

Ch. 1 Introduction to Macroeconomics

Main Questions:

- What is Macroeconomics?
- What do macroeconomists do?
- What is the goal of macroeconomics?
- How is economic policy analyzed?
- What are the different approaches to macroeconomics?

What Macroeconomics is About?

Macroeconomics is the study of the structure and performance of national economies and of the policies that governments use to try to affect economic performance.

1. Issues Addressed by Macroeconomists:

- What determines a nation's long-run economic growth?
- What causes a nation's economic activity to fluctuate?
- What causes unemployment?
- What causes prices to rise?
- How does being a part of a global economic system affect nations' economies?
- Can government policies be used to improve economic performance?

1.1 Long-Run Economic Growth

- Rich nations have experienced extended periods of rapid economic growth.
- Poor nations either have never experienced them or economic growth was offset by economic decline.

Increased Output- reasons:

- Total output is increasing because of increasing population, i.e. the number of available workers.
- Increasing average labour productivity: the amount of output produced per unit of labour input.

Rates of growth of output (or output per worker) are determined by:

- rates of saving and investment;
- rates of technological change;

- rates of change in other factors.

1.2 Business Cycles are short-run contractions and expansions of economic activity. The most volatile period in the history of Canadian output was between 1914 and 1945.

Recessions – A recession is the downward phase of a business cycle when national output is falling or growing slowly.

- Hard times for many people
- A major political concern

1.3 Unemployment- Recessions are usually accompanied by high unemployment: the number of people who are available for work and are actively seeking it but cannot find jobs. The unemployment rate is computed as follows:

$$\text{Unemployment Rate} = \frac{\text{Unemployed}}{\text{Labour Force}} \times 100\%$$

1.4 Inflation & Deflation- When prices of most goods and services are rising over time it is inflation. When they are falling it is deflation.

1.5 The International Economy- An economy which has extensive trading and financial relationships with other national economies is an open economy. An economy with no relationships is a closed economy. International trade and borrowing relationships can transmit business cycles from country to country.

Exports and Imports- Canadian exports are goods and services produced in Canada and consumed abroad. Canadian imports are goods and services produced abroad and consumed in Canada.

Trade Imbalances- Trade imbalances (trade surplus and deficit) affect output and employment.

- **Trade surplus:** exports exceed imports.
- **Trade deficit:** imports exceed exports.

1.6 The Exchange Rate- The trade balance is affected by the exchange rate: the amount of Canadian dollars that can be purchased with a unit of foreign currency.

Macroeconomic Policy- A nation's economic performance depends on:

- natural and human resources;
- capital stock;
- technology;
- economic choices made by citizens;

- macroeconomic policies of the government.

Macroeconomic policies:

- **Fiscal policy:** government spending and taxation.
- **Monetary policy:** the central bank's control of short-term interest rates and the money supply.

Budget Deficits- The economy is affected when there are large budget deficits: the excess of government spending over tax collection.

The Role of Monetary Policy

- Determining the interest rate
- Ensuring the stability of financial institutions and protecting the saving of households
- Determining the success of a modern industrialized economy like Canada's.

Aggregation

Macroeconomists ignore distinctions between individual product markets and focus on national totals. **The process of summing individual economic variables to obtain economy wide totals is called aggregation.**

2. What Macroeconomists Do

- **Macroeconomic forecasting-** prediction of future economic trends - has some success in the short run. In the long run too many factors are highly uncertain.
- **Macroeconomic analysis-** analyzing and interpreting events as they happen – helps both private sector and public policymaking.
- **Macroeconomic research-** trying to understand the structure of the economy in general – forms the basis for macroeconomic analysis and forecasting.
- **Data development-** Macroeconomists use data to assess the state of the economy, make forecasts, analyze policy alternatives, and test theories.
- Providers of data must:
 - Decide what types of data should be collected based on who is expected to use the data and how.
 - Ensure the measures of economic activity correspond to economic concepts.
 - Guarantee the confidentiality of data.

Economic Theory- a set of ideas about the economy to be organized in a logical framework.

- *Economic model*: a simplified description of some aspects of the economy.

Developing and Testing a Theory

- State the research question.
- Make provisional assumptions.
- Work out the implications of the theory.
- Conduct an empirical analysis.
- Evaluate the results.

Criteria for evaluating an economic model

- Are assumptions reasonable?
- Can it be used to study real problems?
- Can it be tested with empirical analysis?
- Are the implications consistent with the data?

Comparative Static Experiments- The experiments conducted by macroeconomists are called comparative static experiments.

Conducting Comparative Static Experiments: First, the economic model is assumed to be in equilibrium (quantities demanded and supplied are equal in all markets). Second, we change the value of one variable in the model, a variable whose value is not affected by changes in other variables in the model (called shocks by economists). Third, we observe how our macroeconomic model responds to the shock.

