AP Macroeconomics

1.1 Basic Economics Concepts

- Economics is the study of choice and scarcity
  - Scarcity is the main economics problem
    - ↳ Scarcity: Infinite wants but scarce/limited resources

- Allocation Problem. Possible Distribution
  1. Sell it
  2. Divide it equally (fair but not fun)
  3. Random, i.e. Raffle (fair but not fun)
  4. Earn / Contest (not fair but fun)

- We must make choices and decisions
  - ↳ This leads to OPPORTUNITY COST
    - ⇒ Opportunity cost
      - ↳ Consequence of choosing
        - ↳ It's the value of the 2nd best option
          - ↳ E.g. If you prefer Econ. over Hist. over Chem.
            - ↳ Then choosing Econ. will lead to an opportunity cost of Hist.

- Equality v.s. Equity

Equality ↓ Giving everyone the same ↓

Equity ↓ Giving everyone based on need ↓

- The best allocator of resources is the market (to sell) but it generates external cost (e.g. trash, pollution)

- Private vs Public (gov't)
  - ↳ E.g. (Vaccine) Faster but need to pay — Slower but equity

Scarce Resource: High demand but limited quantity

Free Resource: Open to public, anyone can use/obtain it without hindering other people's ability to do so.

↳ E.g. "Oxygen on Earth"

Microeconomics	vs	Macroeconomics
↳ The study of small economic units (i.e. individuals, firms, markets, etc.)		↳ The study of the large economy as a whole or economic aggregates
↳ E.g. Supply and demand in specific industries, production costs, labour markets		↳ E.g. economic growth, government spending, inflation, unemployment, international trade

Economics, Scarcity, and Choices

↳ Economics is the science of scarcity

↳ Scarcity - Unlimited wants from limited resources

↳ Scarcity leads to choices.

4 Factors of Production

1. **Land** - Refers to ALL NATURAL RESOURCES
2. **Labour** - Effort and work.
3. **Capital** - Something produced to help you produce other things. Refers to tools, knowledge, or anything to help you produce. (NOT $$$)
   a) **Physical Capital** - Human-made resources to create other goods (tangible)
   b) **Human Capital** - Knowledge or skills of workers
4. **Entrepreneurship** - The putting-together of all resources and factors. An ambitious leader that combine the other factors of production to create goods and services.

4. Entrepreneurship ctd.

↳ Steps:

1. Take the initiative
2. Innovate
3. Act as risk bearers

↳ To obtain PROFIT (Profit = Revenue - costs

Normative Statement: Statement of opinion/ethics. What someone thinks is how the world should be.

↳ E.g. "Paying people who aren't working, even though they could work, is wrong and unfair."

Positive Statement: Statement, not necessarily true, that can be tested.

↳ E.g. "Programs like welfare reduce the incentive for people to work."

Key Terms:

↳ Economics - The study of how individuals and societies choose to allocate scarce resources

↳ Scarcity - Limited amount of resources to satisfy unlimited wants

↳ Economic Resources (Factors of Production) - Land, labour, capital, and entrepreneurship that individuals and businesses use in the production of goods and services.

↳ Models - Graphical and mathematical tools created by economists to better understand complicated processes in economics

↳ "Ceteris Paribus" - Latin phrase meaning "all else equal"

↳ Agent - Some entity making a decision

↳ Incentives - Rewards or punishments associated with a possible action. Agents make decisions based on incentives.

Key Terms ctd.

↳ Rational Decision Making – An agent is "rational" if they use all available information to choose an action that makes them as well off as possible; economic models assume that agents are rational.

↳ Positive Analysis – Analytical thinking about objective facts and cause-and-effect relationships that are testable (e.g. how much of a good will be sold when a price changes).

↳ Normative Analysis – Subjective thinking about what we should value or a course of action that should be taken (e.g. importance of environmental factors and the approach to managing them)

↳ Microeconomics – Study of the interactions of buyers and sellers in the markets for particular goods and services.

↳ Macroeconomics – Study of aggregates and the overall commercial output and health of nations.

↳ Economic Aggregates – Measures such as the unemployment rate, rate of inflation, and national output that summarize all markets in an economy, rather than individual markets; frequently used as measures of the economic performance of an economy.

- Any economic system must provide society with means of making choices that answer three basic questions:
  - What will be produced with society's limited resources?
  - How will we produce the things we need and want?
  - How will society's output be distributed?

Price – What the consumer is willing to pay for a product

Cost – What is necessary to produce a product (i.e. resources)

Opportunity Cost

→ The amount you sacrifice from Product 2 for every Product 1 you produce.

Production "Possibilities" Talole

E.g.

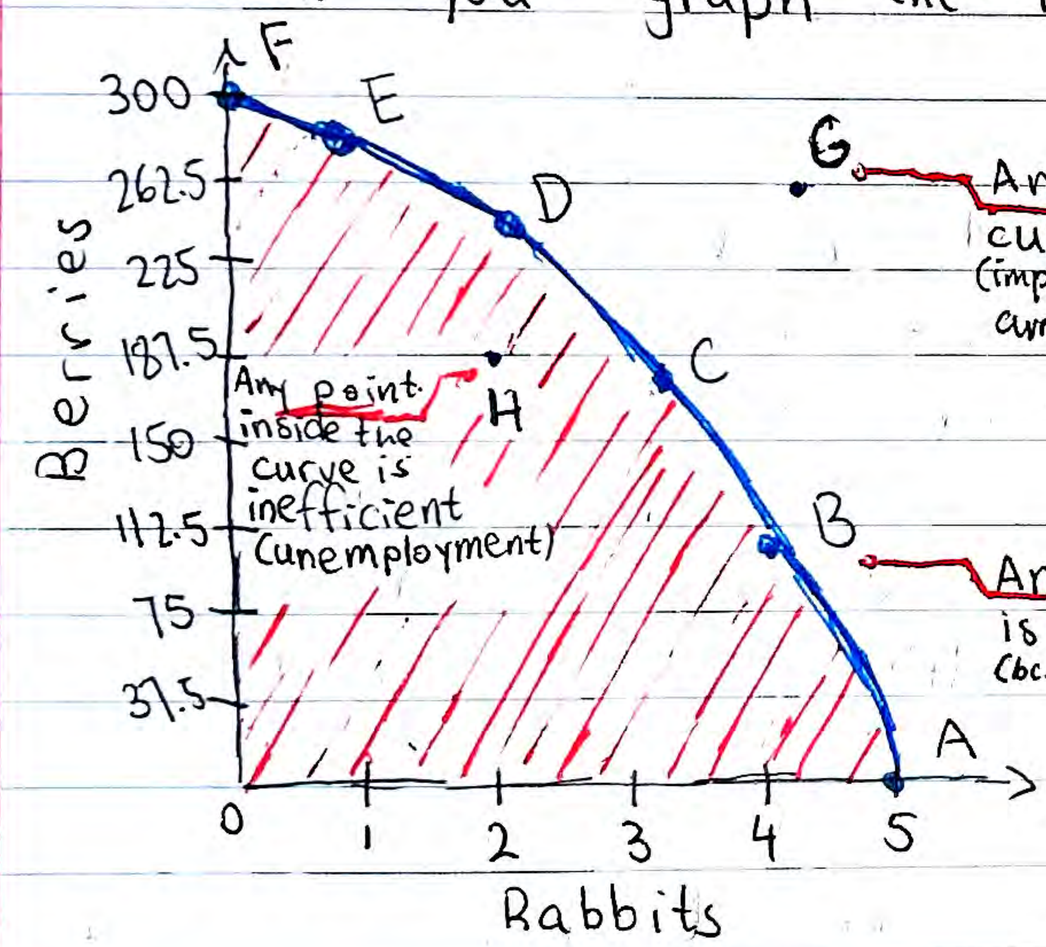
	A	B	C	D	E	F
Rabbits	5	4	3	2	1	0
Berries	0	100	180	240	280	300

-100 berries for +1 rabbit; -80 berries for +1 rabbit; -60 berries for +1 rabbit; -40 berries for +1 rabbit; -20 berries for +1 rabbit

Opportunity Cost per every increase in rabbit ← Models an increasing opportunity cost

Production "Posibilities" Curve (PPC)

↳ When you graph the Production "Possibilities" Table out.



E.g. → From A to B, the opportunity cost is 1 rabbit

→ From F to E, the opportunity cost is 20 berries.

→ From H to D, the opportunity cost is 0 rabbits

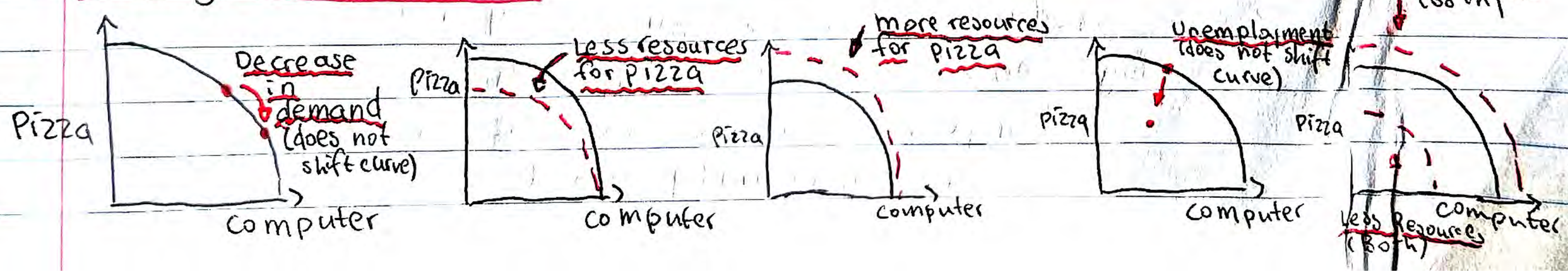
Boosted efficiency of the use of resources

→ Point G is impossible

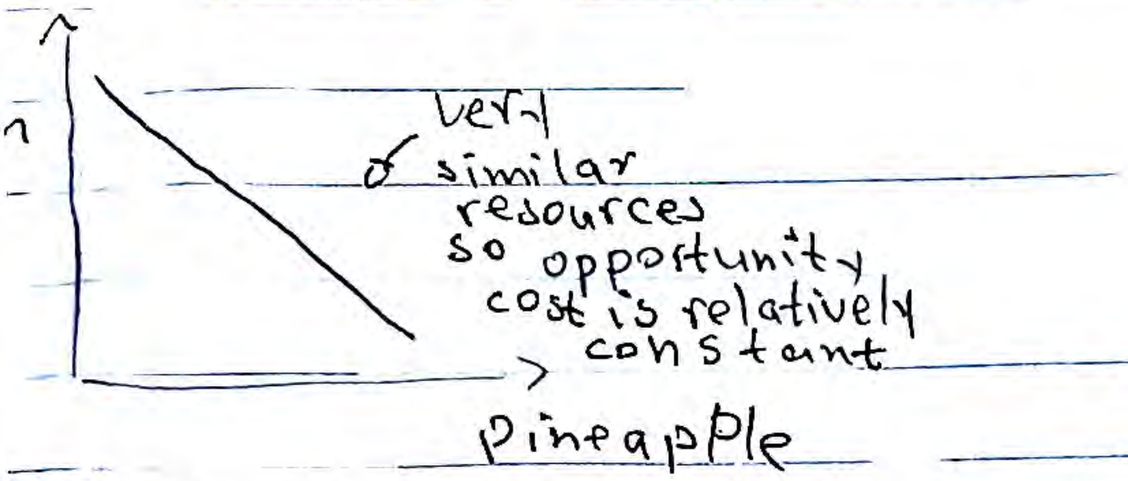
↳ A model that shows alternative ways that an economy can use its scarce resources

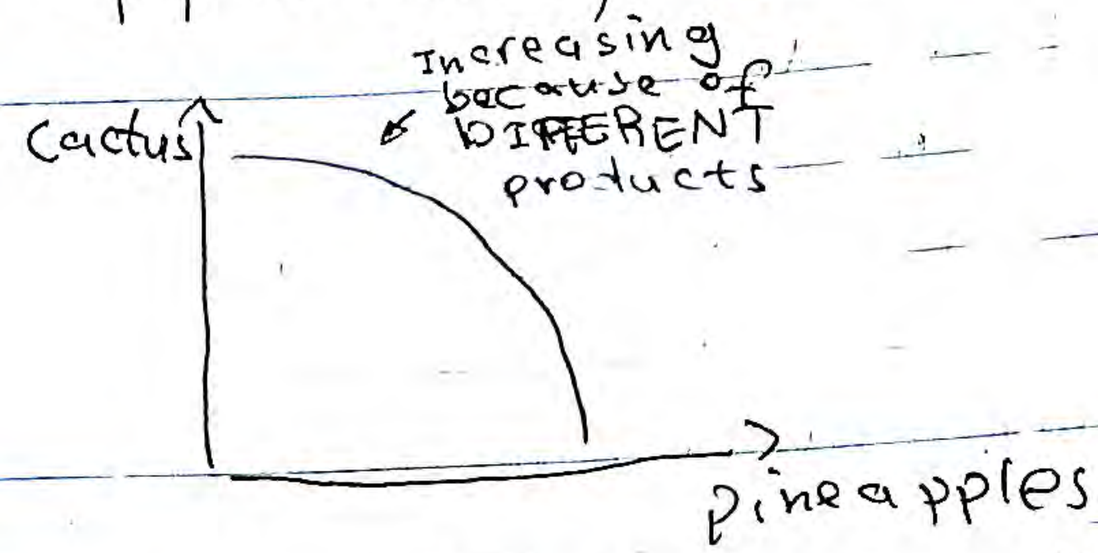
↳ Graphically demonstrates scarcity, trade-offs, opportunity costs and efficiency.

Change in resources



Constant vs Increasing Opportunity Cost





*These two are relatively similar products so you're sacrificing around the same

Better/More realistic

*Increasing because they're two drastically different products so you might need to train specifically when you shift (more resources)

Law of Increasing Opportunity Cost

→ As you increase the production of one good, the opportunity cost to produce the additional good will increase.

↳ Because some people might be more specialised in one product than the other product. Thus, shifting production to the other product will mean that the workers (unspecialised in the other product) will be less effective and so more sacrifices must be made

Absolute Advantage

→ The producer that can produce the most output OR requires the least amount of inputs (resources)

↳ E.g. Papa John has absolute advantage in pizzas because he can produce 100 and Ronald can only make 20.

Comparative Advantage

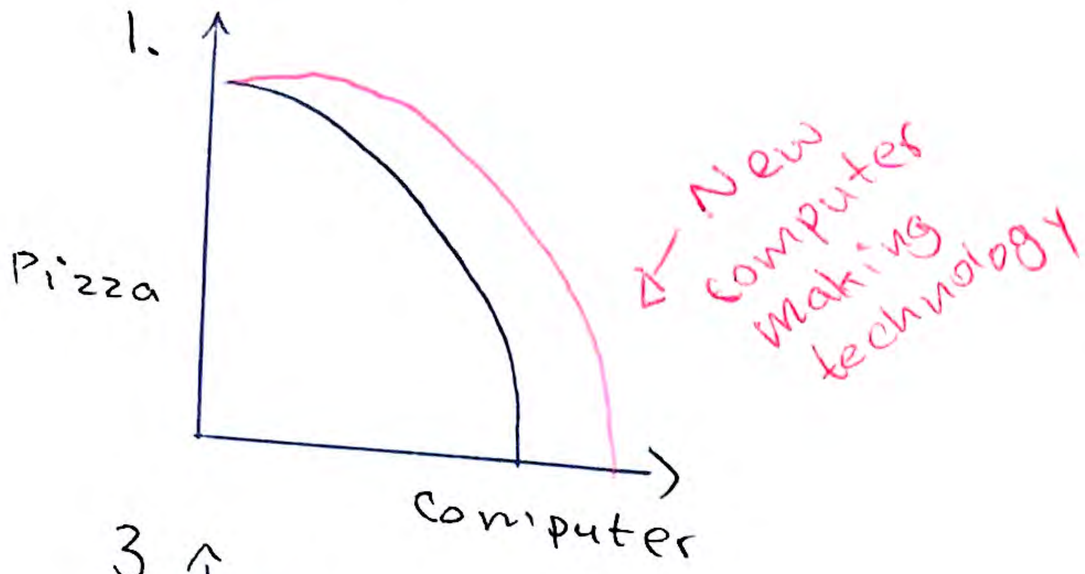
→ The producer with the lowest opportunity cost

↳ E.g. Ronald has a comparative advantage in burgers because he has a lowest PER UNIT opportunity cost

PPC Practice

Pizza and Computers

1.



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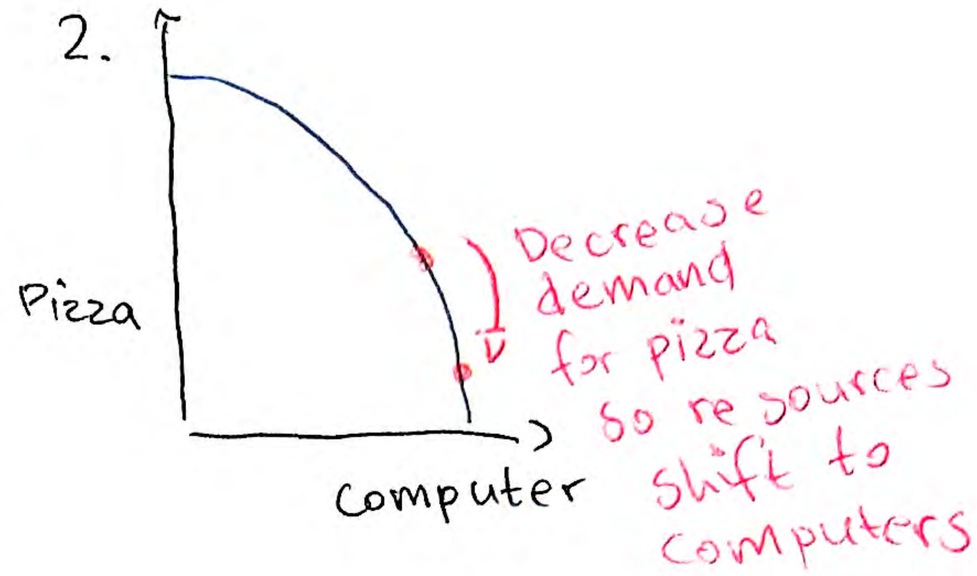
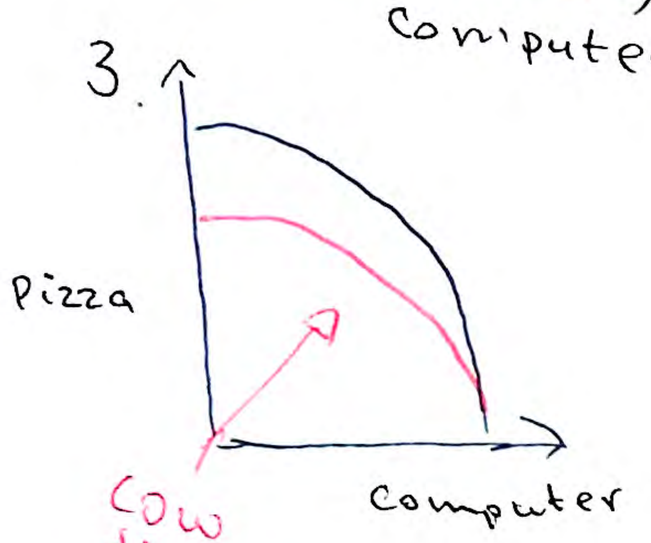


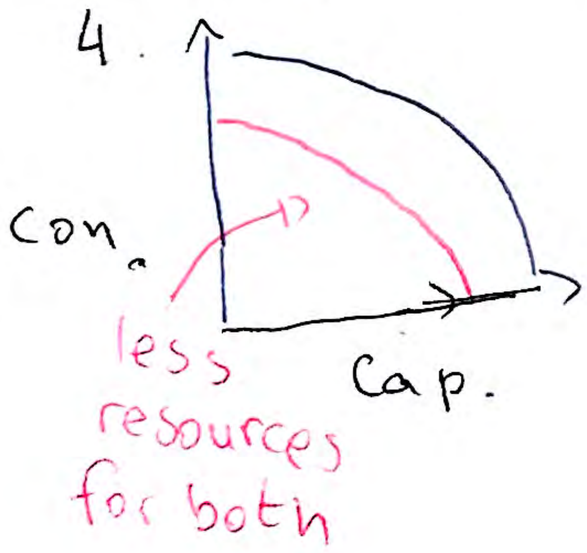
(demand doesn't shift)

3.



Consumer goods and Capital goods

4.



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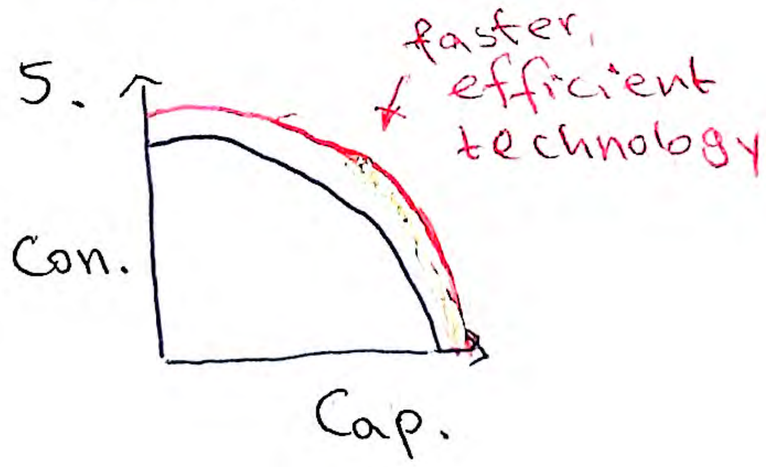

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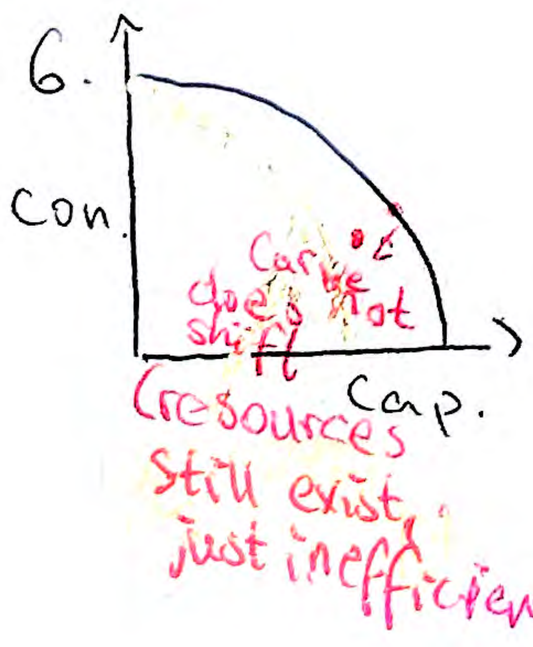


7.

