

VU LEARNING HUB

vulearninghub.xyz

HANDOUT

ECO303

Principles of Macroeconomics

ECO303 by VU Learning HUB

Prepared for VU students • Free study resources

<https://vulearninghub.xyz>

VU STUDY HANDOUT

ECO303

Principles of Macroeconomics

This handout covers the economy as a whole: national income accounting, growth, unemployment, inflation, the financial system, monetary and fiscal policy, and international trade - the core toolkit for understanding economic news and policy debates.

12 lecture-wise topics | key terms | exam pointers

Table of Contents

UNIT 1: MEASURING THE ECONOMY

Lecture 1: The Scope of Macroeconomics

Lecture 2: GDP and National Income Accounting

Lecture 3: Unemployment and Inflation

UNIT 2: THE REAL ECONOMY IN THE LONG RUN

Lecture 4: Economic Growth

Lecture 5: The Financial System and Money

UNIT 3: SHORT-RUN FLUCTUATIONS

Lecture 6: Aggregate Demand and Supply

Lecture 7: The Keynesian Cross and the Multiplier

Lecture 8: IS-LM and Monetary Policy

UNIT 4: POLICY AND THE OPEN ECONOMY

Lecture 9: Fiscal Policy and Government Debt

Lecture 10: Central Banking and Monetary Policy

Lecture 11: International Trade and Finance

Lecture 12: Macroeconomic Debates and Current Issues

UNIT 1: MEASURING THE ECONOMY

Lecture 1: The Scope of Macroeconomics

Learning Objectives

- Define macroeconomics
- Explain the circular flow model
- Distinguish micro from macro

Key Terms & Definitions

Macroeconomics

Study of economy-wide phenomena: output, employment, inflation, growth.

Circular flow

Model of money/goods flows between households, firms, government and foreign sectors.

Leakages and injections

Withdrawals from (saving, taxes, imports) and additions to (investment, government spending, exports) the flow.

While **microeconomics** studies individual markets, **macroeconomics** studies aggregates: total output (**GDP**), the price level, unemployment. The two connect: macro outcomes emerge from micro behavior, and macro policy shifts micro incentives.

The **circular flow**: households supply factors to firms, receive income, and spend on goods; firms produce and pay factors. Add **government** (taxes/spending) and the **foreign sector** (exports/imports). **Equilibrium** requires leakages = injections: $S + T + M = I + G + X$.

Macroeconomic **goals**: high sustainable growth, low unemployment, stable prices - the "holy trinity", often in tension (the Phillips curve trade-off). Policy tools: **fiscal** (government spending/taxation) and **monetary** (money supply/interest rates).

- **Three markets interact**: goods, money, labour - macro models link them.
- **Stocks vs flows**: wealth is a stock; income is a flow - never confuse them.
- **Nominal vs real**: always adjust for price changes before comparing across time.

VERY IMPORTANT — Exam Pointer

Very important: draw and explain the four-sector circular flow with leakages and injections.

Section Summary

Macroeconomics studies aggregates through the circular flow; policy aims at growth, jobs and stable prices.

Lecture 2: GDP and National Income Accounting

Learning Objectives

- Define and compute GDP
- Explain the three approaches
- Discuss GDP limitations

Key Terms & Definitions

GDP

Gross Domestic Product: market value of all final goods/services produced within a country in a period.

Value added

A firm's output value minus its intermediate input costs - prevents double counting.

Nominal vs Real GDP

Valued at current vs constant (base-year) prices.

GDP counts only **final** goods, produced **within borders** (GNP counts nationals' output anywhere), in the **current period** (no second-hand sales), at **market prices**. Three equivalent approaches: **expenditure** ($C + I + G + NX$), **income** (wages + rents + interest + profits), **value-added** (sum over firms).

Nominal GDP uses current prices; **real GDP** fixes prices at a base year to isolate quantity growth. **GDP deflator** = $(\text{Nominal}/\text{Real}) \times 100$ - a broad price index. **Growth rate** = percentage change in real GDP. **Per capita** figures divide by population for welfare comparisons.

