BIEM

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BLAB

HANDOUTS

INTERNATIONAL MACROECONOMICS

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This handout is written by students with no intention of replacing university materials.

It is a useful tool for studying the subject, but does not guarantee preparation as exhaustive and complete as the material recommended by the University.

International Macroeconomics

Lecture 1

In the past 25 years, increase in uncertainty (Brexit 2016, 2018 China-US trade war, Covid 19...) More efficient multilateral coordination is needed: debt resolution, climate change...
Global growth for 2024 is predicted to be 3.1%, consistent with previous years and inflation is expected to fall
In the very long run, we can see that interest rates have been decreasing for around 700 years and the wealth share of the top 1% has been decreasing for over 250 years. It is still decreasing in Continental Europe (L-shape) but increasing since the 1980's in English speaking countries Perception of reality is inaccurate: Public perception is that crime is increasing whereas it's been decreasing since at least the 90's (US)
Expectations are crucial, as shown when AP tweeted (after being hacked) that the White House had been bombed.
A good economic model is simple, flexible and tractable. it has limits and assumptions The basic model links inflation and growth
In the short-medium term: no capital accumulation, the economy does not adjust immediately Aggregate supply: Relationships between prices and production (Questions: How do firms choose their prices, can firms produce more without increasing cost?)
Aggregate demand: Relationship between prices and demands (Who consumes the production, how much do people invest, do interest rates matter?)

We care about changes: In general $Y = A^{\alpha} \cdot B^{\beta}$ $y = \alpha \cdot a + \beta \cdot b$ with y the change

Lecture 2

In the short run, we only look at labor costs
In case of uncertainty, prices are higher just in case. We thus get:
Price= Costs*Mark-up*Uncertainty.

$$\pi = \omega + \frac{M_t - M_{t-1}}{M_{t-1}} + u$$

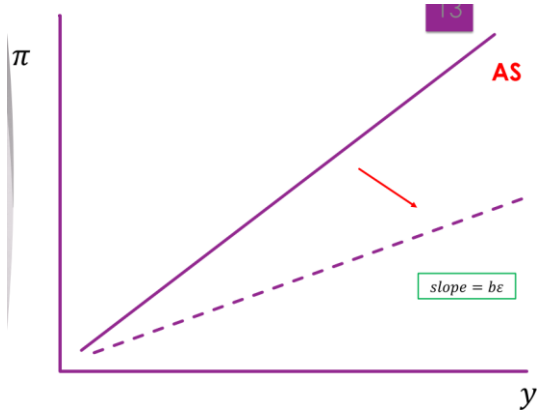
With π=inflation, ω= Change in costs, u=Change in uncertainty and $(Mt-Mt-1)/(M_{t-1})$ =Change in markup
A drop in mark-up can be due to the competition increases
It has increased over the past 60 years and an increase in mark-up is correlated with an increase in profits
bn touches upon employment: The higher the n, the higher the wages. The more rigid a labor market is (high b), the slower the changes in employment
To take into account expected inflation, we have $w - \pi^e$
Two types of expectation:
Flexible/Rational expectations: Anticipates what government and CB will do, cannot be fooled systematically
Sticky expectations: $\pi^e = \pi t$: People are lazy and can be played by CB and Governments, the ex-
pectations can be either constant or same as the previous year (adaptive) We have that the change in nominal wage-expected inflation=bn
A change in inflation and wages are positively correlated but not linearly
The two equations for supply side are thus $w - \pi^e = bn$ (wages equation) and

$$\pi = \omega + \frac{M_t - M_{t-1}}{M_{t-1}} + u$$

Levels of production: $Y = AN^{\alpha}K^{\beta}$ and the change is $y = a + \alpha n + \beta k$
In the short run, we have that technology (A) and capital (K) are fixed In Italy, labor productivity ha declined over time
We thus get: $y = \alpha n$ and $n = \epsilon y$, with ϵ the inefficiency factor ($\varepsilon = 1/\alpha$ Substituting (3) in(2), we get $w - \pi^e = b\varepsilon y$ and after substituting (2) in (1) we get: $\pi = \pi^e + b\varepsilon y + (\mu - 1) + u$.
Once we express it in terms of y, we get that the equation for the supply curve is $y = \frac{1+(\pi-\pi^e)-(\mu-\pi)}{b\varepsilon}$

Lecture 3

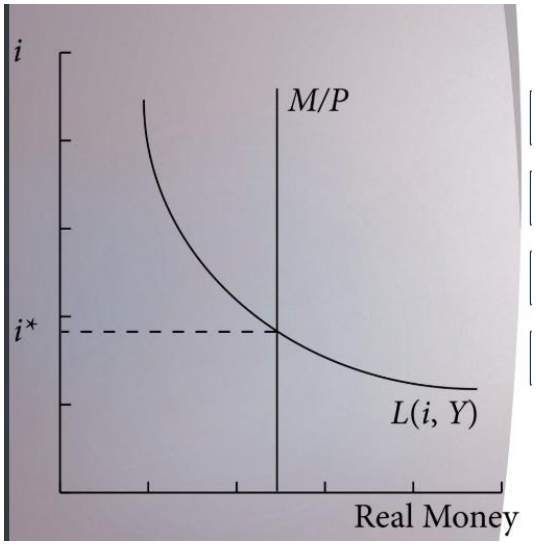
The intercept of the supply curve is $\pi^e + (\mu - 1) + u + b\epsilon y$ The slope is $b\epsilon$ Antitrust policy shifts the curve to the left:



Over the last twenty years, market concentration has increased according to the Herfindah- Hirschmann Index and looking at the top 5 revenue share
In a flexible market b=0, the real wage depends on marginal productivity and does not depend on unemployment
A decrease in b leads to a flatter curve as it implies lower costs, same for an increase in $\alpha\epsilon$
An increase in u leads to a leftwards shift of the curve (higher uncertainty means lower output growth)
Global uncertainty has increased significantly since 2012 Uncertainty and democracy have a U-shaped relationship
Assumptions: The policymaker can influence uncertainty via institutional policies: more efficient policies mean less uncertainty and inversely
At the micro level, less uncertainty means lower costs
Institutions can have some impact at the macro level, such as Roman roads.
Using only equation 1 and 2, we get that $n = \frac{(\pi - \pi^e) + 1 - (\mu - \pi)}{b}$ indicating a link between employment and inflation (Philipps curve). As we know, there is a positive relation between output growth and inflation rate.
The Philips curve disappears when you extend the time period (1960-2020), the correlation be- tween inflation and economic slowdown has become weaker and weaker (1975-1996 vs 1997- 2018)

Lecture 4

Demand side: Sources of changes are exogenous components, changes due to interest rate, inflation expectations and banking and financial shocks
Today, 70 of US GDP on demand side comes from consumption, 15 from investments, 20 from the government, 13.5 from exports and -17 from imports, both imports and exports have been increasing since 1960
We can divide each element of demand in two components: real (exogenous, does not depend on i, inflation...) and dependent/monetary component, which is a function of interest rate
I is based on Î and i (negatively)
Aggregate demand increases with a positive net trade balance (negative since the 60s in the US except for services)
The nominal exchange rate is e (Number of foreign currency units you need to buy one unit of domestic currency) and n is the real exchange rate, the number of foreign currency units you need to buy one unit of domestic currency minus the difference in prices
The net trade balance decreases when the nominal exchange rate increases (Marshall-Lerner condition)
The nominal exchange rate depends on the interest rate positively: $e = e(\bar{e}\, i - i^F)$, hence the net
trade balance decreases with higher interest rates
A higher interest rate leads to a decrease in private investment
Linking interest rates and inflation: We know that $\frac{M}{P} = L\,(i\,, Y)$, hence prices affect the real supply of money:



If interest rates are very high, there is less demand for liquidity (as money in the bank earns more)
If monetary mass (M) increases, the interest rate goes down (there is too much money in circulation, so banks offer low interest rates as investors don't struggle to borrow)
If inflation or price increases, the interest rate goes up (banks need to offer

higher rates to attract investments as purchasing power is reduced)
Hence, interest rates are inversely proportional to the growth of the mass of money and proportional to the growth of prices
We denote autonomous consumption as a

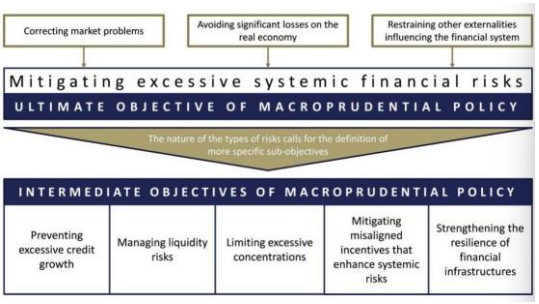
Lecture 5

Money supply m depends on central bank monetary policies, with $m = m$
Positive trend in the money supply until 2021 in the USA
In the Eurozone, it increased until 2022

We denote inflation expectations as $\varphi\pi^e$, with phi the expectation accelerator
Higher inflation expectations increase spending on goods and services today so the expectation accelerator is positive
We denote banking and financial shocks as I
Leverage is the ability to control a large contract value with a relatively small amount of capital. In the futures market, that capital is called a performance bond/initial margin, and is typically 3-12% of a contract's cash value
Leverage=Debt/Equity, peaked around 2010 for US, UK and PIGS
The financial accelerator captures the role of banking and/or financial leverage in influencing aggregate demand: $I = I_0 - I_1 \times J$
I is a random/exogenous component and I1J represent macroprudential policies: J is the change in the level of capital and liquidity ratios and $I_1 > 0$ is the absorber factor/effectiveness of macro-
prudential policy: if the ECB requires higher capital to assets ratios, they can lend less to consumers and firms so lower AD
Macroprudential policies aim at

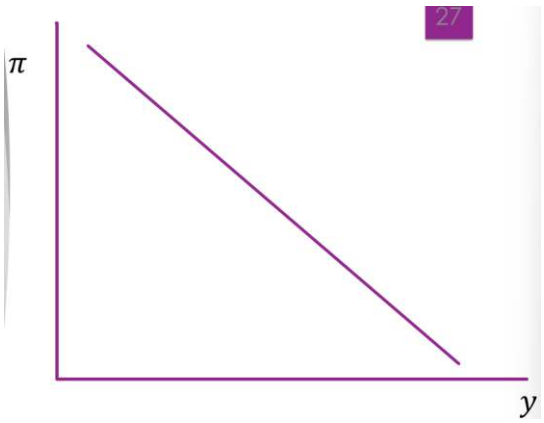
- preventing the excessive build-up of risk from external factors and market failures, to smoothen the financial cycle
- Making the financial sector more resilient and limiting contagion effects
- A system-wide perspective in financial regulation to create the right set of incentives for market participants

Financial stability is "a condition in which the financial system – which comprises financial intermediaries, markets and market infrastructures – is capable of withstanding shocks and the unravelling of financial imbalances"
This mitigates the prospect of disruptions in the financial intermediation process that are severe enough to adversely impact real economic activity



The set of equations we get is $y = a + (m - \pi) + \varphi^e \mp I \quad m = \bar{m} \quad I = I_0 - I_1 * J$

The equation of the Demand curve expressed in terms of y is $y = a + (m - \pi) + \varphi\pi^e + I$



The equilibrium solves $b\varepsilon y - 1 + \pi^e + (\mu + u) = -y + a + m + \varphi\pi^e + l \Rightarrow b\varepsilon y + y = a + m + \varphi\pi^e + l + 1 - \pi^e - (\mu + u) \Rightarrow y(1 + b\varepsilon) = a + m + l + 1 - (1 - \varphi)\pi^e - (\mu + u)$

Supply-side policies that shift the curve:

- Antitrust policies: μ
- Labor policies: b
- Productivity Policies: ϵ
- Institutional Policies: u

Demand-side policies that shift the curve:

- Monetary policies: m
- Banking and financial policies: l
- Fiscal policies: a

An increase in a,mor l leads to a change of $\frac{1}{b\epsilon+1} > 0$ on y

An increase in expected inflation leads to a change of $-\frac{1-\phi}{b\epsilon+1} < 0$ on y

An increase in μ or u leads to a change of $-\frac{1}{b\epsilon+1} < 0$ on y

An increase in b or ϵ leads to a negative change on y

For inflation, we have:

$$\frac{\Delta\pi^*}{\Delta a} = \frac{\Delta\pi^*}{\Delta m} = \frac{\Delta\pi^*}{\Delta l} = \frac{b\varepsilon}{b\varepsilon + 1} > 0$$

$$\frac{\Delta\pi^*}{\Delta\pi^e} = \frac{1 + b\varepsilon\phi}{b\varepsilon + 1} > 0$$

$$\frac{\Delta\pi^*}{\Delta u} = \frac{\Delta\pi^*}{\Delta\mu} = \frac{1}{b\varepsilon + 1} > 0$$

$$\frac{\Delta\pi^*}{\Delta b} = \frac{\Delta\pi^*}{\Delta\varepsilon} >< 0$$

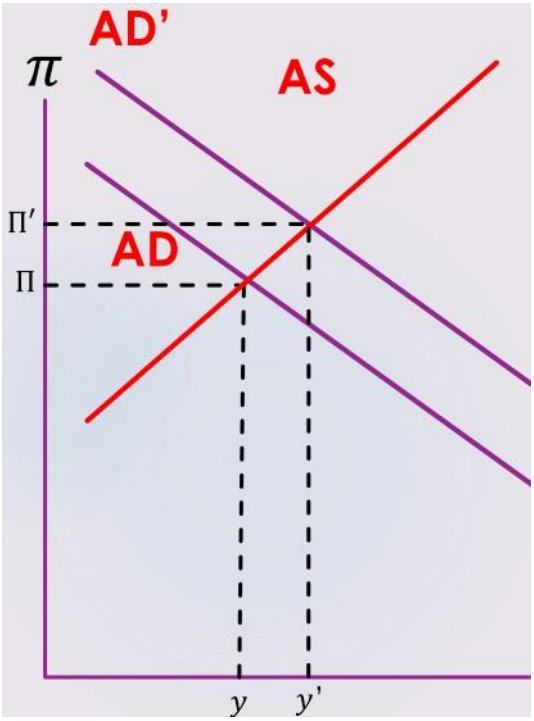
At the equilibrium, the values

$$\pi^* = \frac{(a+\overline{m}+l)b\epsilon+(1+b\epsilon\phi)\pi^e+(\mu+u)-1}{b\epsilon+1}$$

And $y^* = \frac{1+(a+\overline{m}+l)-(1-\phi)\pi^e-(\mu+u)}{b\epsilon+1}$

Lecture 6

Two schools of economics:
Fresh water (Chicago, Minnesota) are considered hawks and believe expectations are rational (perfectly flexible and endogenous), rational agents understand how the economic system works and the efficient market hypothesis holds
Salt Water Economics (Harvard, MIT, Berkeley) are doves and think the economy is inefficient, expectations are exogenous and it's the role of policies to affect the state of the economy
To stimulate the economy, the government can increase G or the CB can increase the monetary base (M), which also means higher inflation
FWE: People anticipate the intent to stimulate the economy and ask for higher nominal wages (Reminder: For FWE, we have that $\pi^e = \pi$) so we get $w - \pi = bn$
Given any n, the real wages remain constant and there is only a nominal effect
Remember that with rational expectations we have a vertical AS
According to FWE, demand policies cannot improve the economy, only supply-side policies SWE economics belive that people do not anticipate what the CB or Government want to do, so there is no change in the nominal wage they ask for, $w - \hat{\pi} = bn$
In that case, in the case of an increase in inflation, real wages go down
Hence, under SWE's view, demand policies can be helpful to boost the economy