Countries should trade if they have a relatively lower opportunity cost

↳ They should specialize in the good that is "cheaper" for them to produce (the one they have a comparative advantage)

Per Unit Opportunity Cost (Review)

→ Per Unit Opportunity Cost = $\frac{\text{Opportunity Cost}}{\text{Units Gained}}$

output
other
over

O . O . O

E.g. a) Ronald can produce 20 pizzas or 200 burgers

b) Papa John can produce 100 pizzas or 200 burgers

1. What is Ronald's opportunity cost for one pizza in terms of burgers given up?

Ans: $\frac{\text{\# burgers}}{\text{\# pizzas}} = \frac{200 \text{ burgers}}{20 \text{ pizzas}}$ = 1 pizza costs 10 pizzas

2. What is Ronald's opp. cost for one burger in terms of pizza given up?

Ans: $\frac{\text{\# pizza}}{\text{\# burger}} = \frac{20 \text{ pizza}}{200 \text{ burgers}}$ = 1 burger costs $\frac{1}{10}$ pizzas

3. What is Papa John's opportunity cost for one pizza in terms of burgers given up?

Ans: $\frac{\text{\# burgers}}{\text{\# pizzas}} = \frac{200 \text{ burgers}}{100 \text{ pizzas}}$ = 1 pizza costs 2 burgers

4. What is Papa John's opportunity cost for one burger in terms of pizzas given up?

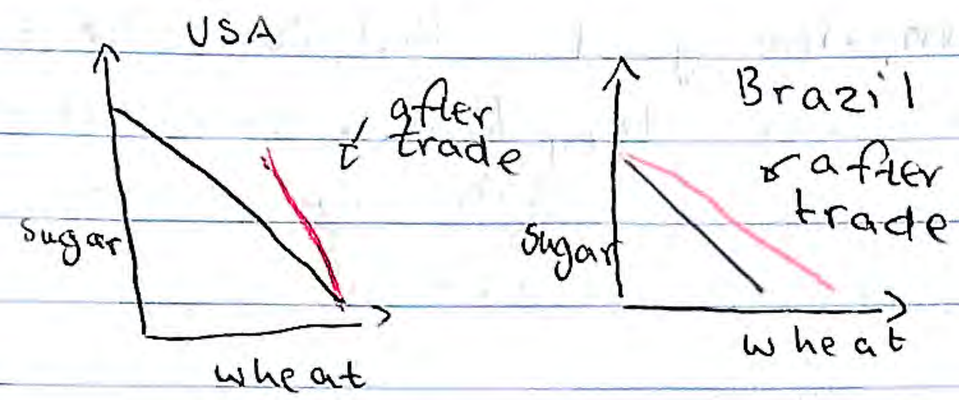
Ans: $\frac{\text{\# pizzas}}{\text{\# burgers}} = \frac{100 \text{ pizzas}}{200 \text{ burgers}}$ = 1 burger costs $\frac{1}{2}$ pizza

*Ronald has a comparative advantage in producing burgers.

*Papa John's has a comparative advantage in producing pizza)

Trade

→ Trade shifts the PPC



→ Analysing Tables

	wheat	Sugar
USA	30	30
Brazil	10	20

1 W costs 3 S

1 S costs W

1 S costs $\frac{1}{2}$ W

1 W costs 2 S

USA has a comparative advantage in wheat

Brazil has a comparative advantage in sugar

Therefore...
Brazil should export sugar and import wheat.
USA should export wheat.

Comparative advantage is RELATIVE →

*NO COUNTRY CAN HAVE A COMPARATIVE ADVANTAGE IN BOTH (If the comparative and/or absolute advantages are equal then neither has the comparative and/or absolute advantage)

Only one country can have an advantage over the other. Or else it wouldn't be called an advantage

Output and Input Questions

→ Output: Other goes Over ⇒ O.O.O.

E.g. Production of... in a day

	CDs	Beef
Japan	4	2
Canada	4	6

$\frac{1}{2}$ Beef for every CD

Absolute Advantage (More is better)

Comparative Advantage (O.O.O.)
↳ Lowest with OOO

→ Input: Other goes Under ⇒ I.O.U

Hours needed to produce...

	Bread	Corn
US	4	2
France	4	6

Absolute Advantage (less is better)

Comparative Advantage (I.O.U)
↳ Lowest with IOU

Trade

E.g. PPC for countries A & B
(# of items per worker per day)

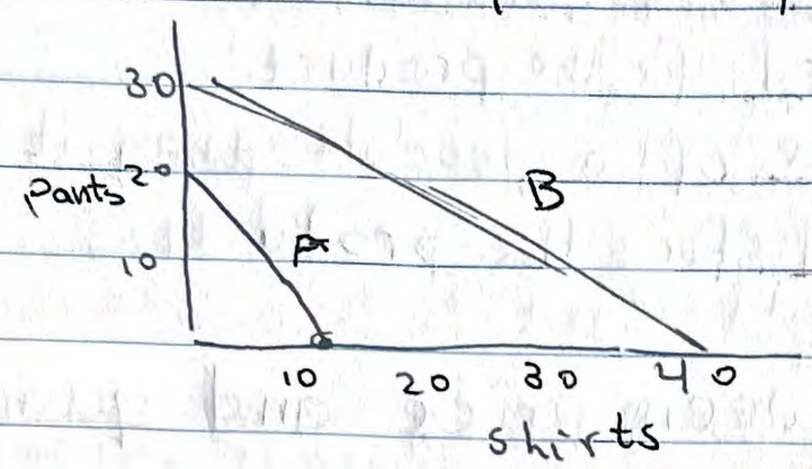


Table:

	A	B
max pants	20	30
max shirts	10	45

Opp. Cost... comp. advantage

	A	B
Pants	$\frac{1}{2}$ shirt	1.5 shirt
shirts	2 pants	$\frac{2}{3}$ pant

Deciding Trade Terms

↳ Trade terms must be beneficial for BOTH countries

↳ Seller: Terms should be greater than seller's opportunity cost.

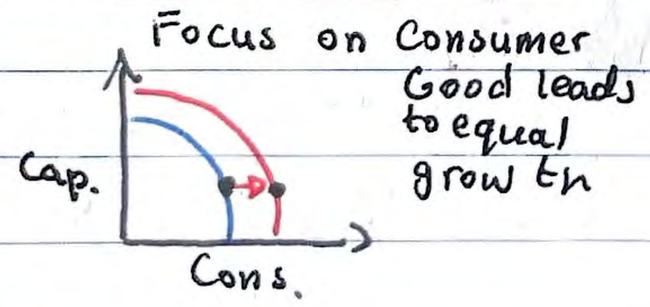
↳ Buyer: Terms should be less than buyer's opportunity cost

↳ E.g. For Pants: Country A is willing to sell them at a price > $\frac{1}{2}$ shirts
country B is willing to buy them at a price < 1.5 shirts
∴ Price can be 1 pant for 1 shirt (satisfies / benefits both countries)

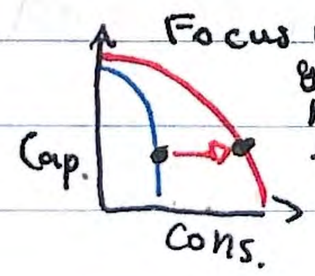
Special Cases:

↳ IF... there is same opportunity costs
↳ THEN... no comparative advantage in either
↳ THEREFORE... no gains from trade
(not beneficial nor harmful for either countries)

Future Growth



Focus on Consumer Good leads to equal growth



Focus on Capital goods leads to more resources to produce consumer goods

Demand

Inverse Relationship

Law of Demand:

↳ If we raise the price of a product, then it will lower the quantity demanded for the product.

↳ If we lower the price of a product, then it will raise the quantity demanded for the product.

Demand - Relationship between price and quantity demanded (ceteris paribus)

↳ should not be confused with quantity (i.e. quantity demanded)

Quantity Demanded - Total amount of a good or service that consumers demand over a given period of time. (consumers are willing and able)

↳ Depends on the price of a good or service in a marketplace

Demand Schedule - Table that shows how the price relates to quantity demanded, given "ceteris paribus".

Graphical Relationship

Demand Curve - A continuous curve that shows the relationship between "Price" and "quantity demanded".

↳ Although quantity demanded depends on price, the Demand Curve usually is graphed such that price is on the vertical axis.

Change in Demand	VS	Change in Quantity Demanded
• Caused by shifter: e.g. income, preferences, changes in price of related goods, etc.		• As a result of change in price

Demand EXAMPLE:

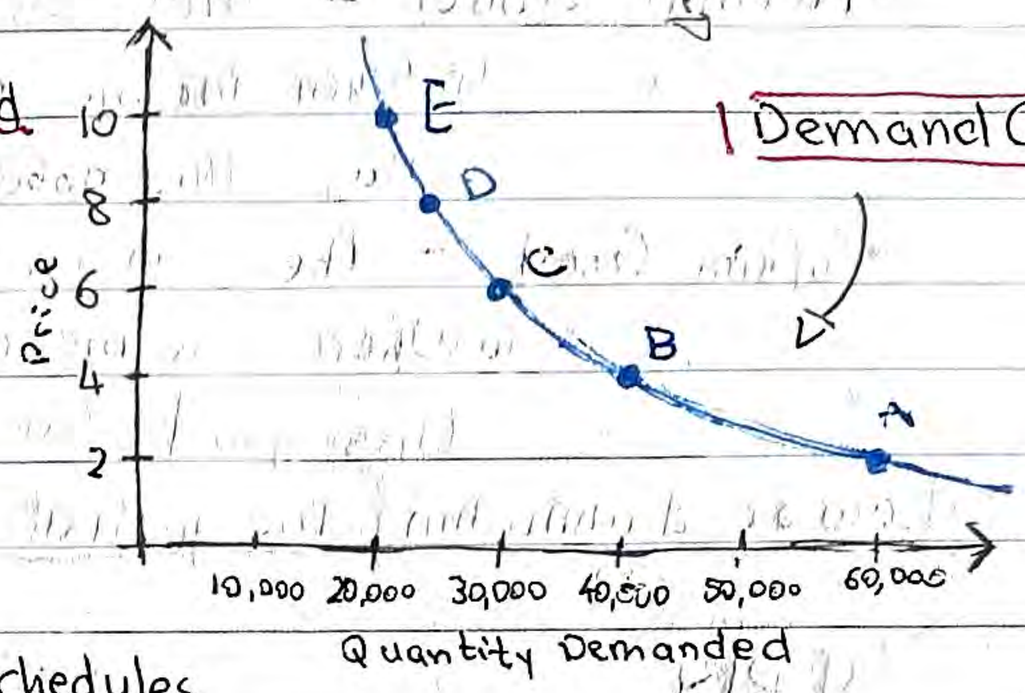
E.g. eBooks...

Demand

Demand Schedule

Scenario	Price	Quantity Demanded
A	$2.00	60,000
B	$4.00	40,000
C	$6.00	30,000
D	$8.00	25,000
E	$10.00	23,000

Total quant. dem. in market for each price



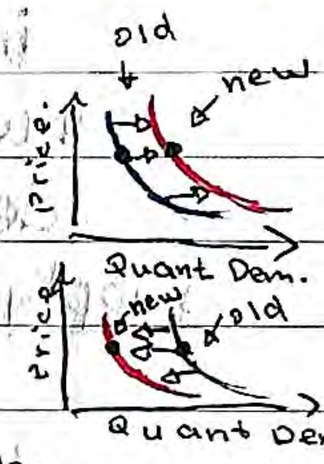
Market Demand - Sum of the demand schedules

Shifts in Demand Curve

5 main:
1. Tastes & Preferences
2. # of Consumers
3. Price of related goods
4. Income
5. Future Expectations

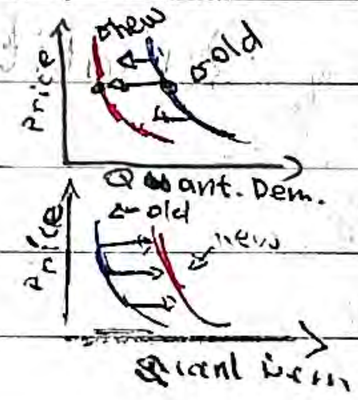
Price of Related Products (i.e. competitors)

- If cost goes up for such products, then more people would want to buy your product.
- If cost goes down for such products, then less people would want to buy your product.
- E.g. eBooks, Related Products include other eBooks or Books.



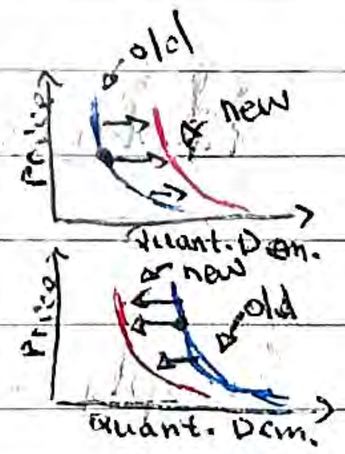
Price of Complements (i.e. Required / Partially Required Products)

- If cost goes up for such products, then less people would want to buy your product.
- if cost goes down for such products, then more people would want to buy your product.



Expectations of Future Price

- If expected future price goes up, then the demand for the product will increase.
- If expected future price goes down, then the demand for the product will decrease.



Other Changes

- More income (disposable income), population, preferences, etc. leads to more demand for a product. (and vice versa)

Normal vs Inferior Good

- Normal Good - The "better" or more "preferred" good
  - ↳ When income rises, people are more willing to buy this good.
- Inferior Good - The "worse" or usually cheaper good.
  - ↳ When income rises, people will buy less of this good (would want to buy something nicer).

Law of diminishing marginal utility - The less of a good you have, the more you value the next good.

You're more satisfied if you buy your first car than your fifth

Supply

more producers are willing to supply if they earn more (and vice versa)

Law of Supply:
- ↳ When price goes up, the quantity supplied will increase.
- ↳ When price goes down, the quantity supplied will decrease.

Supply - Relationship between price and quantity supplied (ceteris paribus)
- ↳ Should not be confused with quantity (i.e. quantity supplied)

Quantity Supplied - Amount of a good or service that is made available at a given price point.
- ↳ Depends on the price of a good or service in a marketplace

Supply Schedule - A table that shows how the price relates to quantity supplied, given "ceteris paribus".

Supply Curve - A continuous curve that shows the relationship between "price" and "quantity supplied".
- ↳ Like the demand curve, "price" is usually graphed on the vertical axis.

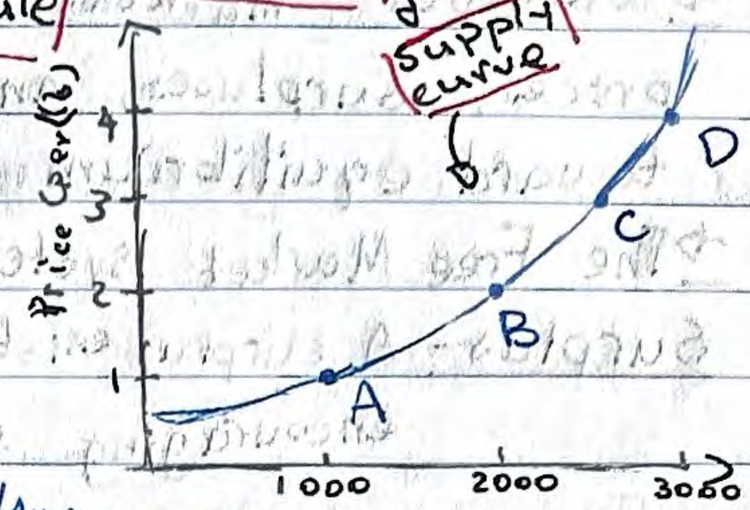
Supply EXAMPLE...

E.g. Grapes

Supply schedule

"Supply"

Scenario	Price	Quantity Supplied
A	$1.00	1000 lbs
B	$2.00	2000 lbs
C	$3.00	2500 lbs
D	$4.00	2750 lbs



5 main: 1. Price s/Availability of inputs
2. # of sellers
3. Technology
4. Gov't Action: taxes & subsidies
5. Expectations of future profit

Factors Affecting Supply (determinants)

E.g. Price of inputs increase, causes decrease in supply (and vice versa)

Price of other things I can produce increase, decrease in supply (and vice versa)

# of suppliers, causes increase in supply (and vice versa)

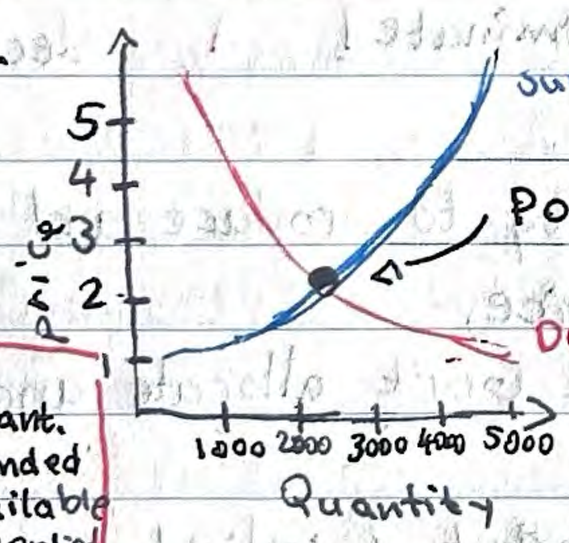
Technology improvement, causes increase in supply (and vice versa)

Market Equilibrium

Equilibrium Price: Price at which the quantity supplied is equal to the quantity demanded.

Equilibrium Quantity: The quantity at which the Equilibrium Price occurs.

E.g.



Point of Equilibrium ⇐ Equilibrium Price = $2.15/lbs

Equilibrium quant. = 2200 lbs

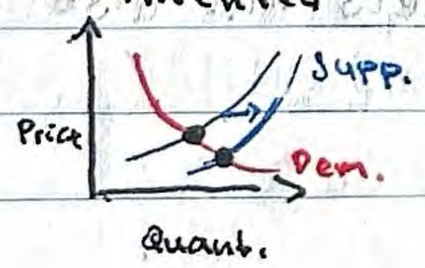
At $1, more quant. is demanded than available quant. supplied

At $5, more quant. is supplied than quant. demanded

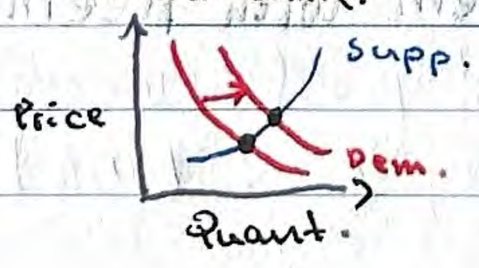
Shifts / Changes in Market Equilibrium

↳ The shifts in demand and/or supply curves can cause a change in the market's point of Equilibrium.

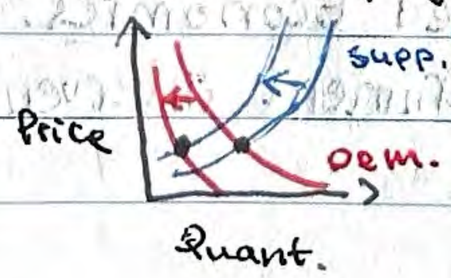
E.g. New disease Ribistant Apple Invented



study shows how Apples Prevent Cancer



Pear cider industry launches ad campaign



Producers shift from apples to pear

Consumers want more pears now

Disequilibrium

→ whenever markets experience imbalances (creating disequilibrium prices, surpluses, and shortages) → market forces drive prices toward equilibrium

→ The Free Market system automatically pushes the price towards equilibrium

Surplus - A surplus exists when the price is above equilibrium, encouraging sellers to lower their prices to eliminate the surplus

Shortage - A shortage will exist at any price below equilibrium, leading to the price of the good increasing.

Changes in Equilibrium

Change	Change in Equi. Price	Change in Equi. Quant.
1. Supply increases (shifts right)	decrease	increase
2. Supply decreases (shifts left)	increase	decrease
3. Demand increases (shifts right)	increase	increase
4. Demand decreases (shifts left)	decrease	decrease
5. Demand increases, Supply increases	[indeterminate]	increase
6. Demand increases, Supply decreases	increase	[indeterminate]
7. Demand decreases, Supply increases	decrease	[indeterminate]
8. Demand decreases, Supply decreases	[indeterminate]	decrease

Economic System - Method used by a society to produce and distribute goods and services

1. **Centrally-Planned (Command) Economy**: Gov't allocate and distribute the resources accordingly.
2. **Free Market (Capitalist) Economy**: Market of individual producers distribute resources.
   - ↳ **Invisible Hand Capitalism** - The concept that society's goals will be met as individuals seek their own self interest.
3. **Mixed Economics**: A system with freemarkets but also some government intervention.

Price Ceiling - Government created maximum legal price a seller can charge for a product.
(To make affordable by keeping price from reaching Equilibrium)

Price Floor - Government created minimum legal price a seller can sell a product
(To keep price high by keeping price from falling to Equilibrium).