Limitations: excludes non-market/home production, the underground economy, leisure, environmental damage, and distribution (averages hide inequality). **Genuine progress indicators** and HDI supplement GDP - but GDP remains the standard cyclical indicator.

- **$Y = C + I + G + NX$:** memorize the expenditure identity.
- **Final goods only** - intermediate sales excluded via value added.
- **Real = nominal/deflator:** always compare in real terms.
- **GDP per capita (PPP)** for cross-country welfare comparisons.

Example

Bread: farmer sells wheat Rs 50 -> miller flour Rs 80 -> baker bread Rs 120. Value added = $50 + 30 + 40 = \text{Rs } 120$ = final bread value. Counting all sales (250) would double-count.

VERY IMPORTANT — Exam Pointer

Very important: compute GDP by expenditure and explain why intermediate goods are excluded.

Section Summary

GDP measures final production three equivalent ways; real GDP tracks actual growth.

Lecture 3: Unemployment and Inflation

Learning Objectives

- Define unemployment measures

- Explain CPI construction
- Discuss costs of each

Key Terms & Definitions

Unemployment rate

Unemployed / labour force x 100 (ILO definitions).

CPI

Consumer Price Index: cost of a fixed basket relative to a base year.

Phillips curve

Short-run inverse relation between inflation and unemployment.

Labour force = employed + unemployed (actively seeking); the **unemployment rate** = unemployed/labour force. Types: **frictional** (job search), **structural** (skills mismatch), **cyclical** (demand shortfall), seasonal. **Natural rate** = frictional + structural; **full employment** means zero cyclical unemployment, not zero unemployment.

CPI: price a representative **basket**, divide by base-year cost, x100. **Inflation** = % change in CPI. **Biases**: substitution, new goods, quality change (Boskin). **GDP deflator** covers all goods; CPI covers consumers' basket. **Costs of inflation**: shoe-leather, menu costs, arbitrary redistribution (borrowers gain), uncertainty; **deflation** risks debt spirals.

Phillips curve: short-run trade-off (demand stimulus lowers unemployment but raises inflation); **long-run vertical** at the natural rate (Friedman/Phelps) - expectations adjust. **Stagflation** (1970s) broke the simple trade-off via supply shocks.

- **Unemployed** = without work AND actively seeking - discouraged workers exit the labour force.
- **Inflation rate** = $(CPI_t - CPI_{t-1}) / CPI_{t-1} \times 100$.
- **Natural rate** is the long-run anchor; policy affects cyclical unemployment.
- **Hyperinflation** destroys money's store-of-value function (Zimbabwe, Venezuela).

Example

Pakistan CPI basket weights food heavily (~35%), so food-price spikes hit measured inflation - and household welfare - harder than in the US.

VERY IMPORTANT — Exam Pointer

Very important: distinguish the four unemployment types and explain the short-run vs long-run Phillips curve.

Section Summary

Unemployment and inflation are measured by surveys and baskets; policy navigates their short-run trade-off.

UNIT 2: THE REAL ECONOMY IN THE LONG RUN

Lecture 4: Economic Growth

Learning Objectives

- Explain growth determinants
- Describe the Solow model
- Discuss convergence

Key Terms & Definitions

Solow growth model

Output from capital, labour and technology; diminishing returns to capital.

Steady state

Capital per worker constant: investment equals depreciation + population growth.

Convergence

Poorer economies growing faster than rich ones (conditional).

Growth compounds: 2% vs 4% annual growth doubles incomes in 35 vs 18 years (**rule of 70**). Sources: **factor accumulation** (capital, labour, human capital) and **productivity** (technology, institutions). **Total factor productivity** - the Solow residual - explains most long-run growth differences.

Solow model: $Y = F(K, AL)$; capital per effective worker k evolves by investment $sf(k)$ minus break-even $(n + g + \delta)k$. **Steady state** where they meet: long-run growth then comes only from **technology**. Policy raises **levels** (saving rate) but lasting growth needs innovation.

Convergence: conditional - similar institutions/policies converge; absolute convergence fails (poverty traps). **Endogenous growth** (Romer): ideas are non-rival, R&D and human capital drive sustained growth; institutions (property rights) are the deep determinant.

