

CFA® Level I

One-Page Learning Module Summaries

Economics

8 learning modules · one page each · built from CFA Program Level I curriculum, Volume 2

How each page works

■ Module banner	Exact module title, exam relevance (High/Medium/Low-yield) and whether it is calculation- or concept-heavy.
■ The big picture	Two or three sentences of intuition: why the module exists.
■ Learning outcomes	Every LOS of the module, in book order, rewritten as what you must know or do.
■ Key formulas / key facts	Formulas in curriculum notation with every variable defined; fact tables for concept modules.
■ Worked example	One numerical example (or a short Ethics case). Tagged [CFA curriculum] when taken from the curriculum, [Illustrative] when made up by RBei.
■ What examiners like to test	Traps, key distinctions and typical question angles.

Notes. (1) The curriculum lists LOS without letters; “LOS 1, 2, 3” follows the order in the book. (2) Exam relevance is RBei’s judgement from the number of LOS, the calculation LOS and the weight of worked examples and practice problems in each module; the curriculum does not rate modules. (3) [India context, not curriculum] marks Indian examples added for context; they are not curriculum. (4) [Note: ...] marks places where the curriculum is inconsistent or offers two framings.

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Module 1 — The Firm and Market Structures

Topic: Economics · Exam relevance: High-yield · Calculation + concept

The big picture

Every firm, whatever its market, maximises profit where **marginal revenue equals marginal cost**; what changes across market structures is the **demand curve the firm faces**. A price taker sees a flat demand curve ($P = MR$); a firm with pricing power faces a downward-sloping one ($P > MR$). Barriers to entry then decide whether economic profit survives into the long run.

Learning outcomes in plain language

- LOS 1 Breakeven, shutdown and scale economies.** Breakeven where $TR = TC$ ($P = ATC$; minimum ATC under perfect competition); short-run shutdown when $TR < TVC$ ($P < \text{minimum AVC}$); long-run exit when $TR < TC$. Economies of scale = falling LRAC (specialisation, better equipment, bulk discounts); diseconomies = rising LRAC (too large to manage, duplicated functions, input bottlenecks); minimum efficient scale = lowest point of LRAC.
- LOS 2 Describe the four structures** — perfect competition, monopolistic competition, oligopoly, monopoly — by number of sellers, product differentiation, barriers to entry, pricing power and non-price competition.
- LOS 3 Monopolistic competition.** Downward-sloping demand; output where $MR = MC$, price read off the demand curve; no well-defined supply curve; low entry barriers push long-run economic profit to zero at an output *below* the minimum-average-cost output.
- LOS 4 Oligopoly.** Interdependent pricing: kinked demand curve (cuts matched, rises ignored), Cournot (rival's output taken as given), Nash equilibrium (no gain from a unilateral change), Stackelberg (leader moves first), dominant-firm price leadership; factors that make collusion succeed or fail.
- LOS 5 Identify the structure and use concentration measures.** Econometric elasticity estimates are ideal but data-hungry; the N -firm concentration ratio and HHI are simple, but ignore entry barriers and demand elasticity, and the ratio barely moves after a merger of leaders.

Key formulas

Profit max: $MR = MC$ (MC not falling), $\pi = TR - TC$; Breakeven: $TR = TC$ ($P = ATC$); Shutdown: $TR < TVC$

Perfect competition: $P = MR = AR$; Concentration ratio = $\sum_{i=1}^N s_i$; $HHI = \sum_{i=1}^N s_i^2$ (M equal firms $\Rightarrow HHI = 1/M$)

where s_i = market share of firm i (HHI uses decimals); TR , TC , TVC = total revenue, total cost, total variable cost; ATC , AVC = average total and average variable cost. All costs are *economic* costs (include opportunity cost). Decision table: $TR \geq TC$ stay; $TVC \leq TR < TC$ operate in the short run but exit in the long run; $TR < TVC$ shut down now, exit later.

[Note: the curriculum's characteristics table lists oligopoly products as "homogeneous/standardized", but its oligopoly text says products may be branded/differentiated (cereals, beverages) or homogeneous (petroleum, cement). Both occur.]

Worked example (CFA curriculum)

Cournot duopoly. $Q_D = 450 - P$, $MC = 30$, so $P = 450 - (q_1 + q_2)$. Each firm sets $450 - 2q_1 - q_2 = 30$; with $q_1 = q_2$: $450 - 3q_1 = 30 \Rightarrow q_1 = q_2 = \mathbf{140}$, $Q = 280$, $P = \mathbf{170}$. Competitive benchmark: $450 - Q = 30 \Rightarrow Q = 420$, $P = 30$. Monopoly: $MR = 450 - 2Q = 30 \Rightarrow Q = 210$, $P = \mathbf{240}$. Cournot lies between the two.

