Week 11 Transcript

Okay.
Okay.
Okay.
So you stand up.
And.
Let's give.
Uh, so.
Uh.
Okay.
Okay.
Good afternoon everybody.
Oh no.
Nothing.
No slides.
Nothing.
Okay.
Um, while we get, uh, we wait for this, uh,
projector to be started.
Um, yes.
We're approaching the last two lectures of our course, so,
um, we are almost through this, uh, macro, uh, macroeconomics
course.
So I hope that you have, um, you will take
away will come up to the end tomorrow.
Next lecture to discuss about what we have learned.
Um, but as we approach the the final two lectures,
uh, we're going to close in on the open macroeconomics
part of it.
And one thing that we have not discussed yet is
the critical, um, price, right, critical price in the open
economy.
And that is, uh, not exchange rates.
Okay.
So last lecture we discussed about current account.
Um, the previous lecture we discussed about international trade.
Uh, current account.
The mirror image of the current account is the financial
account.
They sum up to zero as we mentioned.
So there obviously has to be payments of different currencies
for the goods that and services that we buy.
But you know, as we know there are lots of
countries in the world and there are lots of currencies.
Right.
So I don't need to explain to you what nominal
exchange rates are.
We obviously, uh, deal with it, live with it.
Um, all the time when we go travelling, we have
to change into other currencies.
Uh, and these fluctuations, the fluctuations of nominal exchange rates
could be quite significant and quite important for us.
Now, I remember the days when the exchange rate between
the pound to the dollar was at around two.
Okay.
Uh, this was before, you know, around the mid 2000.
Where is it today?
It's at 1.26.
Right.
So you if you were, um, somebody working in the
UK and you brought all these pounds to the US,
um, back in those days, you could have exchanged, uh,
$2 for £1, and now you simply can only get

$1.26 for every pound you go there.
So that's a really pretty extreme, a pretty, pretty drastic depreciation of the pound.
There are lots of other countries that have more, even more extreme, uh, experiences, especially developing countries.
Uh, there was also a time when Argentina, the Argentine peso, was pegged to the dollar one for one, so $1 for $1.
That is pretty ballsy, actually.
Uh, to think that one unit of peso is, you know, valued at it has the same value of, uh, or purchasing power of the dollar.
And then when the peg broke, it instantly depreciate from 1 to 3.
So $3 to a dollar.
Um, we've seen I'll show you a graph of that a little bit later.
Massive currency crises.
Now, one thing that we have not talked about so much is open economy crisis.
We talked a lot about domestic crises, business cycles and how to deal with that through government spending and monetary policy.
But as this is not a course on international macro, I hope that you'll, uh, a further, uh, take further courses on this.
There's lots of international financial currencies, uh, crises, right?
Whether it's international banking crises, currency crisis, um, in the Asian financial crisis in 1997, uh, uh, you know, the Thai baht depreciated by 60%, followed by the Korean one, Malaysian currency and Indonesia currency all depreciated by that much in 1992, in the errm, crisis.
Um, we're going to see how George Soros made £1 billion in one day, uh, a bunch of advanced economy exchange rates in the European or, sorry, in Europe, um, including Italy, Spain, um, uh, and, and obviously this country, you know, saw massive depreciation in a very short period of time of 30%.
Now, if you think about what this means, well, it's quite significant.
Right.
To have the housing price appreciate by 30% is it takes quite a bit of time for that to happen.
But if you're a foreign buyer trying to buy a house in the UK simply with an exchange rate change, you know it's either 30% more cheaper or 30% more expensive.
So nominal exchange rate obviously fluctuates a lot and it fluctuates by more than prices.
Um, if we look at a graph of prices, domestic prices, it's like a rock compared to the fluctuations of nominal exchange rates.
Right.
So obviously this kind of price is very important.
And when we think about more, um, more broadly about trade, obviously nominal exchange rates.
Matter a lot for trade.
If the pound depreciates by 30%, then obviously the value of exports UK is able to export more goods, but also our imports become more expensive.
Right.
So we're going to deal with a set of these issues not very much in detail because this is about one lecture, one one and a half lecture.
But just to give you a slightly, um, broad overview as to why we care about nominal exchange rates, obviously

lots of countries have their own currency.
A lot of countries choose to not have their own
country.
And this is called dollarisation.
Um, small open economies might not want to just transact
in their own currencies because, well, look, you know, it's
harder to understand the value of their currencies.
And maybe international borrowers don't want to lend to them
in their own currencies, but in dollars now, partly as
a joke, partly not as a joke.
Some small open economies have now switched from their own
currencies, or dollar to bitcoins, which is somehow, um, a
more international currency, if you will, than some of the
smaller economies own currencies.
So all of this is kind of in play.
So obviously these are the major reserve currencies dollar yen,
euro pound.
Um, and and this foreign foreign exchange market is really
massive.
The transactions the volumes every day think amounting to trillions
of dollars is really quite big.
You know, all this demand and supply for foreign currencies.
Okay.
So let's start from the definition of a nominal exchange
rate, um, how it's defined in the textbook.
And this is how we're going to go with it.
Um, but just to warn you that there are lots
of there are, there are ways in which this is
defined in the opposite way.
But here we're going to define it as units of
foreign currency over one unit of domestic currency.
Okay.
So £1 for how many dollars okay.
So £1 was worth $2 before okay.
Now £1 is worth $1.26 in today's currency.
Then the pound has obviously depreciated.
Right.
Because you can exchange fewer dollars for pounds compared to
when it was two.
So this by this definition, when you go up that
means the domestic currency has appreciated.
And when this ratio goes down it has depreciated.
It kind of goes with intuition of going up means
appreciation.
Going down means depreciation.
But let me tell you this is not necessarily that
the convention.
The convention is often defined as the opposite.
So going up means depreciate and going down means appreciate.
But never mind that we're going to follow the textbook.
Um, just uh, just know, you know, whenever you're confused,
just write down which currency it is.
For instance, we're talking about dollar pounds.
Then put, you know, dollar if that's the foreign currency
here and then pounds here.
And then when you do multiplications or divisions, make sure
your units match.
And then you won't be confused.
And I'm not going to penalise you for forgetting which
way it goes, as long as, as long as you
label clearly which is the denominated currency, which is the
numerator currency.
But if you can, just for consistency sake, um, let's
define it this way.
Okay.
So, uh, nominal exchange rate falls.

It's appreciation depreciation.
And when it rises it's appreciation as, as is the
case.
So we talked about this um, how the pound has
depreciated over time against the dollar from 2 to 1.26.
And that ratio going down, if we treat the UK
as the home currency means it's a depreciating.
Now of course, the textbook is US based.
So it's often going to use dollars as the home
currency.
So just bear with that.
Um, but I think it would be a fairly clear
now, um, if we, we wanted to do, you know,
how much does how, how many pounds do we get
for $1?
We just divide it by one over 1.26.
Right.
So E is defined to be this.
And one over E is defined to be one unit
of foreign currency at one unit of domestic currency over
foreign currency.
It's just the inverse.
So um, £1 for uh $1.26 or one dollars for
one point a £0.79, in other words, um, uh, and
rounded up to 0.81 over 1.26.
Okay.
Okay, so one over E is the price of foreign
currency in terms of domestic currency.
Uh, just a brief overview of what it's like two
years ago, March 31st.
Exactly.
Sorry.
Three years ago, um, uh, the euro against the dollar
0.85 ruble Argentinian peso.
Again, you know, quite striking compared to when they they
pegged at one for one, uh, Canadian dollar, Japanese yen,
etc., etc..
Uh, UK pound.
Um, uh, this is a list of some of the,
the currencies, uh, in in the transactions.
Now in terms of currencies, we also have what matches
the currency corresponds to.
The currencies are also exchange rate regimes okay.
Across the countries around the world, some governments would choose
to have a flexible exchange rate regime.
This is all of us in advanced world.
Okay.
Well, most of us, I should say, uh, US, UK,
the euro.
It's a freely floating exchange rate regime.
This means as we will see that now.
No.
So if we if we step back one second, one
of the crucial things we want to answer is how
are these exchange rate levels actually determined?
Right.
Uh, why is it $1.26 per pound rather than $2
per pound?
Uh, why is it, um, you know, I don't know
what it is today, but 1.1, uh, dollars per euro
rather than, uh, you know, €1 for $1.
Who gets to decide on these, these levels?
I mean, right now we have absolutely no clue.
Right.
And why do they fluctuate so much?
This is obviously, again, a very crucial price.