- **Rule of 70**: doubling years = $70 / \text{growth rate}$.
- **Steady state**: $sf(k) = (n+g+\delta)k$.
- **Technology** is the only source of sustained per-capita growth in Solow.
- **Institutions rule** (Acemoglu): property rights and inclusive institutions explain divergence.

VERY IMPORTANT — Exam Pointer

Exam pointer: explain the steady state and why the saving rate affects the level but not the long-run growth rate.

Section Summary

Capital deepening gives temporary growth; technology and institutions drive lasting prosperity.

Lecture 5: The Financial System and Money

Learning Objectives

- Describe financial intermediation

- Define money and its functions
- Explain money creation

Key Terms & Definitions

Financial intermediation

Channeling savings to borrowers via banks and markets.

Money

Medium of exchange, unit of account, store of value.

Money multiplier

$1/\text{reserve ratio}$: how deposits multiply through fractional-reserve banking.

The **financial system** moves savings to investment: **banks** (indirect finance, maturity transformation), **bond/stock markets** (direct finance). Functions: mobilizing savings, allocating capital, **risk sharing** (diversification), providing liquidity, and **price discovery**.

Money: whatever serves as **medium of exchange** (accepted in trade), **unit of account** (prices quoted), **store of value** (purchasing power over time). Measures: **M1** (currency + demand deposits), **M2** (M1 + savings/time deposits). Cryptoassets mostly fail the unit-of-account test.

Money creation: with a 10% reserve ratio, a Rs 1,000 deposit supports Rs 10,000 of deposits system-wide (**multiplier** = $1/0.10$) - banks keep reserves, lend the rest, loans become deposits. The **central bank** controls base money; the multiplier leaks via cash holdings and excess reserves.

- **Banks create deposits** by lending - loans make deposits, not vice versa.
- **Multiplier** = $1/rr$, smaller with cash drains and excess reserves.
- **Real interest rate** = **nominal** - **inflation** (Fisher).
- **Financial crises** erupt when intermediation seizes (2008, bank runs).

Example

State Bank raises the reserve requirement: the multiplier shrinks, banks lend less, broad money contracts - a monetary tightening channel.

VERY IMPORTANT — Exam Pointer

Very important: explain the deposit multiplier process step by step.

Section Summary

Banks intermediate savings into investment and multiply base money into broad money.

UNIT 3: SHORT-RUN FLUCTUATIONS

Lecture 6: Aggregate Demand and Supply

Learning Objectives

- Derive the AD curve
- Explain SRAS and LRAS
- Analyze demand/supply shocks

Key Terms & Definitions

AD curve

Downward-sloping: price level vs quantity of output demanded.

SRAS / LRAS

Short-run (sticky prices, upward-sloping) vs long-run (vertical at potential output) aggregate supply.

Stagflation

Falling output with rising prices - an adverse supply shock.

AD slopes down via the wealth effect (lower P raises real money balances), interest-rate effect, and international-price effect. **Shifts:** consumption (confidence, taxes), investment (interest rates, expectations), government spending, net exports (foreign income, exchange rates).

SRAS slopes up: sticky wages/prices (contracts, menu costs, misperceptions) - higher P with fixed costs raises profits and output. **LRAS is vertical at potential (full-employment) output** - money is neutral in the long run. **Shifts in SRAS:** input prices (oil), productivity, taxes/subsidies, expectations.

Shocks: demand shock (e.g. export boom) moves AD - output and prices move together; **supply shock** (oil spike) moves SRAS - output and prices move oppositely (**stagflation**). Policy can offset demand shocks but faces a cruel trade-off with supply shocks.

- **AD down, SRAS up, LRAS vertical:** draw all three and label.
- **Demand shock:** Y and P same direction; **supply shock:** opposite.
- **Potential output** is supply-determined (technology, factors) - demand only deviates from it short-run.
- **Self-correction:** wages adjust eventually, returning output to potential.

VERY IMPORTANT — Exam Pointer

Very important: use AD-AS to contrast a demand shock with an oil-price (supply) shock.

Section Summary

AD-AS organizes short-run fluctuations: demand moves Y and P together, supply shocks split them.