Shutdown. Revenue GBP2.0m, TFC GBP1.0m, TVC GBP1.5m: operating loses GBP0.5m, shutting down loses GBP1.0m, so **operate** in the short run and exit if the shortfall persists. If revenue falls to GBP1.3m ($< TVC$), operating loses GBP1.2m, so **shut down** and save GBP0.2m.

Concentration. Shares 35/25/20/10 and four firms at 2.5%: 3-firm ratio = 80%, $HHI = 0.35^2 + 0.25^2 + 0.20^2 = \mathbf{0.225}$. If the top two merge: ratio = 90% (only +10 points) but $HHI = 0.60^2 + 0.20^2 + 0.10^2 = \mathbf{0.410}$.

What examiners like to test

- **Breakeven vs shutdown:** breakeven is minimum ATC ; shutdown is minimum AVC . Between the two, the firm keeps operating at a loss because it covers variable cost and part of fixed (sunk) cost.
- **Price $\neq$ MR** outside perfect competition: output from $MR = MC$, price from the demand curve. "Minimise ATC " is *not* the profit-maximising rule, and only perfect competition has a well-defined supply curve (the MC curve).
- **Oligopoly traps:** collusion is *less* likely with similar market shares, differentiated products or different cost structures; the kinked curve explains sticky prices but not how the price was set; a dominant firm's share tends to fall over time. In a Nash payoff matrix, the equilibrium need not maximise joint profit.

Module 2 — Understanding Business Cycles

Topic: Economics · Exam relevance: **Medium-yield** · **Concept-heavy**

The big picture

Output swings around its long-run trend (potential output). Hiring, capital spending, inventories, inflation and asset prices behave differently in each phase, so analysts need to know **where in the cycle** the economy is. Credit cycles amplify the swings; indicators read together locate the turning points.

Learning outcomes in plain language

- LOS 1 Describe the business cycle and its phases.** Recurrent (not periodic) expansions and contractions across many sectors, lasting from over one year to 10–12 years. Classical cycle = level of activity; growth cycle = deviation from trend (the curriculum's default); growth rate cycle = growth of activity. Phases: recovery, expansion, slowdown, contraction.
- LOS 2 Describe credit cycles.** Changing availability and pricing of private credit, tied to construction and property. Longer, deeper and sharper than business cycles; recessions with house/equity busts are deeper; strong credit peaks precede systemic banking crises.
- LOS 3 Describe how activity varies over the cycle and how it is measured.** Employment, capital spending, inventories, housing and trade by phase; **leading, coincident, lagging** indicators; composite and diffusion indexes, surveys, nowcasting.

Key facts

	Recovery	Expansion	Slowdown	Contraction
Output gap	Negative gap starts to narrow (trough)	Positive gap opens	Largest positive gap; starts to narrow (peak)	Negative gap opens
Employment	Layoffs slow; overtime before hiring	Hiring; unemployment falls	Hiring at slower pace	Cut hours/overtime, then layoffs
Capital spending	Low; light equipment, software ordered first	Capacity expansion; heavy equipment	New orders still placed near capacity	Orders cancelled; light equipment cut first
Inventory–sales ratio	Falls (sales outpace production)	Stable (restocking)	Rises (sales slow first)	Falls back to normal

Indicators (curriculum examples). *Leading*: stock market, building permits, manufacturers' new orders, average weekly hours (manufacturing), initial jobless claims, 10-year minus policy-rate spread, consumer expectations. *Coincident*: industrial production, real personal income, manufacturing and trade sales, non-farm payrolls. *Lagging*: average duration of unemployment, inventory–sales ratio, change in unit labour costs, inflation, average prime lending rate, consumer instalment debt to income, commercial and industrial loans outstanding.

Diffusion index (Conference Board): score 1.0 if a component rises $> 0.05\%$, 0.5 if it changes $< 0.05\%$, 0 if it falls $> 0.05\%$; index = (sum of scores/no. of components) $\times 100$. It measures the *breadth* of a move.

[Note: the phase table says inflation "further accelerates" in the slowdown, while the phase text says that in the slowdown "inflation slows at some point". The table has inflation decelerating only in the contraction, with a lag.]