5 shifters (determinants) of demand:

1. Tastes and Preferences
2. Number of Consumers
3. Price of related goods (Substitute)
4. Income → Normal / → Inferior
5. Future Expectations

Complement:

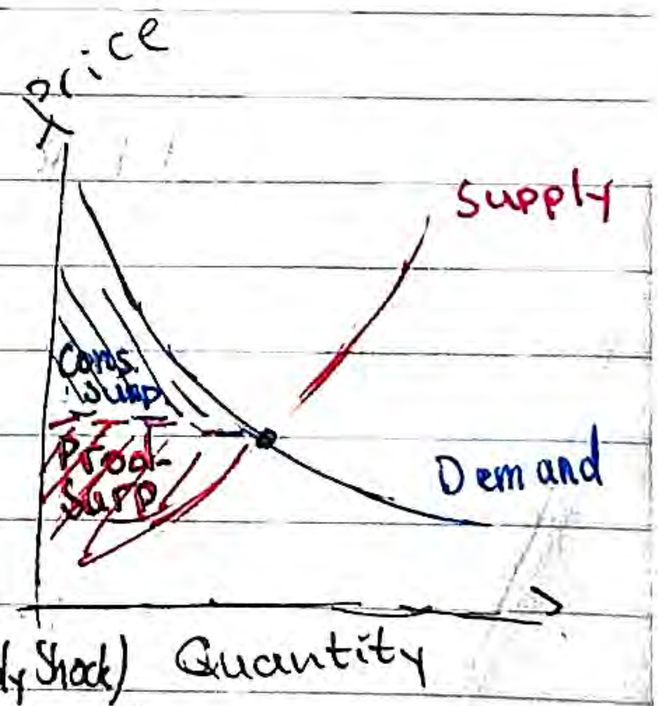
↳ Work together
↳ Related/connected products (used together)
→ Inverse relationship:
↳ Higher price for complement, lower demand for both

Substitute:

↳ Competitors
↳ 2 similar products
↳ E.g. Pepsi vs Coca-Cola
→ ? Supply relationship:
↳ Price lowers for other product causes ~~more~~ less demand for you

5 shifter (determinants) of Supply:

1. Prices of related goods (join or competitive supply)
2. Resources/input prices
3. Increase in technology
4. Expectations of future profit
5. Suppliers increase or decrease
6. Taxes and subsidies
7. Special circumstances (natural disasters)



Consumer Surplus

↳ Everything below the demand until the equilibrium

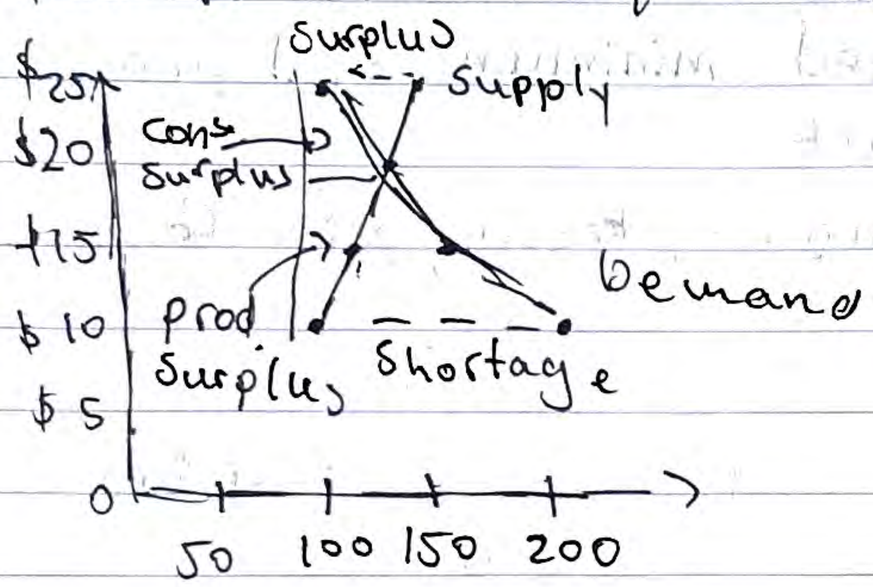
Producer Surplus

↳ Everything above the supply until the equilibrium

Shocks - Shifts in Demand (i.e. Demand Shock) or Supply (i.e. Supply Shock)

Do Now Class #7

1. At $10, there is a shortage of quantity
2. At $25, there is a surplus
3. When $25, the price will expected to decrease to around $20 to match equilibrium



Circular flow of income and expenditures

↳ Describes the cycle of the exchanges of goods with money in the economy

Firm-Household Relationship

Factors of production

Capital, land, labour, entrepreneurship

Firm
i.e enterprise

$ →

Household
Total Income

Building (Rent) e.g. $1000
Land
Wages (Rent & Returns) $1000
Profit $1000

Total Income: $3500 + Profit

And Vice-Versa...

Total Expenditure

Food and Shelter

Household

Food
Rent $

Total Revenue

Firm
i.e. enterprise

At least $3500 to satisfy expenditure

e.g. Food: $2300
Rent: $1200
Total Expenditure: $3500

in this example

GDP: $3500

=> GDP = Household Expenditure = Firm Revenue = Firm Expenditure + Profit = Household income

Gross Domestic Product (GDP) - the market value of all final goods and services produced within a country in a given period.

Market Value - Measure of a value of a product based on how much people are willing to pay in the market.

GDP includes the market value of ALL goods and services, with a few exceptions:

1. Illegal Activities are not kept track of (e.g. drugs)
2. Goods and Services produced in a household and directly consumed (e.g. mother babysitting her children)

GDP describes all FINAL goods and services

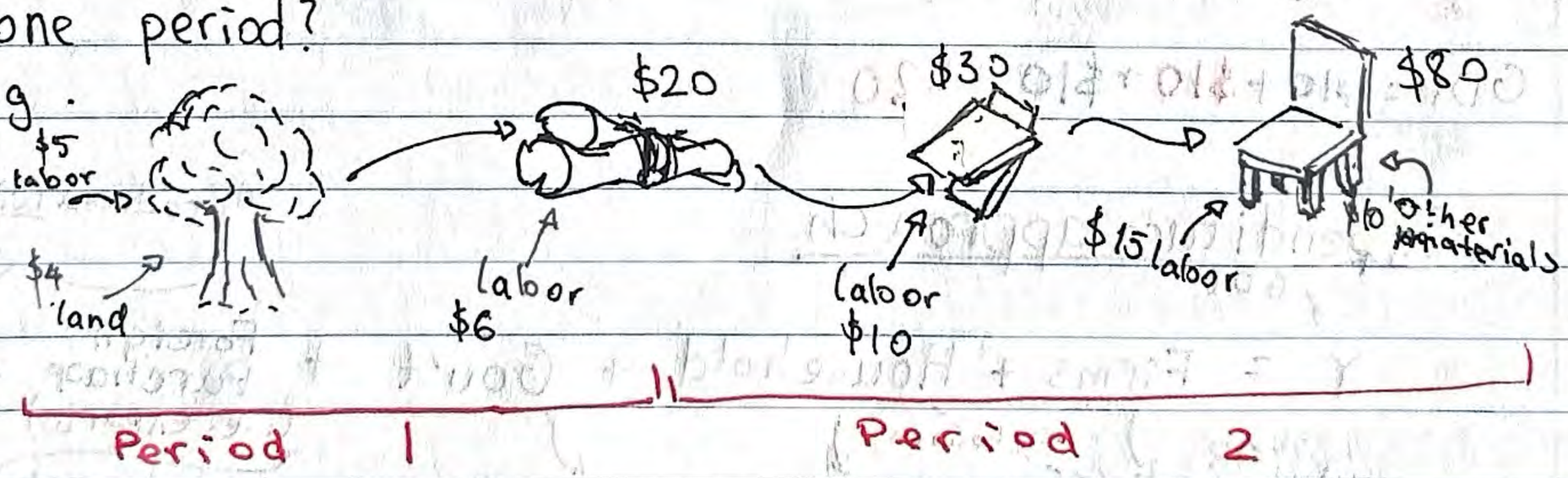
↳ Counting goods in the production of the final good causes excess value (way over market value or price sold)

GDP : Within a Country (no matter who's producing it)
GNP : Nationality (no matter where someone is situated)

Final and Intermediate GDP:

→ What if a good / service does not finish being produced in one period?

e.g.



The end $20 will be counted in the GDP

Since we already counted some value of good, we subtract the period 2 initial value from the final value.

→ $80 - $20 = $60

Only $60 will be counted towards Period 2 GDP

Investment and Consumption

Investment – The purchase of capital equipment, inventory or structures by firms.
The purchase of new homes / houses by households

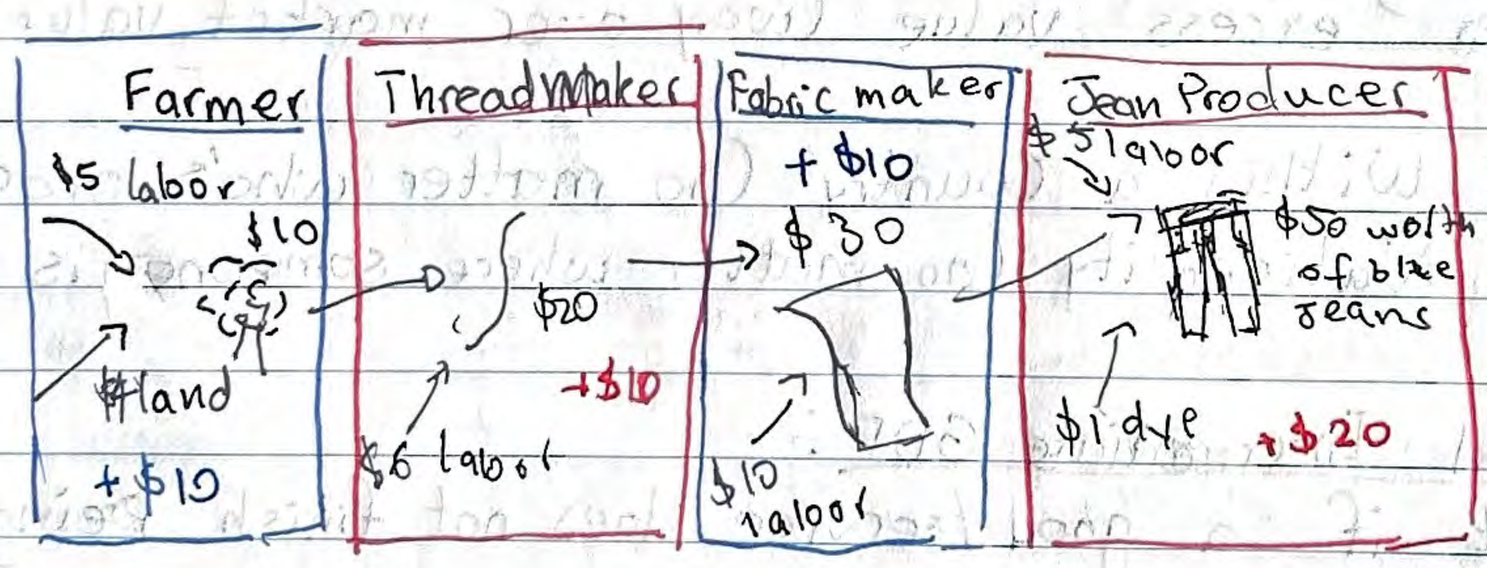
Consumption – Any spending on new final goods/services by Households except for new homes
↳ Even though Education can bring you benefits (long-term), it is not considered an investment, rather more of a consumption.

Calculating GDP:

- Value added approach

GDP is calculated as the sum of the differences in input (buy) and output (sell) prices per each stage of production

E.g.



GDP = $10 + $10 + $10 + $20

- Expenditure approach

"produced within a country"

GDP

$$Y = \text{Firms} + \text{Household} + \text{Gov't} + \underbrace{\text{Foreign Purchase (i.e. exports)} - \text{Foreign Products (i.e. imports)}}_{\text{net exports}}$$

OR

$$Y = \underset{\text{investment}}{I} + \underset{\text{consumption}}{C} + \underset{\text{gov't spending}}{G} + \underset{\text{net exports}}{NX}$$

new homes

Calculating GDP

- Income Approach

interest part of 4 factors of production

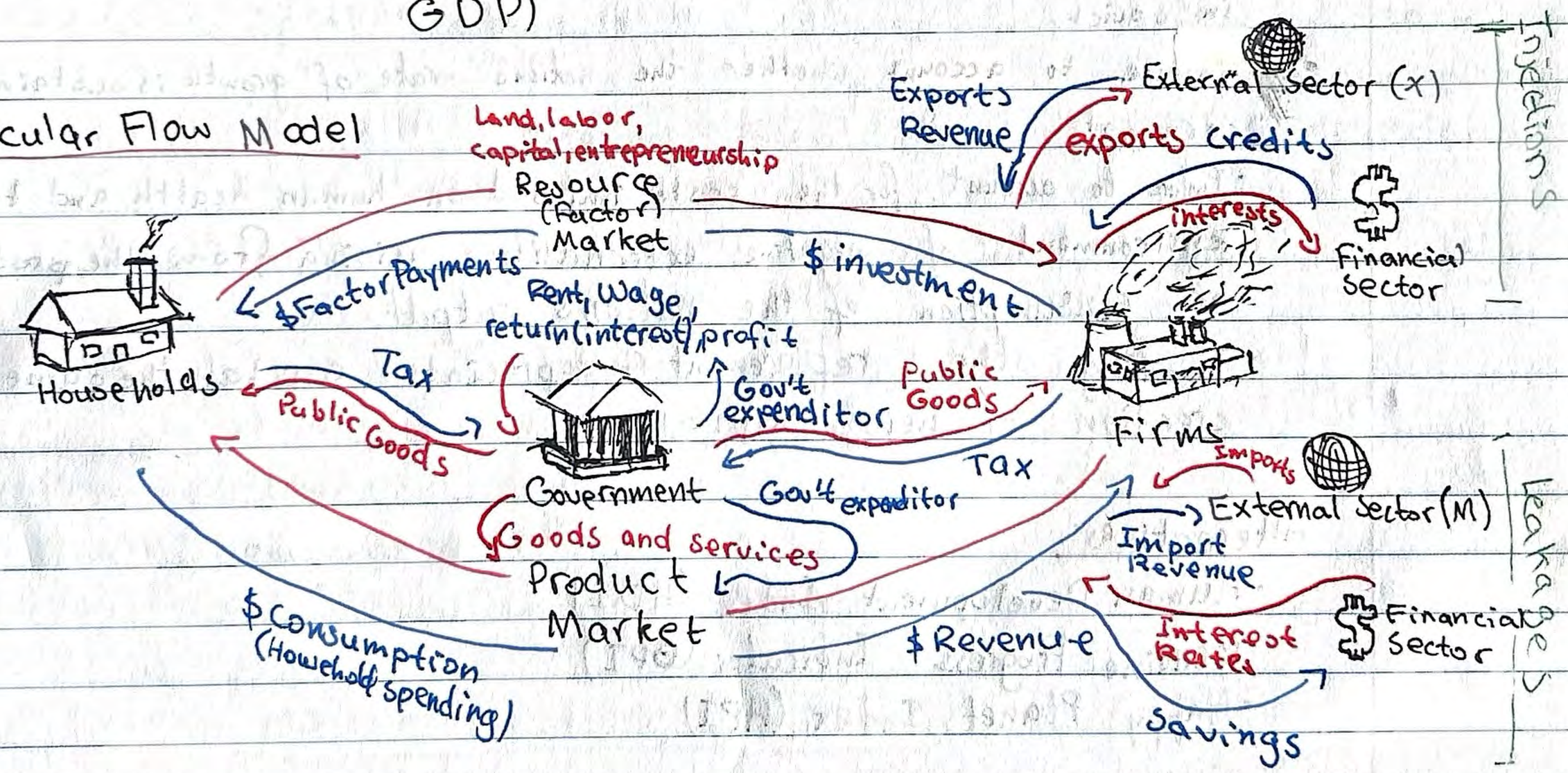
GDP = Rent + Wage + Return + Profit

Other Definitions

- Intermediate Goods and Services - Goods that are used in the production of a final product

- Transfer Payment - Any payment by a government to a household that is not in exchange for a good or service (i.e. not counted in GDP)

Circular Flow Model



Limitations of GDP

GDP helps us measure and determine:
- Economic activity
- Size/influence economy

GDP per capita: Well-being

However, GDP does not capture...
- Pollution
- Health
- Stress / Community

Important limitations
- Exclusion of non-market transactions
- Failure to account for or represent the degree of income inequality in society
- Failure to indicate whether the nation's rate of growth is sustainable or not
- Failure to account for the costs imposed on human health and the environment of negative externalities arising from the production or consumption of the nation's output.
- Treating the replacement of depreciated capital the same as the creation of new capital.

Alternatives:
- Human Development Index (HDI)
- Genuine Progress Indicator (GPI)
- Happy Planet Index (HPI)

4 main limitations
1. Population (different populations might mean different happiness with same GDP)
2. Inequality (does not account for poverty, poor wealth distribution)
3. Environment (does not factor in pollution from production)
4. Shadow Economy (informal sector of economy: black market, volunteer, selling without gov't intervention).

Key terms:

Quality of Life - The standard of health, happiness, security, and material comfort of an individual, a group of people, or a nation.

Income Inequality - When a disproportionate share of a nation's income is earned by a small minority of households.
(GDP does not account for income distribution)

Economic Bads - Any outcome from economic activity that creates negative value for society (e.g. air pollution)
Unsustainable economic growth may diminish the quality of life of a nation's people.

Real GDP per Capita - Real GDP of a nation divide by the nation's population

Depreciation of Capital - Decrease in the value of a nation's capital stock over time. GDP accounts for investment in new capital but does not subtract the lost value of depreciated capital (so GDP can overestimate amount of economic activity in nations with rapidly depreciating capital stocks.)

All countries have macroeconomic goals:

1. Promote Economic Growth
2. Limit Unemployment
3. Keep Prices Stable (Limit Inflation)

How do we measure economic growth?

- Economists collected statistics on production, income, investment, and savings
- This is called national income accounting

How can you measure growth from year to year?

$$\% \text{ change in GDP} = \frac{\text{Year 2 GDP} - \text{Year 1 GDP}}{\text{Year 1 GDP}} \times 100\%$$

Does GDP accurately measure standard of living?

- Standard of living can be measured, in part, by how well the economy is doing...
- But it needs to be adjuoted to reflect the size of the nation's population

GDP Per Capita (per person)

- GDP divided by the population. It identifies an average how many products each person makes

- GDP per Capita is the best measure of a nation's standard of living.

Why do some countries have higher GDPs?

1. Economic System - Capitalism promotes innovation and provides incentives to improve productivity
2. Rule of Law - Countries with solid institutions and political stability have historically had more economic growth
3. Capital Stock - Countries that have more machines and tools are more productive
4. Human Capital - Countries that have better education and training are more productive
5. Natural Resources - In general, countries that have access to more natural resources are more productive

Productivity = Output per unit of input

Depreciation - when Capital wears out

Recession will lead to a decrease in investment by firms

Unemployment

Unemployment - workers that are actively looking for a job but aren't working

↳ People who are not actively looking for a job are not considered unemployed.

The Unemployment Rate - The percent of people in the labor force who want a job but are not working

$$\text{Unemployment Rate} = \frac{\#\text{ unemployed}}{\#\text{ In labor force}} \times 100\%$$

Who is considered in the labor force?

- At least 16 years old
- Able and willing to work
- Not institutionalized (in jails or hospitals)
- Not in military, in school full time, or retired

Alternate formulas

$$\text{Unemployment Rate} = \frac{\#\text{ unemployed}}{\#\text{ in labor force}} \times 100\% = \frac{\#\text{ unemployed}}{\#\text{employed} + \#\text{unemployed}} \times 100\%$$

$$= \frac{\#\text{ unemployed}}{\#\text{population} - \#\text{Not in labor force}} \times 100\%$$

3 Types of Unemployment

1) **Frictional unemployment** - Temporary unemployment or being between jobs
   - Individuals are qualified workers with transferable skills
   - Examples:
     - High school or college graduates looking for jobs
   - Seasonal Unemployment is a specific type of frictional unemployment, which is due to time of the year and the nature of the job

2) **Structural Unemployment** - Changes in the labor force make some skills obsolete
   - These workers DO NOT have transferable skills and these jobs will never come back
   - Workers must learn new skills to get a job
   - Permanent loss of these jobs is called "creative destruction".

3 Types of Unemployment ctd.

2) Structural Unemployment ctd.
- Technological Unemployment - Type of structural unemployment where automation and machinery replace workers
- E.g. VCR repairman, Milkman

3) Cyclical Unemployment - unemployment caused by a recession
- As demand for goods and services falls, demand for labor falls and workers are laid off.
- This is sometimes called "demand deficient unemployment"
- E.g. High unemployment during the Great Depression.

Natural Rate of Unemployment (NRU)

- Frictional and Structural unemployment are present at all times because some people will always be between jobs or replaced by technology
  - ↳ So economy doing great when only frictional and structural unemployment

NRU = Frictional Unemployment + Structural Unemployment

Full Employment Output (Y) - The Real GDP created when there is no cyclical unemployment.

Criticisms of the Unemployment Rate

- Unemployment rate can misdiagnose the actual unemployment due to.....

1. Discouraged Workers
   - Some people are no longer looking for a job because they've given up
   - Labor Force Participation Rate → $\frac{\text{Labor Force}}{\text{Adult Population}}$ Anyone ≥16 yrs who potentially could be part of the labor force
     - Percent of population in the labor force
     - If people leave labor force the unemployment rate falls.

Criticisms of Unemployment Rate cont.