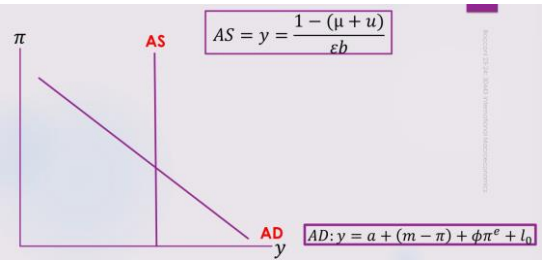
The great Moderaiton from the 1980s to 2007: Stable but low GDP growth, softer business cycles and CB is able to manage them, low and stable inflation, financial innovation leading to high private debt
In 24 OECD countries between 1983 and 1998, we observe 11 drops in both

GDP and inflation volatility, 20 drops in inflation volatility and no countries with an increase in both
The drivers of finance are Technology and Rules

Financial innovation is the creation of novel Financial products that allow larger leverage. Its drivers are creativity, changes in tech and rules
Organizations set the rules banks should follow addressing banking and financial risks: Two approaches: Structural and prudential Regulation
Structural regulation treats the financial sector as special (incalculable risks, domino effect, systemic crises) and as such must be subjected to restrictions and prohibitions to avoid excessive risk taking
Exemples:

- Compulsory reserve requirements
- Ceiling on Loans
- Ceilings on interest rates
- Structural and conduct regulation (investment vs commercial banks)
- Financial repression: Constraints on competition

Prudential regulation considers that all risk can be calculated and hedged with appropriate protections: use of capital ratios such as capital or liquidity requirements. During the Great Moderation, banks has more freedom to operate as long as they kept sufficient capital and liquidity ratios
Prudential Regulation=Financial Deregulation: Bankers enjoy more freedom in setting their business prices and business designs, leading to more innovation
Deregulation increased the size of the financial industry, increased complexity and interconnection
The Great Moderation was NICE: Non-inflationary Consistent Expansion Good disinflation has lower inflation with stable GDP growth
Increase of leverage from due to prudential regulation and financial innovation
Fitting the great moderation into the basic model, we get that private agents have rational expectations ($\pi^e = \pi$) and that in the labor market, wages incorporate the inflation ($w = \pi + bn$) Nominal wages, real wages and employment growth are positively correlated
On the supply side, we still have $AS = y = \frac{1-(\mu-u)}{\varepsilon b}$
With AD shocks, the rational agent anticipates the permanent shocks, which become AS changes and neglects temporary ones which just trigger inflation
We consider that J=0 (banking regulation is at its optimal level) so $I = I_0 - I_1 J = I_0$
We get on the demand side $AD: y = a + (m - \pi) + \varphi\pi^e + I_0$



During the great mdoeration: innovation shifted the supply curve to the left by increasing efficiency and Financial deregulation shifted the demand curve, as it favors high leverage (shock to l_0)

Lecture 7

The Great Financial Crisis:
Drivers:

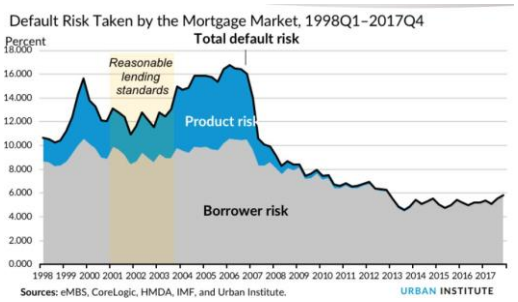
- Regulation: Prudential Regulation was bad financial policy
- Risk Miscalculation: markets are not efficient
- Wrong economic policy: Lax monetary policy

High levels of private debt drove Balance Sheet recession, both relative to GDP and in absolute terms
This led firms and households to increase their savings to repay debt, which led to higher savings (higher financial surplus)
In the USA, savings increased while expenditure decreases, leading overall to lower consumption and lower investment, especially in the residential sector
All this led to slower/negative growth
In Japan, the housing bubble lead to a slowdown in the growth rate and would've been worse without government intervention
BS recession featured: Low growth rate, low inflation and high debt (Financial bubble and credit boom)
Financial Bubble and credit boom: In the early 200s, the ratio between house prices and income sharply increased
There was also an increasing difference between price and earnings in the S&P, which suggests irrational expectations about the future
The order it happened it was: Credit boom (which makes the post recession financial crisis longer and harsher), leading to financial bubbles (leading to a longer and harsher post-recession), leading to economic recessions
Historically, crisis has followed different paths: low credit excess took two year to recover, medium and high credit excess more than 5 years
2007 was very long and very harsh
Designing and implementing deregulation requires financing it, through low and stable interest rates
The three pillars that define monetary rules: Monetary policy tools (nominal interest rate), monetary policy goal (macroeconomic goals) and monetary policy actors (Central Bank). Combining the 3 gives us the monetary rule
Our Benchmark is the Taylor Rule: $i_T = \hat{r}+\pi+\alpha(\pi-\pi^*)+\beta(y-y^*)$, which relates nominal interest
rates with inflation and output growth
We thus obtain i^{TR}, the Taylor Rule interest Rate, which we can compare to i^{FED} to obtain the stance of the Fed policy
Shortly before the crisis, the monetary policy diverged from the Standard monetary policy, with federal funds being way too low
We see the Great Moderation as deviation from the standard policy, on both financial regulation (de-regulation) and monetary policy (Lax monetary policy).
We can thus consider the years be- fore the Great Moderation as the Great Deviation
Yet if the economy is efficient and agents are rational, the Great Deviation doesn't produce real effects as it can be considered a Bubble (financial and monetary events and are neutral)
Both business and financial cycles are recurring and sinusoidal

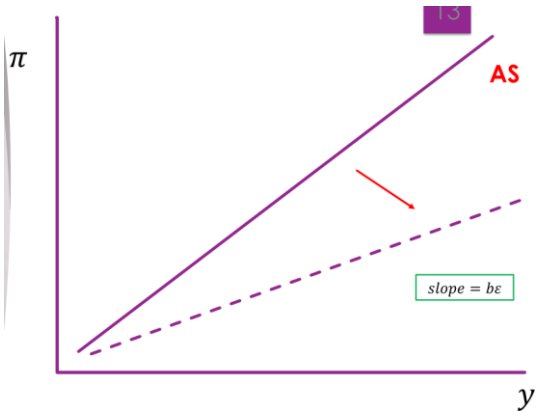
In conclusion there was a policy failure: Economically (Prudential regulation is a bad idea), Risk miscalculation (markets are not efficient a expectations are not rational) and wrong monetary policy (too lax)

Lecture 8

The crisis was due to human actions and inaction
The 2008/2009 financial crisis represented a significant drop in world GDP i both developing and developed countries
There is a strong link between the S&P 500 and consumer sentiment
The GFC involved an increase in unemployment rate (8.8 M jobs lost, peaked at 10%)
All races and ethnicities were affected, although with different volatility, starting level and magnitude
Men were more impacted than women
Domino effect; One event has a knock-on effect throughout the economy
Sub-prime lending is lending to people in the US who may have difficulties in maintaining the repayment schedule (NINJA=No income, No job, no Assets)
The effect of deregulation was increasing competition between banks, monetary lead to low interest rates, market failure was due to risk miscalculation
Sharp increase in both ratios of Mortgage and Non-mortgage lending to GDP and constant rise in the weight of mortgage lending for banks
The subprime market: from $ 94 billion (2001) to $ 685 billion (2006) and subprime loans went from 6 percent to a fifth of the overall mortgage market
Easy access to credit lead to low and declining subprime mortgages interest rates
Increasing faith led to higher housing prices (especially between 2002 and 2006), low delinquency rates (past due payments) and low foreclosure rates (taking control of the mortgaged property) Places with lot of subprime had lower increases in price
Loans were made using previous loans as collateral
Subprime loans were not localized but widespread over all the US



We have: high borrower risk, increasing risk linked to the product and high total default risk In 2006 a fall in the subprime market occurs, with a raise in mortgage interest rates in 2004
The fall was characterized by declining housing prices, increasing delinquency and foreclosure rates

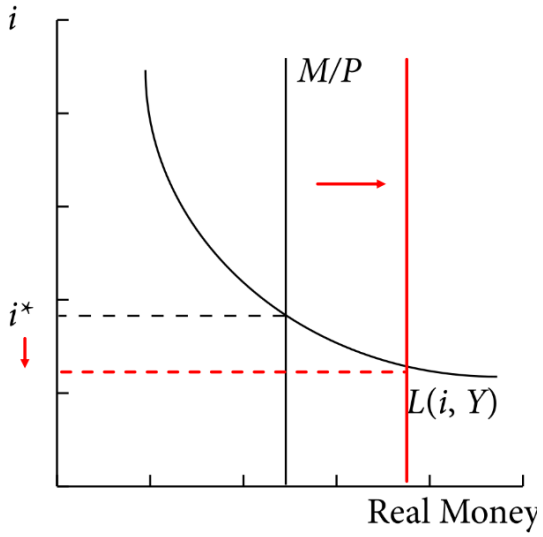


15 percent of subprime loans were not considered fully repayable, 2 percent of the overall mortgage market
The financial industry can be seen as a Big, interconnected, Complex Black box (BIBC): Not new,

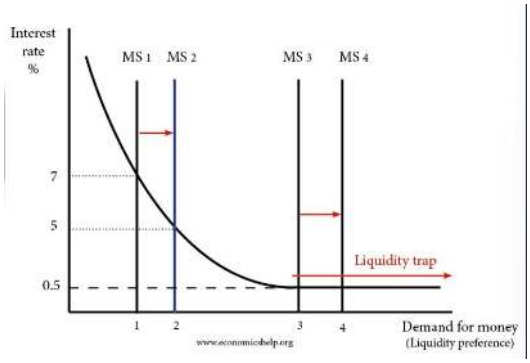
existed already in Rome with capital invested in Asia by Romans that collapsed due to suspension of payments
Eventually, the crisis affects all financial markets and the world economy
The Great Crisis is a case of a Balance sheet recession: High leverage, low growth, low inflation Reminder: Real wage= w-π

Lecture 9

Cash can be kept, at a cost equal to the interest rate, or to buy bonds (investment)
When M/P increases, people buy bonds (they already have the cash needed for transaction), price of bonds increase (i goes down), people keep part in cash
$\delta i = -(m - \pi)$



The change in interest rate is proportional to a change in price.
Usually, the CB can affect i by changing m



This occurs when i is very low and all the money is absorbed if m increases so monetary pol- icy is not effective
Liquidity preference is risk aversion
The outcome of the liquidity trap are that money is held instead of circulating and an increase on the money supply has no effect on aggregate demand
After the Great Recession, there are abnormal relationships between money and interest rates, money and inflation and money and growth
Most developed countries have low growth and inflation rate
Rate of inflation is consistently higher for emerging markets and developing

economies
Using the AD-AS model, we can explain the change: a drop in the financial accelerator l lowers the AD curve and leads to both inflation and output being lower
During and after the crisis, we see a sharp increase in the monetary base but not in i in the UK/US/Eurozone/Japan. GDP does not increase either despite the stock of money
Why is that? In periods of uncertainty, people prefer more liquid assets over less liquid assets which reinforces the liquidity trap, and firms being net lenders (firms prefer to save money rather than to invest it)
The BS of the CB has short-term public bonds as assets and the monetary base (cash+banking reserves) and profits as Liabilities+Net Worth
The CB used three unconventional tools: ZIRP (Zero Lower bound) and NIRP (Negative Lower Bound) policies, Quantitative easing (QE) policies and Forward guidance (GF) policies
ZIRP and NIRP: Every day banks have reserves surplus and deficit so some sell and other buy on the Interbank market, that determines the overnight interest rates
The OIR is somewhere above the Overnight Deposit rate and below the overnight interbank rate (in the Central Bank Corridor)
Quantitative easing: Adds long term public bonds and private securities to the assets of the CB. The CB buys bonds from firms, banks and government through open-market operations to increase the monetary base. These assets might be risky
Forward guidance: Open Mouth operations means announcing tomorrow's interest rates today, hence affecting expectations

Lecture 10

Four different policies to deal with liquidity traps: Conventional monetary policy, aggregate sup- ply policies, fiscal policies and financial policies
Conventional monetary policy is ineffective with no real or nominal effect After the great crisis, expectations depend on beliefs (exogenous)
Aggregate supply policies: Doesn't work as if the risk aversion becomes abnormally high, money is held leading to no consumption or investment (private demand deficit) and more supply or lower prices don't guarantee more sales
Fiscal policies can work as the public demand (either through spending or reduced taxation)
compensates the private demand deficit
In our framework, the Fiscal multiplier is positive and equal to 1 ($FM = \frac{\Delta y^*}{\Delta \bar{a}} = 1$) and the fiscal policy triggers inflation (inflation accelator IA) $IA = \frac{\Delta \pi^*}{\Delta \bar{a}} = b\varepsilon$
Generally, suing the multiplier and accelerator we can calculate the sacrifice ratio $\frac{IA}{FM} = b\varepsilon$ but irl the sign and size of the fiscal multiplier is controversial
Overall, we can say it depends (normal distribution centered around 0.8) and it depends on the type of spending

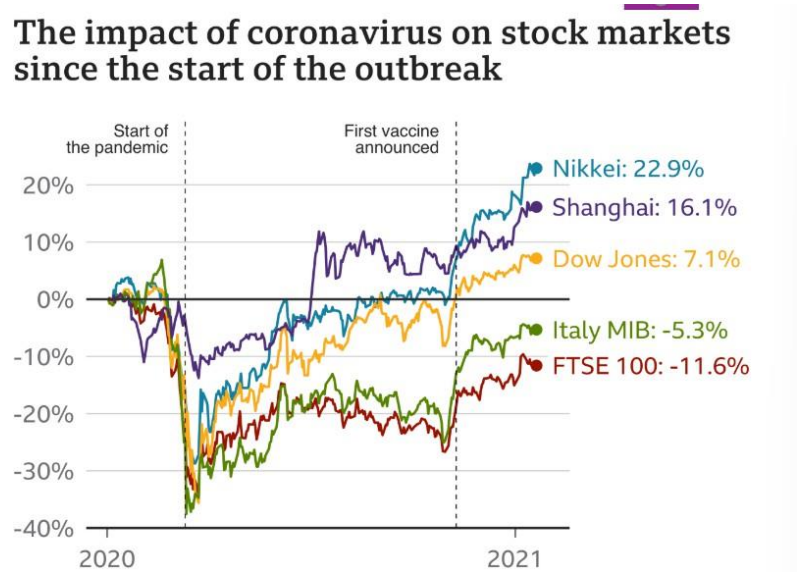
	Year 1	*Year 2*	*Year 3*	*Year 4*	*Year 5*
Government Investment	0.61	0.55	0.49	0.54	0.71
Government Consumption	0.51	0.33	0.13	0.02	0.01
Targeted Lumpsum Transfers	0.45	0.23	-0.07	-0.28	-0.35
General Lumpsum Transfers	0.30	0.13	-0.12	-0.28	-0.31
Corporate Income Taxes	0.53	0.56	0.51	0.58	0.80
Labor Income Taxes	0.40	0.44	0.42	0.41	0.43
Consumption Taxes (VAT)	0.38	0.32	0.17	0.07	0.05

Finally, financial policies: To prevent money holding, we can lower capital ratios to increase loans and private investments BUT this can also increase financial stability risk
In our model, this means lowering J (hence increasing l)
Post 2008, we had a gradual and postponed tightening (increase in J)
After the Great financial crises, both GAAP, IFRS and Basel RWA required higher capital ratios
In Georgia for example, the NGB lowered its rate (due to low inflation and negative output gap) and raised the banking reserve requirements to mitigate future financial risks
Forward guidance: A CB implementing a Forward guidance policy provides information about the future path of the interest rates and/or monetary aggregates. The announcements are called Open-Mouth Operations
We have data dependent forward guidance: We anticipate a zero interest rate will be appropriate as long as unemployment stays over 6.5% and inflation is predicted to be below 2.5%
The key assumptions behind this is that interest rate expectations and inflation expectations are associated, via interest rate announcement (i^a): $\hat{\pi} = f(i^a) = f(i^e)$.

