**CFA 2 Economics**

**2.1 Firms and market structures**

**The firm**

4 factors of production

* Land (site of the business)
* Labour
* Capital (PPE)
* Materials (raw materials)

Total product: Sum of the output from all inputs during the period

Marginal product: Change in total product from one more unit of labour

Average product: Total product divided by quantity of labour

* Essentially average productivity of labour

Law of diminishing marginal returns: With a given quantity of fixed inputs, the MP of the input decreases as it is increased

**Economic profit**

Accounting profit: Revenue minus total accounting costs

* E.g., Gross profit is Revenue minus COGS

Economic profit: Revenue minus total economic costs

* Economic costs include opportunity costs – the next best alternative
* Includes economic depreciation – change in market value of capital (not just book value)

Normal profit: The accounting profit required to cover the implicit costs that were ignored in the accounting costs

* Zero economic profit is made here

**Price and quantity chart**

Marginal revenue is total revenue minus the previous total revenue

Price = Average revenue

Total revenue is maximised when marginal revenue = 0

When marginal revenue of reducing price is positive, demand is elastic

When marginal revenue of reducing price is negative, demand is inelastic

A diagram of a graph

AI-generated content may be incorrect.

**Fixed and variable costs**

Total fixed costs (TFC): Does not depend on level of output

Total variable costs (TVC): Does depend on the level of output

Total costs (TC): Cost of all factors of production a firm uses

For Average fixed costs, Average variable costs, and Average cost, divide by quantity produced

**Marginal costs**

Decreases at low outputs because of increasing factor returns

Eventually increases due to law of diminishing returns

MC curve will intersect the AVC and ATC at the min point

A diagram of a mathematical equation

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**Breakeven and shutdown analysis**

The breakeven point is where:

The shutdown point is where:

* is still incurred when shutting down, these are your losses

The firm continues to operate where to cover part of its fixed costs

A diagram of a graph

AI-generated content may be incorrect.

It is assumed here that firms are price takers

* Hence the horizontal demand curves (these are AR=MR=P)
* New entrants into the market can push out the supply curve, resulting in a lower price

Once the price is below AVC, the costs start going up again as quantity decreases

In the LR, if costs are below ATC, you shut down

**Profit maximisation**

Profit maximised where

A graph of a profit

AI-generated content may be incorrect.

**Short run vs Long run**

Short run: At least one factor of production is fixed

Long run: All factors of production can be varied

**Long run cost curve**

This is for Long Run Average Total Costs

When production is low, you can benefit from economies of scale

Constant returns to scale – costs are largely unchanged

When production is high, you can suffer from diseconomies of scale

A diagram of a graph

AI-generated content may be incorrect.

**Perfect competition**

Many firms selling homogenous products

Low barriers to entry

Can’t generate economic profits in the long run

Everyone is a Price taker:

The demand curve is flat

Goal is the maximise profits:

**Perfect competition profit outcomes**

Can produce profits in the Short run

* Price can be above ATC in the short run

Can’t produce profits in the Long run

* Low barriers to entry mean new entrants come in and price is pushed down
* All profits are competed away
* Produce at minimum average cost
* in the long run

A diagram of a graph

AI-generated content may be incorrect.

If price is pushed below , then economic losses are generated

**Decisions in perfect competition**

Firms stop producing when price is below

In the industry, the supply curve becomes flat below in the long run

* This means if demand is reduced in the long run, price is the same but quantity is reduced

A diagram of a supply curve

AI-generated content may be incorrect.

**Monopolistic competition**

Large number of firms

Low barriers to entry

Key difference compared to perfect competition: Products are slightly differentiated

* Firms can compete on quality, etc, not just on price

Short run: Can create profits

Long run: No economic profits

Profit is the rectangle area between and , at where

Yellow is short run, blue is long run

* SR: , so profits are made
* LR: , so break even

Have spare capacity as they produce below minimum average cost

A diagram of a price

AI-generated content may be incorrect.