Individuals forced to work in low-paying or low-skilled jobs

2. Underemployed Workers
   - Someone who wants more hours but can't get them is still considered employed (in this case considered as underemployed)
3. Race/Age Inequalities
   - The overall unemployment rate doesn't show disparity for minorities and teenagers

Labor Force

The labor force is made up of the number of people unemployed and the number of people employed

$$LF = \underbrace{\#\text{ Unemployed}}_{\text{Not worked at all in reference week and be active, looking for work}} + \underbrace{\#\text{ Employed}}_{\text{worked at least once for pay in the reference week}}$$

The labor force participation rate (LFPR)

Percentage of eligible population in the labor force

$$LFPR = \frac{LF}{\text{Eligible Population}} \times 100\%$$

People are not considered part of eligible population if they are not working age (defined as 16 years or older), institutionalized (e.g. in prison) or in the military

The Unemployment Rate (UR)

Percentage of the labor force that is unemployed

$$UR = \frac{\#\text{ Unemployed}}{\#\text{ in Labor Force}} \times 100\%$$

Inflation

Inflation is rising general level of prices and it reduces the "purchasing power" of money

E.g. It takes $2 to buy what $1 bought in 1989

→ When inflation occurs, each dollar of income will buy fewer goods than before

Definitions

→ Inflation is persistent increase in the price level of an economy over a period of time.

→ Disinflation is fall in the rate of inflation (e.g. 2020, 20% → 2021, 15%)

→ Deflation - decrease in the price level of an economy over a period of time. (negative inflation) (e.g. 2023, -1% → 2024, -3%)

→ Core or underlying rate of inflation - this measurement eliminates the effect of volatile swings in the prices of goods.

Inflation devalues a currency (money worth less than before)

Effects of Unanticipated Inflation

- Hurt by Inflation
  - Lenders - People who lend money (at fixed interest rates)
  - People with fixed incomes
  - Savers

opposite with deflation

- Helped by Inflation
  - Borrowers - People who borrow money
  - A business where the price of the product increases faster than the price of resources.

Nominal Wage - Wage measured by dollars rather than purchasing power

Real Wage - Wage adjusted for inflation

Deflation

Deflation - Decrease in general prices or a negative inflation rate

Deflation is bad because people will hoard money and assets

↳ Decreases consumer spending and GDP

Disinflation - Prices increasing at slower rates

Consumer Price Index - Designed to measure changes in the cost of a select market basket of goods and services.

How is inflation measured?

- The government tracks that prices of specific "market baskets" that included the same goods and services

e.g. Avocado for Mexico - what people consume per month -

2 ways to look at inflation over time:

- Inflation Rate - The percent change in prices from year to year
- Price Indices - Index numbers assigned to each year that show how prices have changed relative to a specific base year.

Calculating the Market Basket

- Cost of Market Basket

↳ Sum of prices of all items in the basket in a given year. The quantity in the basket must be the same as the base year

↳ Only items that consumers would normally purchase are included in the Consumer Price Index (CPI)

Good	Yr 1	Yr 2	Yr 3
1 lb of Apples	$2.00	$2.00	$2.50
1 lb of Bananas	$0.25	$0.50	$0.75
1 gallon of Milk	$1.75	$2.50	$2.25
Cost of Market Basket	$4.00	$5.00	$6.00

CPI	Yr 1	Yr 2	Yr 3
Base Yr 1	100	125	150

The base year can be changed (changes CPI)

The most commonly used measurement of inflation for consumers is the Consumer Price Index (CPI)

$$CPI = \frac{\text{Price of market basket}}{\text{Price of market basket in base year}}$$

Inflation

$$\text{Inflation Rate} = \frac{\overbrace{\text{New} - \text{old}}^{\text{GDP Deflator OR CPI}}}{\text{old}} \times 100\%$$

Prodolems with CPI

1. Substitution Bias - As prices increase for the fixed market basket, consumers buy less of these products and more substitutes that may not be part of the market basket
   - Result :- CPI may be higher than what consumers are really paying
2. New Products - The CPI market basket may not include the newest consumer products
   - Result : CPI measures prices but not the increase in choices
3. Product Quality - The CPI ignores both improvements and decline in product quality
   - Result : CPI may suggest that prices stay the same though the economic well being has improved significantly.

Nominal Variables - Variables such as wages, income, or interest that have not been adjusted for the rate of inflation

Purchasing Power - What can actually bought with money

Real Interest Rate - The interest rate that reflects the actual purchasing power of that interest

Bond - An asset that is a promise to pay a fixed amount at some point in the future

Wealth Redistribution - When the real value of wealth is transferred from one agent to another

Real vs Nominal GDP

$$\text{Real Value} = \frac{\text{Nominal Value}}{\text{Cons. Price Index}} \times 100$$

nominal GDP with base year's prices ⇝ constant prices

E.g. Wages

Nominal Wage	CPI
$8.37	101.9

$\Rightarrow$ $\text{Real Wage} = \frac{\text{Nominal Wage}}{\text{CPI}} \times 100 = \$8.21$

Nominal Value - Value measured in current prices
(does not account for inflation from year to year)
↳ Nominal GDP - GDP that is measured in current prices

Real Value - Value expressed in constant, or unchanging, dollars.
(Adjusts for inflation)
↳ Real GDP - GDP that is measured in prices adjusted for inflation

Real GDP is better than nominal GDP for measuring actual growth

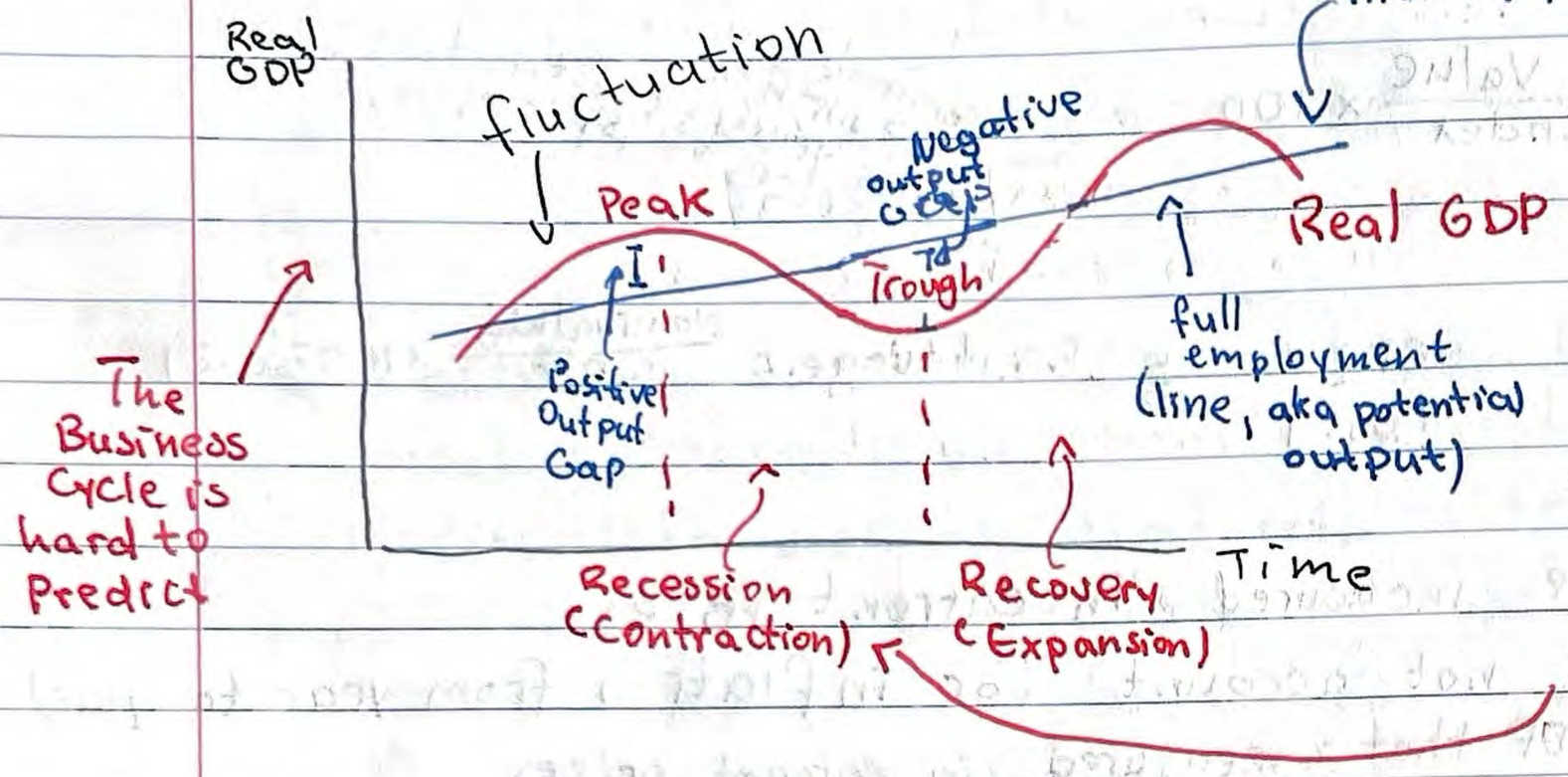
Adjusting for Inflation
↳ It is important to adjust for Inflation
↳ E.g. Year 1: 10 apples at $1 each; GDP = $10
Year 2: 10 apples at $1.25 each; GDP = $1.25
} GDP is rising but country is worse off.

GDP Deflator ⇝ Adapts (not only in market basket)
↳ Measures the prices of all goods produced (CPI only the goods bought by consumers)
↳ Takes into account an increase in the price of goods bought by firms or the government will show up in the GDP deflator but not in the CPI
↳ GDP deflator only includes those goods and services produced domestically

$$\text{GDP deflator} = \frac{\text{Nominal GDP}}{\text{Real GDP}} \times 100$$

$$\text{Nominal GDP} = \frac{(\text{Deflator}) \times (\text{Real GDP})}{100}$$

The Business Cycle



Assuming pop. growth, incr. in productivity

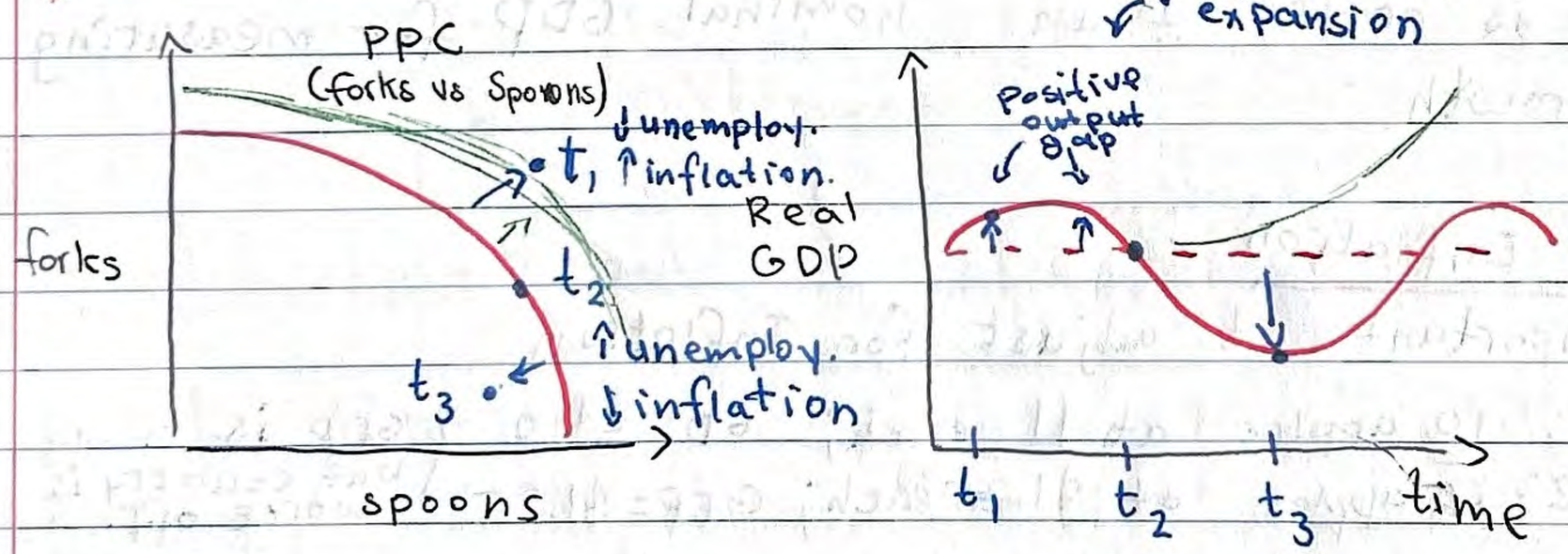
→ The national economy goes up and down like a roller coaster over time

→ A recession is 6 month period of decline in Real GDP (If really bad then depression)

Real GDP = # output × Price in BASE YEAR

The Business Cycle fails to account for Human Emotions (e.g. greed)

Connection with PPC



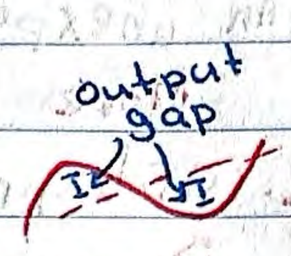
Economic Growth - Potential of an economy increases

Aggregate Demand - Total demand for a nation's output, including household consumption, government spending, business investment, and net exports.

Agregate Supply - Total supply of goods and services produced by a nation's businesses

Connection with Rates of Unemployment

-> When an economy produces more than potential output, the current rate of unemployment is less than the natural rate of unemployment

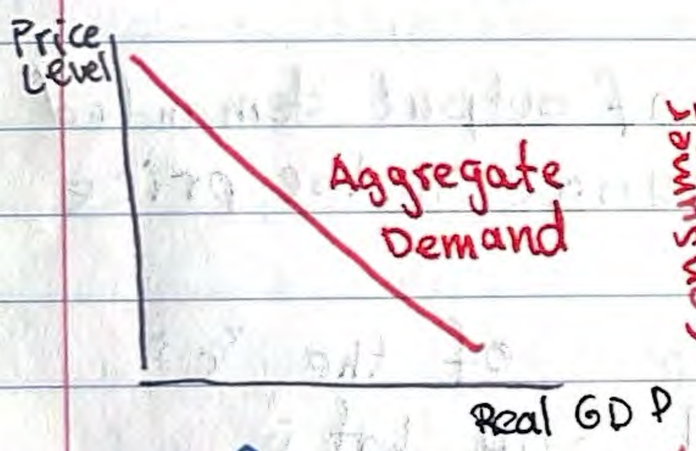


-> When an economy produces less than potential output, the current rate of unemployment is more than the natural rate of unemployment

Aggregate Demand

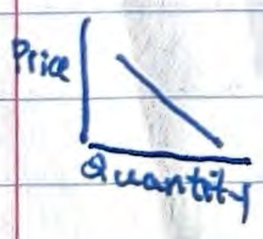
Aggregate - Everything added up (that are relevant in context)

Aggregate Demand - All demand (curves) added up



Aggregate Demand in a Macroeconomic context

(Microeconomic Context:



Downward Sloping Reasons:

Consumer behavior

1. Real Wealth Effect
   -> Price level falls, leads to more purchasing power. Consumers therefore buy more.

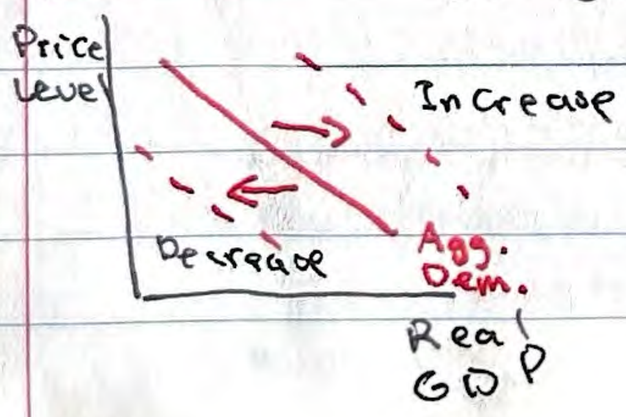
Business behavior

2. Interest Rate Effect (Saving)
   -> Price level rise causing people to buy less. People also save and loan less. Thus higher interest rates, less investment spending, causing a decrease in quantity demanded

People in other countries behavior

3. Exchange Rate Effect
   -> If a country increases price level, then countries wishing to import will demand less

Shifts in Aggregate Demand



Anything that affects consumer spending, investments, government spending or net exports shift Aggregate Dem.

$GDP = C + I + G + (X - M)$

Shifts in Aggregate Demand

1. An unexpected boom in the stock market.
   More money for consumers, more consumption : ↑AD
2. widespread fear of recession
   Decrease consumer confidence, less consumption : ↓AD
3. An increase in transfer payments
   Not gov't spending bc no exchange of goods, Instead more money for consumers, more consumption : ↑AD
4. The US dollar appreciates
   More expensive for outside countries to buy : ↓X ↑M = ↓AD
5. There is a decrease in real interest rates in the US
   Cheaper to take out loans, business buy more : ↑AD
6. Significant increase in income tax rates
   Less disposable income, less consumption ↓AD

Movement Along AD - A change in the amount of output demanded that occurs due to a change in the price level.

Interest-sensitive Consumption - Spending that is part of the "c" category of real GDP that is sensitive to interest rates.

Fiscal Policy - The use of taxes, gov't spending, or gov't transfers to affect real GDP

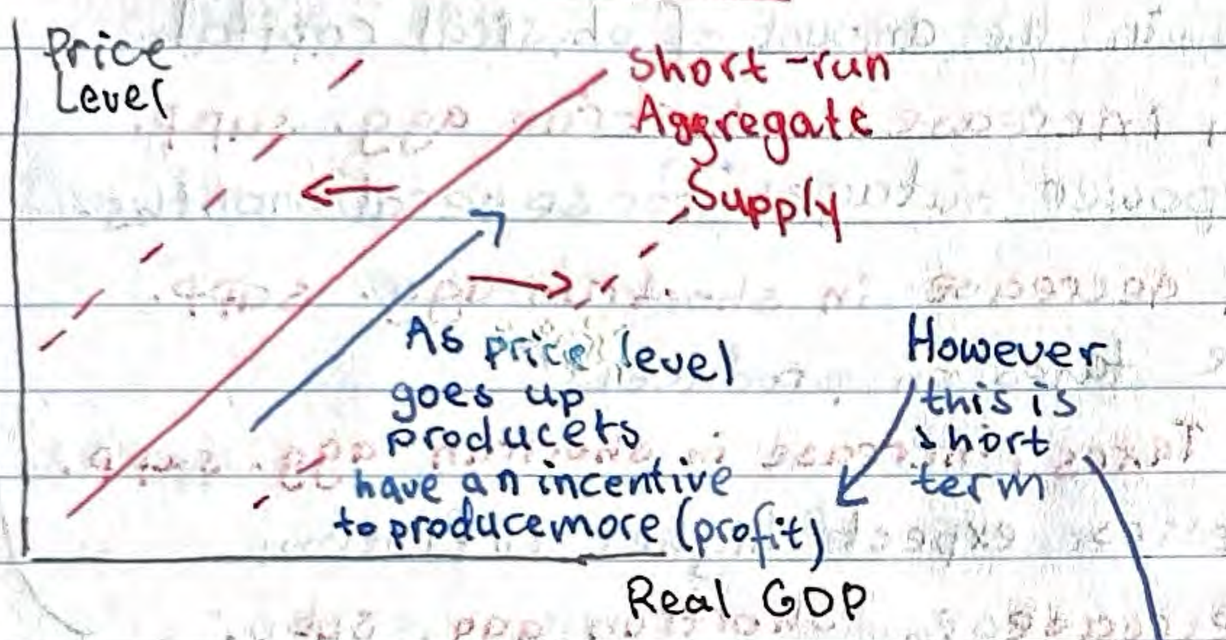
Monetary Policy - The use of the money supply to impact interest rates which in turn affects real GDP

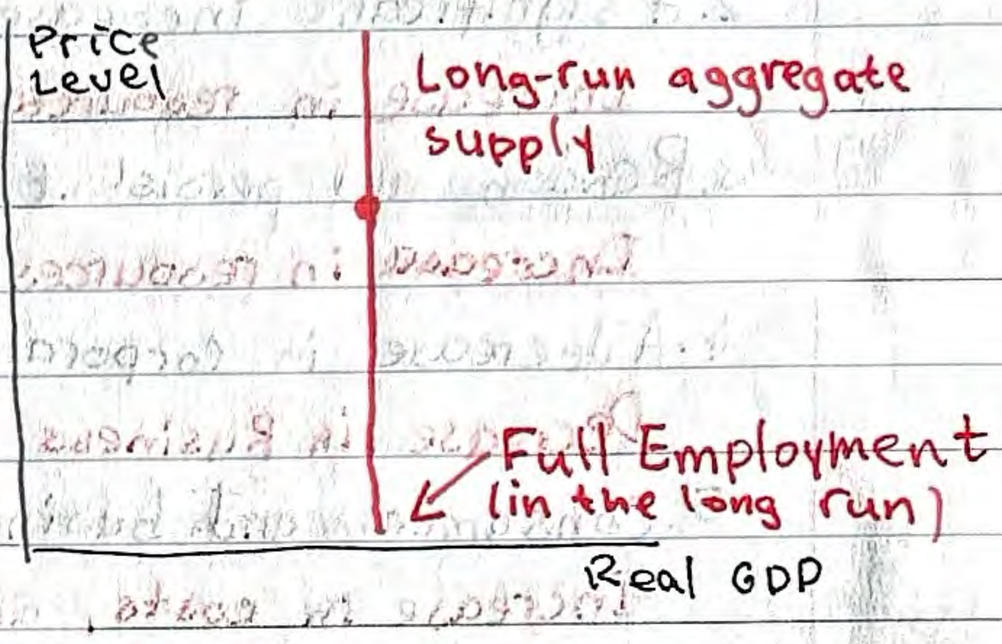
Aggregate Supply

Short-run only happens because wages are STICKY (does not adjust immediately, e.g. contracts)

Two Graphs:

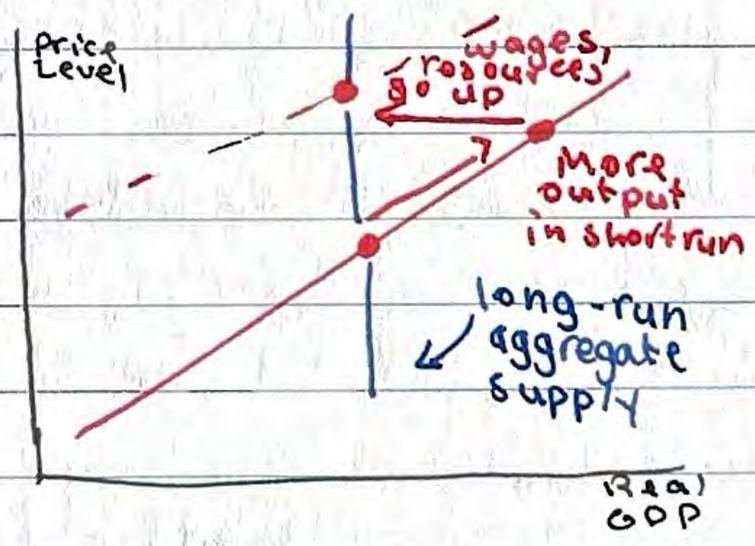
- Short-run Aggregate Supply
- Long-run Aggregate Supply





- Shifters of Short Run
  - → Resource prices - a change in the cost or availability of key resources will affect the amount that producers can make in the short run
  - → Actions by Gov't - a change in taxes, subsidies, or regulations can change the incentives of producers and affect the amount they produce.
  - → Productivity - a change in technology or human capital can change the amount producers can make with the same amount of resources
  - → Capital Stock - Accumulation of physical capital used to produce goods and services
  - → Supply Shock - An unexpected decrease (negative) / increase (positive) of key resources. Dec./Inc. short-run aggregate supply

As price level rises, people expect more inflation so workers want (negotiate) higher wages, thus shifting the supply curve left



Shifters of long run

→ Similar to production possibilities curve

→ Shifters for PPC are same as shifers for long-run aggregate supply

→ E.g. Population Increase

Aggregate Supply

Practice

1. An increase in nominal wages for many workers.
   Increase in costs, decrease in short run agg. supp.
2. A significant increase in the amount of physical capital.
   Increase in resources, increase in shortrun agg. supp.
3. Random and persistent power outages for several months.
   Decrease in resources, decrease in shortrun agg. supp.
4. A decrease in corporate taxes on producers.
   Decrease in Business Taxes, increase in shortrun agg. supp.
5. Consumers and businesses expect higher inflation
   Increase in costs, decrease in shortrun agg. supp.

