Chapter 1: Introduction
Graduate Macroeconomics Slides

Orhan Torul

Boğaziçi University

January 23, 2026

Outline

- Introduction and Motivation

- Historical Episodes and Data

- Economic Growth and Structural Change

- Business Cycles and Policy Shifts

- Inequality, Policy, and Recent Crises

- Concluding Remarks

Motivation

- Macroeconomics studies aggregate economic phenomena:
  - Output, consumption, investment, employment, inflation, etc.
- Important policy questions:
  - How to stabilize fluctuations?
  - How to foster long-run growth?
  - How to address inequality and distributional issues?
- Central theme: **Measurement** and **Theory** have co-evolved.

Motivation

Measurement Challenges During Crises

- Great Depression (1930s): Spurred development of national accounts (NIPA), inspired Keynesian theory, emphasizing aggregate demand, wage/price stickiness, and activist fiscal policy.
- COVID-19 (2020s): Accelerated reliance on high-frequency data (credit card transactions, mobility indices) for real-time policy responses.

Defining Macroeconomics

- There are several ways to define the field of macroeconomics:
  1. Study of aggregate economic variables
  2. Quantitative study of general equilibrium
  3. Study of economic dynamics and the role of expectations
- Caveats to these 3 definitions:
  1. Modern macro often emphasizes distribution (income, wealth)
  2. Full general equilibrium may not be strictly necessary in all analyses
  3. Static approaches can still be insightful

- Macroeconomics also **tracks contemporary events** (Great Recession, COVID-19, etc.).

Empirical and Theoretical Methods

- Macroeconomics is an **empirical** field:
  - Development of national accounting
  - Construction of large-scale and micro-based data sets
- Theory-building follows data:
  - Keynes's theories (Keynes, 1936) after Great Depression
  - Growth theory and productivity accounting (Solow, 1957)
  - Business-cycle theory (Kydland and Prescott, 1982)
- Evolution of **structural** models that can be matched to data quantitatively.

The Great Depression (1930s)

- Severe downturn with **limited data** available
- Spurred creation of the National Income and Product Accounts (NIPA)
- Keynesian Revolution:
  - Emphasized aggregate demand shortfalls and wage/price stickiness
  - Influential for policy design (fiscal stimuli, etc.)

Birth of National Income Accounting

Key Concepts

- **GDP**: Value of final goods/services produced in a period
- **Expenditure approach**: C + I + G + NX
- **Income approach**: Labor + Capital income
- **Value-added approach**: Sum of value-added across firms

- Nominal vs. real GDP requires a price index
- Non-market activities (leisure, environment, informal) are not counted
- Government policy $\rightarrow$ Great Depression impetus for systematic measurement

COVID-19 Pandemic: Data Challenges

- Rapid and unprecedented shock
- Rising demand for **high-frequency** data:
  - Credit/debit card transaction data
  - Mobility indices, online job postings
- Real-time measurement crucial for policy responses (e.g., stimulus checks)

Solow Growth Model (1956)

- **Framework** for understanding long-run per-capita growth
  - Capital accumulation, labor, exogenous technology
- Growth accounting (Solow, 1957):
  - Decompose output growth into contributions from capital, labor, TFP
  - The *Solow residual* $\approx$ technological progress
- Key conclusion: **Technology** is primary engine of sustained growth

Human Capital and Productivity

- Underestimation of factor inputs $\rightarrow$ overestimation of TFP
- Mincer (1958): schooling $\rightarrow$ higher wage

$$\ln(w) = \alpha + \beta_1 \times (\text{Schooling}) + \beta_2 \times (\text{Experience}) + \ldots$$

- Hall and Jorgenson (1967): user cost of capital for measuring capital input
- Data expansions: **Penn World Tables**, Maddison historical data sets

Cross-Country Comparisons

- Data sets (Kravis et al., 1978) $\rightarrow$ Penn World Tables
- Purchasing power parity (PPP) adjustments to compare real GDP across countries
- **Endogenous growth** (Romer, Lucas) emphasizes:
  - Innovation, incentives, R&D
  - Human capital accumulation
- Structural change: from agriculture $\rightarrow$ manufacturing $\rightarrow$ services

Stagflation of the 1970s

- **Oil-shock** (OPEC, 1973) $\rightarrow$ recession, high inflation + high unemployment
- Conventional Keynesian policies less effective
- **Lucas (1976)**:
  - Reduced-form relationships break under policy changes
  - Phillips Curve instability
- Renewed emphasis on **microfoundations** and rational expectations

Kydland & Prescott (1982): Real Business Cycles

- **Quantitative theory**: calibrate micro-based parameters using external evidence
- Showed technology shocks can explain many features of business cycles
- Spurred **real business cycle** (RBC) literature
- Filtering methods:
  - E.g., Hodrick-Prescott (HP) filter to isolate cyclical frequencies