In monopolistic competition more is spent on product development, advertising, branding than in perfect competition or monopoly

Advantages

* Product variety is desirable
* Competition means quality is maintained

Disadvantages

* Marketing generates costs

**Oligopoly**

Products offered are close substitutes

Can be differentiated

High barriers to entry

Small number of rival firms

Firms have pricing power but is interdependent on other firms

3 pricing strategies for oligopoly markets

1) Kinked demand curves

* Each firm believes if it raises prices others will not follow (i.e., it is elastic)
* If it cuts prices, others will follow (i.e., it is inelastic)
* Prices don’t really deviate from the outset price
* However, it doesn’t determine the prevailing price from the outset

2) Cournot assumption

* Determines the prevailing price you observe
* Each firm determines its own profit max level assuming the other firms stay constant
* Doesn’t consider the actions of your competitors

3) Nash equilibrium

* Decisions made on the basis of what you think your competitors will do
* May be an incentive for firms to collude for greater total profits and profit sharing

**Monopoly**

Single seller

No close substitutes

High barriers to entry

* Legal barriers
* Natural barriers (high fixed costs, one firm can supply the market at lower cost than two firms)

Strong pricing power

2 pricing strategies

* Single price monopolies – one price for all customers
* Price discriminating monopolies – can charge highest price per customer segment, and prevent low price customers selling to high price customers

Short run: Can make economic profits

Long run: Can make economic profits

A diagram of profit and loss

AI-generated content may be incorrect.

**Price discrimination**

Assumes:

* Can identify and separate buyer types
* Can sell a product that can’t be resold

Aims to extract the entire consumer surplus

* The Consumer surplus is transformed into Producer surplus

A diagram of a supply line

AI-generated content may be incorrect.

1) First degree price discrimination

* Charges the max WTP for each consumer – perfect price discrimination
* No traits identified
* Can offer products of different prices, customers self-select

2) Second degree price discrimination: Volume

* Quantity purchased determines what to charge

3) Third degree price discrimination: Traits

* Traits are identified – customers segmented

**Market structure**

1) Estimating elasticity through regression analysis

* Estimate the demand function

2) N firm concentration ratio

* Find the market share of “N” largest firms (e.g., 4 largest firms)
* Sum their sales/total sales for industry
* Closer to 100% is a monopoly
* Doesn’t take into account mergers between top players
* Doesn’t take into account ease of entry or elasticity of demand

3) Herfindahl Hirshmann Index

* Sum of the squared market shares of the largest N firms
* The higher the HHI, the closer to monopoly
* Better for taking into account mergers between top players
* Doesn’t take into account ease of entry or elasticity of demand

**2.2 Understanding business cycles**

**Business cycles**

Expansions and contractions in the economy that can vary for >1 year to 12 years

1) Classical cycle – fluctuations in the level of economic activity, measured by GDP

* Contractions are often short, expansions are often longer

2) Growth cycle – fluctuations in the level of economic activity around the long term potential or trend growth level

* Focus is on economic activity below or above trend growth
* There is long run trends and short term fluctuations

3) Growth rate cycle

* Changes in % growth

**Growth cycle**

In the SR, can fluctuate away from Long Run equilibrium

Can go above Full employment if AD faces a positive shock

Can go below Full employment if SRAS faces a negative shock

A diagram of different types of employment

AI-generated content may be incorrect.

**4 stages of business cycle**

4 stages: Recovery, Expansion, Slowdown, Contraction

1) Recovery

* Activity below potential but starting to increase
* Layoffs slow, businesses relying on overtime instead of hiring
* Inflation remains moderate

Investor response

* Expects end of recession and beginning of expansion
* Risky assets repriced upwards
* Higher profit expectations
* Equity markets typically hits a trough 3-6 months before the economy bottoms out

2) Expansion

* Activity shows above average growth rates
* Hiring increases
* Modest inflation increase

Investor response

* Expects boom
* Strong confidence, profit growth, credit growth

3) Slowdown

* Activity above average but decelerating
* Hiring at a slower rate
* Inflation accelerates

Investor response

* Risky assets had the largest price increases during boom
* Safe assets such as bonds may have lower prices and higher yields
* Investors fear higher inflation

4) Contraction

* Activity below potential
* Freeze hiring, layoffs
* Inflation deceleration with lag