Short run Agg. Supply

6. An increase in nominal wages for many workers
   Longrun aggregate supply will stay the same
7. A significant increase in the amount of physical capital.
   Increase in capital stock, increase in longrun agg. supp.

long run agg. supply

Multipliers

The multiplier effect

- An initial change in spending will set off a spending chain that is magnified in the economy

The Multiplier Effect shows how spending is magnified in the economy

Example:

- Bobby spends $100 on Jason's product
  - Jason now has more income so he buys $100 of Nancy's product
  - Nancy now has more income so she buys $100 of Tiffany's product
  - The result is an $300 increase in consumer spending

Effects of Government Spending

- If gov't spends $5 million, will AD increase by the same amount?
  - → No bc AD will increase even more as spending becomes income for consumers (more consumption)

How much will AD increase

→ It depends on how much of the new income consumers save

→ If save a lot, spending & AD increase less

→ If save less, spending & AD increase more

Marginal Propensity to Consume (MPC)

- How much people consume rather than save when there is a change in income
- Always expressed as a fraction or decimal

Multipliers

Marginal Propensity to Consume

$$MPC = \frac{\text{Change in Consumption}}{\text{change in income}}$$

1. If you received $100 and spent $50.

Marginal Propensity to Save (MPS)

- How much people save rather than consume when there is a change in income
- It is also always expressed as a fraction (decimal)

$$MPS = \frac{\text{change in savings}}{\text{Change in income}}$$

1. If you received $100 and save $50.

Since $0 \leq MPC \leq 1$ and $0 \leq MPS \leq 1$

Assuming...

→ Savings + Consumption = income

$\therefore MPS + MPC = 1$ OR $MPS = 1 - MPC$

How is Spending "Multiplied"?

- Assume the MPC is 0.5 for everyone
  - → Increase of $100 for Ashley
  - → She saves $50, spends $50 at Karl's
  - → Karl saves $25, spends $25 at Dan's
  - ... etc. continues until every penny is spent/saved

Total Change in GDP = Multiplier × Initial Change in spending

Multiplier

$$\text{Spending Multiplier} = \frac{1}{MPS} = \frac{1}{1-MPC}$$

If MPC is 0.9, what is multiplier?

$\frac{1}{1-0.9} = \frac{1}{0.1} = 10$

~~Conclusion~~: As the Marginal Prospensity to Consumer falls, the Multiplier Effect is less.

Tax Multiplier

$$\text{Tax Multiplier} = \frac{MPC}{1-MPC} = \frac{MPC}{MPS} = \frac{\text{Change in Consumption}}{\text{Change in saving}}$$

Calculating Total Output

MPC describes how much someone is willing to spend

Initial \$ • MPC = \$pent \$

Farmer: Earns \$1000 → Builder: Earns \$600 → Shop Owner: Earns \$360

MPC: 0.6 Spends \$600 → Spends \$360 → Spends \$216

... continues infinitely

$\therefore$ Total Output = Initial \$ • MPC + Initial \$ • MPC^2 + Initial \$ • MPC^3 ...

= \$1000 • 0.6 + \$1000 • 0.6^2 + \$1000 • 0.6^3 ...

= \$1000 (1 + 0.6 + 0.6^2 + 0.6^3 ...)

= \$1000 • $\frac{1}{1-0.6}$ = \$1000 • 2.5 = \$2500

$\sum$ Geometric = $\frac{1}{a-r}$

a = initial

r = factor

$\therefore$ Total Output = $a \cdot \frac{1}{a-r}$ for a = initial, MPC = r

= $a \cdot \frac{1}{a-MPC}$

Multipliers

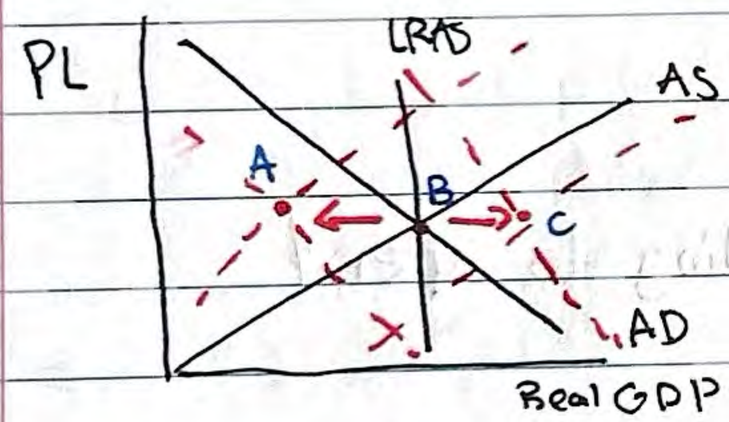
Change in Autonomous Spending

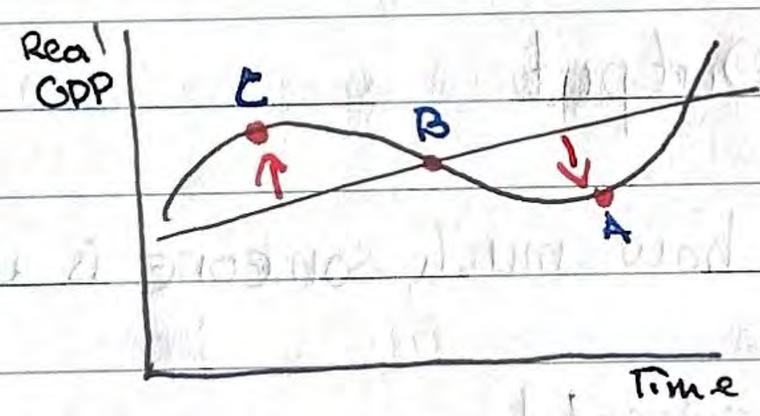
→ Changes in spending that happen in response to something besides an increase in income.

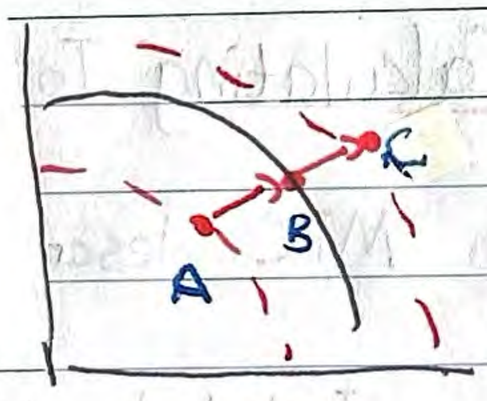
E.g. Governments usually spend money if they have a reason, or an objective to spend it. They don't spend more money just because the economy is doing well and the national income is increasing. This is classified as autonomous spending

Due to the multiplier effect, a $x increase in autonomous spending means more than a $x increase in real GDP.

Business Cycle, PPC, Aggregate Equilibrium Model





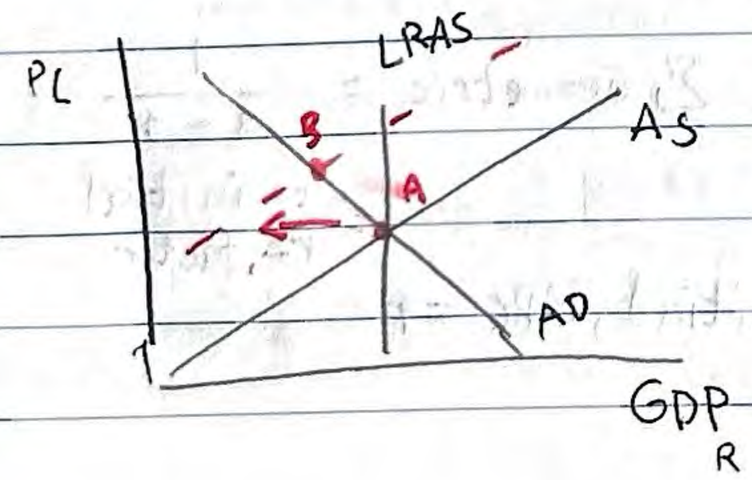


A	Recessionary Gap	Natural Rate of Unemp. < Actual Rate of Unemp.
B	Equilibrium	Natural Rate of Unemp. = Actual Rate of Unemp.
C	Inflationary Gap	Natural Rate of Unemp. > Actual Rate of Unemp.

Stagflation

→ Stagnate Economy + Inflation (increase in Nominal Prices)

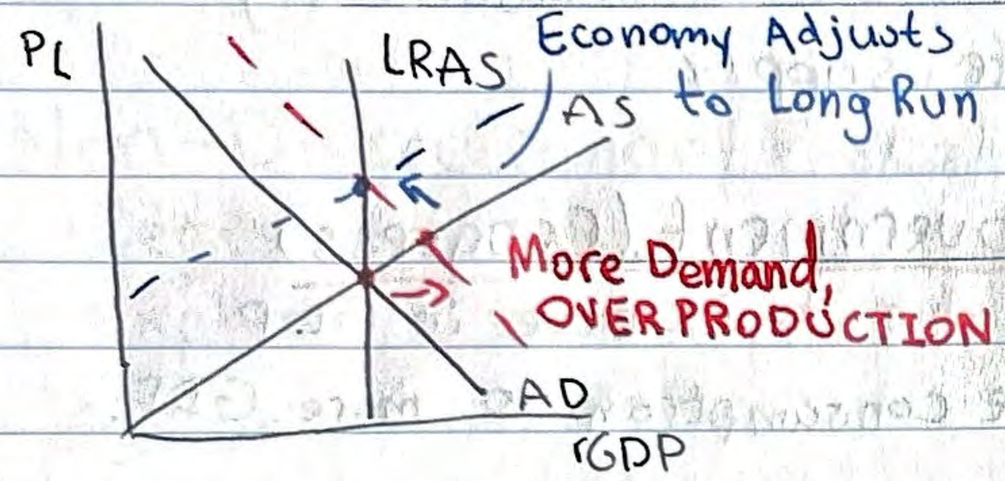
→ Considered a recessionary gap



Price Level increases, GDP (Real) decreases.

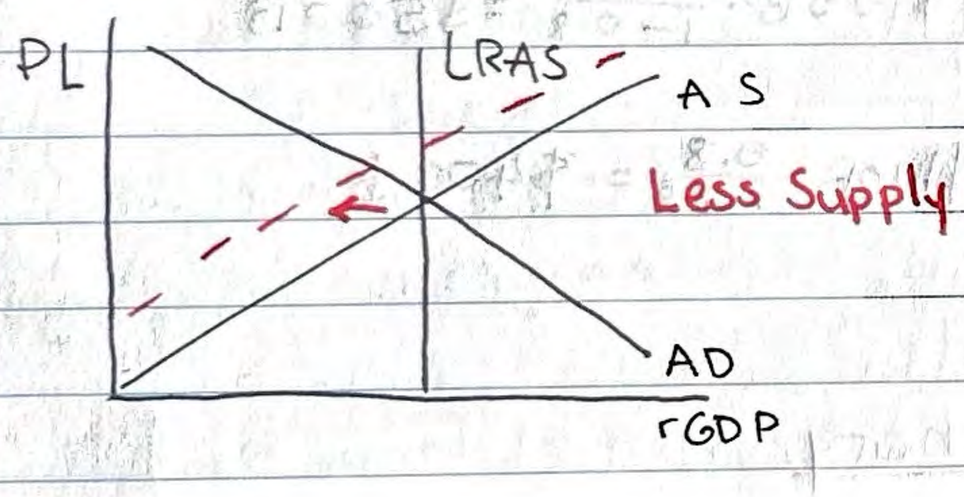
Types of Inflation

Demand Pull Inflation



Aggregate Demand increases.
In the long run, GDP_{real} returns to normal and only price level inflation is left

Cost Push Inflation



Aggregate Supply decreases.
Causes higher price level

Fiscal Policy

Fiscal Policy to address output gaps

→ A fiscal policy can be used to shift a recessionary gap to the long term aggregate supply

Fiscal Policies are by the government (Congress)

1- Gov't Spending, shifts AD due to increase in GDP
2- Tax, shifts AD due to more consumption so more GDP.
(less tax = more GDP)

Effect of fiscal policies

E.g. Government spends \$100B ⇒ $\$100B \cdot \frac{1}{1-0.8} = \$500B$
⇒ MPC = 0.8
Decrease taxes by \$100B ⇒ $\$100B \cdot \frac{0.8}{1-0.8} = \$400B$
⇒ MPC = 0.8

Discretionary vs Non-Discretionary

E.g. In a recession, Congress increases spending

Discretionary Fiscal Policy

- Congress creates a bill that is designed to change AD through government spending or taxation.
- Problem is time lags due to bureaucracy.
- Takes time for Congress to act.

Non-Discretionary Fiscal Policy

- Automatic Stabalizers
- Permanent spending or taxation laws enacted to work counter cyclically to stabalize the economy
- E.g. Welfare, Unemployment, Min. Wage, etc.
  ↳ When there is high unemployment, unemployment benefits to citizens increase consumer spending

Contractionary Fiscal Policy

→ Laws that reduce inflation, decrease GDP
→ Decrease Gov't spending, increase taxes or both

Expansionary Fiscal Policy

→ Laws that reduce unemployment and increase GDP
→ Increase Gov't Spending, Decrease Taxes, or Both

Non-Discretionary Fiscal Policy

- Legislation that act counter cyclically without explicit action by policy makers.
- "Automatic Stabaliser"

The US Progressive Income Tax System acts counter cyclically to stabalize the economy.

1. When GDP is down, the tax burden is low, promoting consumption, increasing AD
2. When GDP is up, more tax burden on consumers, discouraging consumption, decreasing AD.

The more progressive the tax system, the greater the economy's built-in stability.

Progressive Tax System - Higher tax rates for higher income

Lump-sum taxes - Taxes that do not depend on the taxpayer's income (e.g. fixed amount non-dependent on income)

Lag - Delays that occurs with fiscal policies

↳ Data Lag: Time it takes to get macroeconomic data
↳ Recognition Lag: Delay in fiscal policy caused by time that it takes to realize that there is a problem to be corrected.
↳ Decision Lag: The delay in fiscal policy caused by the time it takes to decide on a course of action

Deficit - When expenditures exceed income

Debt - The accumulated debt over time.

Money

Money refers to anything that is generally accepted in payment for goods and services

Wealth - Total collection of assets

Income - Flow of earnings per unit of time

-Money is NOT the same as wealth or income-

Types of Money

Commodity-backed Money
- Money backed by a guarantee of commodity / goods.

- Commodity Money
  - → something that performs the function of money and has intrinsic value.
  - → E.g. Gold, silver, cigarettes, etc.
  - → Good and is money. ⇐ Coins (gold)

Intrinsic: By itself. Value of actual object

- Fiat Money
  - → something that serves as money but has no other value or uses.
  - → E.g. Paper Money, Coins, Digital Currency
  - → Is money but no true value.

3 functions of money

1. A medium of exchange
   - Money can easily be used to buy goods and services with no complications of barter system.
2. A unit of amount (value)
   - Money measures the value of all goods and services. Money acts as a measurement of value.
   - 1 goat = $50 = 5 chickens OR, 1 chicken = $10

3 Functions of Money, ctd.:

3. A Store of Value

- Money allows you to store purchasing power for the future.

Characteristics of Money

1. Durability - Lasts long
2. Portability - Easy to carry
3. Divisibility - Divisible into smaller amounts
4. Recognisability - Easy for people to recognise
5. Scarcity - Hard to obtain lots of
6. Acceptability - Acceptable across society
7. Uniformity - All same amount has same value.

What backs the money supply?

-> There is no gold standard. Money is just an I.O.U. from the government "for all debts, public and private."

-> What makes money effective?

1. Generally Accepted - Buyers and sellers have confidence that it IS legal tender.
2. Scarce - Money must not be easily reproduced
3. Portable and dividable - Money must be easily transported and divided

-> The Purchasing Power of money is the amount of goods and services a unit of money can buy.

Inflation decreases purchasing power.
Rapid inflation decreases acceptability.

Hyperinflation - Rapid inflation caused by social belief of anticipated inflation (goes on in a cycle)
(Real values of products stay the same)

Classifying Money

Liquidity - ease at which an asset can be accessed and used as a medium of exchange

M0/MB: Base Money (from Central Bank) (cash + reserves)

M1: Highest Liquidity (cash + checking + travelers checks)

1. Currency in circulation
2. Checkable bank deposits (checking accounts)
3. Traveler's checks

M2: Near-Moneys, M1 plus the following...

1. Saving deposits (money market accounts)
2. Time deposits (CDs = certificates of deposit)
3. Money market funds

M1 and M2 money often earn little to no interest so the opportunity cost of holding liquid money is the interest you could be earning

The financial Sector

Individuals, businesses, and governments borrow and save so they need institutions to help

- Financial Sector - Network of institutions that link borrowers and lenders including banks, mutual funds, pension funds, and other financial intermediaries.

Bonds vs Stocks

Pretend you are going to start a lemonade stand. You need some money to get started. What do you do?

→ You asked your grandmother to lend you $100, she just bought a bond.

Bonds vs Stocks

- Bonds are loans, or IOUs, that represent debt that the government, business, or individual most repay to the lender
- The bond holder has NO OWNERSHIP of the company. (debt)
  - → To get more money, you could sell half of your company and issue shares of stock.
- Stocks - Represents ownership of a corporation and the stockholder is often entitled to a portion of the profit (equity)

→ Bonds lead to money owed or debt
→ Stocks lead to association or partially owned company

Assets - Anything tangible or intangible that is owned
Liability - Anything that is owed
Loan - An agreement between a lender and a borrow. Usually at a fee called the interest rate.

A loan is an asset for the lender and a liability for the borrower.

Bond price and interest rates are inversely related.

Bond Prices and Interest Rates

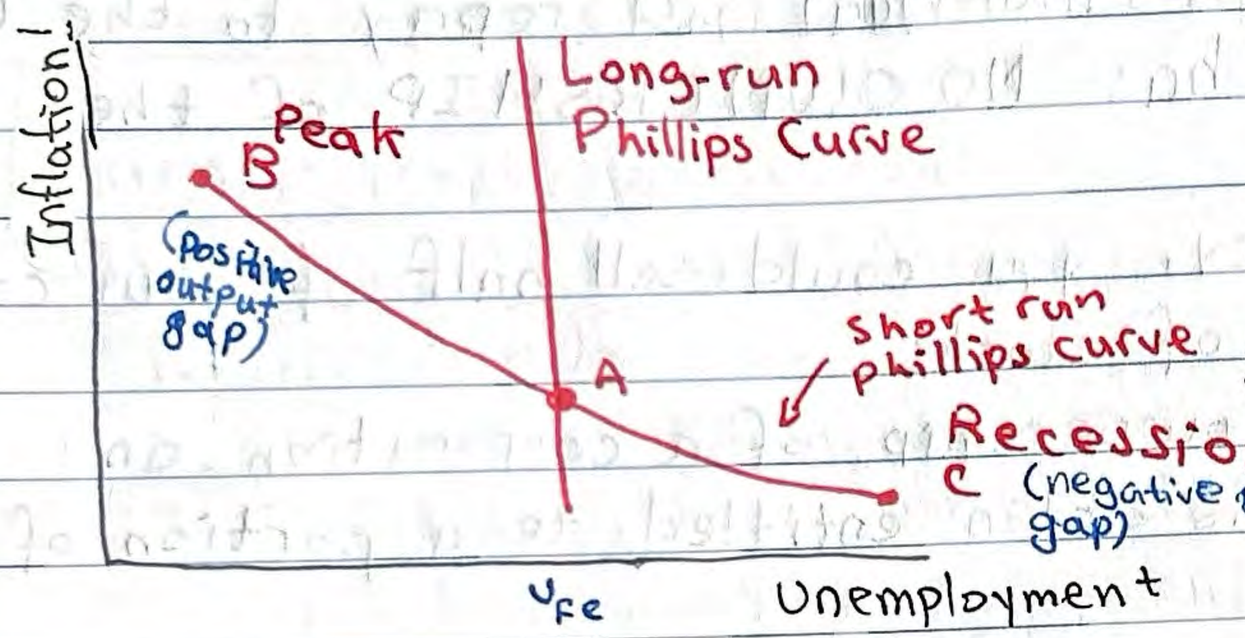
A bond is issued at a specific interest rate that doesn't change throughout the life of the bond

E.g. Assume a 30 year US Treasury bond has a face value of $1000 and the interest rate is 5%. Each year, for 30 years, you will get $50.