Worked example (CFA curriculum)

Diffusion index with four components. Month 1: stock prices $+2.0\%$ (1.0), money growth $+1.0\%$ (1.0), orders flat (0.5), consumer confidence -0.6% (0). Index = $(2.5/4) \times 100 = 62.5$. Month 2: stocks -0.8% (0), money $+0.5\%$ (1.0), orders $+0.5\%$ (1.0), confidence $+3.5\%$ (1.0). Index = $(3.0/4) \times 100 = 75$, a **20%** rise $(75/62.5 - 1)$: more components are rising, so the move in the composite is broader-based.

Reading a mix. Narrowing rate spread, falling capital-goods orders and permits (leading), payrolls turning down (coincident), rising unit labour costs (lagging) $\Rightarrow$ most likely a **peak**.

What examiners like to test

- **Indicator classification:** hours worked and permits *lead*; industrial production and real income *coincide*; unemployment duration, prime rate and unit labour costs *lag* (hiring/firing is costly).
- **Inventories:** the ratio *rises near the top* (sales slow first) and *falls early in a recovery*; productivity peaks at the bottom of a recession ("lean production").
- **Rules of thumb:** "two negative quarters of real GDP" is only a rule; equities usually bottom 3–6 months before the economy; nowcasting estimates the *present*.

Module 3 — Fiscal Policy

Topic: Economics · Exam relevance: **Medium-yield** · Calculation + concept

The big picture

Fiscal policy is the government's decisions on **taxation and spending**; monetary policy is the central bank's influence on the **quantity of money and credit**. Both aim at stable, positive growth with low, stable inflation, but fiscal policy can also redistribute income. Its power comes from the **multiplier**; its weaknesses are lags, uncertainty, crowding out and debt.

Learning outcomes in plain language

- LOS 1 Compare monetary and fiscal policy.** Who acts (central bank vs government), which tools (money and credit vs taxes and spending) and the shared goal; fiscal policy alone can target the distribution of income and wealth.
- LOS 2 Roles and objectives; does debt/GDP matter?** Fiscal policy influences aggregate demand, income distribution and resource allocation; know automatic stabilisers vs discretionary policy. *Not concerned:* debt owed to own citizens, borrowing funds capital or human capital, chance to reform distorting taxes, Ricardian equivalence, spare capacity. *Concerned:* higher future tax rates reduce incentives, money printing and inflation, crowding out.
- LOS 3 Tools, with pros and cons.** Spending: transfer payments (not in GDP), current spending, capital spending. Revenue: direct and indirect taxes. Desirable tax attributes: simplicity, efficiency, fairness (horizontal/vertical equity), revenue sufficiency. Indirect taxes change fast and hit targeted behaviour; direct taxes and transfers need notice; capital projects are slow but add productive capacity.
- LOS 4 Implementation and stance.** Judge the stance by the **structural (cyclically adjusted) deficit**, not the actual deficit; real vs nominal interest on debt; recognition, action and impact lags; forecasting uncertainty, inflation risk, market reaction to large deficits, unknown full employment, supply-side shortfalls, crowding out.

Key formulas

Government sector's net impact on AD: $G - T + B$ ($> 0 \Rightarrow$ deficit), $Y_D = Y - NT = (1 - t)Y$, $c + s = 1$

$$\text{Multiplier (no taxes)} = \frac{1}{1 - c}, \quad \text{Fiscal multiplier} = \frac{1}{1 - c(1 - t)}, \quad \text{Balanced budget multiplier} = 1$$

where G = government spending, T = taxes, B = transfer benefits, NT = net taxes (taxes less transfers), Y = national income, Y_D = disposable income, t = net tax rate, c = marginal propensity to consume (MPC) out of disposable income, s = marginal propensity to save (MPS). The multiplier = change in equilibrium output ÷ change in autonomous spending (prices held constant).

Stance: a rise in the deficit (or fall in the surplus) is expansionary; a rise in the surplus is contractionary; a “pay-as-you-go” rule is neutral. **Ricardian equivalence:** if people foresee the future taxes needed to repay bond-financed tax cuts, they save the cut and spending does not change.

Worked example (CFA curriculum)

MPC. Income USD100, tax USD20, disposable income USD80, consumption USD72, saving USD8: $MPC = 72/80 = 0.9$, $MPS = 0.1$. With no taxes the multiplier would be $1/(1 - 0.9) = 10$.

Fiscal multiplier. $c = 0.9$, $t = 0.2$: $1/[1 - 0.9(1 - 0.2)] = 1/0.28 = 3.57$. A USD1 billion rise in G raises total incomes and spending by about USD3.57 billion (given unused capital and labour).

Balanced budget. G rises by USD200, financed by USD200 of extra tax; with MPC 0.9, consumption falls only USD180, so aggregate demand first rises by $200 - 180 = \text{USD}20$, and the multiplier works on that. A genuinely balanced change has a multiplier of exactly 1.