Investor response

* Higher value on safer assets – flight to quality
* Bonds and safe companies do well

**Credit cycles**

Credit cycles describe the changing availability and price of credit

* Essential for business investments and house purchases

Closely linked to real economic activity

* Better economy means more favourable credit terms
* Costly credit means property prices fall and defaults rise

Businesses cycles can be amplified with changes to access to credit

* Can make recessions worse and recoveries faster

Useful for understanding housing and construction markets, severity of recessions, and policy maker decisions

Monetary and fiscal policy concentrates on reducing business cycle volatility

* Dampen financial booms

**Capital spending during business cycle**

1) Recovery

* Excess capacity, little need to capacity expansion, low interest rates
* Low capex, focuses on efficiency rather than capacity

2) Expansion

* Utilisation increases, more earnings can increase spending ability
* Most capex here

3) Slowdown

* Cash flow healthy
* Interest rates higher
* New orders to increase capacity may indicate late stage of expansion

4) Contraction

* Fall in demand
* Cut back on spending

**Inventory during business cycle**

1) Recovery

* Decline in sales slows and sales recovers
* Production lags sales growth, as excess inventories from contraction are cleared
* Inventory/Sales falls as sales recovery outpaces production

2) Expansion

* Sales increase
* Production rises to keep up with sales growth
* Inventory restocking stage, increased demand for intermediate products
* Inventory/Sales ratio stable

3) Slowdown

* Sales slow faster than production
* Production cutbacks and order cancellations
* Inventory/Sales increases

4) Contraction

* Production below sales volumes to reduce inventory
* Ratio falls back to normal

**Economic indicators**

Variables which provide information about the state of the economy

* Based on historical cyclical observations

Can either lead, coincide, or lag

* Leading is most important as it gives predictive power

Leading – in advance of changes in the economy

* E.g., S&P 500, house prices, retail sales, building permits

Coincident – about the same time

* E.g., IPI, real incomes, trade sales

Lagging – change afterwards

* E.g., Inventory/Sales, average bank prime lending rate, unemployment

**Composite indicators**

Composite indicators- Indicators can be a composite of different variables

The Conference Board Leading Economic Index (LEI)

* Published by the Conference Board
* 10 component parts which lead the business cycle

OECD Composite Leading Indicator (CLI)

* For EU, G7, and others
* Methodology consistent across countries

Composite indicators often use economic tendency surveys (E.g., Confidence surveys)

**Nowcasting**

Problem with data is that it can be slow to arrive

Nowcasting – real time monitoring of economic variables to continuously assess current conditions

* E.g., financial market transactions, internet searches, payment data
* Can provide estimates for key low frequency (monthly/quarterly) economic indicators

GDPNow – Published by many financial institutions such as Atlanta Fed

* Atlanta Fed – one of 12 reserve banks in the US
* Trying to forecast GDP for the quarter in real time

Diffusion Index

* Conference board complies a monthly diffusion index of leading, lagging, and coincident indicators
* Shows the proportion of index components that in moving in pattern consistent with the overall index

**2.3 Fiscal Policy**

Monetary policy: CB influences the quantity of money and credit

Fiscal policy: Decisions about taxation and government spending

**Money**

3 functions of money

* Medium of exchange – facilitates transactions (liquidity)
* Measure of value – compare value
* Store of wealth – transfer purchasing power to the future

**Money creation process**

Fractional reserve banking: Lending customer’s money on the assumption that not all depositors will withdraw at the same time

Reserve requirement: Amount required to maintained

* The remainder can be lent out

Money multiplier: Amount of money created through fractional reserve banking

* Given by: 1/Reserve requirement

**Money definition**

In the US

* M1: Cash + deposits at commercial banks
* M2: M1 + savings deposits + time deposits <100k + Money market mutual funds

In the Eurozone

* M1: Cash + Overnight deposits
* M2: M1 + Deposits with a maturity < 2 years
* M3: M2 + Repos + Money market funds and debt < 2 years maturity

Credit cards are NOT considered money

**Fiscal policy**

Uses government spending and taxation to influence AD

* C+I+G+(X-M)