So we're going to try to get at um where
how do how do we determine these levels.
Now some countries and some countries government just decide that
they are going to decide what that level is.
And that's what happens when they try to fix, uh,
exchange rates.
Okay.
So there are regimes called fixed exchange rate regimes.
Um, again, lots of, you know, developing countries have done
that before.
Um, a good example is China for a long time
was a fixed exchange rate regime to the US, meaning
they just.
To determine themselves.
I was going to be ¥8.5.
That's a Chinese currency against $1 in the earlier years.
Hong Kong today also still, you know, um, a fixed,
uh, exchange rate regimes.
But there's also an in-between regime called, uh, managed, uh,
exchange rate regime.
And, um, this is somewhere in between flexible and fixed.
What does that mean?
Well, first of all, the governments have an intention to
stabilise the exchange rate, uh, and around some level, right.
Not to have huge volatilities.
And so it's partially managed.
Exchange regimes are partially market determined and partially the government
will come in to intervene to fix the exchange rate
around or to maintain the exchange rate around some band,
maybe allowing it to fluctuate 2% up and down, but
maybe not more of that because as we see, you
know, exchange rate can actually fluctuate quite a bit.
You know, 10 to 15% is really massive.
And as we'll see, this can be very disruptive.
So some governments choose to have markets partially determined determine
some band.
And then the the government will intervene to to keep
the exchange rates within some band.
Now.
Exchange of interventions is not just a developing country phenomenon.
As we've seen in more recent years.
Lots of governments have gone and gone in to intervene
in the exchange rate in the markets, for instance, like
Switzerland, for instance, like Japan, even though they are floating,
they wanted to either keep their currency quite a depreciated
right.
I think very few of them want to have an
overvalued exchange rate, but they want to keep their exchange
rates low by intervening.
We'll see how that works.
But the world is roughly divided in these three categories,
although there's actually many, many more dirty float, dirty peg,
whatever it is, just like, you know, a mix of
different combinations.
But you can think about this as different regimes and
we'll talk about why and how it's done.
Well, let me, let me let me mention why we
might want to choose one over the other before we
see how it's actually done.
So take the fixed exchange rate.
Right.
For a developing country, let's say, why would there be
some benefits for fixing your exchange rate?
Now that said, we talked about Argentinian peso one for
one with the dollar.
That obviously was crazy.

But you know, um, there are other reasons why you
want to keep it at some, some fixed level.
One is developing countries rely a lot on exports.
Right.
So by keeping their currency relatively stable they can secure
kind of they can they can make their trade more
stable as well.
Um, not subject to big increases in the prices of
imports or increases in the price of exports, which would
hurt their trade.
And also when you think about foreign investment, we talked
about foreign direct investment last time, FDI, long term investments
in a country.
You know, think about the US investing in, I don't
know, Vietnam in a factory in Vietnam.
Obviously when they go in and invest in the factories
there, they're exchanging us dollar for the Vietnamese local currency,
right.
Five, ten years later, they want to take some of
that money back and change it back to the dollars.
Now, if the Vietnamese currency has depreciated 30%.
In that period, then the US investor would be like,
well, this has wiped out my returns, okay.
That I've invested in, in, in Vietnam.
So by keeping your exchange rate, we're having a commitment
to keep your exchange rate relatively stable.
Then the US investor thinking, well, this exchange rate is
not going to change so much.
So I can be sure that I can take back,
uh, my money at the price in which it was
exchange in the first place that that encourages foreign investment.
So you think that that's all good, right?
That makes a lot of sense.
So why don't everybody do it?
Well, in fact, if we look back in history, um,
there was a period of time when there was called
the, uh, the gold, uh, system, uh, where everybody was
kind of pegged to the gold, the price of the
gold.
And that was a system of fixed exchange rate.
Now, again, this is not a course of international macro.
So I'm not going to go into detail, but there's
some vulnerabilities as well.
Right.
One is um, as we'll see people like George Soros,
he's going to be the evil guy in today's lecture.
But, you know, um, I'm sure he's done lots of
other good things, but that would be an example where
you can really, uh, you know, have these speculative attacks
on your currency.
And the government will have to, you know, kind of,
uh, pay huge sums to defend that currency.
And sometimes it will break, right?
Just like the Argentinean peso, the peg broke, it depreciated,
you know, three fold.
And obviously there will be a lot of consequences on
the economy.
Um, so so that is one reason why we don't
want to pay for speculative attacks, but also look at,
you know, there's a huge debate on whether joining the
euro is a good idea.
Right.
Uh, now Iceland during the banking crisis or the great
financial recession after 2009, lots of European economies were obviously
in trouble.
Guess what it did?

Uh, Iceland was able to depreciate 30% because it had
a flexible exchange rate.
It wasn't tied to the euro and it got itself
out of a crisis.
Okay.
So far we have only talked about monetary policy and
fiscal policy in a domestic economy to deal with these
crises.
Right.
Expansionary policy.
We never talked about the exchange rate because, well, we
haven't talked about open economy matters.
But the truth is that there is, you know, after
a while, there's an intellectual debate that somehow having a
flexible, a flexible exchange rate was good because it could
also be a tool, right, to like monetary fiscal policy
to get countries out of recessions or, you know, cool
booms and things like that.
So lots of countries that had the flexibility or flexible
exchange rates were able to depreciate in bad times.
But guess what happened to European countries?
European countries and crises could not do that because it
was already in the euro.
You can't change the euro countries that have problems like
Spain, like Portugal and so forth.
We'll talk about that next lecture.
Um, they, uh, they couldn't solve their, uh, crisis, uh,
you know, with the natural adjustment factor of the exchange
rate, but had to go through a series of very
painful, uh, changes.
And that couldn't be monetary policy either, because, again, you're
in the euro, so you don't have your independent monetary
policy, and instead it had to go through a huge
round of domestic reforms that was painful and led to
wage decrease and all that.
But, um, but leaving that aside, just this is coming
back to our question is that the flexibility of the
exchange rate can be very useful.
But for developing countries, maybe that, um, that tool, that
that stabilising tool that could be used is less important
than maintaining trade and foreign investment because they're in a
different development stage.
Right?
So this is to give you a little bit of
flavour of why countries choose to have different exchange rate
regimes.
And when the gold standard broke, the fixed exchange rate
regime collapsed.
Okay.
That was also leading to the war.
And there were huge amounts of capital flows that were
unsustainable in the fixed exchange rate regime under the gold
standard.
Um, but then after Bretton Woods, um, uh, 1970s broke,
uh, or collapsed, I should say that was we entered
the full floating exchange rate era where led by the
dollar, okay, pound, euro, etc., Japanese yen were all floating
exchange rates.
Um, managed exchange rate is somewhere in between.
Again, you know, kind of combining some elements of both.
Okay, so we will talk a little bit more about
using the Chinese yuan as an example.
That's a case study in the textbook.
So we'll discuss about that.
So using looking at this this is yuan per dollar
okay.

So as we mentioned it was initially in a totally
fixed exchange rate.
So that's why it's completely flat.
And it was around 8.2 ¥8.3 per dollar okay.
That's what the government decided.
It's not determined by the markets but it's determined by
the government.
But you'd say, okay, where do they come up with
that number?
Why wasn't Argentina like Argentina 1 to 1.
Why was it 8.5 to 1 right there?
There are potentially specific reasons that we'll also discuss.
Now as you can see um this is yuan per
dollar.
So um, uh, under-appreciated.
Um, uh, over time.
Sorry, sorry, this is yuan.
Uh, so this is, um, dollar was exchanging for ¥8.3
and then dollar was exchanging for about ¥6.
Right.
So obviously yuan appreciated over time, um, dollar depreciated uh,
against the yuan.
And you want to appreciate against the dollar.
But you can see that, as we mentioned, it's still
in a managed float.
So it's fluctuating every time.
There's a slow appreciation over time.
But the band and this is you know, this is
what how how it transitioned from a fixed floating to
manage floating the band.
It's never like a massive fluctuation.
Um, and it's a band of around a few percentage
points.
Um, and then in the last few years, since 2013,
it has the yuan has depreciated or dollar has appreciated
over time.
Uh, um, but again, still in the managed floating, sorry
managed fixed exchange rate regime.
Okay.
Now this is a fully floating exchange rate graph of
euro per dollar.
So you can see that the dollar was appreciating.
So this is going up means appreciating exchanging a dollar
for one point almost €1.2 and the depreciated over time.
Um uh, and uh kind of more stabilised uh, at
uh, at this um, at this juncture.
Okay.
So this is uh, euro per dollar, where dollar is
the home currency, uh, on the denominator.
Um, and uh, and so forth.
Now.
Foreign exchange market is the global financial market in which
currencies are traded and nominal exchange rates are determined.
So when we talk about a floating exchange rate regime,
um, we mean that the market actually determines that level.
So why is it, uh $1.21 per €1.2?
Um, uh, you know, back then and now it's around,
uh, you know, less than €1 per dollar.
Uh, so these numbers, because the floating exchange rate regime
are actually determined by the, uh, by the market.
Okay.
So now we're going to look at how that market
is determined.
Now we're going to pick a currency Chinese yuan.
Of course Chinese yuan is not purely floating.
But let's just pretend that it is and we'll compare