Budget gap. UK projection: spending GBP808bn, revenue GBP769bn $\Rightarrow$ deficit GBP39bn to be borrowed.

What examiners like to test

- **Stance from the right measure:** a recession raises the actual deficit through automatic stabilisers without any policy change; use the structural deficit. More spending is not “always expansionary” if taxes rise more; a bigger deficit is.
- **Classification:** tax rates and transfers are fiscal; deposit requirements for house purchases, policy rates and bond purchases are monetary. Employment taxes are *not* indirect taxes; new road-building plans are discretionary, not automatic.
- **Effectiveness:** fiscal expansion has the most effect on output with *considerable* unemployment; near full employment it mainly raises prices. Crowding out = government borrowing raises rates and displaces private investment.

Module 4 — Monetary Policy

Topic: Economics · Exam relevance: **Medium-yield** · **Concept-heavy**

The big picture

Central banks supply the currency and use it to pursue **price stability**. They set a short policy rate (and use open market operations and reserve requirements) and rely on a **transmission mechanism** of market rates, asset prices, expectations and the exchange rate to reach inflation. Independence, credibility and transparency make that work; deflation, liquidity traps and fiscal pressures limit it.

Learning outcomes in plain language

- LOS 1 Roles and objectives of central banks.** Monopoly supplier of (fiat) currency, banker to the government and bankers' bank, lender of last resort, regulator of the payments system, conductor of monetary policy, supervisor of banks (not always, and sometimes shared); usually also manager of FX and gold reserves. Overarching objective: price stability (some add employment or growth).
- LOS 2 Tools and transmission.** Open market operations, the policy (refinancing/repo) rate, reserve requirements (rarely used in developed markets). A policy-rate rise lifts bank and market rates, lowers asset prices, dampens expectations and confidence and appreciates the currency, so domestic demand, net external demand, import prices and hence inflation fall; growth slows.
- LOS 3 Effective central banks, targeting, limits.** Independence (operational vs target), credibility, transparency. Inflation targeting (typically 2% CPI $\pm$ 1 point, about two years ahead); policy rate vs neutral rate (expansionary below, contractionary above); exchange rate targeting "imports" the anchor's inflation but makes domestic rates follow the peg. Limits: no control over deposits or bank lending, bond vigilantes, liquidity trap, deflation and the zero bound, QE risks; developing-market impediments.
- LOS 4 Interaction with fiscal policy.** Easy/tight combinations change output, interest rates and the public-vs-private split; monetary accommodation raises fiscal multipliers; Ricardian equivalence favours monetary tools; large-scale bond buying can monetise deficits.

Key formulas

$$\text{Neutral rate} = \text{Trend growth} + \text{Inflation target}$$

Policy rate > neutral rate: contractionary; policy rate < neutral rate: expansionary.

Trend growth = real trend rate of growth of the economy; the inflation target proxies long-run expected inflation. The neutral rate neither spurs on nor slows the economy and should correspond to the average policy rate over a cycle.

Policy mix	Output and interest rates	Composition of GDP
Easy fiscal / tight monetary	Output up, interest rates up	Public sector share rises
Tight fiscal / easy monetary	Private demand stimulated	Private share rises, public shrinks
Easy fiscal / easy monetary	Highly expansionary; rates lower (if monetary effect larger)	Both sectors grow
Tight fiscal / tight monetary	Aggregate demand falls; rates higher	Both sectors shrink

Exchange rate target under pressure: if domestic inflation exceeds the anchor's, the central bank sells FX reserves and buys its own currency, so the money supply falls and **short-term rates rise**. **Demand vs supply shock:** tighten against a demand-led inflation rise; raising rates into an oil-price (supply) shock may deepen the downturn.

Worked example (CFA curriculum)

Neutral rate. Inflation target 2.0%, sustainable trend growth 2.5%: neutral rate = 2.5% + 2.0% = **4.5%**. A policy rate above 4.5% is contractionary, below it expansionary. With trend growth 3% and a 2% target, neutral = 5%, so a **4%** policy rate is the expansionary choice (5% neutral, 6% contractionary).

IMF study of fiscal–monetary interaction. Cumulative two-year multiplier for government spending: **1.6** with no monetary accommodation vs **3.9** with interest rates held unchanged; for targeted transfers to the poorest: 0.5 vs 1.7. Accommodation lets inflation lower *real* rates, adding private spending; labour tax cuts are the exception.