Lecture 7: The Keynesian Cross and the Multiplier

Learning Objectives

- Build the Keynesian cross
- Derive the spending multiplier
- Explain the paradox of thrift

Key Terms & Definitions

Keynesian cross

45-degree diagram: planned expenditure vs output; equilibrium where $Y = E$.

Multiplier

$1/(1-MPC)$: total output change per unit of autonomous spending.

Paradox of thrift

Higher desired saving can reduce total saving via lower income.

Planned expenditure $E = C + I + G$ (closed economy): $C = a + MPC \times Y$. Equilibrium where $Y = E$ (inventories unplanned-investment signal). A rise in G shifts E up; output rises until new intersection - the diagram shows **demand-determined output** when prices are fixed.

Multiplier: an initial Rs 1 of G becomes someone's income, of which MPC is respent... geometric series summing to $1/(1-MPC)$. $MPC = 0.8 \rightarrow$ multiplier 5. **Tax multiplier** is smaller ($-MPC/(1-MPC)$); **balanced-budget multiplier** = 1. Leakages (imports, taxes) shrink it - open economies have smaller multipliers.

Paradox of thrift: if everyone saves more, consumption falls, output falls, and total saving may not rise - individual virtue, collective harm in a demand-short economy. Keynesian prescription: **active fiscal policy** fills demand gaps; critics warn of lags, debt, and crowding out.

- **Multiplier** = $1/(1-MPC) = 1/MPS$.
- **Equilibrium condition**: $Y = C + I + G (+ NX)$.
- **Paradox of thrift**: saving depends on income, not just thriftiness.
- **Automatic stabilizers** (unemployment benefits, progressive taxes) dampen cycles without new laws.

Example

$MPC = 0.75$, government raises spending Rs 20bn: output rises Rs 80bn (multiplier 4) - before crowding out and import leakages trim it.

VERY IMPORTANT — Exam Pointer

Very important: derive the multiplier and explain the paradox of thrift intuitively.

Section Summary

Demand drives short-run output; the multiplier amplifies fiscal actions, leakages shrink it.

Lecture 8: IS-LM and Monetary Policy

Learning Objectives

- Derive IS and LM curves
- Find equilibrium with IS-LM
- Explain monetary transmission

Key Terms & Definitions

IS curve

Goods-market equilibrium: r vs Y combinations where $I(r) + G = S(Y) + T$.

LM curve

Money-market equilibrium: r vs Y where money demand = money supply.

Liquidity trap

Horizontal LM: monetary policy impotent at near-zero rates.

IS slopes down: lower r raises investment, raising Y via the multiplier. Shifts: fiscal policy (G up shifts IS right), confidence. **LM** slopes up: higher Y raises money demand, requiring higher r to clear a fixed money supply. Shifts: money supply (expansion shifts LM right).

Equilibrium at $IS=LM$ gives (r, Y) . **Fiscal expansion**: IS right $\rightarrow Y$ up, r up (**crowding out** of investment). **Monetary expansion**: LM right $\rightarrow r$ down, Y up. **Policy mix** (e.g. fiscal expansion + monetary accommodation) can raise Y without raising r .

Transmission: central bank sets policy rate $\rightarrow$ bank lending rates $\rightarrow$ investment/consumption $\rightarrow$ AD. **Liquidity trap** (Japan 1990s, 2008): rates near zero, LM flat, extra money hoarded - fiscal policy regains potency. **Quantitative easing** then works via asset prices/expectations.

- **IS down (investment), LM up (money demand)** - memorize slopes and shifters.
- **Crowding out**: fiscal expansion raises r , partly offsetting the stimulus.
- **Liquidity trap** $\Rightarrow$ monetary policy weak, fiscal policy strong.
- **Taylor rule**: rates respond to inflation and output gaps.

VERY IMPORTANT — Exam Pointer

Exam pointer: use IS-LM to show fiscal vs monetary expansion effects on r and Y .

Section Summary

IS-LM unites goods and money markets; it shows how policies move output and interest rates - and their limits.