it to what the case is, you know, in the
fixed exchange rate regime.
Um, so.
There is a demand curve and a supply curve in
every market, right?
So when we talk about the forex market let's think
about the exchange rate for dollar.
Right.
The foreign exchange market for dollars.
There will be people who will be demanding dollars and
there will be people who are supplying dollars okay.
So they come together a demand curve and a supply
curve and the equilibrium, that equilibrium demand and supply for
that currency for dollar is going to be the nominal
exchange rate.
Okay.
So the question is who is part of the demand
curve.
Demand for dollars.
That is to say um, let's say China's domestic airline,
which is called Air China, decides to add one more
aeroplane to its fleet, a US Boeing Dreamliner.
Okay.
What does that need to do?
It needs to use dollars to buy that, um, uh,
aeroplane aircraft.
Right.
So it will need to exchange yuan for dollars in
the forex market to buy that aircraft.
So is it on the demand curve?
It is on the demand curve.
It is part of the demand for dollars.
Um, now Apple buying parts from Chinese Foxconn.
So Chinese Foxconn the company that makes, you know, stuff
for Apple iPhones and things like that.
Apple buying parts from there.
Apple is going to need yuan, right.
So it will have to exchange dollars for yuan.
Okay.
So obviously it is not part of the demand curve
for dollars.
Chinese government buying US Treasury bonds US Treasury bonds is
in dollars, so they will be on the demand curve
for dollars.
US investor buying a Chinese stock on a Chinese exchange
stock exchange or in Hong Kong.
They will actually need to sell dollars in exchange for
Chinese currency.
So they are not on the demand curve.
Right.
So we only have the first and third examples as
being, um, part of the demand curve for dollars.
Now the demand curve where the price usually is sloped
downward.
Right.
Because the more expensive is, the less you demand of
that stuff.
And the same is true for dollars.
So let's just look at this demand curve on the
y axis.
We have the yuan dollar exchange rate.
So when the exchange rate goes up A to B
that means that the dollar appreciates right.
Going up means appreciates.
Um.
And on the x axis is the dollar the equilibrium

equilibrium or the dollar amount that's transacted in the foreign exchange market.
Right.
So we have prices and quantities on the on the y and x axis respectively.
Now let's see why this is downward sloping.
So going from A to B means a dollar deep appreciation okay.
Or it means a yuan depreciation right.
The Chinese currency depreciates dollar appreciates.
That would mean that US goods are more expensive for Chinese households.
Right.
You're a Chinese household.
You're importing US goods.
Suddenly the dollar depreciate appreciates.
Then the cost of these imports are more expensive in your domestic currency.
What do you do?
You decrease your demand for US goods.
And what does that mean?
Well, there will be a smaller demand for dollars, right?
So this is why when the price goes up, the demand for dollars goes down.
Okay.
And again the way we interpret this is to link it to trade.
But obviously it applies to lots of other things like financial assets.
We talked about financial account.
Right.
Um when the dollar appreciates also financial assets okay.
In the US are going to be more expensive and you demand less of that.
So it's not just in goods but services assets and all of these, uh, things that are denominated in dollars.
And that's how we want to interpret this downward sloping curve.
Now who forms the supply curve part of the traders in this big foreign exchange market, because there'll be people who want to buy dollars.
But then that means there'll be others who need to provide these dollars or want to sell the dollars in the forex market.
So who are these people?
Um, obviously we said that the first and third examples are on the part of the demand curve.
When Apple tries to buy parts from Chinese Foxconn, it has to give Foxconn yuan or the Chinese currency so it will sell dollars to exchange for yuan.
So that's part of the supply curve.
Apple's part of the supply curve.
A US investor trying to buy a Chinese stock.
Um, um, then, uh, actually, you know, the textbook uh, gives that example, Alibaba is actually listed, uh, on the US stock exchange, ironically.
So this would not be a good example.
Um, but if it were listed in Hong Kong, it's actually now partly listed in Hong Kong, then you would actually want to, uh, buy exchange dollars for Hong Kong dollars.
Or if they could buy Chinese stocks on the Chinese stock exchange, they would buy Chinese yuan and sell dollars.
So actually the fourth example is, um, part of the supply curve as well.
Okay.

So these two the second and fourth are the supply
curve.
Now similarly the supply curve is upward sloping okay.
Again when the dollar appreciates right.
So going from A to B which is also a
yuan depreciation then guess what.
Us people or us US households and firms are going
to see Chinese goods.
That's being extremely cheap or cheaper because of the UN
depreciation.
So they're going to demand more Chinese goods.
And um, they will increase their supply of dollars for
exchange.
Right.
Because they are on the supply curve, they will provide
more dollars to exchange for Chinese yuan and therefore the
the supply curve is upward sloping.
Um, so in if only in a flexible exchange rate,
is the exchange rate actually determined by this market where
quantity supplied and demand is equal?
Okay.
Demand is supply equals, then this is SDR, is the
nominal exchange rate under floating market transaction.
And Q star is the equilibrium amount of dollar that
is actually transacted.
Okay, so now let's see why some currencies depreciate and
currencies appreciate and why it actually fluctuates.
Uh, that much.
Right.
Um.
So again let's look at some exogenous shocks like what
happens if there's more demand for US dollars.
The example here we give is let's say that Air
China unexpectedly faces a higher demand for air travel and
needs to buy more US Boeing Dreamliners.
Then this would amount to the demand curve of the
dollar shifting, right?
Right.
So for every given exchange rate, I suddenly want to
have more dollars because I need to buy more US
goods or services or financial assets.
And this shifts the demand curve by the right.
And guess what happens.
The equilibrium exchange rate goes up which means the dollar
appreciates.
Okay, more dollar demanded drives up the price of dollars.
Exactly the same idea as demand and supply for any
other goods.
Okay.
So what does that mean to you?
So this is you know, this is the this in
this in this sense, these are the market determined floating
exchange rates.
So what does it mean when you want to, um,
peg your exchange rate to something.
Now lots of countries peg it to the dollar.
The UK, the pound was pegged to the mark for
two years, German mark for two years in the 1990s.
A bunch of other European countries peg to the mark.
Um, uh, you know, you could be pegged to a
nominal anchor.
Um, but a lot of it is, is in dollars.
So how do they decide that?
How does it work?
Uh, now, the government must be prepared to sell or
buy its currency whenever the pegged rate is above or

below the exchange rate.
E star.
So here we're starting to understand or describe how the government actually conducts a fixed exchange rate regime.
Okay.
Let's look at an example.
Okay.
So central bank, this is part of central bank's job.
And we'll explain why.
So let's look at this graph.
E star is the floating exchange rate.
Were it to be in a floating exchange rate regime this is the actual exchange rate, right?
Let's say the Chinese government authorities decides to peg this e at a higher level.
Uh, then estar a higher level, meaning that the US dollar.
Is overvalued.
Okay.
Compared to here, right?
Going up means that US dollar appreciates right.
So US dollar is overvalued.
When we say overvalued it means that it's above the equilibrium exchange rate.
When we say undervalued it's below the uh equilibrium exchange rate okay.
So it's this currency is very cheap.
Now, how does that work in practice in the central bank?
Okay, so central Bank of China or other developing countries that does that, does that remember that we talked about the balance sheet of the central bank.
Right.
It has assets and liabilities okay.
If it's just a domestic country then the liabilities is the money supply, the money that's floating around in the economy.
The assets consist of short term bonds, government bonds, long term government bonds and things like that.
Right.
So when we talk about the open economy, the central bank asset side has an additional element.
And that is something called foreign reserves.
Okay.
Remember that part of the assets is, you know, reserves is also part of the assets.
But foreign reserves is simply just foreign currency like US dollar treasuries, liquid liquid currencies.
Right.
Or euros or Japanese yen.
So lots of these central banks will have a fair amount of foreign currencies or foreign reserves lying around.
That's part of their assets.
Many of them will use this to intervene in the exchange market.
So how does it work?
Let's say that you're the Chinese central bank, and you suddenly see that there's a massive demand for dollars.
Okay.
If you were letting this in a floating exchange rate regime, a strong demand for dollars would mean that your currency would depreciate against the dollar, right.
Because there's an increase in the demand for dollars less the demand for your currency.
But obviously you're in a fixed exchange rate regime.
So you can't let that happen.

You can't let the dollar appreciate against your currency.
So what are you going to do?
Well, you the central bank, was supply the dollars that
that is demanded so that you get that dollars and
there's no additional pressure on the exchange rate to change.
And that means, in practice, that the central bank will
sell the dollars to you.
Right?
And in exchange, take back the R and B, the
UT.
Right.
Um, so it goes in other ways.
If there's too much demand for too little demand for
dollars, then you will buy the currency and so forth.
So it's exactly the opposite.
Now, um, let's look at the case where the dollar
is overvalued.
Now lots of central banks will say choose to to
choose to undervalue their exchange rate.
Let's say take China for example.
Mai the yuan is cheap.
That means that its exports will be cheaper.
Right.
So it's going to stimulate the exports by keeping the
yuan cheap.
That's what the whole debate.
You know, for many years ago, President Trump was saying
China's manipulating the exchange rate, keeping the yuan undervalued.
So to increase the exports and cause a trade surplus
in the China and US deficit in the in Trump.
Right.
There's some debate about whether that actually is is a
sensible argument or not.
But let's just take that example of a of a
undervalued yuan.
So then it's pegged here.
Right.
So again dollar is higher than what it should be
in a floating exchange rate regime.
Look at what happens.
In that case, the demand for dollar is small because
dollar is too expensive, right, compared to the supply of
dollars.
Okay.
So there's an additional supply of dollars in the market.
Who absorbs it.
It's going to be the central bank right, to keep
it at this level.
If you didn't do that then it would just go
to this exchange rate because the dollar will just simply
depreciate.
Your own currency would appreciate.
But to keep it at this level, this gap between
supply and demand will have to be filled by the
central bank.
So this additional supply of dollars will have to be
bought by the central bank.
Right.
So the central bank, the Chinese authorities will exchange yuan,
give markets yuan and take back the dollar's right.
So by dollars selling yuan, that's how you keep it
at that level.
When there's an undervaluation.
Now let's suppose that we have the opposite case which
is an overvaluation.
And let's take Mexico as an example.