What examiners like to test

- **Independence:** a bank that sets both the inflation target and the policy rate is *target and operationally* independent (ECB); one hitting a government-set target (UK, New Zealand, Sweden) is only operationally independent.
- **Why 2%, not 0%:** a zero target risks deflation, which conventional policy handles poorly because rates cannot go much below zero. In a liquidity trap, money demand is perfectly elastic and extra money does not lower rates.
- **Not tools of monetary policy:** transfer programmes and tax rates (fiscal). Selling long-dated bonds *discourages* borrowing; open market purchases and QE are expansionary; raising reserve requirements is contractionary.

Module 5 — Introduction to Geopolitics

Topic: Economics · Exam relevance: **Medium-yield** · **Concept-heavy**

The big picture

Geopolitics studies how geography shapes relations between **actors**: state actors (governments, leaders) and non-state actors (companies, NGOs, individuals). Two axes, **political cooperation vs non-cooperation** and **globalization vs nationalism**, place each country; where it sits, and whether it is moving, drives geopolitical risk, volatility and required returns.

Learning outcomes in plain language

- LOS 1 Cooperation vs competition.** A cooperative country engages *and reciprocates* in rules standardisation, tariff harmonisation and free flows. Drivers: national security, economic interest, resource endowment, standardisation, soft power; strong institutions make it durable; a **hierarchy of interests** (survival first) sets priorities.
- LOS 2 Geopolitics and globalization.** Economic and financial cooperation, driven mainly by non-state actors. Gains: profits, access to resources and markets, intrinsic gains. Costs: unequal gains, lower ESG standards, political backlash, interdependence. Rollback responses: reshore essentials, reglobalise production, double down on key markets.
- LOS 3 International organizations.** **IMF**: stability of the international monetary system; temporary, conditional FX lending for balance of payments problems. **World Bank** (IBRD, IDA): fight poverty, environmentally sound growth; cheap loans, grants, advice. **WTO** (1995, replaced GATT): legal base of global trade; administers agreements, negotiations, disputes.
- LOS 4 Geopolitical risk.** Tensions or actions between actors that disrupt normal, peaceful relations; assess via the four archetypes and each country's stability in its quadrant.
- LOS 5 Tools of geopolitics.** National security (armed conflict, espionage, alliances), economic (trade agreements vs nationalisation, VERs) and financial (free currency exchange vs investment restrictions, sanctions); each can be cooperative or not.
- LOS 6 Impact on investments.** Event, exogenous, thematic risk; assess likelihood, velocity and size/nature of impact; scenarios and signposts; higher risk, higher discount rates.

Key facts

	Globalization	Nationalism
Cooperation	Multilateralism : mutually beneficial trade, extensive rules harmonisation (Singapore, Germany)	Bilateralism : one-at-a-time agreements with single partners (Japan in the past)
Non-cooperation	Hegemony : regional/global leader uses influence to control resources (China, Russia examples)	Autarky : self-sufficiency, little external trade or finance (North Korea, Venezuela)
Risk type	Nature	Curriculum example
Event	Set dates known in advance (elections, legislation)	UK EU referendum, 2016
Exogenous	Sudden, unanticipated (uprisings, invasions, disasters)	Fukushima, 2011
Thematic	Known, evolves over time (climate, cyber, terrorism)	Equifax data breach, 2017
Velocity and reaction : high velocity → market volatility, flight to quality; medium → adjust exposure to specific sectors; low velocity → adjust asset allocation. Signposts work like a traffic light (green, amber, red); follow <i>policy</i> , not politics.		

Worked example (CFA curriculum)

Event risk: Brexit vote. First day: FTSE −3.1%, GBP −8.1%, gilt yield −21%; after one year: FTSE +17.1%, GBP −14.5%. Equities recovered, sterling kept falling: a high-velocity shock plus low-velocity effects. Signposts: green before 2014, amber when the vote was announced, red when May 2016 polls showed “leave” ahead.

High-velocity shock: COVID-19. S&P 500 fell from 3,386 to 2,237.4 ($2,237.4/3,386 - 1 = -33.9\%$) while the 10-year Treasury yield fell from 1.5661 to 0.5407 (flight to safety). [Note: the book calls the yield fall “nearly 68 percent”; the quoted levels give $0.5407/1.5661 - 1 = -65.5\%$.]

What examiners like to test

- **Match the risk type**: election = event; earthquake = exogenous; ongoing civil war or cyber threat = thematic. Event risk has the least uncertainty (time to prepare).
- **Match the organisation**: WTO = trade rules; IMF = monetary system and balance of payments lending (Greece 2010, Asia 1997); World Bank = poverty and development. GATT alone governed trade from 1948 to 1995.
- **Framework traps**: multilateralism vs autarky differ most; interconnected countries are less likely targets but still vulnerable; security tools can be cooperative (NATO); the *threat* of events hurts more over time (GPR index).