Why Macroeconomists Disagree? A positive analysis examines the economic consequences of an economic policy, but it does not address its desirability. A normative analysis tries to determine whether a certain economic policy should be used. Economists can disagree on normative issues because of differences in values. Economists disagree on positive issues because of different schools of thought.

3. Two different approaches to Economics:

3.1 The Classical Approach

The invisible hand of Economics: General welfare will be maximized if:

- there are free markets;
- individuals act in their own best interest.

To maintain markets' equilibrium – the quantities demanded and supplied are equal:

- Markets must function without impediments;
- Wages and prices should be flexible.

- Thus, according to the classical approach, the government should have a limited role in the economy.

3.2 The Keynesian Approach. Keynes (1936) assumed that wages and prices adjust slowly. Thus, markets could be out of equilibrium for long periods of time and unemployment can persist. Therefore, according to the Keynesian approach, it may be useful for governments to take actions to alleviate unemployment. The government can purchase goods and services, thus increasing the demand for output and reducing unemployment. Newly generated incomes would be spent and would raise employment even further.

Unified Approach to Macroeconomics: Individuals, firms and the government interact in goods, asset and labour markets. Macroeconomic analysis is based on the analysis of individual behaviour. Keynesian and classical economists agree that in the long run prices and wages adjust to equilibrium levels. The basic model will be used either with classical or Keynesian assumptions about flexibility of wages and prices in the short run.

Ch. 2 The Measurement and Structure of the Canadian Economy

Main Questions

- How do we measure our current economic activity?
- What is national income account?
- What are the relationships among key macroeconomic variables?
- How are the different sectors of the economy related to each other?

1. National Income Accounting- The national income accounts is an accounting framework used in measuring current economic activity. There are three approaches to calculate national income.

- The product approach** measures the amount of output produced, excluding output used up in intermediate stages of production.
 - Value added= the value of output – the value of inputs purchased from others.
- The income approach** measures the incomes received by the producers of output.
- The expenditure approach** measures the amount of spending by the ultimate purchasers of output.

National Income Accounting- Numerical Example**AppleInc Transactions**

Wages paid to AppleInc employees	15,000
Taxes paid to government	5,000
Revenues received from the sale of	35,000
Apples sold to public	10,000
Apples sold to JuiceInc	25,000

JuiceInc Transactions

Wages paid to JuiceInc employees	10,000
Taxes paid to government	2,000
Apples purchased from AppleInc	25,000
Revenues received from the sales	40,000

Product Approach

AppleInc value added	35,000
JuiceInc value added	<u>15,000</u>
Total Production	50,000

Income Approach

Wages income	25,000
Taxes paid to government	7,000
Profits	<u>18,000</u>
Total Income	50,000

Expenditure Approach

Expenditures on apples	10,000
Expenditures on apple juice	<u>40,000</u>
Total Expenditures	50,000

Why the Three Approaches Are Equivalent?

The market value of a good (product) and the spending on a good (expenditure) are always the same.

The seller's receipts (expenditure) are equal to the total income generated by the economic activity (income).

Fundamental identity of national income accounting:

total production = total income = total expenditure

2. The Product Approach to Measuring GDP

A nation's gross domestic product (GDP) is the market value of final goods and services newly produced within a nation during a fixed period of time. Using market values allows adding the production of different goods and services.

Problems with the market values:

- Some goods are not sold in markets.
- The underground economy – illegal activities and legal activities hidden from the government.
- Lack of market values to use when calculating the government's contribution to the GDP.

GDP includes only goods and services newly produced within the current period. It is a sum of value added – value of an output minus value of its inputs. Intermediate goods are those used up in the production of other goods in the same time period. GDP includes only final goods – not intermediate goods, the end products. Capital goods and inventory investment are final goods.

2.1 GDP versus GNP

Gross national product (GNP) is the market value of final goods newly produced by domestic factors of production (capital, labour) during the current period. Canadian owned capital and labour used abroad produce output and income. They are included into Canadian GNP, not GDP.

Foreign owned capital and labour used in Canada produce output and income. They are included into Canadian GDP, not GNP.

Net factor payments from abroad (*NFP*) is: income paid to domestic factors of production by the rest of the world minus income paid to foreign factors of production by the domestic economy.

$$GDP + NFP = GNP$$

In 2011 Canadian *GDP* was \$1,721 billion and Canadian *GNP* was \$1,689 billion, a difference of less than 2%.