UNIT 4: POLICY AND THE OPEN ECONOMY

Lecture 9: Fiscal Policy and Government Debt

Learning Objectives

- Evaluate fiscal tools
- Discuss deficit financing
- Assess debt sustainability

Key Terms & Definitions

Fiscal policy

Government spending and taxation to influence the economy.

Budget deficit

$G + \text{transfers} - \text{taxes} > 0$ in a year; debt is the accumulated stock.

Crowding out

Government borrowing raising interest rates and reducing private investment.

Tools: discretionary (stimulus packages, tax cuts) and **automatic stabilizers**. **Expansionary** (deficit) in recessions, **contractionary** (surplus) in booms - **countercyclical** policy. **Lags** plague discretion: recognition, legislative, implementation - mistimed stimulus can destabilize.

Deficits financed by borrowing (bonds) or money creation (seigniorage - inflationary). **Crowding out:** borrowing raises r , cutting I ; **Ricardian equivalence** (Barro) claims rational households save the tax cut, neutralizing stimulus - strong assumptions, weak evidence. **Multipliers** are larger in recessions and at the zero lower bound.

Debt sustainability: debt/GDP stabilizes if $(r - g) \times \text{debt ratio} \leq \text{primary surplus}$. If $g > r$, economies can outgrow debt. Dangers: high debt $\rightarrow$ risk premia, rollover crises, burden on future generations (via lower capital stock). Pakistan's debt dynamics illustrate the r -vs- g arithmetic.

- **Deficit = flow, debt = stock** - never confuse them.
- **Countercyclical:** deficits in recessions, surpluses in booms.
- **Debt dynamics:** sustainable iff primary surplus $\geq (r - g) \times (D/Y)$.
- **Automatic stabilizers** act fastest - no vote needed.

VERY IMPORTANT — Exam Pointer

Very important: explain crowding out and the debt-sustainability condition.

Section Summary

Fiscal policy stabilizes demand but faces lags and debt arithmetic; sustainability hinges on r vs g .

Lecture 10: Central Banking and Monetary Policy

Learning Objectives

- Describe central bank functions
- Explain policy instruments
- Discuss inflation targeting

Key Terms & Definitions

Central bank

Monopoly issuer of base money; lender of last resort (e.g. State Bank of Pakistan).

Policy rate

The short-term rate the central bank targets (discount/policy rate).

Inflation targeting

Pre-announced inflation target guiding rate decisions.

Functions: issue currency, conduct **monetary policy**, supervise banks, **lender of last resort** (Bagehot: lend freely at penalty rates against good collateral), manage reserves/payments. **Independence** (instrument, not goal) correlates with lower inflation - politicians face election-cycle temptation.

Instruments: **policy rate** (open market operations move interbank rates), **reserve requirements**, **discount window**, and unconventional: **QE** (buying long bonds), forward guidance. **Transmission:** rates -> credit -> spending -> inflation, with **long and variable lags** (12-24 months).

Inflation targeting (New Zealand 1990 onwards): explicit target (often 2%), transparent communication, accountability. **Rules vs discretion:** rules (Taylor) anchor expectations; discretion handles shocks - modern practice is **constrained discretion**. **Exchange-rate regimes** constrain monetary autonomy (impossible trinity).

- **Bagehot's dictum:** lend freely, at penalty rate, on good collateral.
- **Lags:** monetary policy hits inflation 1-2 years out - be forward-looking.
- **Independence + accountability** is the modern central-bank formula.
- **Impossible trinity:** fixed FX, free capital, independent policy - pick two.

Example

State Bank of Pakistan raises the policy rate to fight inflation: borrowing costs rise, demand cools, the rupee firms - with growth slowing as the side effect.

VERY IMPORTANT — Exam Pointer

Exam pointer: list central bank instruments and explain the transmission lag problem.

Section Summary

Central banks steer demand via interest rates under lags and credibility constraints.

Lecture 11: International Trade and Finance

Learning Objectives

- Explain comparative advantage
- Describe exchange-rate regimes
- Analyze trade policy

Key Terms & Definitions

Comparative advantage

Ricardo: export goods with the lowest opportunity cost, even without absolute advantage.