Module 6 — International Trade

Topic: Economics · Exam relevance: **Medium-yield** · **Calculation + concept**

The big picture

Trade raises overall welfare, but creates losers as well as winners: the winners *could* compensate the losers and still be better off. Restrictions shift surplus from consumers to producers and the government (or foreigners) and leave a **deadweight loss**. Trading blocs liberalise faster than global talks, at the risk of trade diversion.

Learning outcomes in plain language

- LOS 1 Benefits and costs of trade.** Exchange and specialisation by comparative advantage (Ricardian: technology; Heckscher–Ohlin: factor endowments), economies of scale, variety, competition, efficient allocation; intra-industry trade. Costs: inequality, job losses and adjustment in import-competing industries.
- LOS 2 Compare trade restrictions.** Tariffs, quotas, voluntary export restraints (VERs), export subsidies: who gains and loses, net welfare in small vs large countries, quota rents; motives (infant industry, jobs, security, revenue, retaliation).
- LOS 3 Trading blocs.** Levels of integration; trade creation vs diversion; advantages (quicker and easier than WTO talks, bargaining power, less conflict, growth spillovers) and challenges (sovereignty, lost policy independence).

Key facts

Tariff, small country (price taker): domestic price rises from world price P^* to $P_t = P^* + t$; production rises $Q_1 \rightarrow Q_2$, consumption falls $Q_4 \rightarrow Q_3$, imports shrink to Q_2Q_3 .

Consumer surplus $-(A + B + C + D)$; producer surplus $+A$; tariff revenue (or quota rents) $+C$; **national welfare** $-B - D$ (B = production inefficiency, D = lost consumption).

	Tariff	Import quota	Export subsidy	VER
Impact on	Importing country	Importing country	Exporting country	Importing country
Government revenue	Increases	Mixed (who captures quota rents)	Falls (spending rises)	No change (rent to foreigners)
National welfare	Decreases (small); could increase (large)	Decreases (small); could increase (large)	Decreases	Decreases

In all four: price, producer surplus and production $\uparrow$; consumer surplus and consumption $\downarrow$. A **large** country's tariff can improve its terms of trade; world welfare still falls. A monetary union adds a common currency.

	Free trade among members	Common external trade policy	Free movement of factors	Common institutions and policies
Free trade area (USMCA)	Yes	No	No	No
Customs union (Benelux, 1947)	Yes	Yes	No	No
Common market (MERCOSUR)	Yes	Yes	Yes	No
Economic union (EU)	Yes	Yes	Yes	Yes

Worked example (CFA curriculum)

South Africa, paper (small country). Domestic output 110,000 tons, demand 200,000 tons, world price USD5.00, imports 90,000 tons. A 20% tariff lifts the price to USD6.00; output rises to 130,000 tons and demand falls to 170,000 tons (imports 40,000).

Consumer surplus loss $= 1 \times 170,000 + \frac{1}{2} \times 1 \times 30,000 = \text{USD185,000}$ ($A+B+C+D$). Producer gain $= 1 \times 110,000 + \frac{1}{2} \times 1 \times 20,000 = \text{USD120,000}$ (A). Tariff revenue $= 1 \times 40,000 = \text{USD40,000}$ (C). Deadweight loss $= \frac{1}{2}(20,000) + \frac{1}{2}(30,000) = \text{USD25,000}$ ($B+D$) $= 185,000 - 120,000 - 40,000$.

Trade creation. Qualor cuts shirt output from 10m to 7m; imports from bloc partner Vulcan rise from 2m to 11m: 3m is **trade creation**, 6m extra consumption. Switching from cheaper non-member Aurelia to Vulcan only because of the tariff would be **trade diversion**.

What examiners like to test

- **Largest welfare loss:** $\text{VER} \geq \text{quota} \geq \text{tariff}$ for the importer: quota rents captured abroad add area C to the loss; auctioned licences make a quota equivalent to a tariff.
- **Comparative advantage wording:** if tea is relatively cheap in Tealand, copper is relatively cheap in Copperland, so *Copperland's copper industry expands*.
- **Bloc ladder:** common external tariff but no factor mobility = customs union; add factor mobility = common market; add common institutions = economic union. Net benefit requires trade creation $>$ trade diversion.