The Expenditure Approach to Measuring GDP

$$Y = C + I + G + NX$$

Y = GDP

C = consumption

I = investment

G = government purchases of goods and services

NX = net exports of goods and services (exports minus imports)

- **GDP**: total production or total income or total expenditure.
- **Consumption (57.1% of GDP)**: consumer durable goods; semi-durable goods; nondurable goods; services.
- **Investment (22.8% of GDP)**: fixed investment: residential construction, nonresidential investment, machinery and equipment; inventory investment; government investment.
- **Government purchases of goods and services (21.4% of GDP)**: government purchases, other than capital goods; transfers.
- **Net exports of goods and services (-1.2% of GDP)**: exports minus imports, which in 2011 was negative

The Income Approach to Measuring GDP

- **Labour income**: (51.7% of GDP): wages, salaries, employee benefits; employer contributions to the EI and the CPP.
- **Corporate profits**: (13.1% of GDP): taxes levied on corporations; dividends to shareholders; retained earnings.
- **Interest and investment income**: (4.2% of GDP): interest earned by individuals from business and foreign sources minus interest paid by individuals.
- **Unincorporated business income**: (6.5% of GDP): income of self-employed, which includes both labour and capital income.
- **Indirect taxes less subsidies** (10.5% of GDP): provincial sales tax (PST); goods and services tax (GST); minus subsidies.
- **Capital consumption allowances or depreciation** (14% of GDP): the value of capital that wears out during the measured period.

Private Sector and Government Sector Income. Private disposable income (PDI) is the amount of income the private sector has available to spend after paying taxes and receiving government transfers.

$$\text{Private Disposable Income} = Y + NFP - T + TR + INT$$

Y = gross domestic product (GDP);

NFP = net factor payments from abroad;

TR = transfers received from the government;

INT = interest payments on the government's debt;

T = taxes.

$$\text{Net Government Income} = T - TR - INT$$

TR = transfers received from the government

INT = interest payments on the government's debt

T = taxes

3. Saving and Wealth. Wealth is the difference between assets and liabilities. National wealth is the wealth of an entire nation. Saving is current income minus spending on current needs.

The Government Budget Surplus and Budget Deficit. The government budget surplus is a positive difference between government revenue (T) and government expenditure ($G+TR+INT$). The government budget deficit is a negative difference between T and ($G+TR+INT$).

The Uses of Private Saving

$$\begin{aligned} S &= Y + NFP - C - G \\ &= (C + I + G + NX) + NFP - C - G \\ &= I + (NX + NFP) \\ &= I + CA \end{aligned}$$

CA is current account balance – payments received from abroad for exports minus payments made to foreigners for imports, NFP included.

The Uses of Saving Identity

$$\begin{aligned} S - S_{govt} &= I + CA - S_{govt} \\ S_{pvt} &= I + (-S_{govt}) + CA \end{aligned}$$

Private saving is used in three ways:

- investment (I);
- the government budget deficit ($-S_{govt}$);
- the current account balance (CA).

Relating Saving and Wealth

- Saving is a flow variable – a variable that is measured per unit of time.
- Wealth is a stock variable – a variable that is measured at a point in time.

National wealth is: country's domestic physical assets; country's net foreign assets – country's foreign assets minus its foreign liabilities.

National wealth can change through changes in value of national saving ($I+CA$).

Real GDP

- Nominal GDP (or current-dollar GDP) is the dollar value of an economy's final output at current market prices.
- Real GDP (or constant-dollar GDP) is the physical volume of an economy's final output using the prices of a base year.

4. Price Indexes

4.1 GDP Deflator

- A price index is a measure of the average level of prices for some specified set of goods and services.
- The GDP deflator is a price index that measures the overall level of prices of goods and services included in GDP.

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

The measurement of real GDP and the GDP deflator depends on a choice of a base year.

4.2 The Consumer Price Index

The consumer price index (*CPI*) measures the price of consumer goods. The CPI is calculated for a fixed consumer "basket". The basket should be occasionally updated or chain-weighted indexes should be used.

CPI and Inflation

The rate of inflation is the percentage rate of increase in a price index (the CPI, for example) per a period of time.

The Rate of Inflation is computed as:

$$\pi_{t+1} = \frac{(P_{t+1} - P_t)}{P_t} = \frac{\Delta P_{t+1}}{P_t}$$

π_{t+1} is the rate of inflation between t and $t+1$

P_t is the price level in period t

P_{t+1} is the price level in period $t+1$

ΔP_{t+1} is change in the price level between t and $t+1$

5. Real versus Nominal Interest Rates

An interest rate is a rate of return promised by a borrower to a lender. We talk about “the” interest rate. Although they are numerous, they move up and down together. **The real interest rate is the rate at which the real value of an asset increases over time. The nominal interest rate (i) is the rate at which the nominal value of an asset increases over time.**

Real Interest Rate

$$\text{real interest rate} = i - \pi$$

i = nominal interest rate

π = inflation rate

Expected Real Interest Rate

The expected real interest rate (r) is the rate at which the real value of an asset is expected to increase over time.

$$r = i - \pi^e$$

π^e = an expected inflation rate