Right.
What we'll discuss about why you might want to do
that.
But say that you have an overvalued exchange rate so
that the dollar is below the price.
It would have been in a freely floating exchange rate
regime.
So the peso is too expensive, okay.
If the peso is too expensive and the dollar is
too cheap, then you have more demand for dollar than
you have supply of dollar, right?
So what happens?
Who fills this gap?
Again, it is the central bank.
The central bank, given that there is too much demand
for dollars will sell.
Um, a is that right?
Let's see.
This is the dollar is a peso is overvalued.
So dollar is undervalued relative to the peso.
Too much demand for dollars, right.
Too much demand for dollars uh, relative to the supply.
If there's too much demand, then the Mexican government will
have to sell the dollars to satisfy the market.
Right.
So the Mexican government has to supply the dollars and
it sells the dollars, um, uh, to purchase the pesos
right now, first of all, so one is buying dollars,
okay.
And one is selling dollars.
One is buying foreign reserves, one is selling foreign reserves.
Right.
In the different opposite cases.
Now, first of all, why would some some country, if
they're fixing exchange rate, decide to overvalue their exchange rate.
Right.
If we believed in President Trump saying that countries are
manipulating their exchange rates to gain because you're making your
currency cheaper, why would you want to make your currency
more expensive than it has to be?
Well, and this is this is often true in Latin
American countries.
And the opposite case is true for Asian economies, is
that a lot of these countries like to import lots
of American goods or European goods.
Right?
So if you overvalue exchange rate, then guess what happens
to your imports.
Your imports are cheaper right?
You can buy your imports are cheaper.
But also very importantly, um, all these governments, countries, developing
countries, they borrow in dollars, right?
In dollars.
They go out to international financial markets and say, I'm
going to issue a bond, okay, I'm going to borrow.
They only lend them in dollars, right?
Because, you know, it's not.
Or in the majority of cases, uh, foreign investors lend
in dollars precisely because of the exchange rate problem.
Right.
If I lend you in a Mexican pesos, I don't
know if you, you know, depreciated that I'm going to
get less money back a few years down the line.
So we're going to lend in dollars.
And that's exactly what usually happens to developing countries.
They can only borrow up in dollars.

Now if you have an overvalued exchange rate, then the cost of borrowing in terms of dollars, in terms of your own currency is obviously less than if you depreciate it.
Right.
Let's say that the UK borrowed £10 billion.
Okay.
And that was, um, $12 billion, right?
In 1.1 to 1.2.
Okay.
So £10 billion.
Um, I can borrow $12 billion now in the interim before, before I, I, I gave back the or, I repaid the pound depreciated.
So I still have to give back, let's say just the $12 billion.
But because the pound depreciated, I can, um.
Uh oh.
Sorry.
If the pound appreciated, then I can give less pounds.
Right.
If the pound appreciated and we still owed $12 billion.
We can give less than £10 billion to, uh, exchange for the $12 billion.
Right.
So if the pound appreciated in the interim, then I owe the foreigners less.
Right.
So this is why some developing countries, um, say, okay, I'm an overvalued exchange rate.
Well, uh, I owe the, you know, the cost of borrowing also, um, uh, is is smaller now, on the other hand, and this is a problem, had the pound depreciated against the dollar again, pound UK still owed $12 billion of debt.
The pound depreciates then it's going to cost more than £10 billion to repay the $12 billion.
Right.
So once the local currency has depreciated you borrowed in foreign currency.
Guess what?
You owe more to foreigners, right?
And so this has been a big problem with emerging markets, especially after these currency regimes collapse.
Okay.
The currencies depreciate by 60%.
Guess what?
Your dollar borrowing the dollars that you have borrowed are now 60% more expensive.
Right.
That's another problem with these mega currency collapses okay.
So that's the exchange rate crisis I was talking about.
Just very briefly.
Um, uh, this is the Mexican peso.
When the peg, uh, when the peg, uh, broke, it depreciated by more than 50%.
Over in the following year, Thailand depreciated by 50%.
Indonesia currency, 80% ruble, Brazil, Korean one, Argentinian peso, etc., etc..
Right.
Again, when you owe dollars, you owe them that much more once you your pegs break.
Now this is not true only of emerging markets, but also true of advanced economies.
Now look at Britain, right?
Britain was a um.

Pegged to the German mark.
A depreciation of above 15% is a major big deal
for advanced economies.
For other countries Italy, Sweden, Spain, Finland and by almost
25%.
That's the exchange rate crises of the European um exchange
rate mechanism in the 1990s.
Again, pegs can break.
And again, there are some major consequences of that.
Um, in the remaining minutes.
And we'll pick up next lecture where we won't finish
off, um, speculative attacks on pigs.
Right.
This is the famous Black Wednesday of George Soros.
I don't know if he's a paragon of success and
inspiration or otherwise in this lecture, but, you know, let's
just discuss what he did.
Okay?
So the UK was tied to the German mark and
it was considered to be overvalued.
Okay.
Which means what?
Which means that if it's in a floating exchange rate,
it would just have a depreciation.
Right?
That's what it means when it was overvalued.
Now think about what the Bank of England has to
do.
It's overvalued, which means what lots of people are going
to try to sell sell pounds.
Right.
It's overvalued and they want to have other currencies.
So the Bank of England will hence have to sell
foreign reserves.
Okay.
I'll give you back the, the foreign currency, take in
the pounds.
But remember central banks don't have an infinite amount of
foreign reserves.
They can also they can always create domestic currency like
printing money as we mentioned.
Right.
The digital um button that creates central bank money currency,
they can't do that with foreign currency.
So when they have to sell at some point, if
you're continuing to sell, you might be.
You might have, you might have no reserves left.
And investors can see that sometimes.
Right.
This often happen in very fiscally irresponsible, irresponsible developing countries
when they're doing this massive, you know, government deficit and
spending.
And central bank is creating lots of money and then
it's selling these reserves.
Okay.
Um, so when the pound became overvalued and lots of,
you know, there was a lot of a kind of
pressure for the central bank, Bank of England, to defend.
The exchange rate is spent about $26 billion, £26 billion
or something, in the summer of 1992, to defend the
exchange rate again, I have to sell the foreign reserves,
taking the pounds right to defend the exchange rate.
Okay, so in September, George Soros sees that this is
not going to last.
Okay.
It's not going to last.

So what does he do?
He borrows pounds.
And he exchanged them for Marx.
Okay, he borrows £10 billion.
So that's £10 billion additional pressure for the Bank of England, right?
Because we're selling your pounds.
You have to give us the German marks.
And guess what happened?
Well, it's not necessarily that the Bank of England did not have £10, £10 billion worth of German marks anymore, but it decided that it was just way too costly to try to defend this pound.
And so it gave up.
The pound floated.
And a depreciated by I don't know how what, what percentage that is, but by a huge amount.
And George Soros made a billion, uh, pounds off of that.
How?
Because he borrowed him pounds, he got German marks, and now he has to he has to repay the German marks, but the pound has depreciated, so it has to repay less in pounds.
Right.
Um, so that is just all happened in kind of one day.
Now, you can imagine that when this kind of speculative attacks happened during the East Asian crisis in 1997, there was a very famous speech by the Prime Minister of Malaysia, I believe, kind of berating these hedge funds for doing things like breaking countries and profiting themselves.
Right.
Again, there's a debate about this because again, it's a you know, it's a market, their market transactions.
Look, hey, if you didn't peg it in the first place, you won't be overvalued and there won't be speculative attacks.
Right?
So who can you blame for these things to happen again?
A very, um, a very a heated debate.
Um, so, so this is oh, so the British pound depreciate by 12%, but in Thailand depreciated by 60%.
And some of it was forced by the speculative attack, especially towards the end.
Right.
They don't wait for the central bank to run out of reserves.
They attack close enough before you run out of reserves and suddenly your reserves are completely gone.
So that is one of the challenges of the fixed exchange rate regime.
We mentioned that there were some benefits, like Iceland can depreciate 30% and get themselves out of a crisis.
But often if your peg is too far off, like for instance, you know, China has been successfully fixing their exchange rate, roughly speaking, for the last 20, 30 years, no speculative attacks happened.
Why?
First of all, maybe not irresponsible fiscal spending.
Second, maybe the R&B is not so overvalued right now.
You can say it's undervalued.
It's not too far from the equilibrium.
There are a variety of reasons why some speculative attacks happen successfully, and some speculative attacks happen and they fail.

