it is a phase in which the economy is producing the highest level of output in the business cycle. It is the point which marks the end of economic expansion and the beginning of recession. In this phase, 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 option 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.
- A 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.
- Business cycles may vary in duration and intensity.

6.6. Macroeconomic Problems

6.6.1. Unemployment

Can we say that every person who does not have a job is unemployed?

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), who are without a job but are actively searching for a job. In the Ethiopia context, the specified age is between 14 and 60 which are normally named as productive population. To better understand what unemployment is, it is important to begin with classifying the whole population of a country into two major groups: those in the labour force and those outside the labour force.

Labor force includes group of people within a specified age (for instance, people whose ages are greater than 14 are considered as job seekers though formal employment requires a minimum of 18 years of age bracket) who are actually employed and those who are without a job but are actively searching for a job, according to the Ethiopian labour law. Therefore, the labour force does not include: Children <14 and retired people age >60, and also people in mental and correctional institutions, and very sick and disabled people etc.

A person in the labour force is said to be unemployed if he/she is without a job but is actively searching for a job.

Labour force = Employed + Unemployed

Types of unemployment

1. **Frictional unemployment:** 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:** 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:** 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. E.g. During recession

Note: **Frictional** 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
Unemployment rate = total 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 in prices. 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.

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

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*."
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

1. Generally inflation reduces real money balance or purchasing power of money. This will in turn reduce the welfare of individuals.
2. 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.
3. Inflation reduces investment by increasing nominal interest rate and creating uncertainty about macroeconomic policies.
4. 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.

5. Unanticipated inflation hurts individuals with fixed income and pension.
6. 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

Budget deficit

The overriding objectives of the government's fiscal policy are building prudent public financial management, financing the required expenditure with available resource and refrain from possibility of unsustainable fiscal deficit.

The government receives revenue from taxes and uses it to pay for government purchases. Any excess of tax revenue over government spending is called public saving, which can be either positive (a budget surplus) or negative (a 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. The accumulation of past borrowing is the government debt. Debate about the appropriate amount of government debt in the United States is as old as the country itself. Alexander Hamilton believed that "a national debt, if it is not excessive, will be to us a national blessing," while James Madison argued that "a public debt is a public curse".

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. In particular, the Government of Ethiopia finances its budget by accessing external loans on concessional terms. As a rule of thumb, non-concessional loans cannot be used to finance the budgetary activities. On the other hand, external non-concessional loans are used to finance projects that are run by State Owned Enterprises. In recent years, the government accessed loans from international market on non-concessional terms to finance feasible and profitable projects managed by State Owned Enterprises (SOEs). The country's total public debt contains central government, government guaranteed and public enterprises.

Trade deficit

The national income accounts identity shows that net capital outflow always equals the trade balance. Mathematically,

$$S - I \quad = \quad NX.$$

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***, so we say that there is a surplus in the current account. In this case, we are net lenders in world financial markets, and we are exporting more goods than we are importing.
- If the balance between $S - I$ *and* NX is negative, we have a ***trade deficit*** then we say that there is a deficit in the current account. In this case, we are net borrowers in world financial markets, and 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 the value of exports.

6.7. Macroeconomic policy instruments

The ultimate policy objective of any country in general is to have sustainable economic growth and development. Policy measures are geared at achieving moderate inflation rate, keeping unemployment rate low, balancing foreign trade, stabilizing exchange and interest rates, etc and in general attaining stable and well-functioning macroeconomic environment.

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.

Monetary policy is a highly flexible stabilization policy tool. 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 treat 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.