Budget balance: Tax revenues – Expenditures = 0

Budget surplus: Tax revenue > Expenditures

Budget deficit: Tax revenue < Expenditures

Expansionary policy: Tax revenue decreases, gov spending increases

Contractionary policy: Tax revenue increases, gov spending decreases

Automatic: Automatic stabilizers triggered by the state of economy

* E.g., Transfer payments (benefits), taxation

Discretionary: Deliberate change in policy

**Fiscal policy tools**

Gov spending

* Transfer payments (e.g., benefits)
* Current gov spending (e.g., education, health)
* Capital expenditure

Gov revenue

* Direct taxes (e.g., income tax) – on income and wealth
* Indirect taxes (e.g., sales tax, duties) – on goods and services

Indirect taxes can be implemented quickly, direct taxes take time (require policy change and notice period)

* Indirect taxes can have immediate effect

**Fiscal multiplier**

Increasing G increases AD

The ratio of change is the fiscal multiplier

* Multiplier from the circular flow of income

**Balanced budget multiplier effect**

Suppose gov spending and tax are increased by the same amount

The lower (negative) tax multiplier should result in a positive effect for GDP, while retaining a balanced budget

Assumes the Marginal propensity to consume < 1

* Not all income is consumed, but the taxed income is all spent

Includes the fiscal and tax multiplier

**Limitations of discretionary fiscal policy**

1) Recognition lag

* Takes time to figure out that fiscal policy actions are needed

2) Action lag

* Takes time to pass the laws needed to change policy

3) Impact lag

* Takes time from passing a tax or increasing spending for its effects on real GDP to be felt

**Crowding out effect**

Crowding out effect:

* If the gov spends more, the borrow more, which increases interest rates
* This can reduce C, I, and (X-M)

Ricardian equivalence questions whether this is true

Ricardian equivalence

* High gov spending means more taxes in the future
* Consumers save more in anticipation for higher future taxes
* Interest rate decreases from greater saving

**National debt to GDP**

Arguments against huge debt

* May lead to higher tax 🡪 Disincentivise economic activity
* If markets lose confidence, the CB needs to print money 🡪 High inflation
* May crowd out private sector investing

Arguments for huge debt

* Large deficits may require tax changes which can reduce distortions caused by existing tax structures
* Spending may be push out LRAS
* Private sector may offset fiscal deficits in anticipation of future increased taxes by saving more (Ricardian equivalence)
* No crowding out if the economy is below full employment
* Debt may be financed by domestic citizens

**Interaction of monetary and fiscal policy**

Easy monetary + Easy fiscal

* Very expansionary
* Private and public sector growth

Easy monetary + Tight fiscal

* Private sector larger share of GDP

Tight monetary + Easy fiscal

* Public sector larger share of GDP

Tight monetary + Tight fiscal

* Drop in AD

**2.4 Monetary Policy**

**Central bank role**

Key roles of CBs

* Sole authority to money supply – deems what is legal tender
* Banker to the gov and other banks
* Regulator and supervisor of payments system – impose reserve requirements and risk taking standards
* Lender of last resort – prevents run on banks
* Holder of gold and forex reserves
* Control monetary policy – influence money supply

Primary objective: Control inflation, promote price stability

* High inflation leads of menu costs and shoe leather costs

Other objectives

* Stable FX rates
* Full employment
* Sustainable economic growth
* Moderate LT interest rates

Fed and BoJ do not have an explicit inflation target

* Fed - has max employment and moderate LT interest rates as a goal
* BoJ – deflation is the problem, not inflation

If there is FX pegging, the monetary authorities manage it

* They accept the inflation rate of the other country

**Monetary policy tools**

1) Policy rate – rate banks can borrow from the CB

* Discount rate – Banks can borrow from the Fed at this rate
* For ECB it is called the Refinancing rate
* For UK it is 2 week repo rate

2) Reserve requirements

* Decreases the funds available for lending 🡪 Decrease money supply, which increases interest rates

3) Open market operations

* Buying and selling securities
* When CB buys securities, banks have excess reserves from the cash, which increases money supply
* Federal Funds Rate – rate banks charge each other for overnight loans (Fed sets a target for this and uses open market operations to influence it)