Okay.
Next lecture, real exchange rate and concluding remarks that ties
in all these themes together.
See you Thursday.
Thank you.
Uh.
Uh.
Uh, just.
Physical distancing and.

So.
Oh.
Really.
You.
And.
And.
But.
Think about.
Yes.
Yeah.
But by.
The way.
Okay, everybody, um, let's get started.
I think it's just us.
So, um, last, uh, last lecture.
Congratulations on almost finishing the course.
Um, I want to talk about the last topic, but
also what we can learn, what we have learned and
use, what we have learned to analyse some of the
real world events that that seem to kind of endlessly
surround us with excitement.
So I'm going to take the euro crisis, um, as
an example.
Now, last, uh, lecture, we talked about the nominal exchange
rate.
Nominal exchange rate is, you know, how many dollars you
exchange for pounds and vice versa.
And it's determined by, um, the foreign exchange market based
on demand and supply, except that some countries choose to
fix their exchange rate, and then they kind of pick
an exchange rate, nominal exchange rate that is either undervalued
or overvalued, or it could be close to, um, the,
the, the prevailing exchange rate.
Now there's a really important concept that is different from
the nominal exchange rate, which is called the real exchange
rate.
Real.
Whenever we here real here real, we understand that, um,
it's kind of devoid of prices or it takes into
account the changes in levels of prices.
Right.
Real GDP per capita, uh, remind us that nominal GDP,
uh, divided by GDP deflator gives you the real, uh,
GDP.
Real exchange rate is something similar.
Now.
By definition, the real exchange rate is when you convert
a common basket of goods across countries into the same
currency.
What is that price ratio?
So for example, a US common, a common basket of
goods in the US converted in dollars versus the same
common basket of goods in the UK, convert it into
dollars in that ratio gives you an indication of which
country is more expensive, right.

Real exchange rate tells you which country is cheaper, which country is more expensive because it's really comparing. Remember when we did, um, a kind of pptp, we were looking at similar concepts, but this is comparing the basket of goods across countries once converted into the same, uh, currency.
Uh, now the real exchange rate, for example, of a particular good.
Let's take one particular good.
Okay.
When we think about trade and obviously we're trading individual goods, what matters is not really just the nominal exchange rate but actually the real exchange rate.
Why?
Let's take um, the example of a toy.
Okay.
Now we all know that Chinese toys are cheaper, so they are flooding the markets.
And you know, being in places like Walmart.
But what do what does Walmart compare.
It compares the price of a US toy.
With the price of a Chinese toy once converted into the same currency, which is now the dollars.
Okay, so this is the real exchange rate for a toy, right?
The dollar price of a US toy and the dollar price of a Chinese toy.
Okay.
If they're equal, we say that there is purchasing power parity.
So purchasing power is exactly the same.
And the real exchange rate is equal to one.
Sorry.
Sorry if if the purchasing power parity holds.
So um purchasing power is the same then what it implies is that real exchange rate is equal to one for this real exchange rate of the toy.
If the price are the same ones converted to the dollars, we say the real exchange rate is equal to one.
So how does Walmart make that comparison?
Okay, so the dollar price of a US toy.
And then you get the yuan price of a Chinese toy in Chinese currency.
We have to multiply it by an exchange rate that converts yuan into dollar.
Right.
So this is $1 over yuan.
Yuan is down here.
Um, it you, um, you eliminate with the yuan here, so you end up with dollars here.
Okay.
And this is in dollars and you have a ratio.
In other words, one over e becomes multiplied by e on the numerator.
So that's a real exchangeable for particular good.
That is actually what matters when it determines when we think about exports.
Right.
It's not the nominal exchange rate.
That's a very, very broad thing.
It's when guys like Walmart, they're going to compare the dollar price of the Chinese import with the dollar price of an American good and decide which one it's going to sell.
But real exchange rate in general, not for a particular

good, but for an economy, is, as we mentioned in
the beginning, that it indicates how expensive a country is.
So in that sense, the real exchange rate is, um,
defined by the dollar price of a US basket basket
divided by, um, the dollar price of a Chinese basket,
right.
Which is yuan over times one over E.
So one of the interesting phenomenon is that, um, rich
countries, right?
Rich countries, which we mean by per capita GDP being
high, have are more expensive.
Right.
Look at the UK, very expensive US, uh, France, Germany,
etc. compared to poorer countries.
But why is it right?
Why is it necessarily the case that the real exchange
rate tends to appreciate over time as you get richer?
Right.
This is not something we're going to explore in this
in this class, but this is something which you would
learn more about if you're studying international macro is that
as countries get richer per capita GDP, they also become
more expensive.
And this is a lot to do with the cost
of services.
Right.
Wages rise.
You know, think about the price of our haircuts in
the UK compared to one in India.
And a lot of that is driven by by the
prices of the non-tradable good.
But the real exchange rate is important so far as
it matters.
Um, it is what it actually determines net exports.
So let's look at a graph of the nominal exchange
rate between the dollar and the pound and the real
exchange rate, which is in the red okay.
So again nominal exchange rate as as we all know
it, what is the market price of the exchange rate.
So for a period of time since 1950 to the
mid 1960s or before 1970, UK and US were on
a fixed exchange rate because they were fixed at the
dollar.
Sorry.
They were um, yeah.
So, um, the Bretton Woods system pretty much tied to
the dollar.
So nominal exchange rate is of course flat.
And afterwards the Bretton Woods system broke the Nixon shock
and dollar was allowed to float.
So then you can see that the pound and the
dollar exchange rate, um, were uh, were a fluctuating and
this is going up means a dollar, um, appreciation.
Right.
Uh, and so dollar appreciated generally uh, over time and
then depreciate and then went back and appreciated uh, since
recently.
Now look at the real exchange rate okay.
So, so when we fix the nominal exchange rate.
Um, when we fixed the nominal exchange rate.
The real exchange rate is simply the changes in the
price levels.
Correct?
See, this is not.
This is the real exchange rate.
This is the nominal exchange rate.

So this is a price levels.
What does that mean?
That means that if the fixed exchange rate is fixed,
nominal is fixed, then any change in the real exchange
rate must be due to inflation differentials between the two
countries.
Right.
Since we know that nominal exchange rate is not moving
between US and UK during the fixed exchange rate period,
then it must be the relative prices are moving.
And this is what explains this real exchange rate move.
Right.
So prices inflation was lower in the US and in
the UK which is indicated by the real exchange rate
depreciation.
Correct.
Once your normal exchange rate is fixed, your real exchange
rate depreciates means that prices are falling or inflation is
slower than in the UK.
So that's the fixed exchange rate period.
You can see the gap is solely determined by inflation.
But then afterwards the you know when you have nominal
exchange rate fluctuations as well, then all of this gap
could be due to both nominal exchange rate and inflation
differences.
And you can see that nominal and real tracks each
other pretty closely.
After the US dollar or the fixed exchange rate came
to a halt.
And these move along pretty well with the gap being
an inflation gap.
And there are some episodes of divergence.
So that's just a graphical look at the difference between
real and nominal exchange rate.
Again, the difference is the difference in the price levels
or inflation's right.
Um.
So first of all, why is it that the real
exchange rate is what we care about when we think
about exports or trade balances, right?
This is, as we can see from this, uh, this
graph, um, if a dollar appreciates, then you would import
less from the China imports, less from the United States
because US goods become more expensive.
Right.
And x more to the United States.
If dollar appreciates, then US becomes more or less competitive.
So you export less to China and Chinese goods become
cheaper.
So you import more.
Right.
And the inverse is true when the dollar depreciates.
So this is the relationship between the real exchange rate
and net exports.
So when we hear a lot about, you know in
the news oh this currency depreciated.
So it's going to export more.
That's a shortcut right.
Shortcut way of saying the real exchange rate is depreciating.
Because you know once the nominal exchange rate depreciates and
your prices don't move that much, then that must mean
that you have you have a real depreciation.
Right.
And so when we hear in the news, oh, this
country depreciates and you export more.
This is captured by this, this graph.