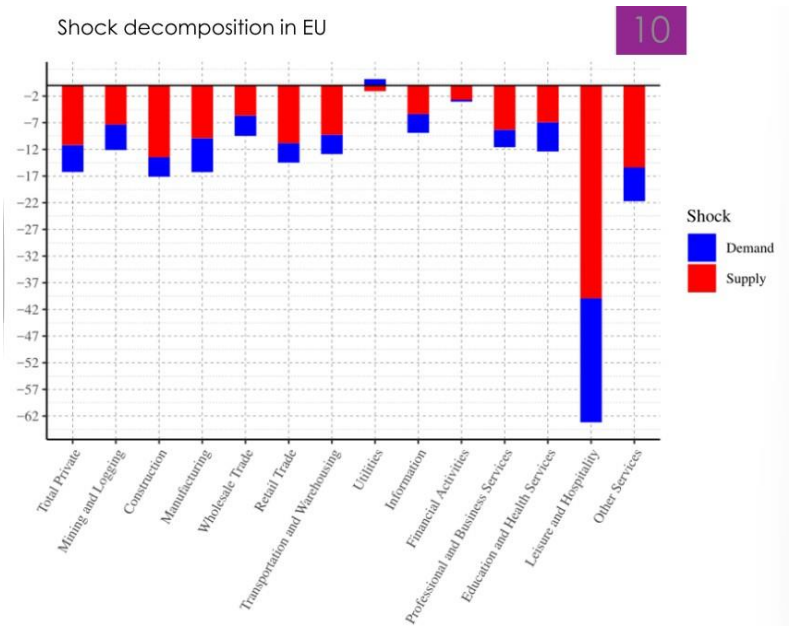
In a liquidity trap, it can be a useful tool
On the supply and demand side,we have a change in $\hat{\pi}$, leading to a rightward shift of the demand curve and a leftward (increase) in the supply curve
Conclusion: Announcemennts of future expansionary monetary policy (lower i) can be effective in a liquidity trap

Lecture 11

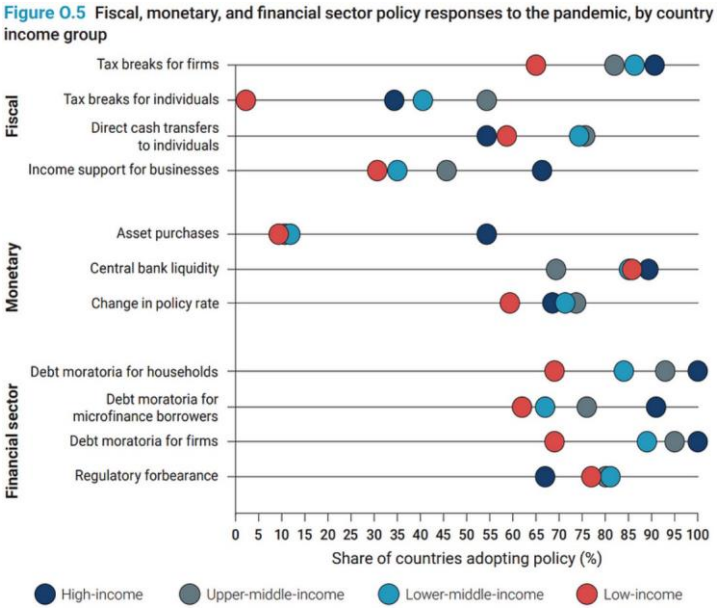
Covid 19 impacted all countries but differently Huge impact in Eurozone
Financial impact was important but recovered quickly, although at different paces



In our model, we have an aggregate demand shock (drop in a), leading to a drop in the AD curve and an aggregate supply shock, leading to higher uncertainty and disruptions in the supply chain lead to higher mark-ups



The covid shock was deeper than the financial crisis but recovery was faster In all EU countries, we had a huge fiscal stimulus and an increase in debt



Fiscal stimulus translated to a higher a and thus an increase in the AD curve Today, we still have high inflation rates, although they are dropping

Useful recaps

$Y = AN^{\alpha}K^{\beta}$ and $y = \alpha n + \beta k$

The formulas for the Supply curve $\pi = \pi^{e} + b\varepsilon y + (\mu - 1) + u$ $y = \frac{1+(\pi-\pi^{e})-(\mu-\pi)}{b\varepsilon}$

If expectations, are rational, we have that $\pi^{e} = \pi$

final equation: $\pi = w + (\mu - 1) + u$

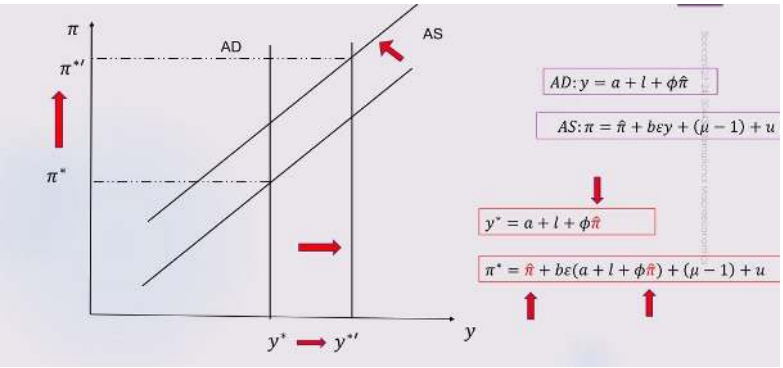
AS is vertical in the case where expectations are rational Higher interest rates lead to a stronger currency

$-\delta i = m - \pi$ ($m - \pi$ is the dependent component), the inflation expectations are modelled through $\Phi\pi^{e}$

Finally, the financial sector affects real demand though leverage (access to credit), which depends on macroprudential regulation (if regulation becomes stricter J increases: $l = l_0 - l_1 J$

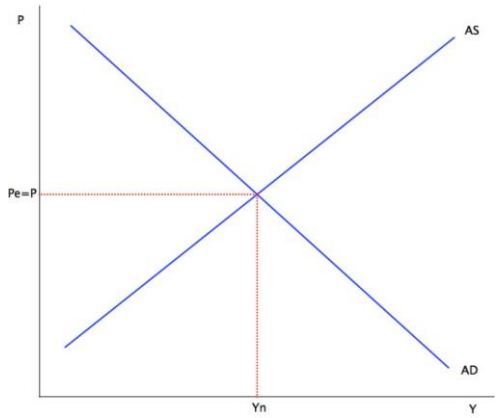
Hence, we get: $y = a + m - \pi + \varphi\pi^{e} + l \quad m = \bar{m}l = l_0 - l_1 J$

AD can be vertical when we are in a liquidity trap



Lecture 1: Introduction

In the last 25 years, increasing uncertainty in the world (WUI) In the past 700 years, interest rates have overall decreased
U-shape for share of total income for 1% in English Speaking countries, L-shaped in Europe and Japan
The basic model:
Assumptions: In the short-medium term: No capital accumulation and the economy does not adjust immediately



We care about changes in variables, not their value. We use the fact that $Y = A^{\alpha} \times B^{\beta}$ means that the change is equal to $y = \alpha \times a + \beta \times b$

Lecture 2: The basic model

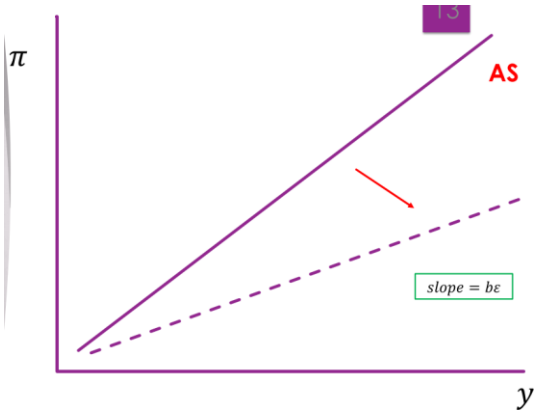
Analyzing the Supply side:
How do firms set prices, what are the impact of wages change.
Three elements determine the price: Costs (in short run, we only look at labor costs), mark-up (lower the higher the competition), and uncertainty.'
We get the following formula:

$$\pi = \omega + \frac{M_t - M_{t-1}}{M_{t-1}} + u$$

We define μ as $\frac{M_t}{M_{t-1}}$ and obtain that the change in mark-up is $\mu - 1$
Over time, the markup and profit have overall increased (since the 1960s)
Wages depend on the rigidity of the labor market (b) and the level of employment (n). The higher the two are, the higher the increase in wages
Wages are also affected by expected inflation
Expectations about inflation are formed in two ways: Flexible (people are smart and anticipate what will be done, so they can't systematically be fooled) and sticky expectations (Can be played by CB and government, can be same as last year or a constant for example)
We name the change in nominal wage w and we get

$w - \pi^e = bn$

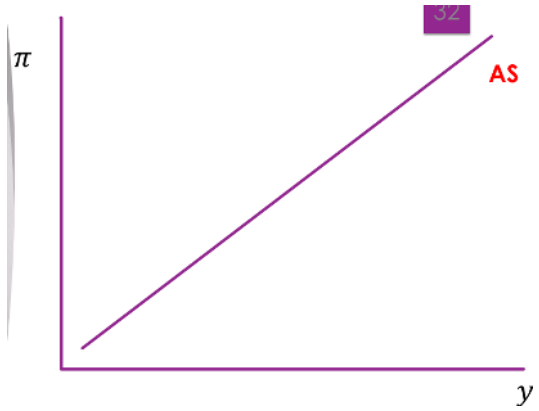
Hence, for a given bn, a higher expected inflation will lead to higher change in nominal wages Irl, rowt in wages and inflation are highly correlated but not linearly



For the production function, we assume that it is of the form $Y = AN^{\alpha}K^{\beta}$ so $y = a + \alpha n + \beta k$
Since in the short-run capital is constant, we get $y = \alpha n$
Irl, in Italy,labor productivity declined over time
We call ϵ the inefficiency factor, the inverse of labor productivity $\epsilon = \frac{1}{\alpha}$, so to double production, a firm needs to multiply the labor factor by $2 \times \epsilon$
So our third equation is $n = \epsilon y$
So our three equations are: $\pi = w + (\mu - 1) + u$ $w - \pi^e = bn$ $n = \epsilon y$

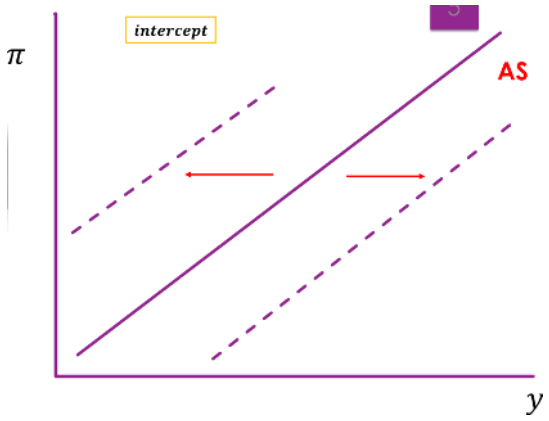
Putting them together, we obtain: $\pi = \pi^e + b\epsilon y + (\mu - 1) + u$

Solving for y, we get: $y = \frac{1+(\pi-\pi^e)-(\mu-\pi)}{b\varepsilon}$



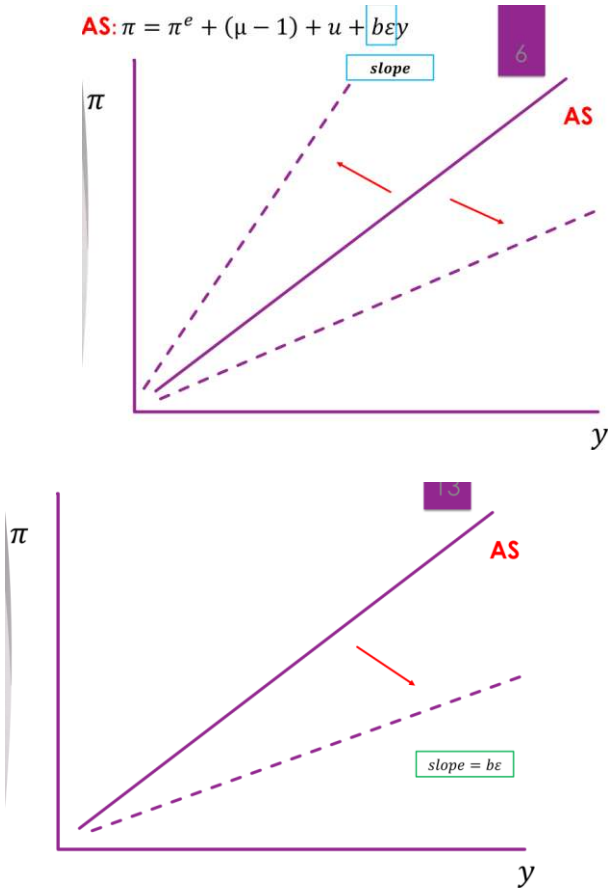
Lecture 3: The supply side

The equation of the curve is $\pi = \pi^e + b\epsilon y + (\mu - 1) + u$
hence, a shift in the curve (that changes the intercept) is a change in π^e, u *or* μ



A shift in the slope is a change in b *or* ϵ (does not affect the intercept)

Increase in antitrust legislation leads to lower markups and higher output and lower inflation Irl in the US, market concentration lowered until 2000 then grew again
Weaker labor policies lead to a lower costs hence higher outputs and lower inflation
A decrease in labor policies leads to a more flexible labor market (b closer to 0) so the curve shifts downwards, leading to lower inflation and higher increase in output
Higher efficiency of labor ($\alpha \uparrow / \epsilon \downarrow$) also shifts the curve downwards: Higher increase in output
and lower inflation For both:
A change in u due to institutional policies shifts the curve left or right
Irl, uncertainty and democracy have a U-shape relationship
When we express the supply curve equation in terms of n, we get $n = \frac{(\pi - \pi^e) + 1 - (\mu - \pi)}{b}$ indicating a link between employment and inflation (Philips Curve)
However irl the link between employment and inflation has become weaker and weaker