Module 7 — Capital Flows and the FX Market

Topic: Economics · Exam relevance: **High-yield** · Calculation + concept

The big picture

The FX market is the world's largest market, and most of its turnover comes from investment and hedging, not from trade in goods. Every quote is **price currency per one unit of base currency**, so a percentage change always describes the base currency. Governments choose an exchange rate regime that trades off stability, convertibility and monetary independence, and sometimes restrict capital flows outright.

Learning outcomes in plain language

- LOS 1 FX market, nominal vs real rates, percentage change.** Functions (trade, capital flows, hedging, speculation); buy side (corporates, real money, leveraged, retail, governments, central banks, sovereign wealth funds) vs sell side (large dealing banks, then regional banks); swaps are the largest product. Nominal rates are quoted and traded; real rates are analysts' indexes of relative purchasing power. Compute the percentage appreciation/depreciation of a currency correctly.
- LOS 2 Exchange rate regimes and effects on trade and capital flows.** No ideal regime (fixed rates + full convertibility + independent monetary policy cannot coexist). Regimes from dollarisation, monetary union and currency board to fixed parity, target zone, crawling pegs/bands, managed and independent floats. A trade deficit must be matched by a capital account surplus; capital flows dominate exchange rates in the short to medium term.
- LOS 3 Objectives of capital restrictions.** Protect employment, regional development or strategic/defence industries; prevent capital flight in a crisis; limit inflows that hurt competitiveness; support fixed exchange rate targets while keeping monetary policy for domestic goals. Costs: administration, delayed adjustment, negative market perception (Malaysia 1998: stabilised, but later harder to attract long-term capital).

Key formulas

$$\text{Real exchange rate}_{(d/f)} = S_{d/f} \times \frac{P_f}{P_d}, \quad \% \Delta R_{d/f} = \frac{(1 + \% \Delta S_{d/f})(1 + \% \Delta P_f)}{1 + \% \Delta P_d} - 1 \approx \% \Delta S_{d/f} + \% \Delta P_f - \% \Delta P_d$$

$$\% \Delta \text{ in base currency} = \frac{S_1}{S_0} - 1, \quad \% \Delta \text{ in price currency} = \frac{1/S_1}{1/S_0} - 1 = \frac{S_0}{S_1} - 1, \quad X - M = (S - I) + (T - G)$$

where $S_{d/f}$ = nominal spot rate in units of domestic currency per unit of foreign currency; P_f, P_d = foreign and domestic price levels; S_0, S_1 = old and new quotes of A/B (A = price, B = base currency); X = exports, M = imports, S = private saving, I = investment, T = taxes net of transfers, G = government spending. A **higher** real rate means **lower** domestic purchasing power over foreign goods. A **direct** quote has the domestic currency as price currency; it falls when the domestic currency appreciates.

Regime bands (curriculum): fixed parity up to $\pm 1\%$ around parity, no legal commitment, discretionary reserves; target zone up to $\pm 2\%$; currency board = legal commitment and 100% FX backing of the monetary base (Hong Kong SAR, HKD/USD 7.80), so no lender of last resort; dollarisation gives currency credibility, not creditworthiness, and no seigniorage. [Note: the IMF regime table lists Denmark as a euro fixed parity, while a later example calls Denmark a target zone with a $\pm 2.5\%$ band, wider than the "up to $\pm 2\%$ " definition.]

Worked example (CFA curriculum)

Percentage change. USD/EUR rises from 1.1500 to 1.2000: the euro (base) appreciates $1.2000/1.1500 - 1 = +4.35\%$; the dollar depreciates $1.1500/1.2000 - 1 = -4.17\%$, not -4.35% . If the franc falls 12% against sterling, sterling rises $1/0.88 - 1 = 13.64\%$. A rate that rose to 1.4500 after an 8% base-currency appreciation started at $1.45/1.08 = 1.3426$.

Real exchange rate (UK buyer of eurozone goods). GBP/EUR +10%, eurozone prices +5%, UK prices +2%: $\% \Delta R \approx 10\% + 5\% - 2\% = 13\%$ (exactly $1.10 \times 1.05/1.02 - 1 = 13.2\%$), so the UK buyer's purchasing power over eurozone goods falls about 13%. Australian investor: AUD/HKD +5%, HK prices +5%, Australian prices +2% $\Rightarrow$ real rate about +8%, purchasing power about -8%.

What examiners like to test

- **Base vs price currency:** an increase in A/B means B (base) appreciates. Appreciation and depreciation percentages are never equal; the inverse quote swaps bid and offer (MXN/USD 18.8580–18.8600 becomes USD/MXN 0.05302–0.05303).
- **Real rate direction:** higher domestic inflation *lowers* $R_{d/f}$; real rates are not traded and are poor predictors of nominal moves (PPP deviations persist for years).
- **Regime ranking for FX risk** (US investor): float (Canada) > currency board (Hong Kong SAR) > dollarised (Panama). A fixed parity is *less* credible than a currency board and still moves within a band.