**Monetary transmission mechanism**

How a change in monetary policy affects the price level and inflation

Policy rates transmit to prices with 4 channels

1) Short term lending rates of banks

* Influence AD

2) Asset values

* Discount rate to cash flow changes, which causes wealth effect change

3) Expectations for future growth

* May increase or reduce savings

4) FX rates

* Interest rates can influence FX rates which influence imports/exports

**Qualities a CB needs**

1) Independence – can’t be influenced by politics

* Operational independence – independently determine the policy rate
* Target independence – independently set inflation target
* Most CBs only have operational independence

2) Credibility – follow through on actions

* Targets can be self-fulfilling prophecies if credible

3) Transparency – regularly disclose views and indicators

* Boosts credibility

**CB’s targets**

Inflation targeting – most widely tool used

* Most common 2% with 1-3% band
* CBs target the inflation in 2 years’ time

Neutral interest rate: Growth rate of money supply that neither increases or decreases the economic growth rate

Neutral interest rate = Real trend rate of economic growth + Inflation target

Many developing countries use Exchange rate targeting

* Must buy and sell domestic currency to do this
* Can lead to greater domestic money supply as monetary policy is preoccupied with this
* Will end up with the same inflation rate as the country with the targeted currency

**Monetary policy limitations**

Transmission may not be as effective if:

1) Long term rates may not rise and fall with short term rates due to expected inflation

* If the CB reduces the money supply short term rates rise, people would expect lower long term inflation
* Long term rates could fall as long term bond yields have an inflation premium
* If the CB’s targets are credible, the effect on LT rates is smaller

2) Liquidity trap

* Demand for money is very elastic and individuals hold more money, even without a decrease in short term rates
* Increasing money supply here won’t decrease short term rates as investors hold the money in cash instead of investing
* Happens during deflation

3) ZLB

* Nominal policy rate can’t be below 0

4) Even with excess reserves, banks might not be able to lend

* During Quantitative easing (purchase bonds to reduce interest rates), banks held onto excess reserves instead of making loans

5) Monetary policy in developing countries

* Rate information may be distorted due to illiquid gov bond market
* CB’s may lack credibility
* Hard to determine the neutral rate of interest

**2.5 Geopolitics**

Geopolitics: How geography affects interactions of nations and how they cooperate

* Geophysical resource endowment, politics may influence cooperation
* May cooperate on standardisation of regulations and processes (e.g., IFRS)
* Strong and stable institutions make cooperation easier

**Globalisation**

Globalisation – worldwide integration of economic activity

* Nationalism is the opposite – pursuing own interests independently of other countries

Cooperation and globalisation 4 types

* Autarky – non-cooperation and nationalism (national self-reliance)
* Hegemony – non-cooperation and globalisation (open to globalisation, has the scale to influence other countries without cooperating)
* Bilateralism – cooperation and nationalism (cooperation between 2 countries)
* Multilateralism – cooperation and globalisation

Portfolio investment flows: Trading foreign securities

FDI: Capex in other countries

**NGOs**

IMF: Promotes monetary cooperation, international trade, FX stability, reliable payments

World Bank: Fight poverty, increase development, low-no interest loans

WTO: Ensure trade flows smoothly, has a dispute settlement process, multilateral trading system

**Geopolitical risk**

1) Event risk – know the timing but not the outcome (e.g., elections)

2) Exogenous risk – unanticipated events (e.g., war)

3) Thematic risk – effects over long periods (e.g., migration, cyber)

Geopolitical risk affects the risk premium of holding assets in a region

* Depends on the likelihood, impact, and velocity (velocity is how quickly investment values reflect effects)

More cooperative and globalised countries have less geopolitical risk (e.g., armed conflict)

**Geopolitics tools**

1) National security tools

* E.g., Armed conflict, espionage
* Active if a country is using it, Threatened if it is likely to use it

2) Economic tools

* Cooperative: E.g., Free trade areas, common markets, economic unions
* Uncooperative: E.g., Domestic content requirements, voluntary export restraints, nationalisation