So what does this say on the x axis is
net exports.
So to the right of zero net exports is greater
than zero obviously.
So that means you're running a surplus trade surplus.
And to the left of zero you are importing more
than you're exporting.
So you're running a trade deficit.
Correct.
And this is a downward sloping curve with the relationship
between the real exchange rate and net exports.
Because as the real exchange rate depreciates.
You can see going down this curve.
Then you export more.
Your net export rises.
Right.
So that's why it's a downward sloping curve.
Again if you want to think about this as a
price, um, this is um, demand.
Uh, the demand for net exports is a downward sloping
curve, uh, of the real exchange rate, not the nominal.
Right.
It's real exchange rate, to be precise.
But again, nominal and real could move quite a bit.
Okay.
E star is simply an equilibrium nominal exchange rate, sorry
equilibrium real exchange rate corresponding at a nominal exchange rate
for which there is no trade imbalance.
Okay, so this is why when we look at certain
governments, we talked about Western governments want to undervalue their
nominal exchange rate or overvalue their nominal exchange rate for
different reasons.
So one of the reasons why they want undervalued nominal
exchange rate, and this is true for many Asian economies,
is that they would like to promote their exports.
Right.
So by undervaluing the nominal exchange rate, how do we
do that?
How do we keep a currency low.
You sell that currency and you buy dollars, right?
You buy dollar, you sell that country, keep that currency
at a more depreciate or undervalued exchange rate.
That's what we talked about last time.
Okay.
Um, so a weaker domestic currency, let's say yuan leads
to an overvalued yuan dollar exchange rate.
So that means that you get to export more as
China okay.
China exports more than it imports because of the this
table that we talked about here.
And that leads to a trade surplus for China and
a trade deficit for the US.
You can see that this is US trade balance with
China.
Okay.
Now in the textbook, it's explained as if it's all
driven by this undervalued exchange rate.
In reality it's not that simple, right.
Chinese goods are cheaper.
Not because the exchange rate is at a low level,
but also because Chinese goods, uh, Chinese labour is cheaper.
Um, supply chain is efficient and so forth.
Right.
So just to say that it's because of undervalued exchange
rate doesn't paint the whole picture.
Usually developing countries are cheaper in general, whether they have

a floating or fixed exchange rate.
Right.
But just to take this as an example, illustrating one
thing, following the textbook and undervalued exchange rate can lead
to a larger deficit in the US, a larger surplus
in China.
And this is the US deficit.
Okay.
And then a reversed starting from 2016.
Exactly when Trump came in and was saying that the
trade deficit was too large for the US and China
was undervaluing the exchange rate, the exchange, the the trade
surplus actually reversed, right?
It became, uh, Chinese trade surpluses started to fall.
Now.
Um.
Using what we have learned in the closed economy setting,
let's try to apply it to the open economy setting.
Some things change.
Some things remain the same.
So let's consider the case of what happens when there's
a real exchange rate appreciation.
Now we're going to appreciate appreciate sorry no pun intended.
This this example a lot more when we discuss the
euro crisis which is coming up.
But um, let's say that a country just experiences an
appreciation.
Why is that bad for the economy?
Could potentially could be bad.
Well, if it's a real appreciation.
What you do is your net.
Your exports fall right?
You export less if exports is basically your domestically produced
stuff.
So that means that the labour demand falls because the
demand for your stuff.
Right.
Let's say to the US, US appreciates in real terms
the demand for US goods falls.
So labour demand in the US shifts to the left.
Correct.
And we're back into familiar territory which says that this
can lead to lower employment.
And it's exacerbated by the downward wage rigidity because if
it were upward sloping, then we would have a smaller
fall in employment or a larger, a smaller rise in
unemployment.
But because of downward wage rigidity, that's amplified.
Um, and so that obviously leads to sequence of sequence
of multiplier problems.
Right.
Once they just refresh our memory, once, um, uh, unemployment
rises or employment falls, these households start to cut spending,
right?
Once the house will start to cut spending, the firms,
because the demand for their goods and services has fallen,
they will start to cut more people employment.
Right.
Because demand has fallen.
And once that gets going, it's a it's a multiplier
effect.
Right.
So we're down to the multiplier.
So you can see that in the open economy there
are some external factors that could cause a recession.
For instance, a large real appreciation that shifts the labour

curve to the labour demand curve to the left is
an onset of a potential recession.
Right.
That's the trigger being the open economy.
Then a feeds back into the closed economy mechanisms that
we have studied.
So whenever there is a crisis or a recession, we
all know, let's turn to policy.
Okay.
What can we do here?
Um, what can the US monetary policy do?
What can the US fiscal policy do?
Right.
So in the open economy, one difference is that US
monetary policy not only lowers interest rates.
But it also affects the exchange rate and hence the
real exchange rate.
Okay.
So how does that work?
So remember that just in the closed economy setting, lowering
your interest rate leads to higher borrowing, right?
For investment investment rises because interest rates are lower.
Consumers might be borrowing more to purchase housing or durable
goods.
And then you kind of get the economy going right.
But the difference is what is the connection between monetary
policy and the exchange rate.
Okay.
So let's look at um this graph here.
This basically explains the verbal the verbal explanation um above
okay.
So we are expanding monetary policy right.
This is the credit market.
Okay.
Um, this is the demand for credit.
This is a supply of credit.
So expansionary monetary policy expands or increases the supply of
funds.
So supply of credit.
So this curve shifts to the right.
And this reduces the interest rate right.
So classic um uh credit market uh transmission mechanism okay.
Now the key is here, right?
This is what connects to the open economy.
When the interest rate falls, let's say in the US
what happens is that.
The US interest rate falls, we're going to demand less
of US assets, right?
US government bonds returns are lower.
And that capital is going to flow out of the
US to other countries that have a higher interest rate.
Right.
Chasing that, that return.
So this is captured by a downward sloping demand curve
for US assets against the real interest rate.
Okay.
So as the real interest rate falls sorry, this is
this is the um, a let me correct myself.
This is the this is the net capital outflow curve
against the real interest rate.
So when interest rate falls, capital flows, more capital flows
out of the US on net.
Okay.
Um, this is again, very easy to understand.
Your interest rate drop.
Think about US treasuries buying US treasuries or UK treasuries.

Right?
US interest rate falls US leaves and buys UK interest
rates, which are treasuries which have a higher rate of
return.
So net capital outflows increase when domestic interest rates fall.
But now let's connect what we have learned in the
open economy and think about what that means for exports.
Remember that this is the financial account okay.
The flip side of the financial account with assets is
the current account.
Right.
So net capital outflows is a reflection or this is
a current account surplus is simply a reflection of an
increase in net exports.
Right.
Once you increase your net exports you are also lending
more to foreigners.
Right.
Because they are importing more from you.
So you lend to them to buy from you.
Remember that idea that that that graph about, you know,
once we export we're accumulating US treasuries, right.
That's exactly that notion.
So the net export net net capital outflow increase is
exactly coincides with a trade surplus okay.
And trade surplus is um, uh, a trade surplus is
also consistent with an exchange rate depreciation.
Okay, so that's the link between a monetary policy expansion
and a depreciation.
Um, the short cut of this is you want to
think about, you know, US interest rate falls because the
monetary expansion capital leaves the demand for your US assets
falls.
So your exchange rate depreciates.
Okay.
You don't have to think about in terms of trade,
but the trade is just the mirror image of that.
Right?
The demand for your own assets falls as your interest
rate falls.
So your exchange rate tends to depreciate.
Okay.
So there's this one missing link that we haven't talked
about.
And this is that which is how do you link
exchange rates with policy.
Um, so we didn't talk about fiscal policy here, where
we'll get to that with a with an example.
Um, but let's revisit what happened to Black Wednesday, George
Soros.
Right.
Um, personally made more than £1 billion induce the the
Bank of England to, uh, defend the exchange rate with
billions lost billions of pounds in the banking.
And that must have been bad, except that it was
good.
Why was it good?
Because it led to a very, um, uh, significant depreciation
of the pound.
Remember that once the German mark and the pound peg
was broken, the pound depreciated.
And the depreciation of the real exchange rate.
Um, induced or caused a much more, um, a higher
expansion in net exports.
So the UK was actually doing very well.
Now, the backdrop of this is that of course, the

pound was overvalued, right?
That's what everybody was seeing overvalued.
And so then you bet against the pound and it
broke because in the end the central bank is going
to run out of reserves to defend the the pound.
And so if we look at the.
Real exchange rate.
Remember that it's not just determined by nominal exchange rate,
but also by prices.
Right?
So the UK government was saying, okay, we have a
fixed exchange rate.
We can't do anything about that.
And we know that we're overvalued in real terms.
So let's let's bet that the British business will start
to cut their prices, right.
By cutting prices.
You can also depreciate the real exchange rate.
Correct.
Um, even even when nominal exchange rate is not changing.
So again, real depreciation comes from nominal depreciation or from
prices falling.
So they were saying, well, companies, if they're going to,
they realise they're very uncompetitive, they will slash prices and
then the real exchange will depreciate even if the nominal
doesn't depreciate.
But guess what?
That doesn't really that didn't really happen and took a
long period of time.
I mean, it would take a long period of time
for business to want to do that.
And they don't really like to cut prices.
So that's that's why the pound being overvalued for a
long period of time was ultimately broken.
But once you devalued or depreciated your nominal exchange rate,
you had a massive real depreciation.
And that actually boosted UK exports enough to actually make
it grow at a significantly higher rate post George Soros.
Okay.
So you can now also understand the problems of a
fixed exchange rate.
Now there are benefits right.
Like we said trade stability investment stability.
But if you're too overvalued to out of line then
especially overvalued then these you are also vulnerable to speculative
attacks and then ultimate collapses of these regimes.
Okay, so what I want to do now before we
turn to a whirlwind tour of kind of what we
have learned so far, is to use some of the
tools, hopefully all of the tools that we have learned
to start thinking about real world events.
Okay, so I want to walk you through an example,
and hopefully you'll at least retain something from this lecture.
And if you retain something as much as what we
were talking about in the last lecture, that would be
plenty for you to go out and understand some of
understand a deeper level, the things that are happening and
the world is not, um, going to be in a
deficit of crises for you to learn about in the
future, I'm sure.
So this would be a good exercise.
Okay, so let's take the euro crisis, for example.
Okay.
Now, um, and again, I'm going to try to bring
in some of the stuff that we've learned.
Now Euro general idea.

