

Introductory Macroeconomics for Engineers

Instructor Name

Semester and Year

Overview

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- 2 Economic Concepts
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Introduction

- Course Overview
- Objectives
- Grading

Micro vs. Macro

- **Microeconomics** The study of individual economic agents such as households and firms, how they make decisions, and how they interact in individual markets.

Micro vs. Macro

- **Microeconomics** The study of individual economic agents such as households and firms, how they make decisions, and how they interact in individual markets.
- **Macroeconomics** The study of the economy as a whole, including aggregate measures such as GDP, consumption, investment, inflation, and unemployment.
 - **Short-run:** Business cycles, recessions, and monetary and fiscal policy.
 - **Long-run:** Economic growth, productivity, and international trade.
- **Why study macroeconomics?**

History of Macroeconomics

Pre-Lucas Critique: 1936-1976

- John Maynard Keynes's seminal book in 1936 "The General Theory of Employment, Interest, and Money"
- **Keynesian Economics:** Advocated for government intervention to stabilize the economy.
- **Limitations:** Based on aggregate relationships such as the Phillips Curve, an inverse relationship between inflation and unemployment (Phillips 1958).
- Broke down in the 1970s due to stagflation, a combination of high inflation and high unemployment, which was unexplained by Keynesian models.

History of Macroeconomics

Post-Lucas Critique: 1976-Present

- **Robert Lucas's critique in 1976:** Micro-foundations are essential for macroeconomic models! (Lucas 1976).
- Led to development of modern macro, starting with Real Business Cycle Kydland and Prescott (1982).
- **Key Insights:** Expectations, rationality and shocks.
- **New Keynesian Economics:** Incorporates sticky prices and wages into models: DSGE models.

Understanding Economic Models

What is a Model?

- A model is a **simplified representation** of a complex reality.
- Models help us understand, explain, and predict economic phenomena with a clear framework.
- **Purpose:** To abstract the complex real-world into manageable parts.

Understanding Economic Models

Why Use Models?

- **Conducting Experiments:** Models allow economists to conduct experiments that are not feasible in the real world.
- **Informing Policy:** Results from these experiments can guide policy-making decisions.
- **Exploratory Tools:** They help in exploring the outcomes of different economic scenarios and policies.

Understanding Economic Models

Testing Model Usefulness

- A model designed to explain phenomenon x can be tested by its ability to explain y , a related but untargeted phenomenon.
- **Test of Usefulness:** Whether it can illuminate aspects it was not specifically designed to explain.
- A model's inability to explain every aspect of reality is not necessarily a drawback.
- **All models are wrong, but some are useful.**
- The best models are those that offer the greatest clarity and predictive power while acknowledging their limitations.

Basic Concepts

GDP - Overview

- **GDP (Gross Domestic Product)** measures the total value of all final goods and services produced within a country during a specific period.
- **Goods and Services:** "Goods" are tangible like shirts; "Services" are intangible like education.
- **Final Goods:** Only considers goods and services sold to end-users, excludes intermediate goods to avoid double counting.
- **Current Prices:** Values are based on prices during the period being measured.
- **Exclusions:** Does not account for home labor, or illegal activities.

Basic Concepts

GDP - Expenditure vs Income Approach

- GDP calculated as the sum of Consumption (C), Investment (I), Government Expenditures (G), and Net Exports (NX).
- **Net Exports (NX)** = Exports (X) - Imports (IM).
- **Why subtract imports?** We exclude imports because they are products produced outside the domestic economy.
- **Formula:** $GDP_t = C_t + I_t + G_t + (X_t - IM_t)$

Basic Concepts

GDP - Income Approach

- The income approach calculates GDP by summing all incomes earned in the production of goods and services.
- **Components:** Includes wages (labor income), rents (income from property), interest (income from capital), and profits (corporate earnings).
- **Formula:** $GDP = \text{wages} + \text{rents} + \text{interest} + \text{profits} + \text{taxes on production and imports} - \text{subsidies}$
- This method mirrors the expenditure approach as every dollar spent in an economy is a dollar income to someone else.
- **Key Insight:** Helps in understanding the distribution of income in the economy, showing how much income is generated from various economic activities.

Basic Concepts

Real vs. Nominal GDP

- **Nominal GDP:** Measured in current prices, reflects price and quantity changes.
- **Real GDP:** Adjusted for price changes, provides a clearer measure of economic performance.
- **Example:** If 10 units of a good are produced at a price of \$1.50 each, Nominal GDP is \$15.00.
- **Calculating Real GDP:** $\text{Real GDP} = \frac{\text{Nominal GDP}}{\text{Price Level}}$ focuses on quantity only.

Kaldor's Stylized Facts

- Kaldor's stylized facts are a set of empirical regularities observed in economic growth.
- They were identified by economist Nicholas Kaldor in the 1950s and 1960s.
- These facts provide insights into the patterns and characteristics of economic growth.
- The stylized facts include:
 - High and sustained rates of economic growth are possible.
 - Economic growth is uneven across countries and regions.
 - The distribution of income becomes more unequal during the early stages of economic growth.
 - The share of labor income in national income tends to decline over time.
 - The share of investment in national income tends to increase over time.