Lecture 4: Demand Curve

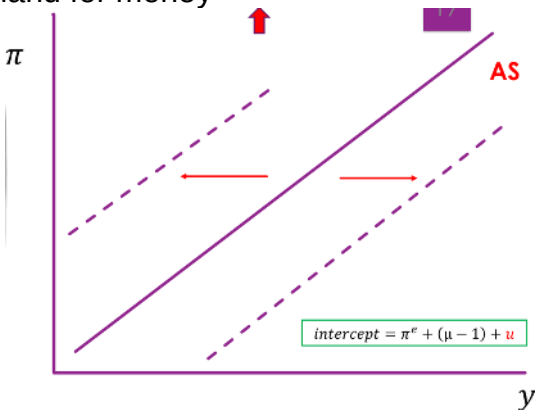
4 components: Ecogenous, changes in interest rates, inflation expectations and Baking and Financial shocks

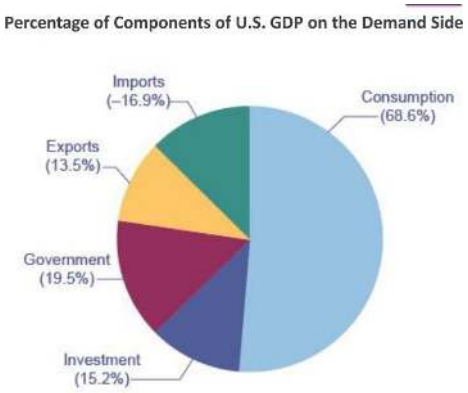
Imports and export have both increased since 1960
Two components of demand: Real/Autonomous (exogenous and do not depend on interest rate and inflation) and dependent (function of interest rate)
Investment has both an autonomous and an endogenous component NX=X-IM
if the country imports, aggregate demand decreases

Services are in a surplus in the US but goods a (larger) deficit
e is the nominal exchange rate: number of foreign currencies to buy one unit of domestic currency
n is the real exchange rate: number of foreign currencies to buy one unit of domestic currency minus the differences in price
When e increases, the net Trade Balance decreases (Marshall-Lerner)
The nominal exchange rate depends **positively** on the interest rate and negatively on the foreign interest rate: $e = e(\bar{e}, i - i^F)$
Hence, we get that Net Trade Balance decreases with higher interest rates

(BCS e rises) When i increases, I increases, NX decreases

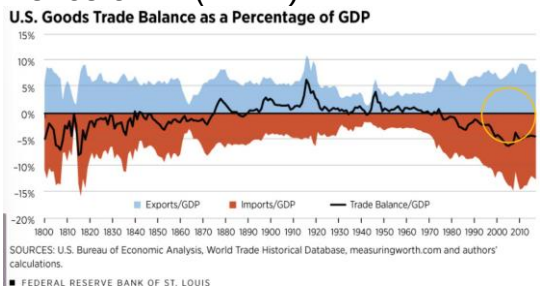
From Macro, we know that M/P = $L(i, Y)$, so prices affect the real supply of money and interest rate affect the demand for money

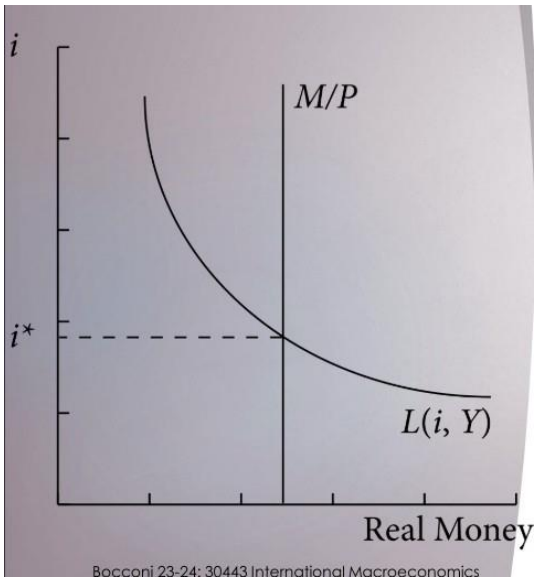




An increase in inflation increases interest rates and an increase in monetary amss decreases interest rates‘

Hence $\delta i = -(m - \pi)$





Lecture 5: Demand Side

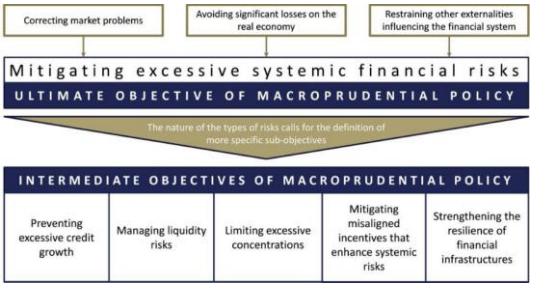
Money supply depends on CB (exogenous). Irl, it increased from 2000 to 2021 (US) and 2022 (EU) then decreased but across history it goes up and down
We have that $y = a - \delta i = a + \bar{m} - \pi$

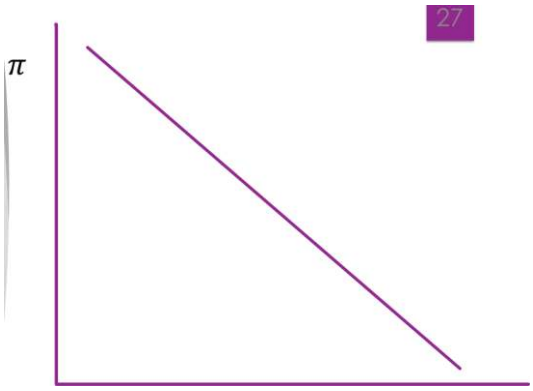
Inflation expectations are modelled with $\varphi\pi^{e}$, with φ the expectation's accelerator
Higher expected inflation increases spending on goods today. The accelerator is positive and represents how sensitive the demand is to changes in expectations
Finally I represents Banking and Financial shocks
Leverage is the ability to control a large contract value with a relatively small amount of capital It is equal to Debt over Equity (sharply increased right before 2008)
The financial accelerator represents the role of banking and leverage in influencing AD
$I = I_0 - I_1 * J$
I0 is exogenous and J is the change in the level of capital and liquidity ratios. I1 is strictly positive and is the absorber factor that measures the effectiveness of macroprudential policy
The higher it is, the more restrictive the policies and the lower the AD
Macro prudential policies aim to prevent excessive build-up of risk and to smoothen the financial cycle, make the financial sector more resilient and limit contagion effects. A
system-wide perspective in financial regulations to create the right set of incentives

So the three AD formulas are: $y = a + (m - \pi) + \varphi\pi^{e} + I \qquad m = \bar{m} \qquad I = I0 - I1\ J$
Expressing AD in function of inflation, we get: $\pi = -y + a + m + \varphi\pi^{e} + I$

Setting AD=AS, we obtain $b\varepsilon y - 1 + \pi e + (\mu + u) = -y + a + m + \varphi \pi e + l$ so:

$$y^* = \frac{1+(a+\bar{m}+l)-(1-\phi)\pi^e-(\mu-u)}{b\epsilon+1}$$



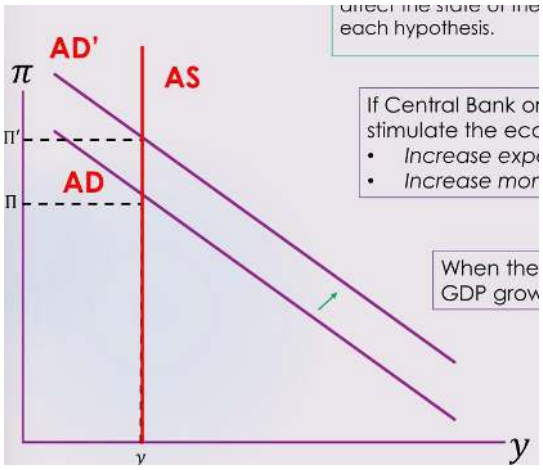


$$\pi^* = \frac{(a+\bar{m}+l)b\varepsilon + (1+b\varepsilon\phi)\pi^e + (\mu+u) - 1}{b\varepsilon + 1}$$

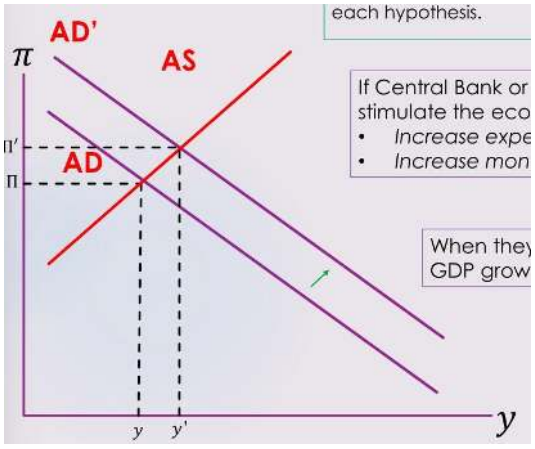
Policies that shift the curve on the supply side are:
Antitrust policies (μ), labor policies (b), productivity policies (ϵ) and institutional policies (u) Policies that shift the curve on the demand side are Monetary policies (m), banking and financial policies (l) and fiscal policies (a)

Lecture 6: The Great Moderation

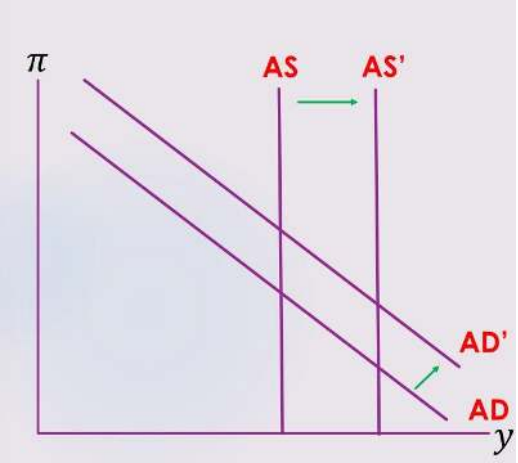
Fresh Water Economics (Chicago, Minnesota) (Hawks) vs Salt water (Harvard, MIT Berkeley) (Doves)
FW: Expectations are rational, rational agents understand how the system works and EMH SW: Economy is inefficient, expectations are exogenous and policies have a role to affect the state of the economy
The impact of an increase in AD demand due to higher m or a
According to FWE: People anticipate so the ask for higher nominal wages: $w - \pi = bn$ Hence, for a given n real wages remain constant and other are only nominal effects Hence, demand policies can't improve the economy, only supply policies
Reminder: With RE we have a vertical AS
SWE: People do not anticipate so they do not change the nominal wage they ask for and
$w - \hat{\pi} = bn$
Hence an increase in inflation leads to lower real wages and lower real costs, so demand policies can be useful to improve the economy
FWE:



SWE:

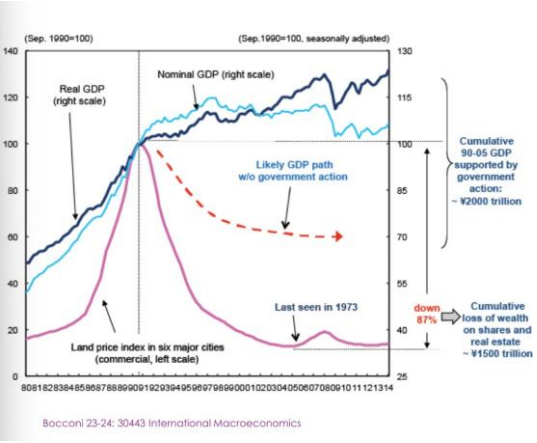


The Great Moderation is from the mid 1980s to 2007, which soft business cycles, low and stable inflation and financial innovation (high private debt)
People prefer low volatility: Stable income, smooth consumption and no employment fluctuations
This was associated with low inflation volatility: In the OECD, 20 countries experienced one between 1983 and 1998 and 11 in both GDP and inflation volatility
The drivers of finance are technology and rules
Financial innovation is the creation of novel financial products that allow larger leverage. it's driven by Creativity, changes in tech and changes in rules
Regulation is rules setting and supervision is rules enforcement Two different approaches to regulation: Structural vs prudential
Structural regulation treats finance uniquely, and the banking sector must be subjected to restrictions and prohibitions to avoid excessive risk-taking
Structural regulation includes reserve requirements, celings on loans, ceilings on interest rates, splitting CB and IB...
Prudential regulation assumes all risk-distribution can be calculated and risks can be hedged Capital ratios are used instead of constraints and prohibitions (Capital and Liquidity Requiremenets)
During the Great Moderation, banks had more freedom to operate as long as they had sufficient capital and liquidity ratios
Prudential Regulation lead to Financial Deregulation and higher financial innovation Deregulation increased the size of finance (relative to GDP), Complexity and Interconnection The GM was NICE (Non-inflationnary consistent expansion)
Because of the consistent inflation, we can use the FW framework and assume rational expectations
In this case, we get that $y = \frac{1-(\mu-u)}{\epsilon b}$ so a shock in demand doesn't affect y as it was already anticipated
On the demand side we assume that policy is perfectly effective so J is 0
So $y = a + m - \pi + \varphi\pi^e + I_0$
The effects of an increase in efficiency (AS) and Finacial Deregulation (AD):



Lecture 7: The Great Financial crises, 207

The Great Crisis' drivers are regulation, market and policy failures. It was a Balance Sheet Recession and monetary policy contributed to it.
Prudential regulation was a mistake, markets are not efficient and the monetary policy was too lax
The Recession was driven by high levels of private debt (different from business cycles recessions)
These high levels of debt led to an increase in savings to repay debt (higher financial surplus), during the crisis savings increased while expenditures decreased
The overall consequence was lower consumption and investment, especially in residential. We thus obtain slower/negative growth
In Japan:



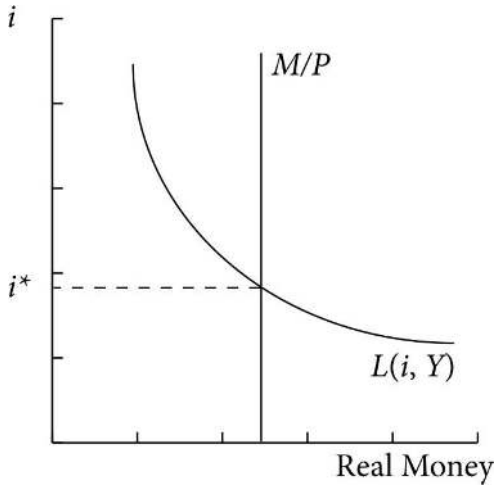
A BS recession is marked by a lower growth rate, inflation and high debt
The private debt was due to an increase in housing prices relative to income
Increase in the P/E ration in the S&P, suggesting irrational expectations
Overall we have credit booms + Financial bubbles + Economic Recessions. The first two worsened the post recession crisis
The recession was very long and very painful
To design and implement deregulation, it must be financed and requires low interest rates to increase the overall leverage
Three pillars define a monetary rule: The tool (Nominal interest rate), the goal (stability) and the actor (CBB). The three of them form a monetary rule
We use the Taylor rule as a benchmark: $i_T = \hat{r} + \pi + \alpha(\pi - \pi^*) + \beta(y - y^*)$
With it we can obtain the i^{TR} that we can then compare with the CB's interest rate and obtaining
the stance of the CB. It artificially lowered interest rates before 2007
We can consider the years before the Great Crisis to be the Great Deviation: De-regulation and lax monetary policy
Yet if the economy were efficient and agents were rational than the great deviation shouldn't produce real effects as bubbles are financial and monetary events and neutral