3) Financial tools

* FDI and FX
* Sanctions are a financial tool

**2.6 International Trade**

**Benefits and costs of international trade**

Comparative advantage: Countries specialise and export goods with a lower relative cost

* Increases total output of goods

Other benefits:

* Gains from economies of scale can reduce costs of export goods
* Greater variety
* Reduce the pricing power of domestic monopolies through increased competition

Costs:

* Loss of domestic jobs in an importing industry 🡪 Increase inequality
* If labour costs are lower in the exporting country, wages and employment can decrease in the domestic country
* Increased domestic prices in an exporting industry (from greater demand)
* Though SR costs exist, in the LR when workers retrain, the costs can be mitigated

Gains are greater than the losses if gainers can compensate losers and still be better off

**Trade restrictions**

Reasons supported by economists

* Infant industry – protect from foreign competition for new industries so they can get to competitive scale
* National security – so goods are available in the event of a conflict

Reasons not supported

* Protecting jobs – while jobs are cost, new ones will be created and prices for domestic consumers will improve
* Protecting industries – comes at the detriment to consumers who face higher prices

Other arguments

* Retaliation for foreign trade restrictions
* Prevent dumping
* Get more tariff revenue
* Counter foreign subsidies to producers

Types of trade restrictions

* Tariffs, Quotas, Export subsidies
* Minimum domestic content (requirement for minimum amount of production domestically)
* Voluntary export restraint (restricts their own exports to avoid tariffs from its trading partners)

**Economic implications of trade restrictions**

Assume Tariffs and Quotas have same effect

* Quota licenses are sold

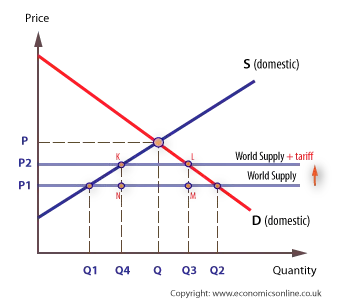
Q3-Q4 is imports under tariff

Q2-Q1 is imports without tariff

KLNM is the tariff revenue

The two triangles are the deadweight loss

Domestic producer gains surplus from consumer



Voluntary trade restriction

* Protects the domestic producers of the importing country
* Results in welfare loss for importing country

Export subsidies

* Benefits producers but increases prices and reduces consumer surplus of exporting country
* If small exporter: Price will increase by world price + subsidy
* If large exporter: World price decreases and foreign consumers benefit

All methods increase import prices, decrease import quantity, increase demand for domestic goods, increase producer surplus and reduce consumer surplus

All methods will decrease national welfare

* Exception: In a large country, tariffs can reduce the world price for the good as it pushes the demand down

**Capital restrictions**

Countries can restrict the flow of financial capital across borders

* Generally they decrease welfare
* Useful for developing countries to avoid investment volatility

**Free trade agreements**

Free Trade Areas:

* No barriers to trade between member countries

Customs Union

* No barriers to trade between member countries
* Common set of trade restrictions with non-members

Common Market

* No barriers to trade between member countries
* Common set of trade restrictions with non-members
* No barriers to movement of labour and capital goods among members

Economic Union

* No barriers to trade between member countries
* Common set of trade restrictions with non-members
* No barriers to movement of labour and capital goods among members
* Members have common institutions and economic policy

Monetary Union

* No barriers to trade between member countries
* Common set of trade restrictions with non-members
* No barriers to movement of labour and capital goods among members
* Members have common institutions and economic policy
* Members have a single currency

NAFTA – Free Trade Area

EU – Economic Union

Eurozone – Monetary Union

**2.7 Capital flows and the FX market**

**FX market**

If a Japanese company expects to receive 10m EUR in the future, they have YEN/EUR risk

Sell side: Large banks that deal in FX and originate forward FX contracts

Buyers: Corporations, Investment accounts, Governments, Retail FX market

**Exchange rates**

1.5 USD/EUR means 1 EUR is 1.5 USD

* This is how it is quoted in the CFA, FX traders quote it the other way round

USD is the price currency, EUR is the base currency

* Essentially the price of EUR in USD

USD/EUR is a direct quote for the USD investor, and an indirect quote for the EUR investor