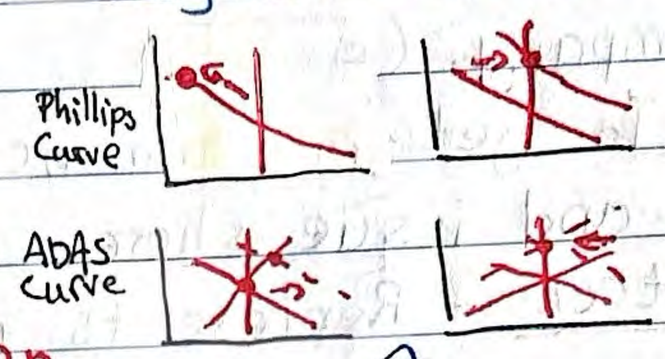
If the interest rate falls and new bonds are being issued at 3% then people would rather have the old 5% bonds.
If you like, you can sell bonds before they mature.
If you sold the original 5% bond, buyers would bid up the price since they would rather have 5%.

Phillips Curve

Curve that relates price level (inflation) and unemployment



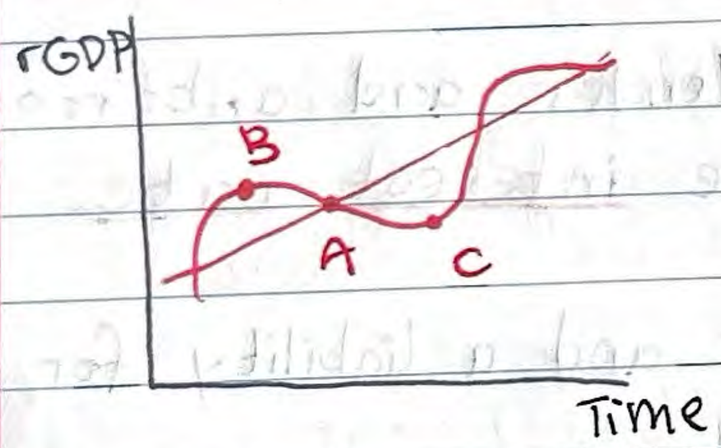
Long-run selfadjustment



A change in Aggregate Demand is a movement along SRPC.
A change in AS shifts SRPC

Illustrates that there is an INVERSE RELATIONSHIP

Relation with Business Cycle



POINT A - Long-run inflation / price-level.
Unemployment = Natural Rate Un.

POINT B - Inflationary price-level
Unemployment < Natural Rate Unemp.

POINT C - Recessionary Price-level
Unemployment > Natural Rate Unemp.

Taxes

The multiplier effect also applies when the government cuts or increase

But changing taxes has less of an impact than government spending due to tax multiplier.

E.g. Assume MPC is 0.75. If gov't taxes are cut by $4 million, how much will consumer spending increase?

$$\$4 \text{ million} \times 0.75 \times \frac{1}{1-0.75} = \$12 \text{ Million}$$

Not $16M bc consumers save and then spending magnified.

Interested Rates and Inflation

What are interest rates? Why do lenders charge them?

Real Interest Rates - The percentage increase in purchasing power that a borrower pays (adjusted for inflation)

CAN BE POSITIVE OR NEGATIVE

Real interest rate = nominal interest rate − expected inflation

Nominal Interest Rates - The percentage increase in money that the borrower pays not adjusting for inflation

CAN ONLY BE POSITIVE

Nominal interest rate = Real interest rate + expected inflation

The Fisher Equation

Nominal Interest Rate = Real Interest Rate + Inflation

Unanticipated Inflation

- REAL rate of return on the financial asset falls
- REAL value of the financial asset falls
- Lenders, borrowers, and savers make decisions about loaning, borrowing, or saving based on what they expect or anticipate inflation to be over the term of their loan or saving.

The Fisher Effect

- The idea that an increase in expected inflation drives up the nominal interest rate, leaving the expected real interest rate unchanged

Money, Banking, and Monetary Policy

Fractional Reserve Banking

- When banks hold only a small portion of deposits to cover potential withdrawals and then loans the rest of the money out.
  - ↳ A Bank Run occurs when a sudden withdrawal of money occurs at the same time.

Central Bank - An institution that oversees and regulates the banking system and quantity of money in the economy.

Dual Mandate - The Federal Reserve's responsibility to use monetary policy to promote maximum employment and price stability.

- **Price stability** - A low and stable rate of inflation maintained over an extended period of time. The Fed has a longer-run goal of 2% inflation.
- **Maximum Employment** - The Fed does not have a specific unemployment target but regularly publishes a forecast for the longer-run unemployment rate.

Bank Balance Sheets

When you deposit your money in the bank, money supply doesn't change, only the composition

Liability: **Demand Deposits** - Money deposited in a commercial bank in a checking account

Asset:
- **Required Reserves** - The percent that banks must hold by law
- **Excess Reserves** - The amount that the bank can loan out.

- **Balance Sheet** - A record of a bank's assets, liabilities, and net worth

Bank Balance Sheets

Assets		Liabilities	
Required reserves	$2,000	Demand deposits	$10,000
Excess reserves	$0	Owner's equity	$10,000
Customer Loans	$8,000		
Government securities (bonds)	$7,000		
Building and fixtures	$3,000		

Also known as a T-account

TOTAL ASSETS: $20,000 TOTAL LIABILITIES: $20,000

Must be EQUAL

$$\text{Required Reserve Ratio} = \frac{\text{Required Reserves}}{\text{Demand deposits}} \times 100\%$$

Total Reserves = Excess Reserves + Required Reserves

$$\text{Money Multiplier} = \frac{1}{\text{Required Reserve Ratio}}$$

↳ Money can be seemingly created out of thin air when loaned too many times

↳ Banks loan to banks loan to banks, which cause money to be double counted

E.g. Save $1,000, required 10% reserve.

$1000 → $100 → $10 → $1 → $0.1 → $0.01 etc.

Money loaned (not directly saved) × Money Multiplier = Total Money "created" (counting money invested by bank after savings) in LOANS or in MONEY SUPPLY

Total Money CHANGE in DEMAND Deposits = Total Money "Created" + initial = Money × Money Multiplier

NOTE: Money change in LOANS or MONEY SUPPLY is money loaned × money multiplier

Money change in DEMAND Deposits is money deposited × money multiplier

The Money Market

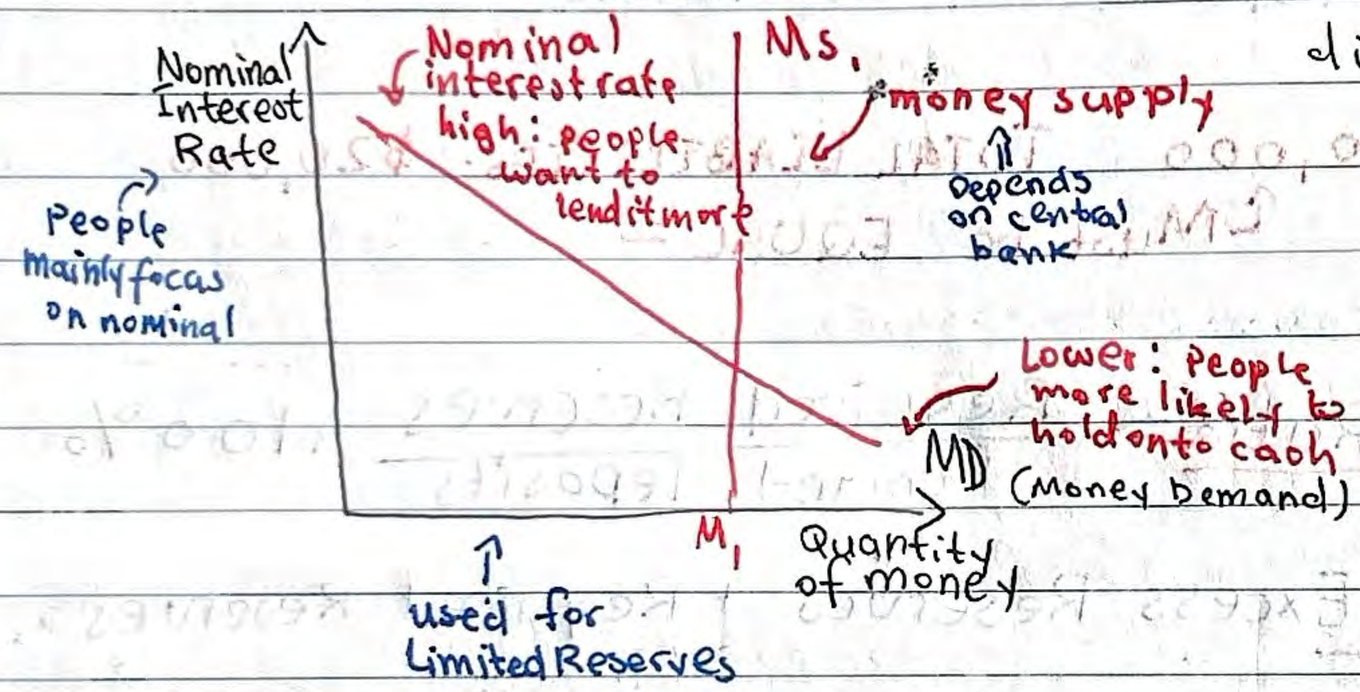
Two ways to think about money:

1. Cash

Opp. Cost: interest % opp. cost
(Bonds give interest)

2. Bonds

Liquidity, no cash to spend directy



Shifts of Money Demand

1. Transactions Motive (More transactions, MD right)
2. Precautionary Motive (More precaution, MD right)
3. Speculative Motive

OR

1. Changes in national income
   (higher GDP, more goods to be bought, MD right)
2. Changes in price level (inflation or deflation)
   (increase in price, MD right)
3. Changes in money technology
   (New tech makes it easier to convert wealth into money, MD left)

Monetary Policy

- A central bank can choose to enact a monetary policy as a way to solve recessionary / inflationary gaps.
  - ↳ Change in money supply (injection of money or reserve requirement)
    - Increase MS, solves rec. gap — Increase, MS↑ — Decrease, MS↑
    - Decrease MS, solves infationary gap

Purchase of bonds

The Money Market

Discount Rate - The name given to the interest rate that the Federal Reserve sets on loans that the Fed makes to banks; changing the discount rate is a tool of monetary policy, but it is not the primary tool that central banks use.

Fed Funds Rate - The interest rate that banks charge each other for short-term loans; when the Federal Reserve changes the money supply, it changes the Fed Funds rate

Interest on Reserves (IOR) - Interest on the deposits that commercial banks hold within the central bank

Outcomes of monetary policy

	Recessionary Gaps ($Y < Y_f$, $UR > UR_n$)	Inflationary gaps ($Y > Y_f$, $UR < UR_n$)
Why	full employment	price stability
How	increase money supply	decrease money supply
Tools Used	1) open market purchases (buy bonds) 2) decrease discount rate 3) decrease reserve ratio	1) open market sales (sell bonds) 2) increase discount rate 3) increase reserve ratio
Impact on interest rates	decrease nominal interest rate	increase nominal interest rate
Impact on output	Y increases	Y decreases
Impact on unemployment	UR decreases	UR increases
Impact on price level / inflation	Inflation increases	Inflation decreases

The Demand for Money

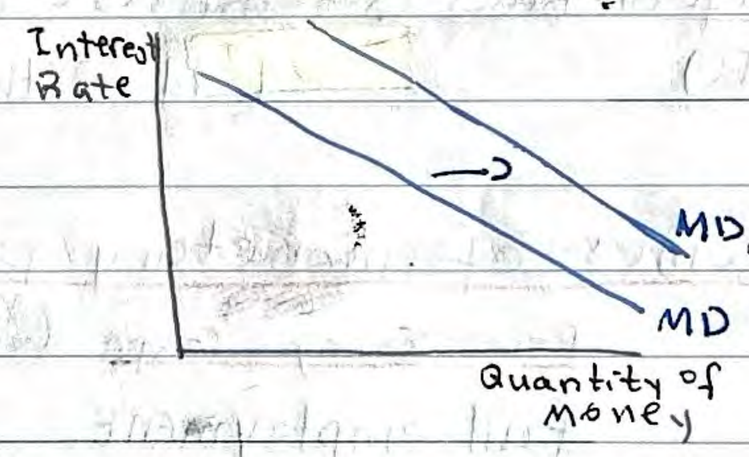
At any given time, people demand a certain amount of liquid assets (money) for two different reasons:

1. Transaction Demand for Money
   → People hold money for everyday transactions
2. Asset Demand for Money
   → People hold money since it is less risky than other assets.

Opportunity Cost (of cash): Interest you could be earning from other financial assets like stocks, bonds, and real estate.

Money Demand Shifters

1. Changes in Price Level
2. Changes in income
3. Changes in technology



The amount of money that the pulolic wants to hold, in the form of cash will decrease if the interest rates increase.

The Supply for Money

monetary policy

The US Money Supply is set by Board of Governors of the Federal Reserve System (FED)

- Central Bank is a nonpartican government office that sets and adjusts the money supply to adjust the economy.

Increase Money Supply ⇒ Decrease Interest Rate ⇒ Increase Investment ⇒ Increases AD

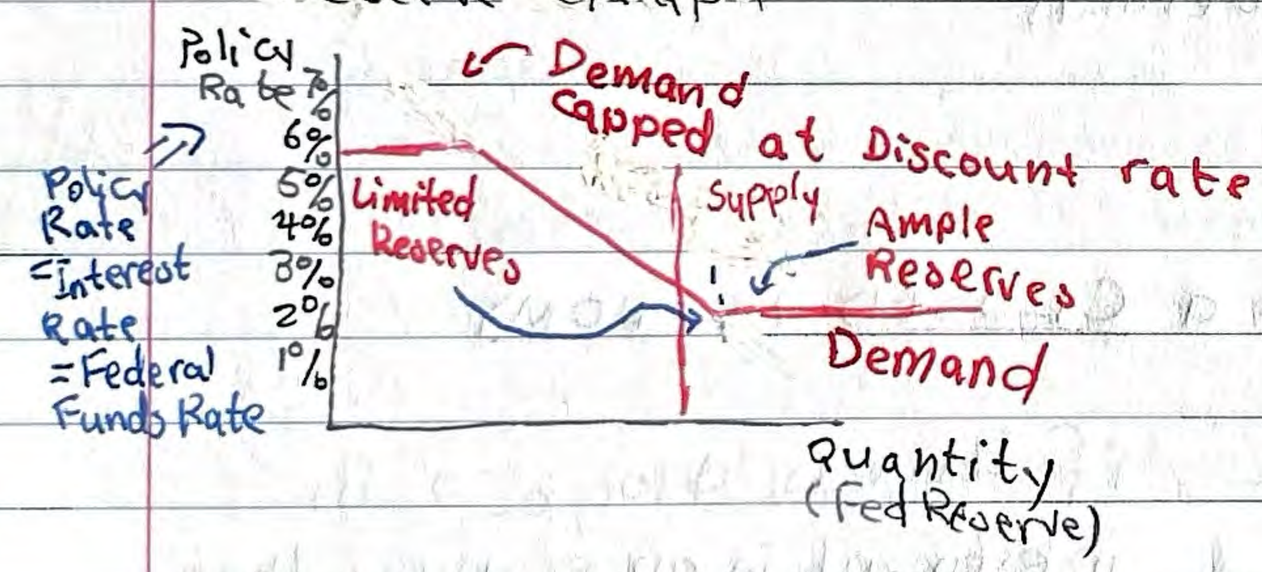
vice versa

Money Supply

Money supply shifters
1. setting Reserve Requirements → Dec. RR, more loans, more AD; Inc. RR, less loans, less AD
2. Lending Money to Banks & Thrifts ↑MS ↓PR
   - Discount Rate (interest rates for banks) ↓MS ↑PR
3. Open market operations
   - Buying and selling Bonds
     - → inc. MS, Buy gov't securities
     - dec. MS, sell gov't securities

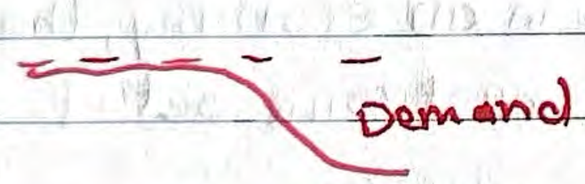
The Reserve Market

- Reserve Graph

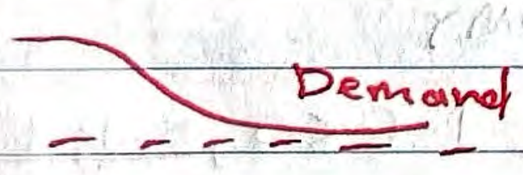


Monetary policy
→ Limited Reserves
- Fed uses reserve requirement
- Discount Rate
- Open Market Operations

→ Ample Reserves
- Interest on reserves



Demand is capped at discount rate because banks will not borrow at a higher interest rate when central bank offers lower discount rate



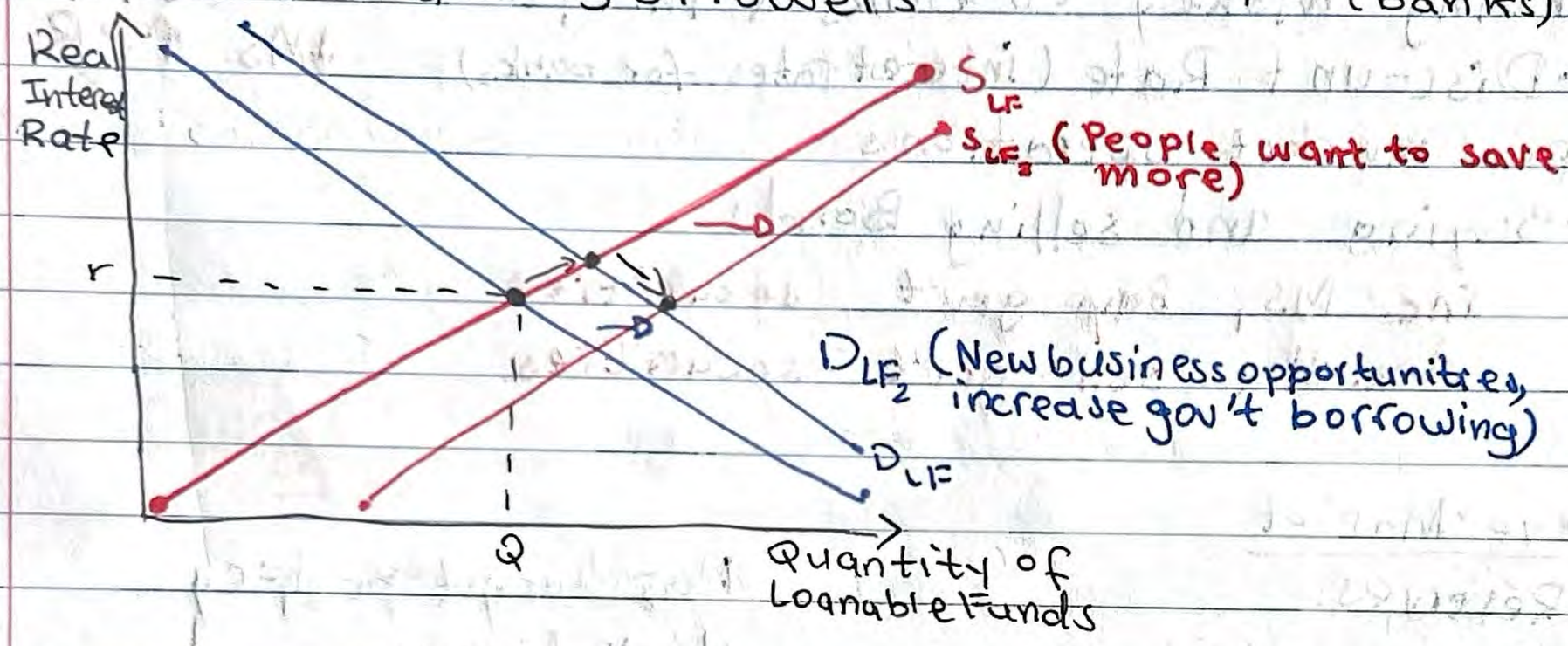
Demand is capped by interest on reserves rate because no bank will have demand for a lower interest rate when central bank offers higher

Interest On Reserves = The interest rate that Federal Reserve pays commercial banks to hold reserves

Downward sloping because high policy rate, banks loan. Low policy rate, demand for quantity in Federal Reserves higher

Loanable Funds Market

- Market for loans
  - ↳ Suppliers = Savers → Usually through a third party financial institutions (banks)
  - Demand = Borrowers



Types of Savings

$rGDP = Y = C + I + G$ in a CLOSED ECONOMY

$\underbrace{Y - C - G}_{\text{National Savings "S"}} = I \Rightarrow S = I$

if there is $100,000 in investment in an economy, that $100,000 must come out of savings