Lecture 8: Great Financial Crises

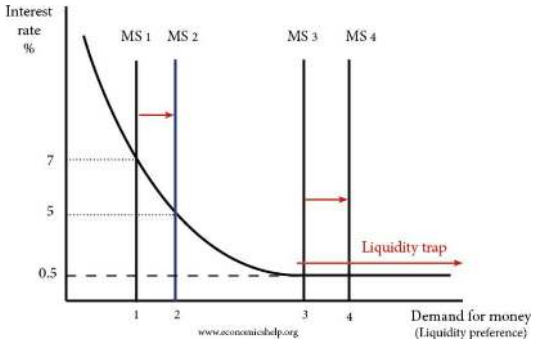
The Great Crisis lead to a big drop in world GDP growth, massive drop in employment rate in the US and affected every race and gender
Subprime lending is providing loans who may struggle to repay them: NINJA (No income, job or assets)
Deregulation lead to high competition among banks (supply trigger) and lax monetary policy leads to low interest rates (demand trigger), leading to risk miscalculation
Subprime lending in particular massively increased between 2001 and 2006 (multiplied by 7). This increased housing prices, associated to low delinquency and foreclosure rates
The way it worked is loan to a SB borrower to buy a house, the house is then overvalued and used as a collateral for another loan...
The fall started in 2006, with an increase in mortgage interest rate, decrease in housing price and an increase in delinquency and foreclosure rates
Via the Domino effect, the crisis affects all the financial markets
If expectations are exogenous, real wage changes and employment growth are affected by expectations

Lecture 9: Liquidity Trap

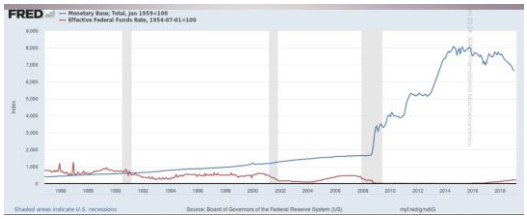
An increase in M/P means that people buy bonds, so the interest rate decreases and people keep part in cash
The change of interest rate is $\delta i = -(m - \pi)$



Part of demand depends on interest rate (Investment and export)
In a liquidity trap, interest rate is very low (price of holding cash) and an increase in M has no impact on i so monetary policy is not effective



We end up with only holding instead of circulation, an increase in the money supply would have no impact on AD
After the Great Recession: Low growth and low inflation (most developed countries especially), abnormal relationship between money and i, inflation and growth. This was due to a drop in the financial accelerator shifting AD downwards



After the Great Crisis, inflation and GDP do not grow despite large increase in monetary base, due to higher cash preference and firms prefer to save

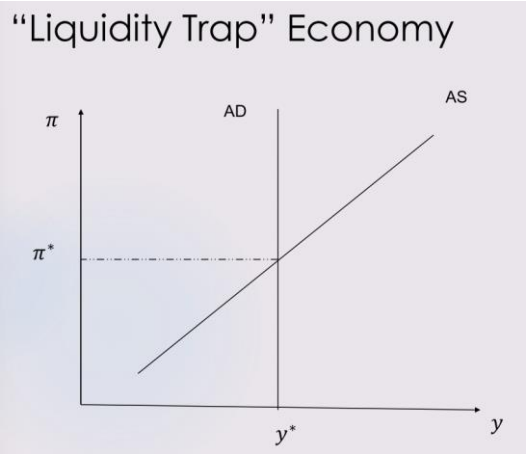
CB Balance sheet:
ASSETS: Short Term Public bonds
Liabilities and Net Worth: Monetary base (Cash and baking Reserves), Profits
Three Unconventional tools were used by advanced countries: ZIRP (Zero Lower Bound) and NIRP (Negative Lower Bound) policies, quantitative easing and Forward Guidance
ZIRP and NIRP: Three interest rates: Overnight Interbank rate, Overnight deposit rate and Overnight Lending rate
The first and last one form the central Bank corridor, and the second is between the two
Quantitative Easing: The CB increases is BS by adding Long-term public bonds and private securities through open-market operations, changing long maturity assets into liquid money
Forward Guindance: Announcing future interest rates today to influence expectations of inflation

Lecture 10: The Liquidity Trap in the BM

Four Posible policies:

- Monetary policies
- AS policies
- Fiscal Policies
- Financial Policies

Conventional Monetary policy is useless (no real or nominal effect)
When in a liquidity trap, there is no link between AD and i as the change in i is 0



In a liquidity trap, AS policies (ex: antitrust legislation) don't work: If risk aversion is too high, money is held and lower prices don't mean more sales. They have no effect on y, only on inflation
Fiscal policies (Increase in g): It can work, as it compensates for the lack in private demand due to risk aversion

In our Liquidity Trap framework,

the **fiscal multiplier (FM)**- *change in output growth given a change in the fiscal policy* - is **positive** and **= 1**

$AD: y = a + l + \phi\hat{\pi}$ $\quad FM = \frac{\Delta y^*}{\Delta \bar{a}} = 1$

On top the fiscal policy triggers inflation (**inflation accelerator IA**):

$AS: \pi = \hat{\pi} + b\varepsilon y + (\mu - 1) + u$ $\quad IA = \frac{\Delta \pi^*}{\Delta \bar{a}} = b\varepsilon$

Note: generally using the multiplier and the accelerator we can calculate the **sacrifice ratio.**

In this case: $\frac{IA}{FM} = b\varepsilon$

However, irl, it is a controversial topic
Financial policies: Lowering capital ratios can increase loans but reduce stability. Post 2008, we had a gradual and postponed tightening
Forward Guidance: Monetary policy announcements are called Open-Mouth operation. It can be data dependent (if xxxx, then yyyy). The assumption

behind it is that the interest rate expectations and inflation expectations are associated, and it can be an effective tool in a LT. Affects both AS and AD

Lecture 11: Covid 19

Slower or negative growth worldwide, crash of stock market Decrease of a increase of markup and uncertainty
Covid 19 was deeper but faster recovery than Great Crisis
Heavy fiscal cost everywhere, especially high-earning countries to compensate by increasing a

Lecture 1

Economi globalization: Increasing interedepence of world economies through:

- Exchange of intermediate and final goods and services
- Flow of production factors (capital, labor)
- Wide and rapid spread of technologies

Three waves of globalization: Innovation (reduction in transportation and communication costs, new technologies and new products...) and economic/trade policies

First one: 1850-1914: The Great Divergence, through

- Transport: Steamships and railways
- Other tech: Refrigeration, telegraph
- International economic cooperation and spread of liberal economic policies
- First unbundling: Separating production and consumption and switch to secondary sector from primary

It doesn't include the whole world and it tends to be inter-industry trade

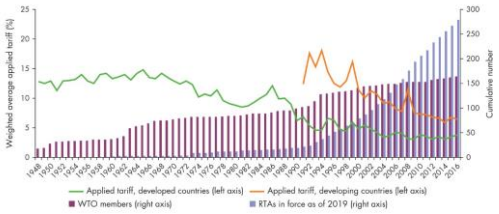
WWI and WWII are a reversal in globalization with the Great Depression and economic nationalism

The Second Wave is from 1945 to the 70s and features new players. Driven by technological progress: Containers, civil aviation, telephone...

The types of exchanges that were possible and profitable also changed: Trade in similar things between similar countries, intra-industry and North-North Trade

Economic policy also changed, with multilateral cooperation in trade liberalization (GATT) Third wave is from the 80s: Global production networks (GVC), second unbundling is the end of the need to perform most manufacturing stages in the same location; growing roles of developing countries

Trade liberalization: WTO, preferential trade agreements Since 2019, increase in Regional Trade Agreements (RTA):



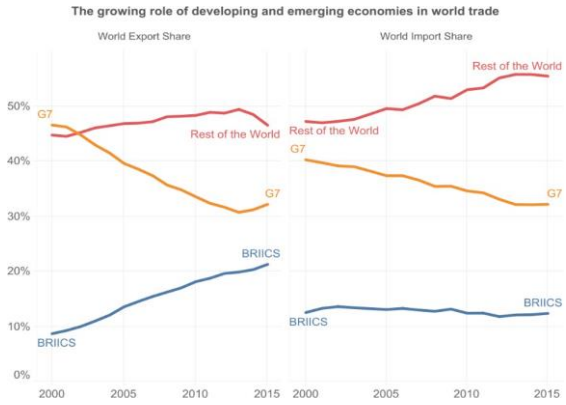
Strong development of ICT favors globalization:

Countries gain from trade, thanks to Specialization, economies of scale, increased competition, productivity gains and product variety

This can be due to differences in climate and resources, but also labor productivity and relative supplies of K, L and Land and their use

The size of an economy is related to the volume of imports and exports: Larger economies produce more and so have more to sell, and they generate more

income from goods and services sold so they are able to import more
The gravity model is$T_{ij} = \frac{AY_iY_j}{D_{ij}}$, with A a constant, T the amount of bilateral trade, Yi and Yj the GDP of country i and j and Di j is the distance
Good but not perfect (NE, BE and IRE trade much more with the US than that)
Potential factors:



- Distance
- Cultural affinity
- Geography
- Multinational corporations
- Borders
- Trade Agreements

Recent challenges to globalization: US-China trade war, covid, Houthis
The main costs of globalization are income distribution/inequality, structural adjustments (jobs and technological change), increased interdependence (geopolitical tensions), impact on the environment and climate change.
Offshoring is the relocation of tasks of the value chain abroad while outsourcing is when a task is externalized to a supplier
Global Value chains are unbundled production, with different stages of production located across different countries

Lecture 2: Ricardian Model

Benefits from trade come from economies of scale and differences (production factors, differences...)

a_j^i is the unit labour requirement to produce good i in country j, and $\frac{1}{a_j^i}$is the productivity of labor in industry i in country j

Even if Portugal has an absolute advantage in both wine and cloth production, both countries still benefit from trade. This is because of opportunity cost: To produce 1 cloth, a_c units of labor are needed, with which you could produce $1/a_w$ units of wine, so with a_c/a_w the opportunity cost of cloth in terms of wine

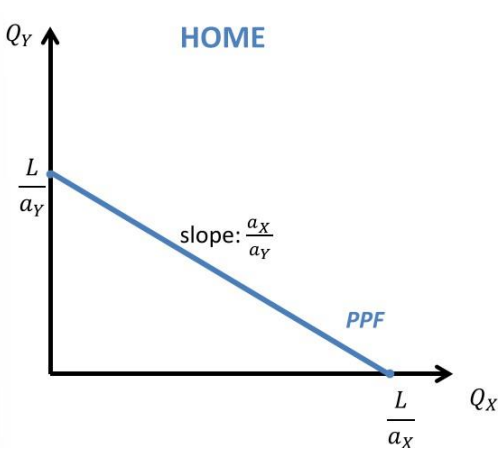
Since the opportunity cost of cloth is lower in the UK, so they have a comparative advantage in the production of cloth. Even a country with an absolute disadvantage in all goods has a comparative advantage, we can always define a comparative advantage if countries are different. Both countries gain from trade if they specialize according to the comparative advantage

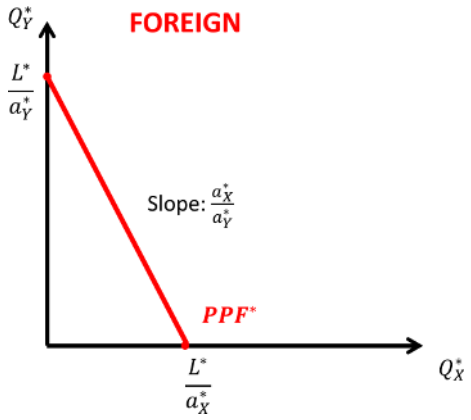
The model: Only one factor of production (L and L*)n supply of labor is constant and homogenous, L is perfectly mobile between industries and L is immobile across countries, two goods X and Y, constant return to scale in production, perfectly competitive markets, and same tastes in Home and Foreign

The production possibilities frontier: PPF: $a_x Q_x + a_y Q_y = L$, solving for Qy we get $Q_Y = \frac{L}{a_Y}\frac{a_X}{a_Y}Q_X$.

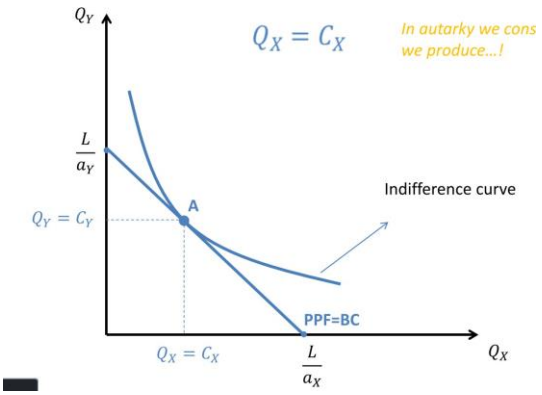
The vertical intercept is L/ay and represents the max amount of Y that home can produce, L/ax is the horizontal intercept and ax/ay is the slope (opportunity cost of good x in terms of good y).

We assume $\frac{a_X}{a_Y} < \frac{a_x^*}{a_y^*}$ Home has a comparative advantage in x and foreign in y.