This exchange rate is the Nominal exchange rate

**Real exchange rate**

Real exchange rate: The purchasing power of one currency in terms of the amount of goods priced in another currency, relative to an earlier base period

If the nominal USD/EUR increases:

* Purchasing power of USD in Europe has decreased
* The real USD/EUR has increased

If the Eurozone price level increases while FX remains the same:

* Purchasing power of USD in Europe has decreased
* The real USD/EUR has increased

The real Price/Base exchange rate is given by:

Where CPI values are relative to base period values of 100

Spot exchange rate: Exchange rate for immediate delivery (usually 2 days after trade)

Forward exchange rate: Exchange rate for an exchange in the future (with specific amounts)

**Depreciation and appreciation**

If USD/EUR changes, the % appreciation in the Dollar is NOT the same as the % depreciation in the Euro

Suppose USD/EUR falls from 1.42 to 1.39, calculating the % change tells you the Euro depreciation relative to the Dollar

To find the Dollar appreciation relative to the Euro, you need to calculate the % change using EUR/USD

**Exchange rate regimes**

IMF categorises 2 for countries without their own currency, 7 for countries with their own currency

**Countries that do not have their own currency:**

1) Formal Dollarization

* Uses the currency of another country, doesn’t have its own monetary policy

2) Member of Monetary Union

* Members share a common currency, monetary policy determined by shared CB
* E.g., EU

**Countries that have their own currency**

3) Currency board arrangement

* Explicit commitment to exchange domestic currency for a specified foreign currency at a fixed exchange rate
* E.g., Hong Kong

4) Conventional fixed peg arrangement

* Pegs its currency with a range of +/-1% vs another currency
* Can buy and sell currencies or use policy to achieve

5) Pegged exchange rates with a target zone

* Pegs its currency with a range of +/-2% vs another currency or basket of currencies

6) Crawling peg

* Exchange rate is adjusted periodically, typically to adjust for higher inflation vs the currency used in the peg

7) Management of exchange rates within crawling bands

* Width of the bands that is permissible is increased over time

8) Managed floating exchange rates

* Influence the exchange rate in response to specific macro indicators (e.g., balance of payments, inflation, etc) without a target exchange rate

9) Independently floating

* Market determined exchange rate

**Balance of payments**

Balance of payments: Capital flows must offset any imbalance between the value the country exports to and imports from another country

If a country has a trade deficit with another, capital flows must offset the difference

* The trade deficit will be offset by the capital account surplus
* The trade surplus will be offset by the capital account deficit

is exports

is imports

is private savings

is investment in physical capital

is tax revenue

is government spending

A trade deficit means the total domestic savings is less than domestic investment in physical capital

* The additional amount invested in physical capital must come from foreigners (which creates capital account surplus)

Capital flows are the primary determinant of FX rates in the short term

* Trade flows are more important for determining FX in the long term as asset prices, savings, and investment adjust over time

**Objective of capital restrictions**

1) Reduce volatility of domestic asset prices

* Capital outflows during a crisis can crash asset prices otherwise

2) Maintain fixed exchange rates

* Makes it easier to meet exchange rate targets
* Frees up monetary policy so it doesn’t have to manage exchange rates

3) Keep domestic interest rates low

* Limits capital outflow, so hot money can’t flow to places with higher rates

4) Protect strategic industries

* For national security

**2.8 Exchange Rate Calculations**

**Cross rates**

Cross rate: Exchange rate between two currencies implied by their exchange rates with a 3rd common currency

Calculation:

**No arbitrage between exchange rates and interest rates**

Forward rates need to reflect differences in interest rates, otherwise there is arbitrage

No arbitrage condition:

Remember the rates used may be annual but the actual time period may not, so remember to de-annualise the rates if necessary

If there is arbitrage available, people will buy the arbitrage asset such that there is no longer any arbitrage left from price increases

If the forward rate is given in points, the points are the smallest decimal

* E.g., 0.7313 + 3.5 points is 0.7313 + 0.00035

Note: The no arbitrage forward rate is simply the forward rate the prevents currency arbitrage, rather than the expected future spot rate

* They are poor predictors of future exchange rates

**Forward premium**

The forward premium is given by