$\underbrace{Y - C - T}_{\text{Private Savings}} + \underbrace{T - G}_{\text{Public Savings}} = I$

+NCI for OPEN ECONOMY

Budget Surplus: $T - G > 0$; Budget deficit: $T - G < 0$; Budget balance: $T - G = 0$

↑ More funds to supply OR Less funds to demand

↑ Less funds to supply (gov't can't supply) OR More funds to demand (gov't borrows)

Domestic Outflow of funds - Financial assets that leave the country ↑ Less supply funds

Capital Inflow - Financial capital coming in the country ↓ More supply funds

NCI - Net capital inflows: the difference between financial capital entering the country and financial capital leaving the country

Fiscal and Monetary policy in parallel

-> Fiscal Policy

- Changing taxes and/or government spending

Expansionary Policies

=> Taxes decrease or government spending increase, increase AD

Contractionary Policies

=> Taxes increase or government spending decrease, decrease AD

-> Monetary Policy

- Actions by central bank, (independent of federal government in some)
- Changes in money supply to impact interest rates
  - => Lower interest rates, more borrowing and spending (investment)
  - => Impacts Aggregate Demand

Expansionary Policies

=> Money supply increase, interest rates decrease

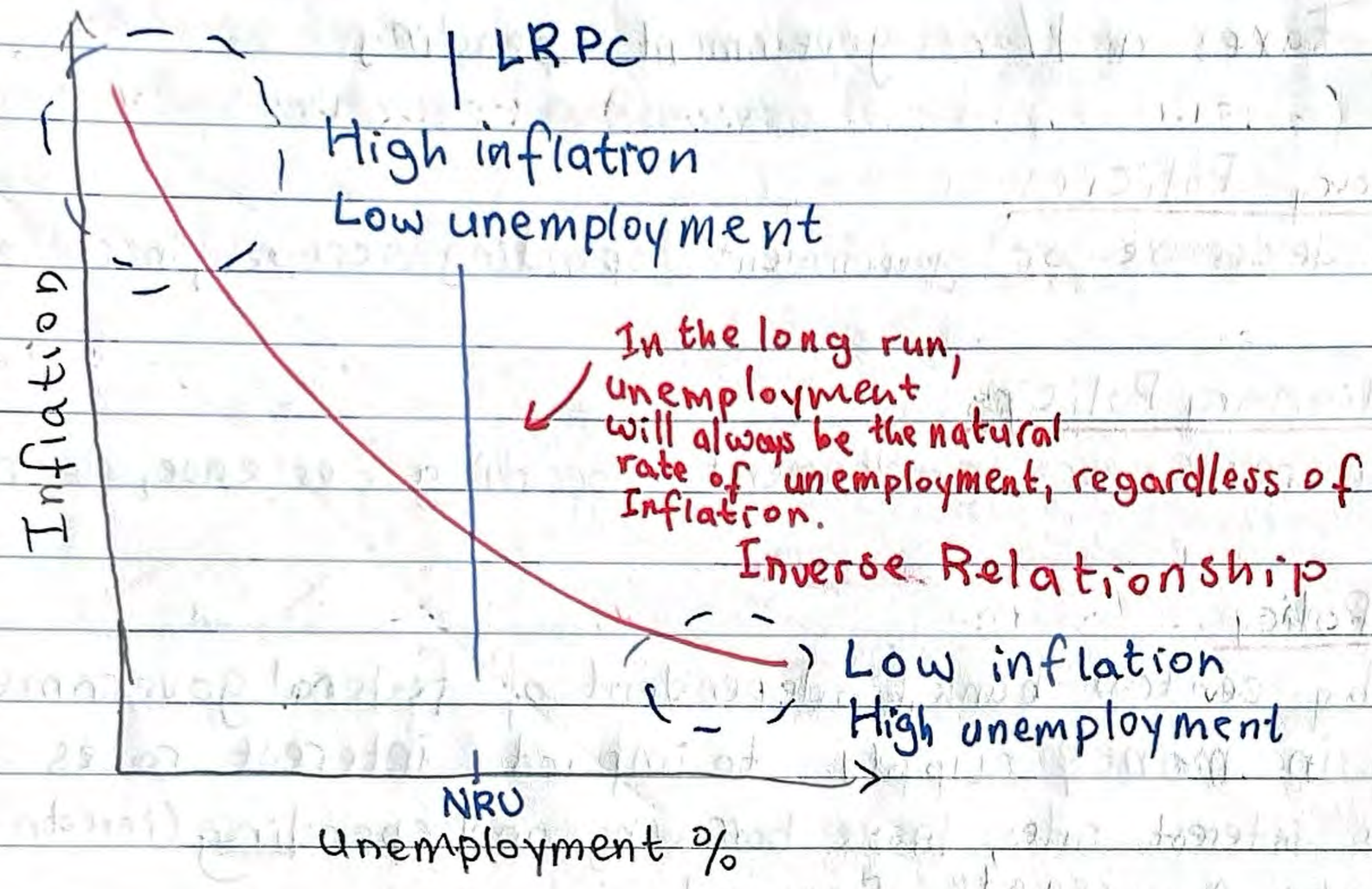
Contractionary Policies

=> Money supply decrease, interest rates increase

Central Bank Autonomy - The idea that a central bank should be an independent government entity that operates without influence from other parts of a government

Phillips Curve

By William Phillips



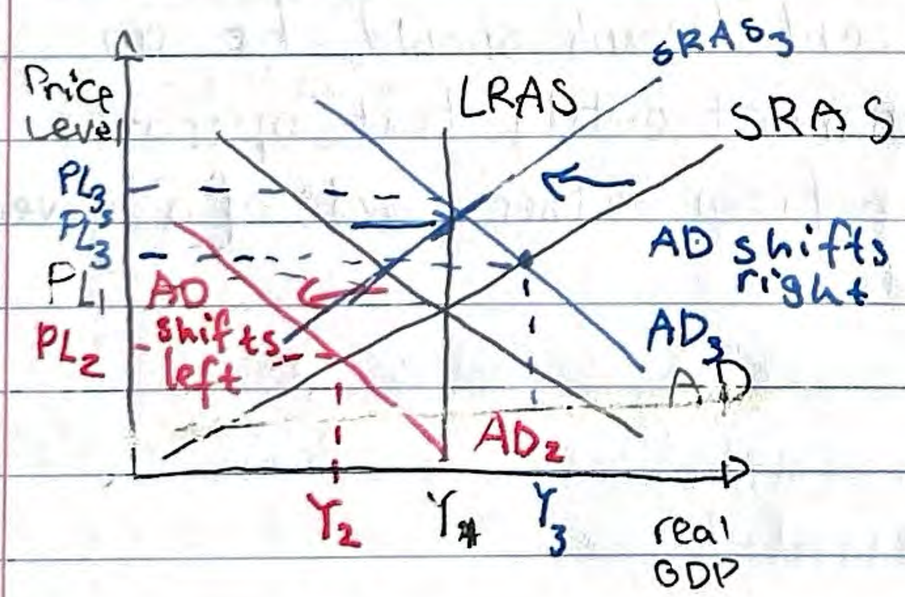
Low Unemployment → Workers have more options → Employers raise wages to attract workers

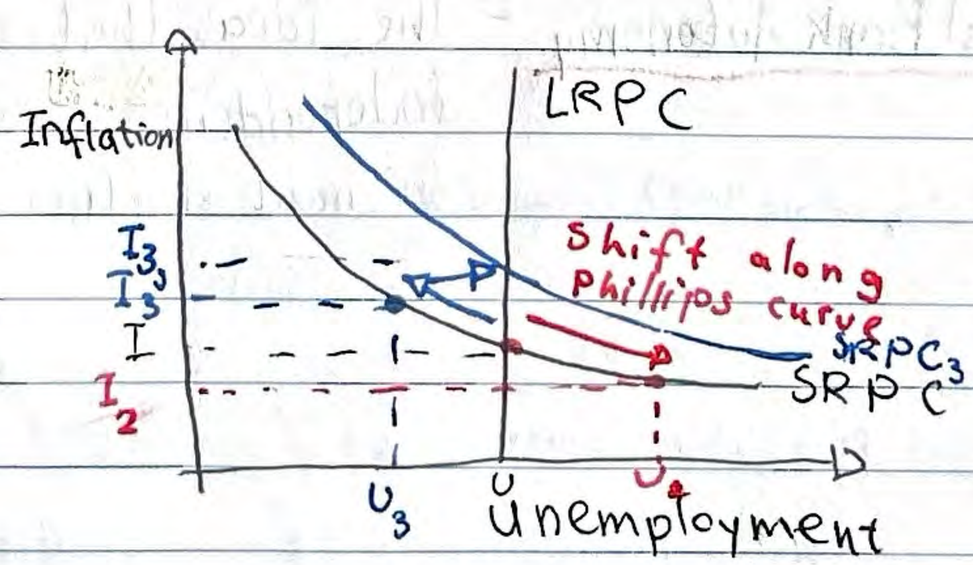
Prices increase

Increase in Demand ← Increase in Buying Power

↳ Higher cost of living → workers demand more wages

Connection with AD-AS





Shift in AD = movement ALONG Phillips Curve (short run)

Shift in AS = shift in Phillips Curve (short run)

Long run unemployment changes (e.g. better tech, U↓) = Shift in Phillips curve (long run)
(NRU changes)

⇓ LRPC left

Quantity Theory of Money

Relates M, Y, PL and introduces V

How quickly $$$ is circulating

M = Money Supply, Y = Real GDP, PL = Price Level, V = Velocity of money

Equation of exchange

$$M \cdot V = PL \cdot Y \Rightarrow [\text{Money Supply}] \cdot [\text{Velocity of Money}] = \underbrace{[\text{Price Level}] \cdot [\text{Real GDP}]}_{\text{Nominal GDP}}$$

Assumption by Monetarists

⇒ Velocity of Money is constant (though not necessarily true)
⇒ Change in Money Supply don't have impact on real output in long run

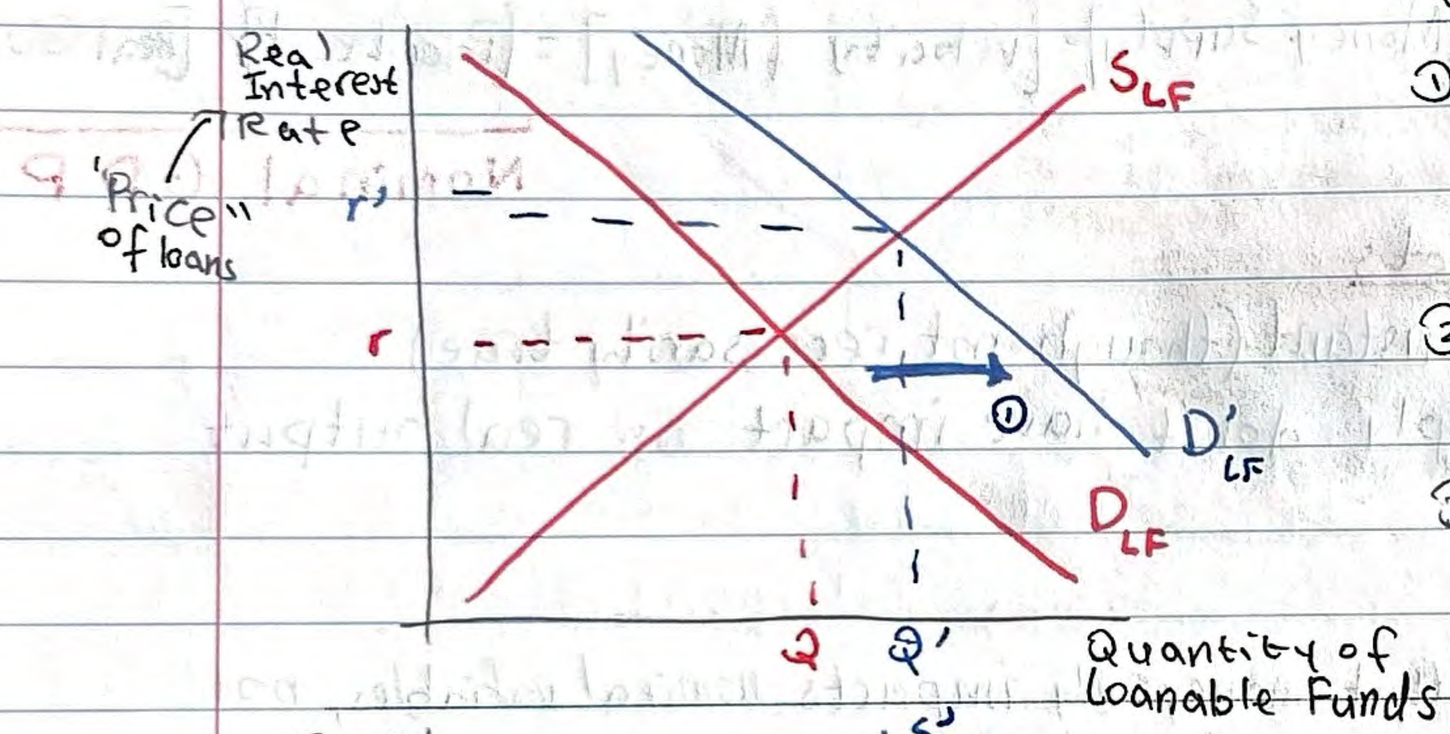
Money Neutrality - The concept that money only impacts nominal variables, not real variables, in the long run

The Quantity Theory of Money - A theoretical model that when the velocity of money is fixed and real output is limited to full employment output, any increase in the money supply causes an increase in the Price Level

Crowding Out

Phenomenon that happens when a government borrows money that "crowds out" private sector borrowing and investment. (causes less investment)

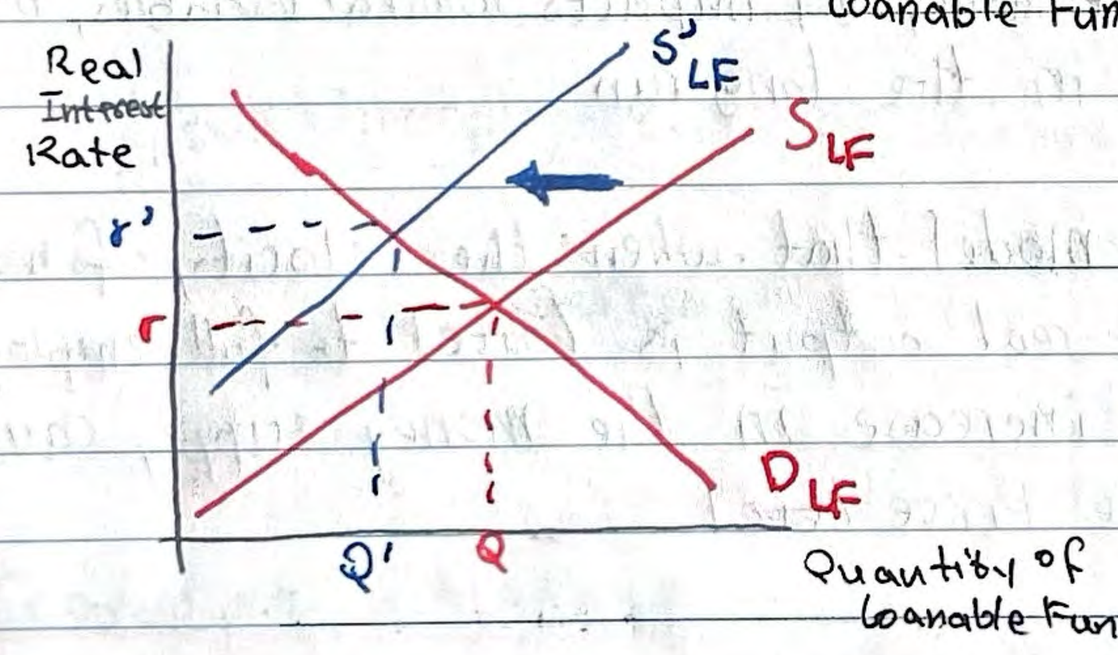
Loanable Funds Market



"Crowding Out"

Due to deficit spending

① Gov't borrow
↓
shifts D_{LF} to right
↓
② Real Interest Rate ↑
↓
③ Private Sector borrows Less
↓
Less capital accumulation
↓
Less investment
↓
Slower economic growth



⇒ Gov't defict = Less supply

Deficits and Debt

Deficit - Spending exceeds income / money taken in, per time
Mathematically refers to \$ Spent - \$ taken in (usually each year)

Debt - Total amount owed (accumulated deficit)

Budget Deficit - When gov't spends more on goods, services, and transfer payments than tax revenue

Budget Surplus - When gov't spends less on goods, services, and transfer payments than tax revenue

A NEGATIVE deficit refers to POSITIVE surplus and vice versa

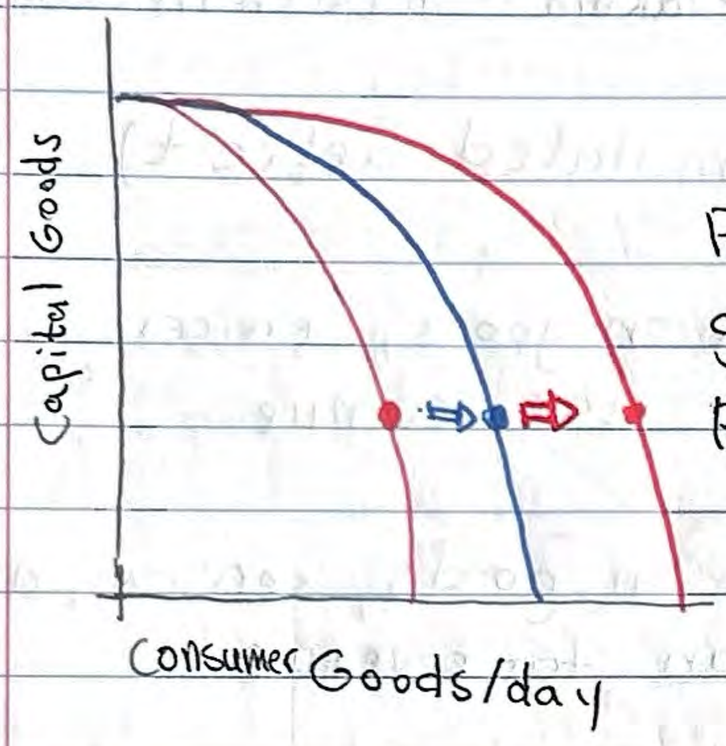
National Debt - The accumulated amount of money that a government owes to its creditors as a result of a running budget deficit.

Pros of Defict
- -> Expansionary Fiscal Policy
- -> Countercyclical Policies

Cons of Deficit
- -> Unsustainable debt, cannot service interest
- -> Increase in interest rate causing "crowding out" effect

Economic Growth

Economic growth can be caused through investment

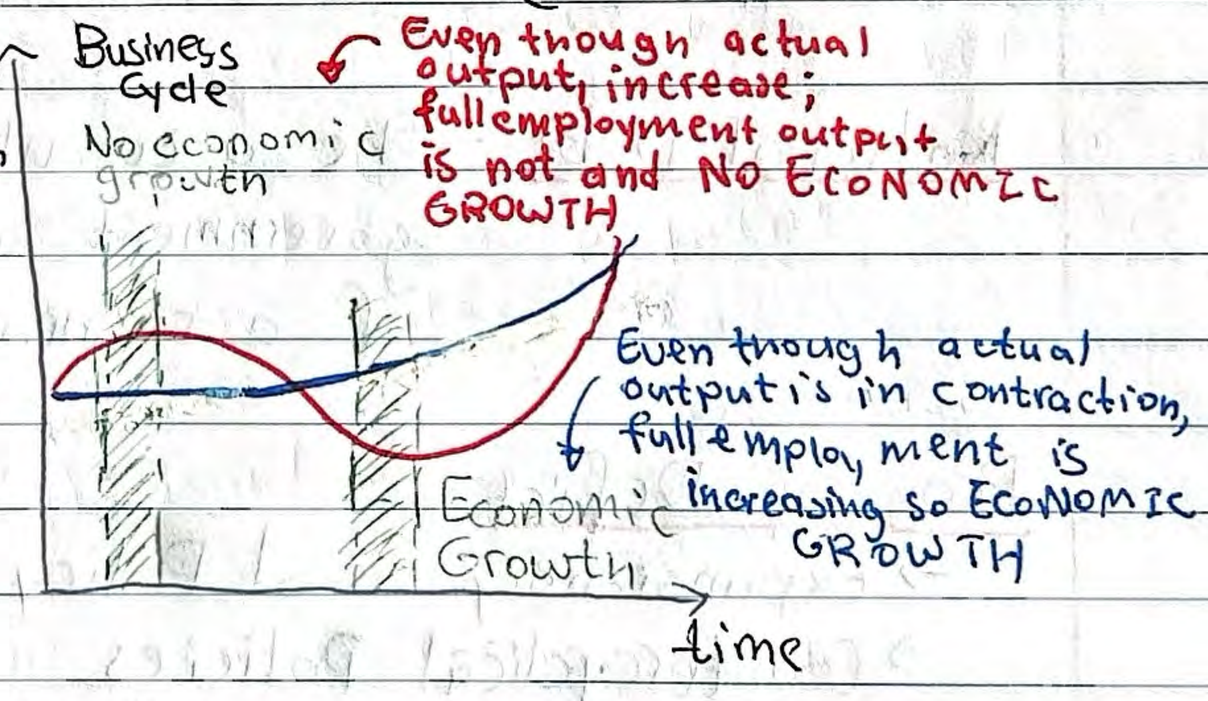


PPC will shift because more capital goods allows more efficient consumer goods production.
⇒ This stimulates economic growth