Module 8 — Exchange Rate Calculations

Topic: Economics · Exam relevance: **High-yield** · **Calculation-heavy**

The big picture

Currencies are always priced against each other, so every FX calculation starts with one question: which currency is the **base** (the “one unit”) and which is the **price** currency? Cross-rates come from making a common currency cancel. Forward rates are not forecasts: they are set by **arbitrage** so that a hedged foreign deposit earns the same as a domestic one.

Learning outcomes in plain language

- LOS 1 Calculate and interpret currency cross-rates.** Arrange two quotes so the common currency cancels ($A/B \times B/C = A/C$), inverting a quote when needed, and recognise when a dealer’s cross-rate is out of line with the implied cross-rate (a triangular arbitrage opportunity).
- LOS 2 Explain covered interest rate parity and compute forwards.** Explain why the forward rate is fixed by spot and the two interest rates; convert **forward points** (pips) into an outright forward, express the premium/discount as a **percentage**, calculate a forward for a fraction of a year (actual/360), and say which currency trades at a forward **premium** or **discount**.

Key formulas

Quote convention (curriculum): A/B = number of units of A (**price** currency) per one unit of B (**base** currency). Cross-rate:

$$\frac{A}{B} \times \frac{B}{C} = \frac{A}{C}; \quad \frac{B}{A} = \frac{1}{A/B}.$$

$$\text{Outright forward} = S + \frac{\text{forward points}}{10,000} \quad (\div 100 \text{ for yen quotes}), \quad \text{Forward premium (\%)} = \frac{F}{S} - 1$$

$$F_{f/d} = S_{f/d} \left(\frac{1 + r_f \tau}{1 + r_d \tau} \right), \quad F_{f/d} - S_{f/d} = S_{f/d} \left(\frac{r_f - r_d}{1 + r_d \tau} \right) \tau$$

where $S_{f/d}$, $F_{f/d}$ = spot and forward rates quoted as foreign (price) currency per unit of domestic (base) currency; r_f , r_d = annual risk-free rates of the price and base currencies; τ = fraction of the year (actual/360 for the curriculum’s deposit rates; $\tau = 1$ for a one-year forward). The price currency’s rate sits in the **numerator**.

Premium or discount: if $r_f > r_d$ then $F_{f/d} > S_{f/d}$ and the **base** currency trades at a forward **premium**; the **higher-interest-rate** currency trades at a forward **discount**. Forward points grow with the rate differential and are approximately (not exactly) proportional to maturity.

Worked example (CFA curriculum)

Cross-rate. CAD/USD = 1.3020 and JPY/USD = 111.94. For JPY/CAD, invert CAD/USD: $1/1.3020 = 0.7680$ USD/CAD, then $0.7680 \times 111.94 = \mathbf{85.97}$ JPY per CAD. (Multiplying 1.3020×111.94 without inverting gives 145.75 — wrong.)

Forward points. Spot USD/EUR = 1.15885; three-month points = +80.9. Forward = $1.15885 + 80.9/10,000 = \mathbf{1.16694}$; premium = $1.16694/1.15885 - 1 = \mathbf{+0.698\%}$, so the euro (base) is at a forward premium.

Covered interest parity. $S_{f/d} = 1.6535$, $r_d = 3.50\%$, $r_f = 5.00\%$, one year: $F_{f/d} = 1.6535 \times 1.0500/1.0350 = \mathbf{1.6775}$.

Fraction of a year. $S_{f/d} = 1.6555$, $r_f = 3\%$, $r_d = 2\%$, 30 days: $F = 1.6555 \times \frac{1 + 0.03(30/360)}{1 + 0.02(30/360)} = \mathbf{1.6569}$, about +14 pips. At 180 days the same inputs give about +82 pips, not $6 \times 14 = 84$.

What examiners like to test

- **Flipped formula:** putting the base currency’s rate on top gives $1.6535 \times 1.035/1.05 = 1.6299$ instead of 1.6775. Check that the currency with the higher rate ends up at a **discount**.
- **Market codes vs curriculum notation:** the market code EURJPY is written JPY/EUR in the curriculum. Identify the “one unit” currency before multiplying or dividing; yen points are divided by 100, not 10,000.
- **Forwards as forecasts:** the curriculum stresses forward rates come from arbitrage and are poor predictors of future spot rates. A “forward discount means the market expects depreciation” option is a trap.