

INTERMEDIATE MACROECONOMICS SKILLS ASSESSMENT (IESA-Macro)

LEARNING GOALS

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GENERAL GOALS

Intermediate-level courses in Intermediate Macroeconomics build on the concepts introduced in introductory macroeconomics and formalize them within more mathematically rigorous models. The main audience for these courses is comprised of economics (or economics-adjacent) majors and we expect these students to attain the following general skills:

- Understand the motivation, assumptions, and the mathematics behind formal economic models applicable to the aggregate agents and the economy as whole (in contrast to the choices of individuals which are discussed in the *Intermediate Microeconomic Theory* course).
- Use these models to obtain predictions about the functioning of the economy and the changes precipitated by both exogenous shocks and monetary and fiscal policy.
- Identify and characterize the purposes, strengths, and weaknesses of economy-wide government interventions.
- Use real world data (e.g., the Federal Reserve Economic Data (FRED)) to assess the validity of these models, by examining graphs and tables.
- Apply knowledge and understanding of macroeconomic foundations to critically assess economic indicators and policy coverage via media (news articles, podcasts, etc.) and other outlets.
- Understand how economists approach analyzing real world situations and apply economic models to make choices, predictions, and policy recommendations.

SPECIFIC LEARNING GOALS

1. Mathematical tools:
 - a. Perform Taylor expansions and understand what they represent
 - b. Define Present Value and be able to calculate it.
 - c. Obtain optimal solutions of unconstrained maximization problems.

2. Measuring economic activity:

- a. Define Gross Domestic Product (GDP) and Gross National Product (GNP). Explain the limitations of the GDP as a measure of the economy's performance.
- b. Calculate the Gross Domestic Product (GDP) using the expenditure approach. Know what is included in personal consumption expenditures (C), gross domestic investment (I), government consumption and gross investment (G), exports (EX), and imports (IM).
- c. Differentiate between nominal GDP and real GDP.
- d. Distinguish the Consumer Price Index (CPI), the GDP deflator, and the Personal Consumption Expenditures (PCE) deflator.
- e. Define the real interest rate, nominal interest rates, inflation. Explain how they are linked. Define the Fisher Equation and explain its use.

3. Output

- a. Describe what a production function is. Know the properties of interest for production functions and derive them for a variety of functional forms (including Cobb-Douglas).
- b. Decompose the growth in output into the growth driven by changes in specific components of the production function.

4. Labor Market and Unemployment

- a. Set up the firm's profit maximization problem and derive demand functions as a part of the solution. Derive the relevant comparative statics from the formula of the demand for labor.
- b. Explain what determines changes to the supply of labor. Understand how the magnitudes of income and substitution effects are reflected in the shape of the labor supply.
- c. Discuss how an equilibrium arises in the market for labor in the classical framework.
- d. Know the definitions of an unemployed individual and an individual not in the labor force. Calculate the employment and unemployment rates.

5. The Goods Market in the Macroeconomy: Consumption, Savings, and Investment

- a. Set up a two-period lifetime consumption optimization problem: (i) Explain what a utility function is and know its properties; (ii) Write down the intertemporal budget constraint and interpret its components.
- b. Derive and interpret the consumer Euler equation. Explain how the interest rate and discount factor change the consumption path of a household.

- c. Describe how the introduction of taxation and government spending into the lifetime consumption problem changes household lifetime consumption behavior.
- d. Explain what Ricardian equivalence is and under which conditions it can fail in theory, as well as its real-world validity.
- e. Define gross private domestic investment and decompose it into net investment and depreciation.
- f. Set up and solve the firm profit maximization problem with respect to investment in future capital.
- g. Define, derive, and decompose the user cost of capital.
- h. Discuss the factors that affect investment.
- i. Calculate the equilibrium in the goods market in the absence of imports and exports.

6. Asset Markets, Money Creation, and Monetary Policy

- a. Explain what a bond is. Know types of bonds and major issuers. Discuss the determinants of bond prices.
- b. Explain what a stock is. Discuss the basics of equity pricing.
- c. Define money in terms of its functions: medium of exchange, store of value, unit of account. Describe what is included in the monetary aggregates M1 and M2.
- d. Define the supply of money. Explain the role that the central bank, the depository institutions, and the public (firms and individuals) play in the determination of the money supply. Understand how assets and liabilities are balanced on private banks' and the central bank's balance sheets.
- e. Define the demand for money and write down the function for the desired amount of money. Explain the factors that affect the demand for money.
- f. Determine the equilibrium in the money market.
- g. Explain the model of the asset market including the monetary and nonmonetary components. Determine the equilibrium in the asset market.
- h. Define required, total, and excess reserves and the required reserve ratio. (i.e., a T-Account). Define and derive the money multiplier. Explain how the changes in regulations and money market affect the money creation process (money multiplier comparative statics).
- i. Describe the monetary policy instruments available to the central bank (open market operations, changes in the discount window lending, changes in the required reserves, changes to the interest paid on reserves). Explain how they affect the money market and through what channels they affect the economy as a whole.