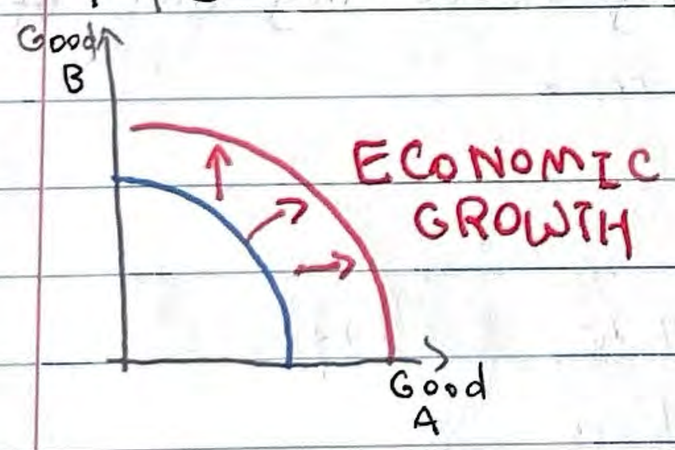
Expansion in Economy, Real GDP increase
Contraction in Economy, Real GDP decrease

Economic Expansion ≠ Economic Growth
NOT NECESSARILY

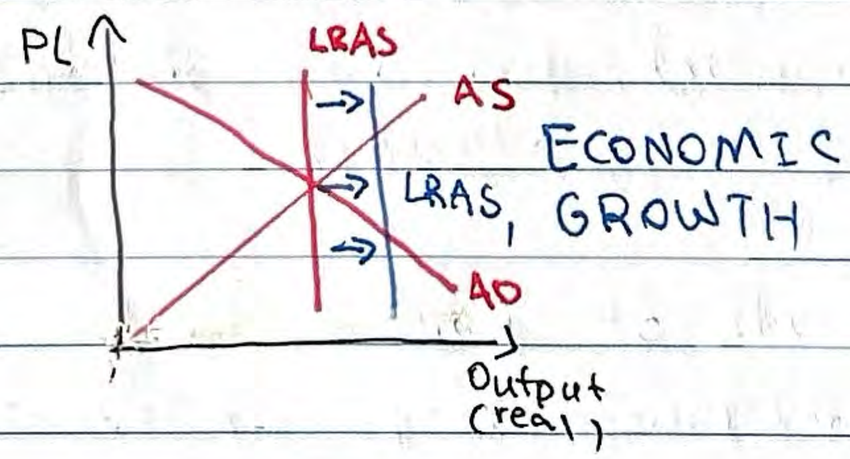
Economic Growth ONLY occurs when full employment real GDP increases

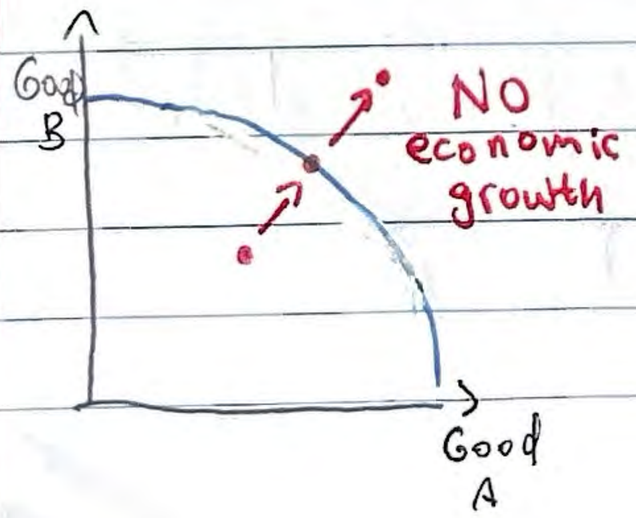


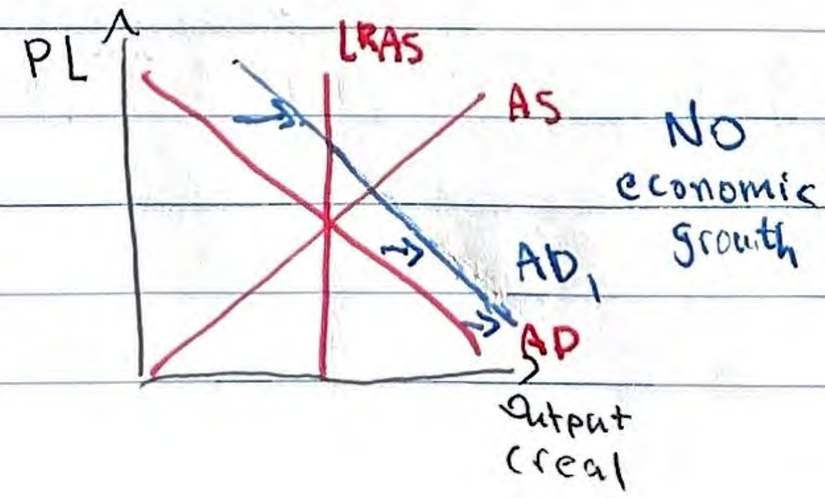
PPC



AD-AS Model







Aggregate Production Function

Aggregate Production Function

$$\underbrace{Y}_{\text{output}} = \overbrace{A}^{\text{total factor productivity}} \cdot F(\underbrace{K}_{\text{Non-human Capital}}, \overbrace{L}^{\text{human capital}})$$

← Technology

"A" is usually used as a "filler" adjustment to fill gap between K, L and Y

(e.g. $Y = A \cdot Y^{\frac{1}{4}} \cdot L^{\frac{3}{4}}$)

Measurement of production factors

L = Labour : Measurement of labor force
→ Education, health, etc.

K = Non-human Capital : Value of capital in country

F(K, L) just refers to some function of K and L

Return on Capital

$$\frac{\text{Cash you get per year}}{\text{Cash you put in}} \times 100\%$$

} Revenue per year
} Investment

It is usually better to go with higher return on capital investments

However Rate on Capital must be GREATER than interest rate (cost of capital) for the investment to be profitable.

E.g. \$1M loan for investment
→ If 10% return, \$100k
→ If 15% interest, \$150k → You must pay \$50k extra, no profits ⇓ not worth it

Balance of Payments

Account of the different ways that money is flowing into the country or payments out of the country

E.g.

Trade, income (stock), transfer of money

Transfers or payments due to TRASFER of OWNERSHIP

Current Account

2011

Inflow
- Exports: $2,105B
- Income Receipts: $739B

Outflow
- Imports: $2665B
- Income Payments: $518B
- Net Transfers: $135B

Capital Account

2011

Inflow
- Private: change in Foreign-owned assets in US (+ derivatives): $625B
- Public (gov't): change in Foreign Reserves: $165B

Outflow
- Private: change in US assets abroad: $380B
- Public (gov't): change in US reserves: $16B

Current Account - Change in money from trade, income or transfers of money (due to assets)

Capital Account - Change in money from payments due to change in ownership (due to purchase or sales of financial assets, e.g. bonds)

Income - Money gained from owning foreign assets abroad (e.g. rent)

=> Can be Income Receipt (received from) or Income Payments (payed to)

Transfers - Giving "free" money to the world and receiving "free" money

Total Current Account = Inflow - Outflow

anything "NET" you ADD instead of subtract

Remittances - Money that is received from another country that is not in exchange for a good, service, or financial asset.

Capital and Financial Account creates a future obligation (liability, e.g. bonds)

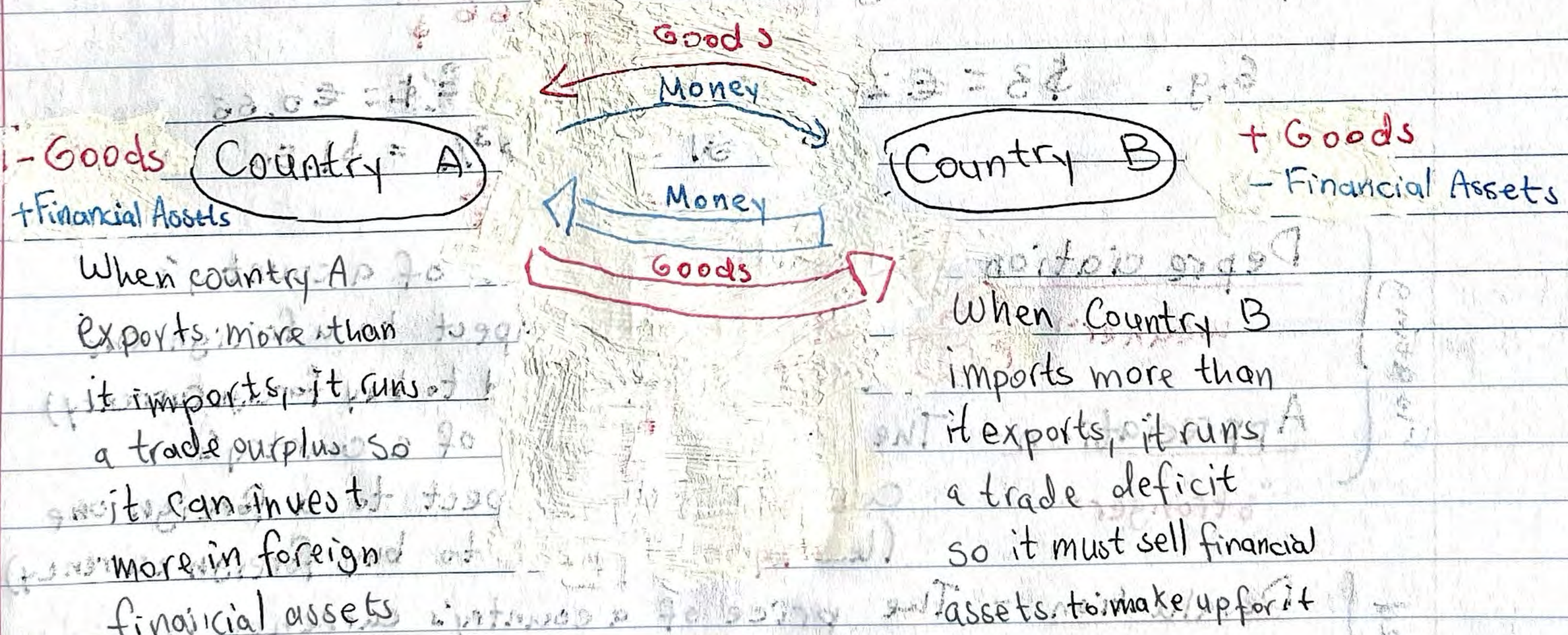
K or CFA refers to Capital (Financial) Account

CA refers to Current Account

$$CA + K = 0$$

Outflow in current means inflow in capital (and vice versa)

$$\Rightarrow CA = -K \quad \text{OR} \quad -CA = K$$



An inflow of money is CREDIT
An outflow of money is DEBIT

Exchange Rates

Foreign Exchange Market

Exchange Rate = Relative Price of Currencies

For different international transactions, each country must be paid in their own currency.

The buyer (importer) must exchange their currency for that of the sellers (exporter).

We only look at two countries and their currencies in the Foreign Exchange market at a time

The Exchange Rate depends on which currency you are converting

$0.66 \frac{€}{\$}$

E.g. $\$3 = €2$ $\Rightarrow \$1$ USD $= €\,2/3 = €0.66$

$\Rightarrow €1$ EUR $= \$\,3/2 = \$1.50$

$1.50 \frac{\$}{€}$

Floating

Depreciation - The loss of value of a country's currency with respect to a foreign one (more units required to buy foreign currency)
"weaker"

Appreciation - The increase of value of a country's currency with respect to a foreign one (less units required to buy foreign currency)
"stronger"

Fixed

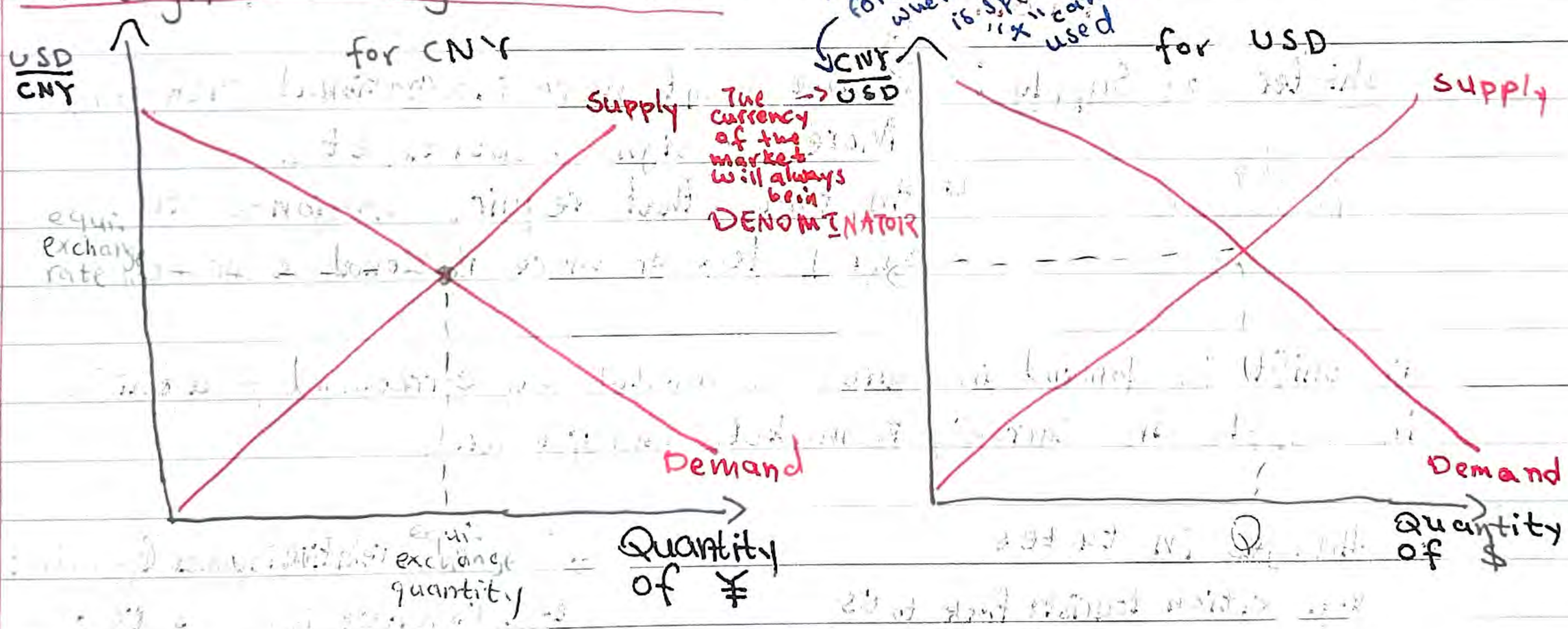
Devaluation - The price of a country's currency is officially decreased in a fixed exchange rate system

Revaluation - The price of a country's currency is officially increased in a fixed exchange rate system

Floating Exchange Rate System - A system of exchange rate that allows the exchange rate to fluctuate according to market forces without the intervention of the central bank nor the government.

Fixed Exchange Rate System - A system of exchange rate where the exchange rate is set and maintained by the government or central bank irrespective of market forces (usually through shifts in foreign exchange market supply and/or demand)

Foreign Exchange Market

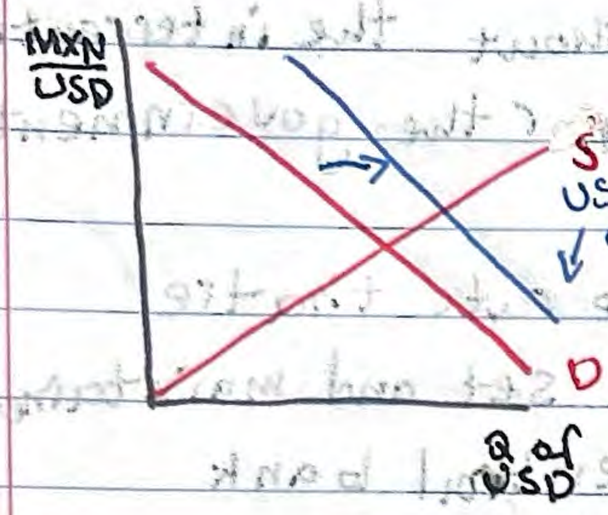


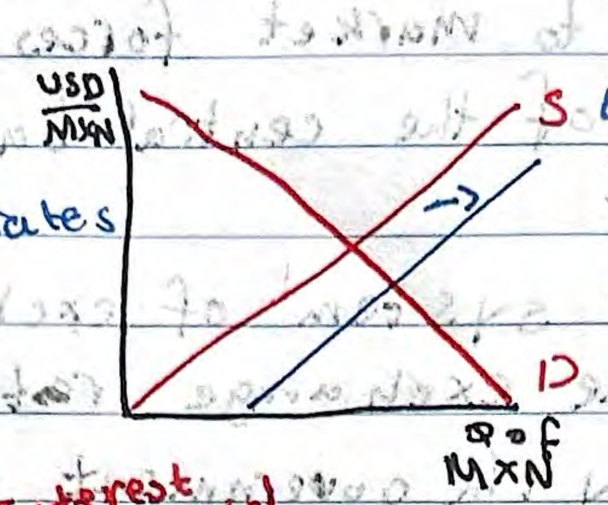
Demand - Refers to the foreign demand for specific currency (how many people want to exchange for specific currency)

Supply - Refers to the national supply of a specific currency for foreign exchange (how many people want to supply a specific currency for exchange)

Foreign Exchange Market

Shifts in Supply, Demand in foreign exchange market





MXN depreciates

More people demand USD so are willing to supply more MXN. USD/MXN ↓, but MXN/USD ↑

Interest Rates and inflation also affect

stability of currency

Shifters of Demand: More tourism (in country), More foreign exports, etc.

⇓ motivated by foreign countries

↳ Anything that requires foreigners to purchase less or more national currency

Increase in GDP

Shifters of Supply: People want more international vacation, More foreign imports, etc.

⇓ motivated by country itself

↳ Anything that requires nationals to supply less or more national currency

A shift in demand in currency A market may correspond to a shift in supply in currency B market, and vice versa

1. Changes in tastes

e.g. British tourists flock to US

⇒ Demand for USD increases

⇒ Supply for GBP increases

Pound depreciates, dollar appreciates

2. Changes in relative incomes (resulting in imports)

e.g. US growth increases US incomes

⇒ US buys more imports

⇒ Demand for GBP increases

⇒ Supply for USD increases

Pound appreciates, dollar depreciates

3. Changes in relative price level (resulting in imports)

e.g. US prices increase relative to Britain

⇒ US demand for cheaper imports increase

⇒ US demand for pounds increases

⇒ Supply of USD increases

Pound appreciates; dollar depreciates

4. Changes in relative interest rates

e.g. US has higher interest rate than Britain

⇒ British want to put money in US banks

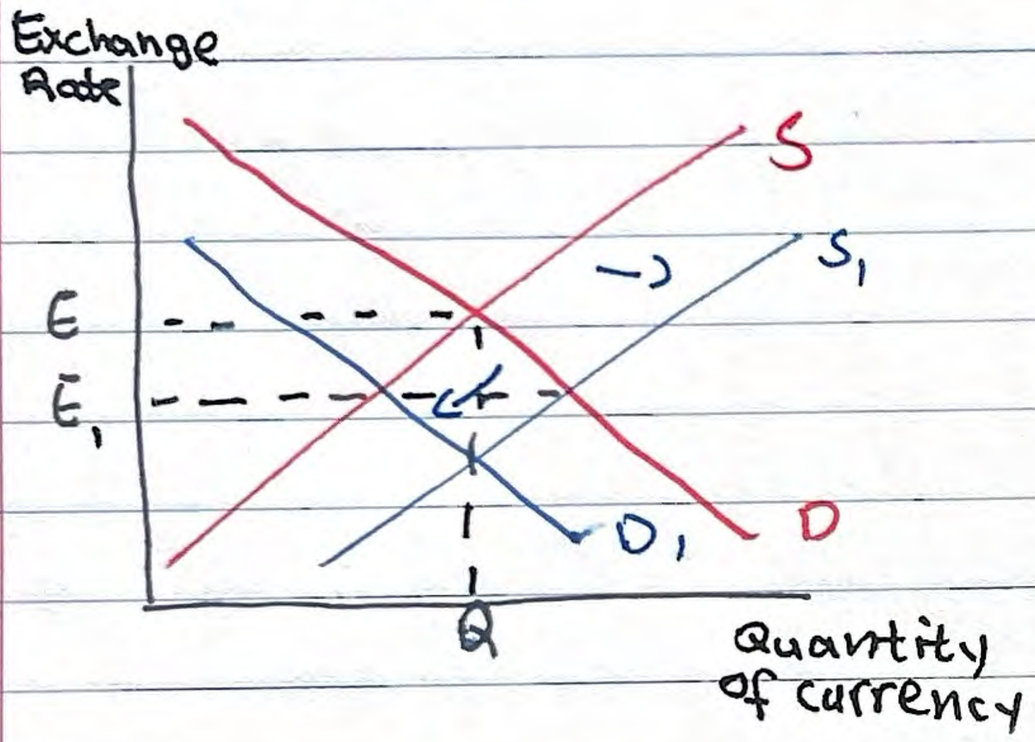
⇒ British demand for USD increases

⇒ British supply more GBP

Pound depreciates, dollar appreciates

What happens to the international value of a currency if that country experiences high inflation?

=> The demand for that currency will decrease since the country's trading partners will not want to purchase higher priced products. The supply will increase as people in that country will look to buy lower priced imports



The Currency depreciates

Tariff - A tax on imported goods

e.g. If Maxistan places a tariff on goods from other countries, it will supply less of its own currency because it will want to buy fewer foreign goods

Quota - A limit on the quantity of goods that can be imported

e.g. If Maxistan places a restrictive quota on goods from other countries, it will supply less of its own currency because it will buy fewer foreign goods

Capital Controls - Legal restrictions on the movement of capital between countries

Financial Contagion - The spread of economic conditions, especially negative market disturbances (e.g. recessions) from one country to another