Everybody understand what it is.
You know, European Union more integration, more political stability a
big, big market, single market that can rival that of
the US.
So a very, very good plan in principle.
However, the euro um, after the EU, after the creation
of the eurozone, uh, a series of things happened.
First, a lot of these countries, let's call it, um,
the periphery.
Okay.
No, no.
Um, uh, periphery, like Greece, Portugal, um, uh, Spain, if
you will.
Um, they started to borrow a lot.
Okay.
Why?
Because the interest rates started to fall right again, linking
to what we know when interest rate fall, people borrow
more, companies borrow more.
Governments can also borrow more.
Right.
Why was the interest rate wrong?
Well, because it was an integrated eurozone.
So they were able to borrow interest rates at the
same interest rate levels as those like France and Germany.
Right.
The core companies.
So what happens when you borrow a lot?
Let's just use what we have learned before.
Well, some of that went into consumption okay.
As we said, you know, you borrowed to consume.
A lot of it went into property in the case
of Spain.
Property prices really ballooned.
Again, reminding us of the initial onslaught of the onset
of the US financial crisis was a housing boom and
a housing collapse.
Right.
So you can think about this eurozone initial shock as
one that has capital flows from Greece, I'm sorry, from
Germany and France, the core into the periphery, uh, Greece,
Spain, Portugal, Ireland and so forth.
And so that finance not only more, um, more consumption,
high property, but also greater government budget deficits.
Right.
But the deficit is basically just borrowing, right?
Government borrowing, the public borrowing, not just private borrowing and
public borrowing.
Okay.
When interest rate falls, you expand borrowing.
Um, not only were governments borrowing, banks were also doing
much more borrowing and lending.
Okay, so a lot of these banks borrowed a low
interest rate.
That's short term, right?
Think about their liabilities being very short term.
And they're invested in long term assets.
Think about the balance sheet thing that we have learned
in class.
What are these long term assets?
Well housing.
Okay or financing kind of unproductive, not necessarily productive activities.
So if they go into housing, that also becomes, you
know, a potential, um, a risk when housing prices fall.
Now here is something that now it relates to very
much is at the core of what we learn, right?

Once you have this massive capital inflow in these periphery countries, these capital inflows turn into a rise in demand, correct?
Whether it's consumption or investment or, you know, more government spending or more property, that's all demand.
So what does that mean?
The labour demand curve shifts to the right.
Okay, again, what we have learned.
Now, we know that when labour demand curve shifts to the right.
It can cause what?
Not only higher employment, more GDP, but also more inflation.
Okay, so prices started to rise in these country as well as wages.
So wages started climbing up.
Okay because of these massive capital inflows that drove up demand, but because these capital inflows weren't necessarily invested in really productive things, right, like making your economy more, you know, I don't know, infrastructure or good infrastructure or productivity, but it was invested in housing and consumption.
That meant that these rising prices simply made you more uncompetitive.
Think about the real exchange rate.
Okay.
Now everybody's in the euro, right?
So the euro, the nominal exchange rate is not changing.
But when prices rise, what happens to the real exchange rate?
The real exchange rate appreciates.
What happens to real exchange rate depreciation?
We saw this.
Labour curve's labour demand curve starts to move to the left.
Okay, so once you become more uncompetitive then you can export less, right, because the prices are higher and that would lead to more current account deficit rather than current account surplus.
Okay.
So that kind of perpetuates the borrowing.
Okay.
Now, at this point, you're in a very kind of risky circumstance.
What would you do if you had labour demand curve starting to shift to the left.
Right.
Okay.
So before we get to what would you do?
Um, what was the trigger of the eurozone crisis?
Was harking back to what we have learned in, um, uh, in the financial crisis, the US financial crisis.
Remember that the US financial crisis, Lehman fell and all that started, you know, the banking sector and the financial system started to, uh, go into a credit freeze.
So then they turn to Europe.
These investors say, hey.
Maybe we should be careful about these countries as well.
Started with Greece.
Okay.
Greece.
Um, first of all, kind of did a very did a self disservice by announcing that actually the previous government lied about its deficit.
It was not 6% of GDP, was actually 12% of GDP.
Okay.
Government deficit.

And then these um, these investors like, whoa, is this sustainable?
Are you going to be able to repay your debt?
Okay.
So that started from Spain, Greece.
And then they start to look at our Spain and Portugal and Ireland Ireland.
Ireland's banking system is 700% of GDP.
Okay.
So again coming back to what we're saying, these bank borrowed a lot short term and massively long term.
So it was very, very fragile at that point.
Because remember what we when we learned about the banking system.
There's a mismatch right.
Mis maturity mismatch which is you borrow short term and you have to lend long term.
And guess what.
You have to keep on constantly rolling over your short term debt, right?
One year or two year every time you have to roll.
But then your long term investments like in housing and infrastructure, you can't take that back.
Okay, so they look at the banks and like, whoa, this is.
This is very dangerous, right?
So there was a sudden stop of capital flows.
They stopped lending, or it was much harder to roll over their debt.
And these banks in Greece, Italy, Spain and so forth.
Okay.
Or they were charging really high interest rates for you to row over because that's the risk premium they want to charge for the greater risk.
So when you have the sudden stop of capital flows, what does that mean?
Linking back to what we said.
Less credit in the system, less lending, less economic activity.
Right.
Less economic activity because there's less bank lending and credit.
Um, government lost the tax revenue base, and so they had to borrow more from banks.
Okay, so this government and banking relationship also something we have learned is at the very also at the very core of the euro crisis.
Why?
Because banks lend to the government.
Right.
So banks were holding sovereign debt of these or government debt.
If these debt.
Become problematic, the banks become problematic.
And guess what?
The governments have to go out and bail the bank.
So that doesn't make any any sense, right?
It's a doom loop.
So again, that's all connecting to what we have learned also in the banking system now.
Banks were highly leveraged.
So they found themselves difficult with this capital inflows.
And that led to an economic crisis in these countries, um, and many and many unemployment rates in Greece, Italy and Spain reached 27%.
The crisis didn't end here and then started to spread into the core economies that didn't have a problem.

Why?
Because the likes of France, Germany, Belgium, they were fine.
They weren't borrowing that much, right?
They were actually the current account surplus holders lending to these countries.
But they held their banks, held a lot of the Greek debt and the Spanish debt and the Italian debt.
So then you're an investor in the U.S., you're thinking, hmm, um, well, these countries, they're fine, but their banks are holding all these Greek debt.
So if we have a Greek debt write off that's going to put the French banks and German banks into trouble.
So they become risky.
So we're going to charge a higher interest rate on their banks as well.
So you see that all these macro things are connected right.
For the sentiment through these bank, um, and lending connections so that then can potentially spread to even the countries that didn't have a problem in the first place.
Okay.
So first of all let's look at the multiplier effects.
Freshen up on our multiplier effects.
Okay.
So economic crisis that occurred in these countries.
Worsened the debt problems, right.
Because they're looking at these country and say, oh, you guys have a really high debt to GDP ratio.
But when there's an economic contraction, GDP falls.
And this debt to GDP ratio actually rises even more.
Right.
So then investors actually charge a higher interest rate.
And the debt becomes even more sustainable because you have to service pay a higher interest.
So then it becomes this circle, right?
That becomes even larger, GDP falls even more and you're even more risky.
They're going to charge even higher interest rate.
And we know from what we have learned, higher interest rate can cause investment to fall and GDP to fall, right.
Now, the second kind of multiplier effect is something what we talked about just mentioned is that close link between government and banks.
So banks held government debt.
So for a while think about it.
If you're a kind of a fiscally irresponsible, responsible country, you're borrowing a lot as a government.
You have a populist government and you want to borrow.
Who's going to lend to you?
Well, either the central bank or the private banks will lend to you.
So the banks were holding a lot of the government debt.
Now the banks were holding Greek debts became a um or a or a um were uh, were questioned in terms of their viability.
So then the government has to bail them out.
Right.
But the governments, while bailing them out, can actually go down with them.
Why?
Because you're going to spend a lot of government resources trying to bail out the bank, and then you're bankrupt.
So the irony, I don't know if everybody will get