Exchange rate

Price of domestic currency in foreign currency terms.

Balance of payments

Record of transactions: current account + capital/financial account = 0.

Comparative advantage: Portugal makes wine and cloth cheaper (absolute), but England's opportunity cost of cloth is lower - both gain by specializing. Sources: factor endowments (**Heckscher-Ohlin**), technology, scale economies. **Gains from trade** raise consumption possibilities; adjustment costs (displaced workers) are real and need policy response.

Exchange rates: **fixed** (peg - needs reserves/credibility), **floating** (market-determined, shock absorber), managed float. **Depreciation** boosts exports, raises import prices (pass-through inflation). **Purchasing power parity** anchors long-run rates; interest differentials drive short-run (**uncovered interest parity**).

Balance of payments: current account (trade + incomes + transfers) + financial account = 0 - a deficit is financed by capital inflows/debt. **Trade policy:** tariffs/quotas protect but cost consumers and invite retaliation; WTO rules discipline them. **Mundell-Fleming:** fiscal power under fixed rates, monetary power under floating (with capital mobility).

- **Comparative, not absolute, advantage** drives trade - opportunity cost is the key.
- **Depreciation:** exports cheaper abroad, imports dearer at home.
- **BOP identity:** current + capital account = 0 (excluding errors).
- **Mundell-Fleming:** match the effective policy tool to the FX regime.

VERY IMPORTANT — Exam Pointer

Very important: prove gains from trade with a two-good comparative-advantage example.

Section Summary

Trade raises welfare via comparative advantage; exchange-rate regimes shape policy effectiveness.

Lecture 12: Macroeconomic Debates and Current Issues

Learning Objectives

- Contrast classical and Keynesian views
- Discuss supply-side economics
- Apply macro to current issues

Key Terms & Definitions

Classical view

Markets clear; economy self-corrects to full employment (Say's law).

New Keynesian

Micro-founded models with sticky prices justifying stabilization policy.

Rational expectations

Agents use all available information; systematic policy may be neutralized (Lucas).

Classical: flexible wages/prices, **Say's law** (supply creates its demand), money neutral - recessions are brief. **Keynes:** sticky wages, demand failures, animal spirits - active stabilization needed. **Monetarists** (Friedman): steady money growth; **New Classical** (Lucas): **rational expectations** + policy ineffectiveness proposition; **Real business cycles:** technology shocks drive cycles.

New Keynesian synthesis: DSGE models with sticky prices, monopolistic competition - the modern workhorse justifying inflation-targeting central banks. **Supply-side:** incentives, taxes, deregulation shift LRAS. **MMT** debates: currency issuers' fiscal space - mainstream accepts the accounting, disputes the inflation complacency.

Current applications: post-COVID inflation (supply chains + demand stimulus), Pakistan's IMF programs (fiscal consolidation vs growth), climate change as a macro shock, digital currencies (CBDCs) and monetary sovereignty. Macro is a living debate, not settled doctrine.

- **Schools timeline:** Classical -> Keynes -> Monetarist -> New Classical -> New Keynesian synthesis.
- **Lucas critique:** policy evaluation must model expectations, not just past correlations.
- **Apply frameworks**, don't memorize slogans - examiners reward AD-AS/IS-LM applied to news.
- **Humility:** forecasts err; ranges and scenarios beat point predictions.

VERY IMPORTANT — Exam Pointer

Exam pointer: contrast the classical and Keynesian policy conclusions from their core assumptions.

Section Summary

Macro debates reflect assumptions about flexibility and expectations; apply the frameworks to live issues.

Glossary of Key Terms

GDP — Market value of final goods/services produced domestically in a period.

Multiplier — $1/(1-MPC)$: output change per unit of autonomous spending.

Phillips curve — Short-run inflation-unemployment trade-off; vertical long-run.

IS-LM — Goods- and money-market equilibrium determining r and Y .

Crowding out — Public borrowing raising rates and displacing private investment.

Comparative advantage — Export where opportunity cost is lowest (Ricardo).

Inflation targeting — Pre-announced inflation target guiding monetary policy.

Stagflation — Stagnant output with rising inflation (supply shock).