7. General Equilibrium (IS/LM/FE Model)

- a. Explain the derivation of the IS curve (the Goods Market) and the factors that shift it.
- b. Explain the derivation of the LM curve (the Financial Market) and the factors that shift it.
- c. Explain the derivation of the FE curve (the Labor Market) and the factors that shift it.
- d. Put the IS, LM, FE curves together into a model that determines output and interest rates. Distinguish between the Short Run and the Long Run equilibria in the IS/LM/FE model.

8. General Equilibrium (AS-AD Model)

- a. Derive the Aggregate Demand (AD) curve and describe the factors that shift it.
- b. Derive the Short Run Aggregate Supply (SRAS) and Long Run Aggregate Supply (LRAS) curves and describe factors that shift them.
- c. Put the AD, SRAS, and LRAS curves together into a model that determines output and prices. Determine the equilibrium in the AS-AD model. Describe how changes in factors that affect aggregate supply or aggregate demand affect the equilibrium output and price level.

9. Connecting Inflation and Unemployment

- a. Know the historical foundations of the Phillips Curve. Define the expectations-augmented Phillips Curve.
- b. Explain what misperception theory is.
- c. Know and explain what the Lucas' Critique is. Distinguish the classical and Keynesian views on exploiting the Phillips curve for policy purposes.
- d. Discuss what the costs of unemployment and inflation are.

10. Open Economies

- a. Define current account and decompose it into its components: net exports, net factor payments, and net unilateral transfers. Distinguish capital and financial accounts. Know the identities of balance of payments accounting.
- b. Know the assumptions and components of the international loanable funds market model. Define what small and large economies are and distinguish between the how the international loanable funds market reaches equilibrium for the two types of economies.
- c. Define nominal and real exchange rates. Distinguish between flexible (floating) and fixed (pegged) exchange rates.

- d. Know the assumptions and limitations of the supply-and-demand model of exchange rates and solve for the equilibrium exchange rate. Know the factors that cause the currency to appreciate and depreciate in the foreign exchange market.
- e. Define exchange rate expectations. Distinguish between Uncovered and Covered Interest Rate Parity (UIP and CIP). Discuss what absolute and relative Purchasing Power Parity (PPP) is.
- f. Describe how the introduction of an open economy changes the IS/LM/FE model. Know and derive the determinants of net savings and net exports.
- g. Describe the factors that shift the IS curve in an open economy IS/LM/FE model. Determine the short-run and long-run equilibria in an open economy IS/LM/FE model.
- h. Describe how domestic fiscal and monetary policy affect the equilibrium interest rate and output.

OPTIONAL LEARNING GOALS (not tested by IESA-Macro)

1. Labor Market and Unemployment

- a. Define and distinguish the three types of unemployment: frictional, structural, and cyclical. Define the natural rate of unemployment.
- b. Set up the model of transition between employment and unemployment. Define what a steady state is and calculate it for this model. Explain how the unemployment rate changes as the job finding and job separation rates change (i.e., analyze comparative statics).

2. Macroeconomic Thought: Classical vs Keynesian Frameworks

- a. Know and contrast the main differences made in the classical and Keynesian views on the functioning of the economy.
- b. Distinguish nominal and real shocks in the business cycle framework. Explain what predictions of the Real Business Cycle (RBC) Model are consistent with historical data and where are the shortcomings of this approach are.
- c. Know and explain the main assumptions underlying the (new) Keynesian view of the economy. Explain how the price and wage rigidity change the workings of the IS-LM model.
- d. Explain the 20th and 21st century recessions through the prisms of Classical and Keynesian approaches.

3. Money Creation and Monetary Policy (See Core Learning Goal 11)
 - a. Read and interpret yield curve graphs. Know the *expectations hypothesis*, its shortcomings, and how they are overcome in *preferred habitat theory*.
 - b. Discuss the limitations of conventional monetary policy: lags in the response to policy implementation and the liquidity trap. Define quantitative easing and explain why this unconventional monetary policy tool overcomes the above limitations.

4. Open Economies (See Core Learning Goal 12)
 - a. Describe the interventions available to a country's central bank to address issues with domestic currency being undervalued or overvalued on the foreign exchange market. Contrast fixed and flexible exchange rates in terms of their advantages and disadvantages.
 - b. Define what a currency union is. Describe the advantages and vulnerabilities of this arrangement.

5. Economic Growth in the Solow Growth Model
 - a. Starting from the goods market equation (with a closed economy and no government purchases) derive the conditions for the long-run (or *steady state*) equilibrium.
 - b. Discuss the effect that saving and productivity have on economic growth in the context of the Solow Model. Explain what trade-offs are involved and the limitations of saving as a vehicle of economic growth. Describe factors that increase productivity in the economy.
 - c. Introduce population growth into the model and derive/describe how the steady state equilibrium changes as a result.
 - d. Describe factors that affect the poverty of countries and drive the convergence of per capita output between "developing" and "developed" countries (i.e., the role of good institutions and foreign aid).