Macroeconometrics and Identification

- Traditional Keynesian: large simultaneous-equations models
- Lucas critique $\rightarrow$ structural estimation (MLE, GMM, Bayesian)
- **Calibration** approach (Kydland & Prescott):
  - Match parameters to micro-data or long-run averages
  - Evaluate model predictions *without* re-fitting to targeted moments
- **Vector Autoregressions (VARs)** (Sims, 1980):
  - Empirical identification of shocks (e.g., monetary policy)
- **Natural experiments** and **narrative** approaches

From RBC to New Keynesian Models

- RBC criticized for ignoring nominal frictions
- **New Keynesian** approach:
  - Sticky prices and wages $\rightarrow$ monetary policy has real effects
  - Microfoundations with rigidities
- Empirical micro-studies (e.g., Bils and Klenow (2004))on price stickiness

Inequality Trends

- Since late 1970s: rising wage and wealth inequality in the U.S.
- Key drivers studied in macro-labor:
  - Skill-biased technological change
  - Globalization, union decline
  - Institutional factors
- Growing use of administrative micro-data on households and firms

Heterogeneous Agent Models

- Incomplete markets and borrowing constraints
- Distribution of wealth impacts **aggregate** outcomes:
    - E.g., consumption responses to tax rebates
- Policy implications:
    - Redistribution $\rightarrow$ macro stabilization
    - Role of automatic stabilizers

Fiscal Policy and Time Inconsistency

- Governments use taxes, spending, and regulation to influence the economy
- **Time inconsistency** problem:
  - Ex-post incentives to raise capital taxes
  - Similarly, inflation bias when central banks lack credibility
- Independence of central banks partly to mitigate short-run policy temptations
- **Political economy** constraints (elections, lobbying) also matter

The Great Recession (2007–2009)

- End of the Great Moderation
- Triggered by **housing/financial crisis**:
  - Mortgage-backed securities, excessive leverage
  - Rapid contagion throughout global financial system
- Slow recovery, persistent high unemployment
- Massive new research on **financial frictions** in macro models

Climate Change and Macroeconomics

- **Integrated assessment models** (IAMs) to link climate science and economics
- Policies to curb emissions (carbon tax, etc.) have macro impacts
- Development implications: poorer countries likely hit harder by warming
- Resource and energy economics: role of technology and policy in shifting from fossil fuels

Global Interactions

- **The Great Recession as a Global Crisis**
  - Shocks originating in the U.S. with housing and banking sectors
  - synchronized recessions worldwide via trade and funding markets which highlights the necessity of **Open-Economy Models**:
    - Study how shocks (e.g., TFP disturbances) propagate through capital flows and relative prices (Terms of Trade, RER).
    - Spillovers determined by international risk sharing and balance sheet exposure.

- **The European Sovereign-Debt Crisis in 2011-12**
  - Triggered partly by the Great Recession exposing Euro-area fragilities.
  - Debt sustainability concerns led to sharp rises in spreads (Greece, Cyprus, Ireland, Portugal, Spain).

- **Revival of Sovereign-Default Models**
  - Originally developed for 1980s Latin America; returned to center stage.
  - Focus is the interaction of borrowing, default risk, and fiscal policy with business cycles.
  - Renewed importance due to post-pandemic rise in public debt ratios.

Where Do We Stand?

- Modern macroeconomics is **richer** and more **data-oriented** than ever
- Innovations of new data-sets transformed the discipline of macroeconomics from a theory-based field into an empirically rigorous discipline.
- Lessons from past crises are built into current frameworks
- Ongoing research:
  - Behavioral elements (expectations formation, bounded rationality)
  - Financial frictions and heterogeneous agents
  - Climate macroeconomics
- Aim is and better-informed policies

Looking Ahead

Measurement and Theory Co-Evolution

- National accounts (Kuznets, Stone) enabled growth accounting (Solow residual).
- Cross-country datasets (Penn World Tables, Maddison Project) facilitated comparative growth studies.
- Microdata (SCF, PSID, JOLTS) expanded analysis of inequality and labor markets.

Looking Ahead

Theoretical Milestones

- Solow Growth Model (Solow, 1957): Highlighted technology as the engine of long-run growth.
- Real Business Cycle (RBC) Theory (Kydland and Prescott, 1982): Introduced calibration and quantitative dynamic models.
- New Keynesian Synthesis: Integrated sticky prices, monetary policy, and DSGE frameworks.

- Key theme of this text: interplay of data and theory
- **Neoclassical growth model** as benchmark for most macro topics
- Applications in subsequent chapters:
  - Growth, business cycles, asset pricing, labor, fiscal/monetary policy, etc.
- Emphasis on **quantitative methods** (calibration, estimation, simulation)

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Thank you!

Questions or comments?
orhan.torul@bogazici.edu.tr