To determine what is actually produced, wemust use prices, wages and preferences. Since we
have perfect competition, the price is the marginal cost ($i = a_i \times w_i$). Since
$p_x = a_x w_x$ -> $w_x = \frac{p_x}{a_x}$
If wgaes for x are higher than in y, workers will only work in the X industry. When in autarky, the economy must produce both goods, which requires $w_x = w_y$ -> $\frac{p_x}{a_x} = \frac{p_y}{a_y}$ -> $\frac{p_x}{p_y} = \frac{a_x}{a_y}$
in autarky, the relative price of good X is equal to the opportunity cost of X in terms of Y
The budget constraint is $p_x Q_x + p_y Q_y = Income$, with income =wL
Solving for Qy, we get: $Q_Y = \frac{wL}{p_y} - \frac{p_x}{p_y} Q_x$.In autarky, the Budget Curve coincides with the PP, as we consume what we produce. Given the BC, consumers choose the bundle of consumption that maximizes utility (tangency/highest indifference curve)



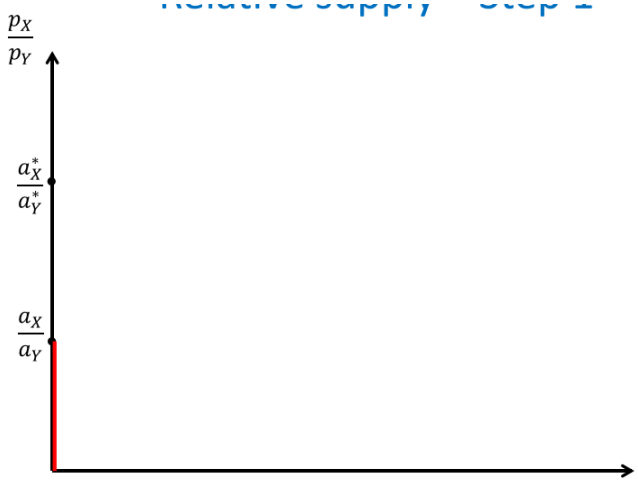
Overall, in autarky, the quantity of x produced is the quantity consumed, efficient production is on the PFF, full employment

Lecture 3: Ricardian Model

If free trade is possible (no costs), balanced (no international trade in financial assets) and $\frac{a_x}{a_y} = \frac{a_x^*}{a_y^*}$ (the opportunity cost of X is lower in home than in foreign/Home has a comparative advantage in producing X and Foregin for Y)

The World Relative Supply is $\frac{Q_X^S + Q_X^{*S}}{Q_Y^S + Q_Y^{*S}} = f(\frac{p_x}{p_y})$ and the world relative demand is: $\frac{Q_X^D + Q_X^{*D}}{Q_Y^D + Q_Y^{*D}} = f(\frac{p_x}{p_y})$ %beginfigure[h] If $\frac{p_x}{p_y} < \frac{a_x}{a_y}$ in home $\frac{p_x}{a_x} < \frac{p_y}{a_y}$ -> $w_x < w_y$ so home specialises in the production of Y

Since $\frac{a_x}{a_y} < \frac{a_x^*}{a_y^*}$ foreign specialises in Y too and only produces Y: The Relative supply curve is:

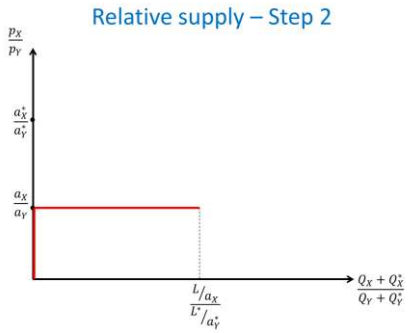


If $\frac{a_x}{a_y} = \frac{p_x}{p_y} < \frac{a_x^*}{a_y^*}$

In home, same situation as in autarky was wages for x are equal to wages for y, indifferent between X or Y

For foreign, since they have a relative advantage in Y, they will produce exclusively Y so $RS \in [0, \frac{\frac{L}{a_x}}{\frac{L^*}{a_y^*}}]$

Relative supply:

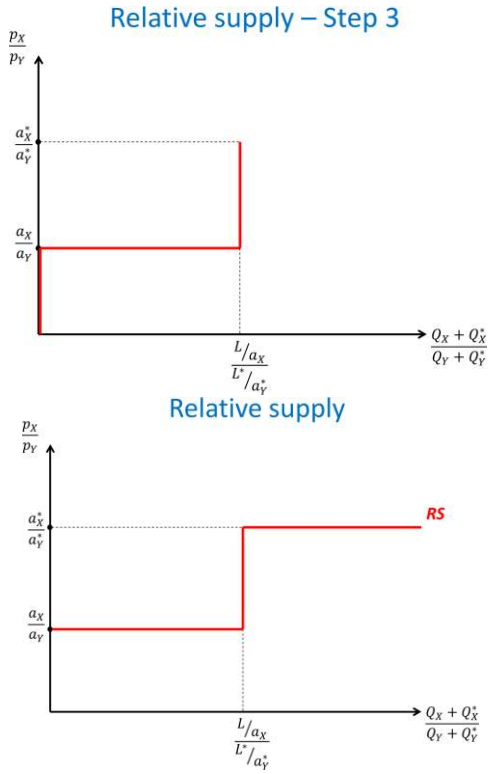


If $\frac{a_x}{a_y} < \frac{p_x}{p_y} < \frac{a_x^*}{a_y^*}$ home specialises in X and Foreign in Y and the relative supply is $\frac{\frac{L}{a_x}}{\frac{L^*}{a_y^*}}$

If $\frac{a_x}{a_y} < \frac{p_x}{p_y} = \frac{a_x^*}{a_y^*}$ Home specialises in X and Foreign does not specialize (RS is horizontal)

RD is the relative demand for good X as a function of the relative price. If $\frac{p_x}{p_y}$ decreases then RD_x increases

We can thus use a normal sloping curve:



When two countries open up to trade ,the relative price of X converges

Here, home is completely specialized in producing good X and foreign is completely specialized in producing good Y

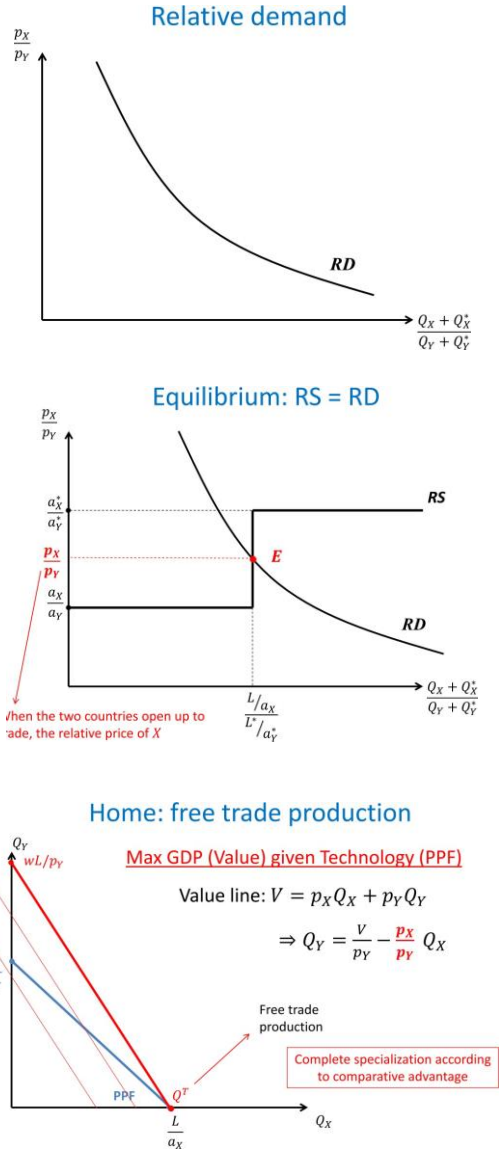
Gains from trade: While home can produce $1/a_y$ units of good Y, it can produce $1/a_x$ units of good x

What home odes is buy $\frac{p_x}{p_y a_x}$units of good Y, which is higher than 1/ay because $\frac{p_x}{p_y} > \frac{a_x}{a_y}$ A value line is a line that represent the value generated by a combination of production: $wL = p_X Q_X + p_Y Q_Y$ so $Q_Y = \frac{wL}{p_y} - \frac{p_x}{p_y} Q_x$

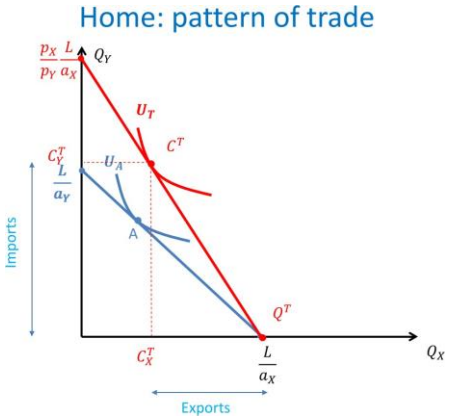
Comapring the Value Line with the PPF, we get:

Bundles not previously affordable (on the PPF) are now affordable (on the VL)

The larger the difference between free trade and autarky relative price the bigger the gains The same logic applies for Foreign



When RD intersects RS on a horizontal line, one country is specialized and the other makes both and the one that doesn't specialise doesn't gain nor lose (the other gains)



Lecture 4: The Ricardian Model and Myths

Free trade is not only beneficial if your country is strong enough to stand up to foreign competition, it depends on comparative advantages, absolute productivity is neither necessary nor sufficient

It doesn't hurt other countries when it's based on low wages, the source of comparative advantages is not relevant

Trade also doesn't exploit a country due to its workers receiving lower wages

The key results from the Ricardian model are convergence of relative price of goods, specialization according to comparative advantage, pattern of trade according to comparative advantage and gains from trade (no losses)

Gains from trade depends on terms of trade $\frac{p_{Export}}{p_{Import}}$

w is the value of the marginal productivity of labor

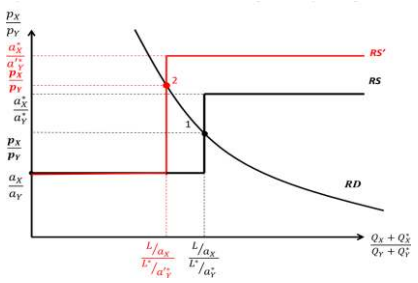
The Ricardian model explains the real world (technology and comparative advantage rather than absolute advantage matters)

Limits: Only one factor, extreme degree of specialization, long-run model (no adjustment costs analyzed), Intra industry trade isn't explained, lack of extensions (more goods/countries)

An increase in Labor supply in Home shifts the vertical part to the right, leading to lower relative price of x, meaning lower gains from trade for Home nad higher gains for Foreign

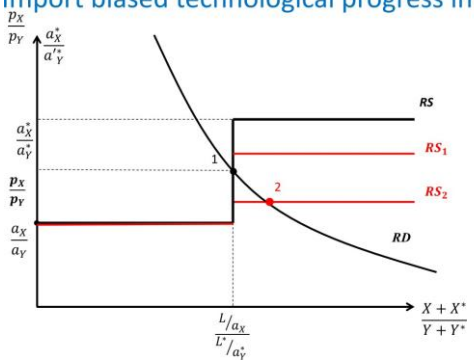
A technological improvement in Foreign's export based industries leads to a lower a_Y^*

This means the opportunity cost of X increases in Foreign so $\frac{L^*}{a_y^*}$ increases and $\frac{\frac{L}{a_X}}{\frac{L^*}{a_y^*}}$ decreases and RS decreases



For Foreign, deterioration of terms of trade ($\frac{p_{Export}}{p_{Import}}$), higher absolute produitvity, positive technological spillover on Home. For Home, we have improvements of terms of trade

Import biased technological progress in F



Import biased technological improvement in Foreign (lower a for x)
This means that $\frac{a_x^*}{a_y^*}$ decreased and so: If it shifts to RS 1, each country stays perfectly specialized
and no changes to the relative price of X so no effect on home
If it shifts to RS2, the Home terms of trade deteriorate, welfare decreases
If it shifts to RS2, the Home terms of trade deteriorate, welfare decreases (Home is still better off than in autarky)
Overall, it benefits Home if Home's terms of trade increase and hurts it if it deteriorates Home's Terms of trade (lower, not negative gains)
Di Giovanni et al.: Is productivity growth in China beneficial for the ret of the world. Ricardian model with 75 countries, 2 factors (K and L), 19 manufacturing sectors
Their simulations show positive to negative gains, with Asian countries on average gaining more (the closer the better), countries with important textile and apparel sectors have small welfare losses
In the second simulation, we compare balanced improvement (other countries gain) and import-biased improvements (other countries may lose but higher variance also for gains) What matters is China's similarity to the world weighted average productivity and its comparative advantage: balanced growth in China keeps it similar to the typical country while unbalanced growth makes it more different from the rest of the world
Remember: The larger the difference the larger the gains

Lecture 5: Heckscher-Ohlin Model

Different factor endowments + different factor intensities lead to gains from trade

We use two factors L and K: They are homogeneous and freely mobile across sectors but immobile across countries

We have constant returns to scale and diminishing marginal returns

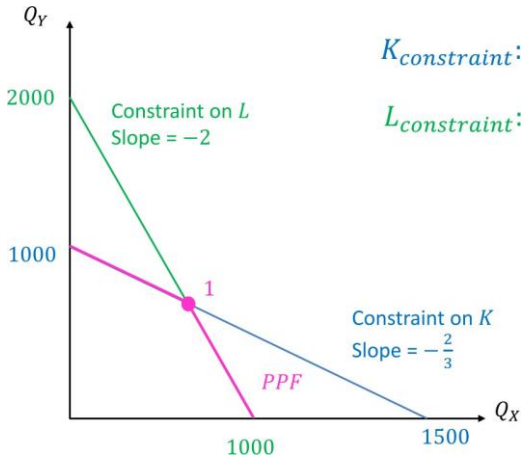
Relative factor intensity: $\frac{L_x}{K_x} > \frac{L_y}{K_y}$ (production of X is relatively intensive in L and of K is relatively intensive in K

Home is relatively more labor-abundant than foreign, which is relatively K abundant $(\frac{L}{K})_{Home} > (\frac{L}{K})_{Foreign}$

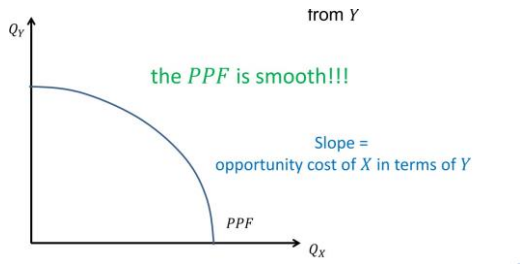
Perfect competition so price= marginal cost (L and K are paid the value of their marginal productivity)

Factors work in the industry that pays them the most, hence in equilibrium the two industries pay the same

We now have one constraint by type of endowments, as we must respect $a_{KX}Q_X + a_{KY}Q_Y \leq K$ and $a_{LX}Q_X + a_{LY}Q_Y \leq L$:



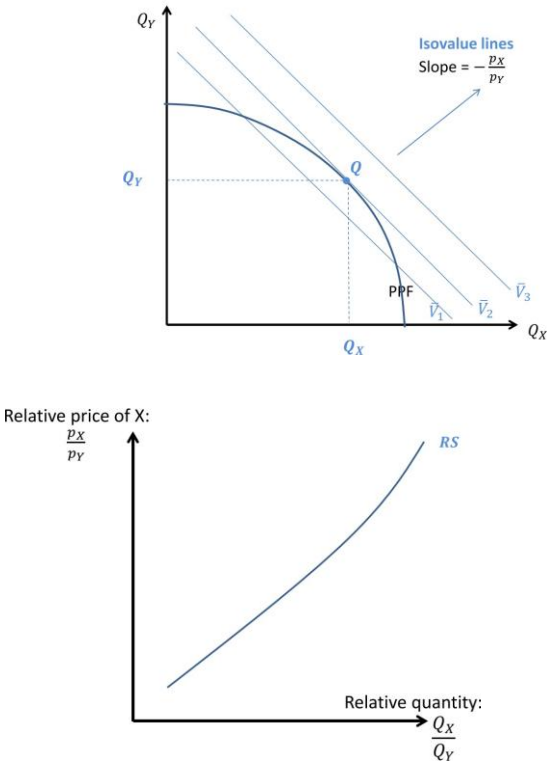
The opportunity cost of X is low when little X is already being produced and high when lot of X is being produced (low marginal productivity of the resources). In other words, when a lot of X is produced, the marginal productivity of the resources used for it tends to be low and the opportunity cost is high



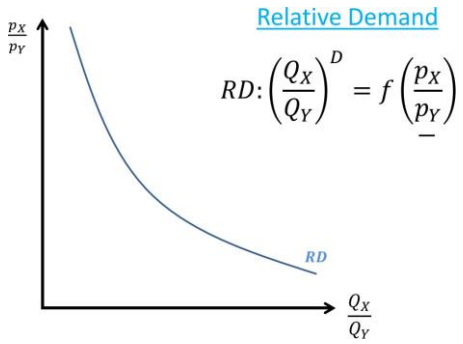
The economy produces at the point that maximizes the value of production:

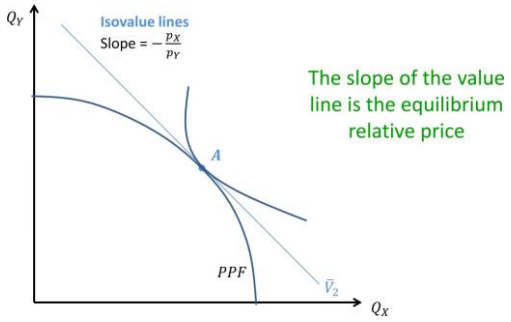
V = pXQX + pYQY $\Rightarrow Q_y = \frac{V}{p_y} - \frac{p_x}{p_y} Q_x$: The slope of the isovalue line is the relative price: Efficiency is at point Q, where opportunity cost of X=Marginal benefit of X
An increase in the relative price of X will increase the slope, shift the tangency point to the right and increase production of X
Hence the supply curve is: The budget constraint is $p_X Q_X + p_Y Q_Y = Income$, so equivalent to the value line
Relative demand is inversely proportional to the relative price

Production and Prices



Since Home is better suited to produce x, PFF is biased towards it and inversely:
In autarky, the relative price of X in Foreign is higher than in Home
In free trade, the world relative supply is a weighted average of RS in the two countries With trade, relative prices converge. The increase in relative price increases supply of X and
reduces demand. Home partially specializes and exports X and vice versa for Foreign. Gains from trade at the aggregate level and both countries gain
Heckscher-Ohlin theorem: the country that is abundant in a factor exports the good whose production is intensive in that factor





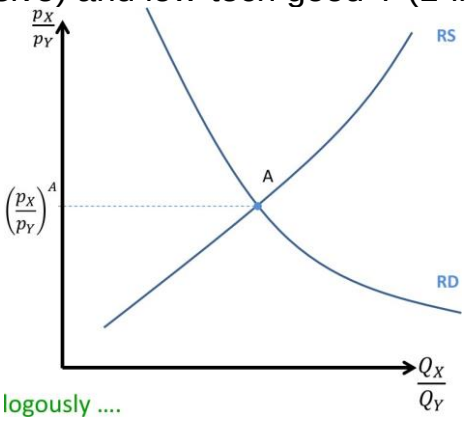
Lecture 6 and 7

Does international trade increase inequality?
Factors are paid the values of the marginal products and p_x/p_y determines the relative
remuneration of labor w/r
Supply side: An increase in the relative price of x means an increase in the relative quantity of X produced, hence increasing the relative price of labor as it uses it disproportionately: SS relationship:
If w/r increases, L/K demand decreases in both sectors Turning around the graphs and combining them, we get:
Stolper Samuelson theorem: An increase in the relative price of a good increases the real return to the factor used intensively in the production of that good, and decreases the real return to the other factor, in terms of both goods. The owners of the abundant factor gain but the owners of the scarce factor lose with international trade
Consequence of an increase in p_x/p_y:
Factors are paid at the value of the Marginal product:

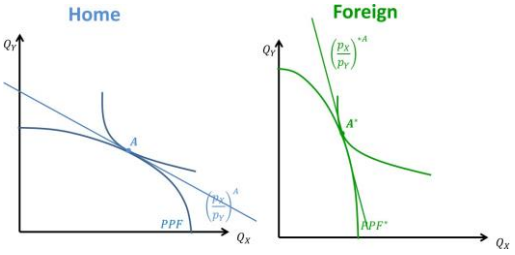
$$w = p_x MP_{LX} = p_Y MP_{LY} \rightarrow \frac{w}{p_x} = MP_{LX} \rightarrow \frac{w}{p_y} = MP_{LY}$$

Law of diminishing returns: If capital is contant and labor increases, then labor productivity decreases and capital productivity increases and vice versa
The convergence of prices:
At Home: Increase in p_x/p_y so increase in w/r so decrease in L_x/K_x and L_y/k_y so marginal productivity of labor increases and mp of labor decreases: workers are better off and capital owners worse off

The opposite happens in Foreign: the owners of the abundant factor gain while the owner of the scarce factor lose in real terms
In principle, if winners compensate losers, everyone is better off in free trade (Pareto improvement)
Two factors of production: L and S (low and high skilled workers), ws>wl 2 goods: High tech good X (S-intensive) and low-tech good Y (L-intensive)

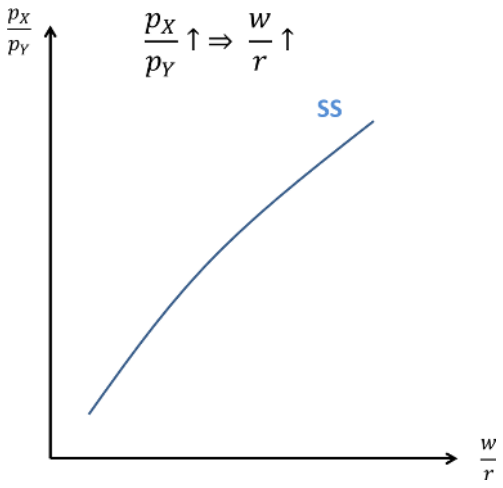


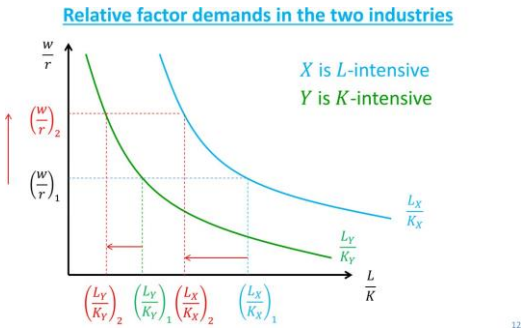
logously ....



2 countries: Home is developed and S abundant and Foreign is developing and L-Abundant In autarky, px/py is higher in Foreign
SS predicts that in the developed country there will be an increase in the relative price of X (false irl), a reduction of skill intensity in both sectors (No, the opposite happens) so an increase in wage inequality (true), while the opposite happens in Foreign (Lower inequality has mixed evidence)
China Syndrome: What are the local labor market effects of import competition in the US: Rising exposure increased unemployment, lowered labor force participation and reduced wages in come area
China has very uneven export growth across sectors; the US manufacturing industry are highly concentrated geographically and US workers are not willing/able to move: The China shock displaced a million U.S. manufacturing jobs
Although Chinese imports may have reduced employment in some industries/regions, these losses can be more than offset by gains in employment in other industries/regions
Net job losses in manufacturing sectors for the US but remarkable job gains in services: international trade has an impact on the labor market in line with comparative advantage Skill-biased technological change: New technologies

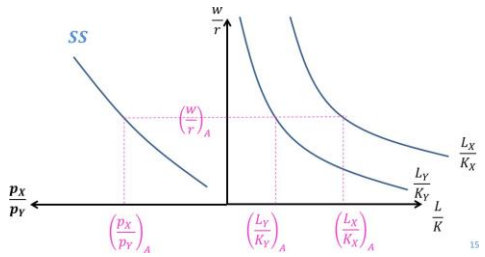
(complements to skilled labor an
substitutes for low-skilled labor): 2 effects: given goods prices, skilled workers become relatively more productive: increase in ws/wl: SS relationship shifts up. Given the skill premium, higher relative demand (shift in relative factor demands)
The SBTC explanation matches empirical observations: No changes in relative prices of high-tech goods, increased skill intensity, increasing inequality
International trade can facilitate the adoption of ICT
SBTC also explains polarization: Higher inequality between high-income and medium-income workers, reduction of inequality between medium and low-income earners
Medium-skilles workers are those more risk of automation
SS vs SBTC: International trade is not the main driver, its impact comes from diffusing technology
However during the last two decade international trade flows have changed: more North-South

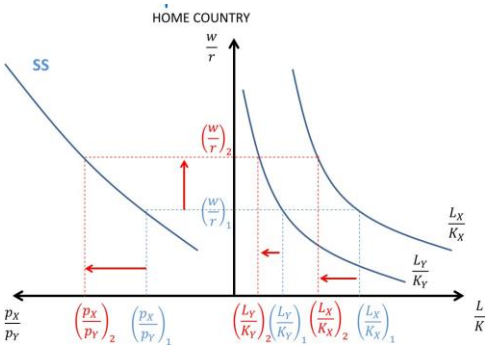




compared to the past and global value chains
An alternative explanation is off shoring
Suppose a fall in trade costs (offshoring is cheaper): We have more unskilled labor being done in Foreign (low skilled workers):
The relative demand for skilled labor increases in both countries and so their

wages increase, leading to increased inequality:
Conclusion: No evidence supporting the HO and SS theorem. Alternative explanations are SBTC and offshoring (in which case trade is an important driver)

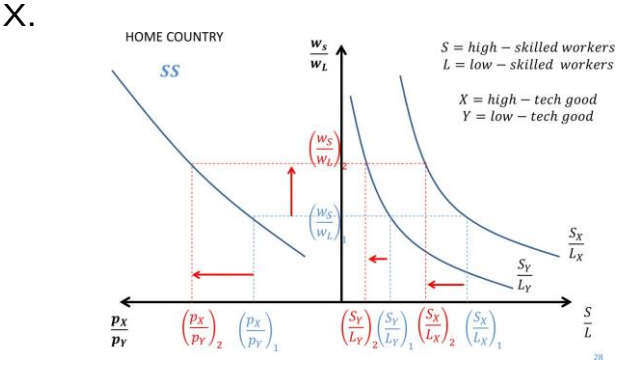


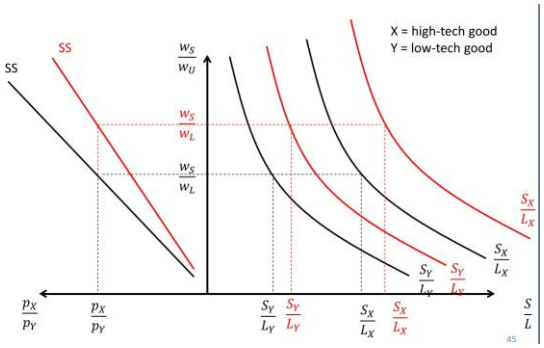


Lecture 8: The Standard Trade model

it's a combination of Ricardian and HO model
We have diffferences in factor endowment and/or in the use of factors giving rise to productive differences
Differences in technologies or production factors are represented by dfferent PPF, implying different RS curves. For a given relative price, RS of Home >RS of Foreign
RS world is a weighted average of both
A higher relative price for export means that the country can buy more imports so higher TOT means higher welfare and inversely '
The world market relative price falls between the two countries' autarkic relative prices. A country gains from trade thanks to the difference between world ToT and its own autarkic price Two kinds of gains: Consumption and production gains
Consumption: Imported goods are relatively cheaper than in autarky so consumers reach a higher indifference curve for a given production
Production gain; The country specializes more in the production of the good paying a higher relative price so higher GDP, income and indifference curve
'Given the higher relative price of X, the country specializes more in the production of X, GDP increases (upwards shift in the value line)
Small vs large countries Small countries have aa negligible impact on the international market and lead to no change in the equilibrium relative price on the international market

Large countries have an impact on the international market so a shock to their relative supply or demand have an impact on the relative S or D worldwide and affects the equilibrium relative price and the terms of trade
Growth in one country only matters if it's biased: It occurs in one sector more than the other and changes the relative supply; unbiased growth is exactly equal to a change in countries' size
Biased growth in X: Tech improvement in the production of X, increase in relative endowment of labor, the relative supply of X increases, the relative supply curve shifts right and the PPF shifts our more towards X and inversely for Y (increase in relative endowment of capital, rsc shifts left...)
In a small country Assume that L increases in Home/ improvement in tech in X industry (same thing), there is an outwards shit of the PPF but since it's biased it grows more for X.

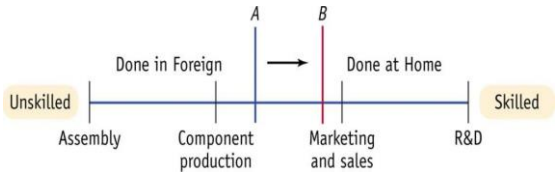




However, there is no impact on international market so no change in the slope of the isovalue line
Rybczynski theorem: For given relative goods prices, an increase in the endowment of a factor will increase output in the sector that uses this factor intensively and will decrease output in the other sector
For the welfare in home, the larger consumption set earns higher indifference curve: The impact on welfare at home is positive and no impact on the world
Asian tigers and their export led growth thanks to reduction in trade barriers, they became relatively capital-abundant instead of relatively labor abundant, mainly thanks to FDI, so they gained a comparative advantage in K-intensive industries
In a closed economy, an increase in K for a given L leads to lower return to capital, but in a small open economy, goods prices determine factor prices, so

they're fixed so Rybczynski effect
In large countries: In Home increase in L, the relative supply of x increases RSx so the world relative supply of X increases and RS world shifts to the right => Impact on the terms of trade. The relative price of X decreases so the tot of exporters of X deteriorate
Welfare effects: At home, growth leads to higher welfare, but tot deterioration leads to lower welfare so under special conditions the effect can be negative
In Foreign, the terms of trade improvement improved welfare
The differences between the two countries are now even larger so larger gains from trade
In theory US tot should have worsened with the growth of China in competing sectors, but data indicates that changes have been small with no clear trend, however those for China have worsened, suggesting their recent growth may have been export-biased
Developed countries tend to experience mild swings in their tot (around 1%). Some developing countries exports are heavily concentrated on some sectors (mineral, agricultural) and since those goods are very volatile, this leads to large swings in the terms of trade, leading to substantial changes in welfare

Task type		Task description	Example of occupations	Effect of ICT	Education Levels
Routine	Manual	Rules based; repetitive; procedural	Assembly line workers;	Direct substitution	Low
	Non-Manual		Clerical ; Book-keepers	Direct substitution	Middle
Non-Routine	Non-Manual	Abstract problem solving (analytic); mental flexibility	Managers; doctors; lawyers; scientists	Strongly complementary	High
	Manual	Environmental adaptability; Interpersonal adaptability	Maids/Janitors; security guards; waiters; drivers	Broadly Neutral	Low

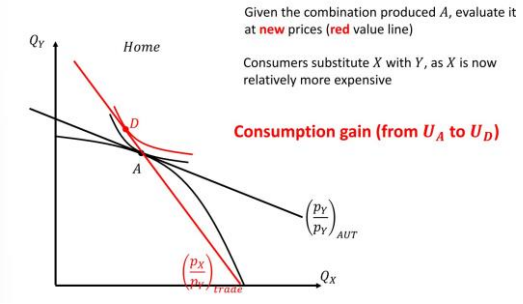


Lecture 9: Firms in the global economy

Gruber-Lloyd index:
with $(X_i + M_i)$ the total trade in industry i and $|X_i - M_i|$ net exports
In the case where there are no imports, only exports, we get 0, imports=exports we get 1.
Intra industry trade concerns mainly rich and intermediate countries', as well as intermediate and final goods mostly
Horizontal differentiation is over the varieties for the same quality and vertical differentiation is different quality/ price range
External economies of scale: the average cost faced by a firm decreases with the output of its industry, many small firms take prices as given an internal

economies of scale: the average cost faced by a firm decreases with its own output„ few large firms set prices thanks to their market power
A price-taker firm faces an infinitely elastic demand at the given market (horizontal demand curve), the price-maker firm fces a downward sloping demand with finite elasticity.
Higher productivity implies lower marginal cost c and: larger output (q)n lower price (p), higher markup M(c), higher profit $\pi(c)$. In our case, homogeneous fims with the same c
A model with market power and no strategic interaction due to many firms is called monopolistic competition
We have horizontal differentiation; each firm faces some competition but is a monopolist of its variety
Under monopolistic competition, a firm sells more as total sales in the industry increase and as prices charged by rivals increase and less as the number of firms in the industry increases and its price increases: $q = S[\frac{1}{n} - b(p - \overline{p})]$
is themarket size (exogenous), n the number of firms, b is a constant representing the
responsiveness of a firm's sales to prices and p bar is the average price charged by competitors
Demand: $q = S[\frac{1}{n} - b(p - \overline{p})]$
If firms are symmetric, in equilibrium p=p bar so $q = S/n$
The amount of output produced by the individual firmis
The amount of output produced by the individual firm is equal to its market share Technology: TC=f+cq, all firms have the same TC function
Free entry/exit: If profits are positive, new firms enter, if profits are below 0, some exit and in equilibrium no profit: p=AC
To find the equilibrium: 1) Average cost and number of firms: if n increases, firms size declines for a given market size so AC increases: $AC = \frac{f}{q} + c$
and in equilibrium $q = S/n$
CC curve: $AC = \frac{fn}{S} + c$
The higher the n, the lower the exploitation of economies of scale.

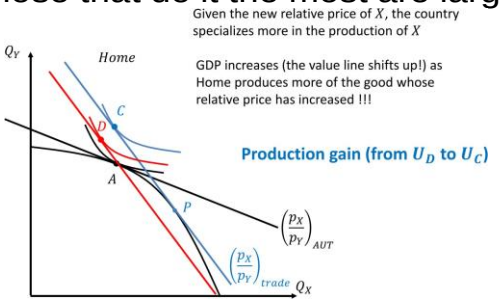
% of increase explained by the two factors	
Offshoring	Technology
Relative wage of skilled workers (w_S/w_L)	
21 – 27 %	20 – 32%

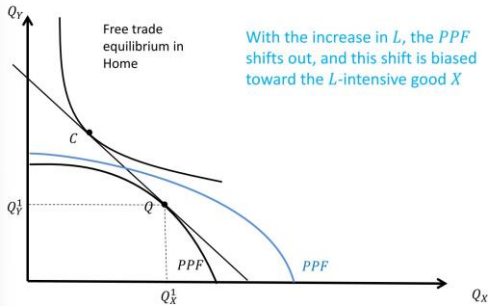


In equilibrium MR=MC
For the demand: $PP: p = c + \frac{1}{bn}$
If p is above AC firms enter and vice versa
In equilibrium, $n_A \sqrt{\frac{S}{fb}}$
If S increases, n increases less than proportionally
If f increases than n decreases, if b increases then n decreases (more competition means lower prices, lower profits)

Monopolistic competition and trade

2 identical countries, with market size S, free trade so market size 2S Larger market means more unit sold so lower AC and lower CC
4 effects of trade: Price drops due to competition increasing and the number of firms increases, leading to higher variety. Although some firms do exist, the total number of firms of the two markets together is lower than twice the total number in each market before trade. Finally, Scale effect lead to more efficient production (q increases)
Hence, identical countries grain from trade thanks to lower prices, more efficient production and more variety: IIT
Irl few firms export and those that do it the most are large companies





Lecture 10: Firms in the Global Eonomy

Only some firms export due to differences between firms, high productivity firms expand to serve the foreign market, low productivity firms suffer from foreign competition while least productive firms exit, so the average productivity of the industry increases when in international trade

We use the same assumption as in the Krugman model but firms have different marginal costs: a firm doesn't know its productivity until it starts producing the good, firms enter if expected profits are positive and exit if observed profits are negative

Comparing two firms, with c1 below c2, and firm 1 larger than firm 2 (q1>q2) and charging a lower price:

Firm 1 gets higher profits. For all firms whose c is above the vertical intercept of D, they exit the market. We call the vertical intercept c* the cutoff marginal cost

Under trade: Larger market leading to a higher quantity produced and higher profit but also a higher n so larger competition, lower q and lower profit

With homogeneous firms, q=S/n increases for all firms but for heterogeneous firms, the impact on the demand faced depends on the marginal cost of the firm

The new cutoff marginal cost is c'* and lower than before

Trade winners generate winners and losers, there is a reallocation of resources from less productive to more productive firms so the average productivity increases: Gains from trade: Countries are more efficient

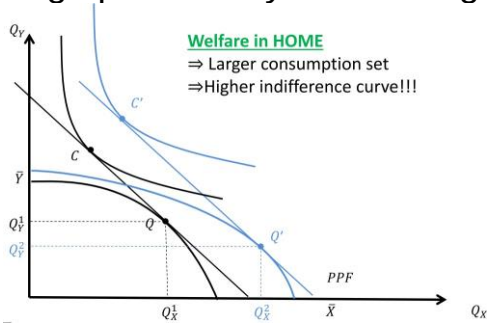
Note that in this model, all surviving firms export

Irl, we can explain the small number of firms who export due to trade cost, which reduces the profitability of exporting for all firms and makes it unprofitable for some firms

If firms pay a tariff t to sell in the foreign market, the marginal cost for exported goods is higher, firms set higher prices abroad and sell a lower quantity, leading to lower profits

In the case of a bilateral reduction in t, lower cost of exporting increase profits but increased competition on the home market leads to less demand for variety and lower profits

We thus get heterogeneous effect: firms that used to or can now export make bigger profits and those that couldn't make less. Since least productive firms leave the market, the average productivity of surviving firms is greater



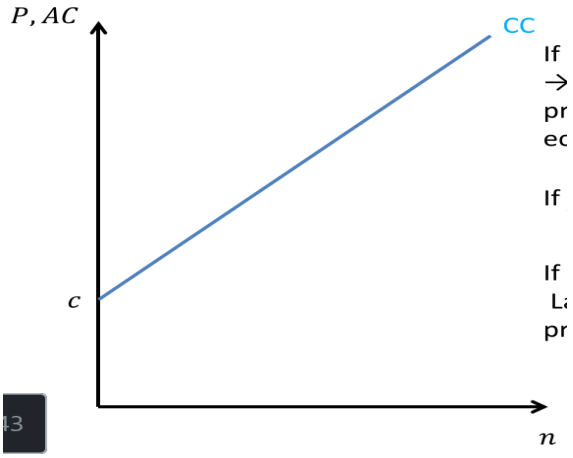
$$GL = \frac{\sum_{i=1}^{n}(X_i + M_i) - |X_i - M_i|}{\sum_{i=1}^{n}(X_i + M_i)}$$

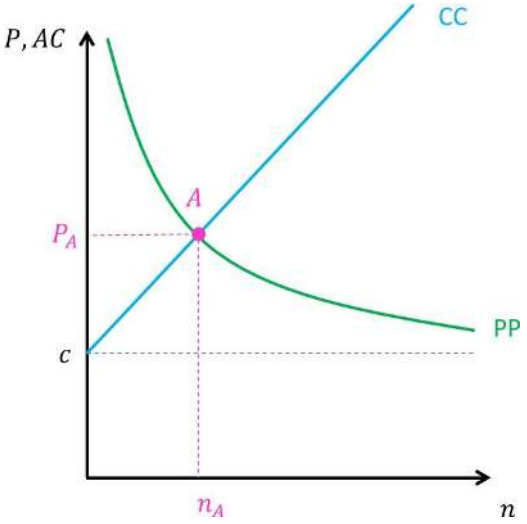
Lecture 11: Firms in the global market

An MNE manages production establishments located in at least two countries
Tow key elements: plants in at least two countries must be involved in production and must be managed and controlled by the same firm (location and internalization)
FDI: An investment made to acquire lasting interest in enterprises operating outside of the economy of the investor. You need to control at least 10 of stocks. 80% of global trade is connected to international trade
Horizontal offshoring: Same tasks performed abroad and domestically vs vertical offshoring: different tasks performed at home and abroad:
Measure of GVC: FVA: foreign value added (backward), value added by foreign countries in a country's export, imported goods and services incorporates into a country's exports
DVA: Domestic Value added (Forward): Value added produced by the country in the exports of another one
GVC grew rapidly in the 90s but stagnated after the 2008 financial crisis
In vertical FDI/Offshoring: domestic and foreign plants perform different tasks along the value chain
In horizontal FDI/Offshoring: Domestic and foreign plants perform the same task
In vertical FDI/Offshoring: domestic and foreign plants perform different tasks along the value chain
Proximity Concentration tradeoff Trade and transport costs: Exports: Transport costs and tariffs which they avoid with HFDI => Negative impact of plant-level economies of scale on FDI The larger the foreign market, the larger the size of the foreign plant! Positive impact on foreign market size on offshoring
The larger the local markets and the lower the barriers, the higher the probability of offshoring Customization: Local production allows more info on local consumers and customization to their needs. Thus offshoring is preferred to exports if customization is relevant
Coordination costs: Geographically dispersed plants => Coordination is more difficult Overall: Trade and transport costs +
Economies of scale - Market size + Customization + Coordination costs -

Vertical offshoring

Differences in factor prices and costs of production: Move tasks intensive in the use of factor F where F is relatively cheaper: cost saving offshoring
Why do factor prices differ across countries: Endowments (HO) and technologies (Ricardo) Trade and V-offshoring are complements, trade barriers and transport costs reduce the

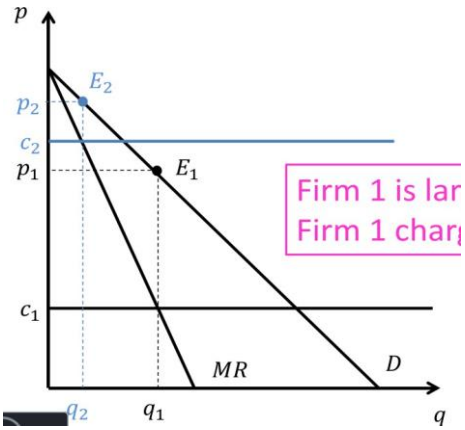


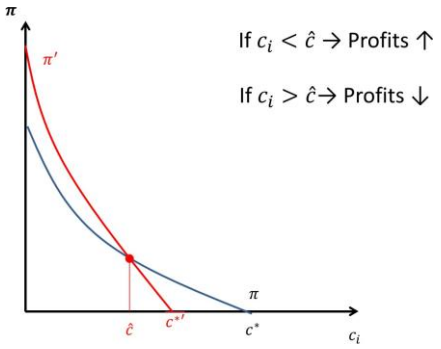


incentive to offshore production (opposite to H-offshoring)
Coordination costs: Disintegration costs: Higher cost in managaging a GV, timing
Specific resources: An activity may be moved where a specific resource is available (resource seeking FDI)
Overall:
Differences in factor prices + Trade and transport costs - Coordination costs - Specific resources needed +

Internalization

In house enables full control, so higher costs Outsourcing: Lower costs but lower control
Relevant factors are incomplete contracts and countries' structure (quality of institutions)



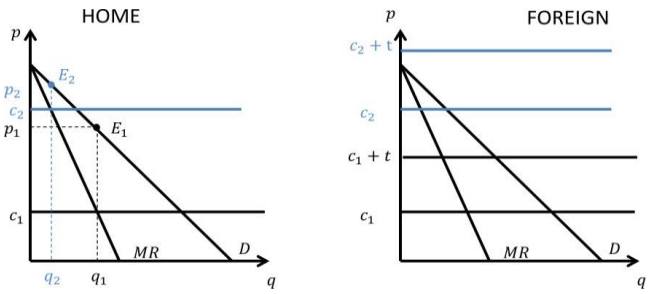


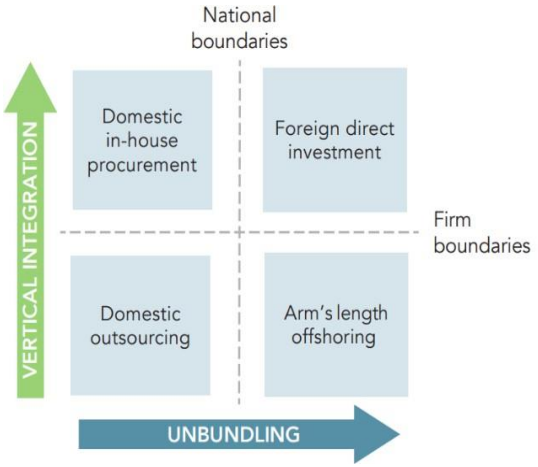
Incomplete contracts: It's impossible to specify all contingencies, when specific tech or knowledge is require transaction costs are high, risk of knowledge dissipation
The configuration of the GVC is determined by the complexity of the input needed (standardized or customized input), ability to codify transactions (need of specific investment to produce the input) and the capabilities in the supply base
We now have a much finer division of labor internationally, countries have different comparative advantages in different sectors and stages of production within sectors, better access to a greater variety of higher quality/cheaper intermediate inputs, greater economies of scales. GVC also spread know-how and technology
GVC trade is associated with a more than 1 percent increase in per capita income in the long run It increases employment, wages, reduces poverty

New trends

A new model for exporting services of intangible assets: A firm outsourcing manufacturing outsources but maintains control of the production process, owns the associated IP and bears the entrepreneurial risk (Nike)
Countries like China can upgrade along the GVC

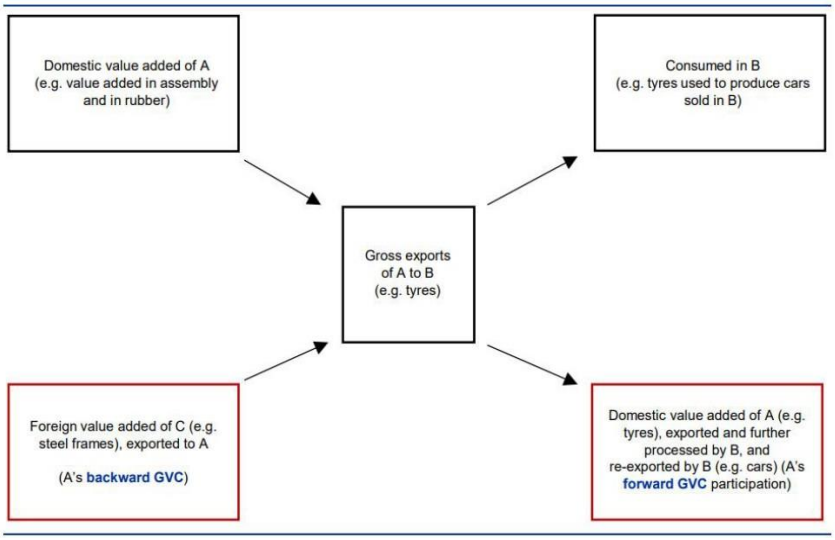
Risks: geopolitical, pandemic and environmental, companies are more likely to want to reshore ad invest in resilience (diversification, nearshoring, increasing visibility, flexibility and backup inventory)





Offshoring: production abroad

Outsourcing: externalization of production



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