this.
Is that the rescue?
The rescue refers to the.
And the government bailing out the banks.
That rescue involves the rescuer, the government borrowing from the
rescued the bank to do the rescue.
Okay, so that tight link makes the problem much worse.
You're borrowing from the banks to bail them out.
You know how how great is that, right?
So that created a doom loop in Ireland was the
first to fall from that.
And many other countries flirted with this crisis, was ultimately
able to avoid it.
So again, that close link.
This is why we study central bank balance sheet and
bank balance sheets and how monetary policy works to understand
some of these mechanisms.
And so when the credit market comes or the financial
system becomes problematic, that spills onto the real economy.
Right.
When credit contracts, then nobody can do business.
I'm exaggerating here.
There's less business activity and and the real economy goes
into recession.
This is exactly how the financial crisis in the US,
which started from the financial system, ultimately trickled to the
real economy, right, because banks were not able to lend.
Now, what makes it another source of multiplier is the
wage rigidity.
Okay.
Now, if you could just lower wages, right, you would
be able to stem a bit at least the degree
of the crisis.
But because of wage rigidity, when your labour demand curve
shifts to the left and worsens the problem, you can't
adjust through falling wages.
Unemployment becomes even higher and even worse than that.
And this is part about the euro, is that you
can't devalue your currency.
You could have simply if you were Iceland.
Right?
In Iceland did exactly that.
Iceland had a banking crisis that was bailed out.
It depreciated by something like 30%.
And what happened?
Well, it was exporting like crazy.
And the demand for its goods and services and tourism
rose, and it was able to get itself out of
crisis.
You can't do that when you're in the eurozone.
Right.
So that links to our policy choice to the open
economy.
Now.
What could have these countries done right?
In the absence of a eurozone, your real exchange rate
depreciate.
There's a bad shock.
There's a pandemic shock.
First of all, you do countercyclical policy.
You can do countercyclical monetary policy, right.
You can lower interest rates.
Can you do that in the eurozone?
No, because you don't have a national central bank.
The central bank is called the ECB, ECB run by
Christine Lagarde.

She doesn't.
She can't put money for you, right?
You're in Greece.
ECB is not going to print money for you to
repay Greek debt.
But if you were Greece and you have your own
national central bank again one click create central bank money
service the debt.
Right.
That's what the UK was able to do.
UK, the Bank of England was able to buy up
its own debt.
Depreciate the pound no problem.
No euro.
And that's because it's not part of the euro.
Right.
So countercyclical monetary policy when you have only one central
bank for the eurozone.
Difficult.
Why?
Because not every country is the same, right?
If every country was the same, like in the US,
you have lots of regions under one umbrella.
That would be fine.
But Greece and Greece and Italy and Spain were very
different from France and Germany and Netherlands and northern Europe.
Right.
You can't have one monetary policy that's going to fit
everybody.
That's one limitation.
Second, could you do countercyclical fiscal policy?
That's what you would also do in the in times
of crisis.
Right.
Usually yes.
Okay.
That's one tool that's afforded to you in the eurozone.
But it was quite the opposite.
Not only did they not do counter-cyclical fiscal fiscal policy,
they did pro cyclical fiscal policy.
Why in the recession or when times were really bad,
they actually contracted their fiscal deficit okay.
So they spent less or in raise taxes.
You don't raise taxes when you're in recession.
You're supposed to lower taxes.
But why do they have to do that?
Well, either because they were in bailout and bailout had
some prescriptions about fiscal basically austerity, right?
Austerity.
Austerity is not the right policy in a recession.
But that's what was prescribed to them when they had
the bailout, or they were just voluntarily contracting their fiscal
deficit because they want to avoid that doom loop of
sovereign debt crises leading to bank crises.
But again, that worsened the situation because you can't do
countercyclical policy when you don't do count when you do
austerity in a recession, that's pro cyclical fiscal policy rather
than countercyclical fiscal policy.
And third, they couldn't devalue their currency.
So what's left?
Well, what's left.
Left is a very long period of time of internal
devaluation.
Internal devaluation just means you become cheaper within the country.
You can't be cheaper by devaluing your nominal exchange rate.
So how do you become cheaper?

Well, you have very painful either wage cuts or slow
wage growth, slower wage growth and price growth compared to
other countries.
And we know that because of downward wage rigidity, it's
very hard to cut wages.
Right.
You can't simply just be 30% cheaper by cutting wages
by something of that significant amount.
So it was exacerbated by this rigidity both in price,
you know, kind of factor markets the labour and capital.
And so then ultimately you had to do these structural
reforms, which is why if you look at a graph
of, you know, the eurozone growth, UK growth, US growth,
eurozone growth is post-crisis.
The the slowest.
I'm not saying this is the problem, but at least
looking at the data.
Um, there is a sense in which these restrictions, uh,
could, um, could, could be quite painful.
And, and the lesson here is, you know, we need
to have flexibility, right, to counter these shocks.
And again, these shocks can come from a variety of
things.
You need to have policy tools.
And this is exactly why the boring second part of
this course was talking about.
Right.
You need these tools to deal with these various shocks
as they come along.
But by being in a currency union with very heterogeneous
countries with different conditions, you're losing or giving up a
substantial number of these tools.
Okay.
So.
Lastly, in conclusion, um, the last few minutes, I want
to give an overall or overarching view of what we
have learned so that once you go back and review,
hopefully conceptually, you'll be able to link things together and
understand why we spent so much time talking about one
thing over another and use these tools to analyse things
like the euro crisis, the US financial crisis, the pandemic,
and see, see how far you can get right.
These are enough tools for you to get get out
there and educate people about what has happened.
So we started out with some basic basics, right?
The founding building blocks of what we need from GDP
measurement to understand really what goes into GDP.
Um, uh, a key equation here is the production equals
expenditure equals income.
So we can measure GDP through the value added, um
approach and a GDP income approach.
Very very important C plus I plus G plus net
exports tell us demand.
Demand is coming from these factors.
Rising demand leads to rise in income.
And as we mentioned nominal versus real GDP P adjusted
so as to compare income across countries.
Right.
These are all things that we needed to do.
Um prices involved inflation.
Obviously we know why inflation is really important because inflation
affects real wages.
Real interest rate, um, which is what ultimately drives, uh,
things, um, in, in the real economy.
Okay.
Of course it produces winners and losers.

If you're a borrower, you like inflation.
If you're a lender, you don't like inflation and things
like that.
Quantity money.
A quantity theory of money tells us that, um, money
supply is roughly, uh, going to grow in line with
nominal GDP, right?
If there's too much money, uh, for the level of
GDP that produces inflation, if there's too little money that
produces deflation.
So policymakers have to make sure that money supply, uh,
is roughly in line with economic activity of, of the
country.
So once we trended.
A GDP series.
Okay.
We know that there's trend growth.
And that comes back to our first topic, which is
what drives growth, right?
The trend that's growth.
And then the cycles, the short run fluctuations is the
business cycle, the stuff that we have talked about pandemic,
real estate, you know, real estate crisis, housing crisis, euro
crisis, etc..
And the second element that's important is that there are
three or a few more, but three key markets that
we've learned.
Again, building blocks to understand how the whole economy works,
we need to understand these building blocks right.
Labour markets.
Determining wages, unemployment, equilibrium, employment, voluntary unemployment and things like
voluntary unemployed and things like that.
And this is very important for the multiplier effect or
amplification effect of the business cycle.
Okay.
Labour markets determine labour.
Capital markets determine capital.
Those are elements that go into the solo growth model
or long term growth.
And we had a deep dive in what determines the
demand and supply of credit and labour.
And the foreign exchange rate markets determine the price, which
is exchange rates, a key determinant for things like net
exports.
Okay, the real exchange rate.
But that's very much linked to the nominal exchange rate.
So it's roughly just three topics right.
Growth is about that trend growth that we talked about.
And because there's roughly constant growth we have exponential growth.
And exponential growth is very powerful.
Remember that once you exponentially, uh compound something it becomes
very large very quickly.
And that is the power of constant growth.
So when we look at growth in the future and
again that trend.
We're looking at long term income per capita, right?
Not the demand side.
Demand side is short term consumption investment net exports.
Government spending determines income in the short run because that's
demand.
And the long term income is determined by real stuff
like capital, labour and productivity.
That's what we've seen in the solo model.
And the solo model tells us that long run product,
long run growth is either zero if you don't have
any productivity growth or is equal to productivity growth, you

cannot grow in the long run by accumulating capital.
Why?
Because of the diminishing returns to capital.
Okay, so solo model tells you that if you want
to grow perpetually, it has to come from, um, productivity
growth.
But in the short term.
If you have a lower capital stock to labour ratio
compared to the steady state, you can grow by capital
accumulation, but that doesn't last.
And that leads to the distinction between ketchup growth, which
is, you know, catching up and sustained growth, which is
driven by a productivity growth.
And that implies that there are things like convergence, right.
Poor countries tend to grow faster than richer countries, conditional
upon things like saving education and, you know, things like
that.
Right.
Important factors.
And there are some different debates about what causes growth
that are going beyond just the solo model or Malthus.
Geography, institutions, culture and all that.
But remember that solo model where.
Note that solo model.
This does not have any role for globalisation, right?
Which is what we touched upon the last part of
the course.
Trade.
FDI.
Foreign capital flows can also enhance a nation's GDP if
it raises its productivity, if it stimulates their demand, and
lots of things that we have not really explored in
detail.
But so far in topic one, we haven't addressed this
and this is something we have a taste of this
globalisation in the very final part of the course.
Topic two fluctuations.
Once we looked at the trend, which is growth.
Let's look at the cycle.
Fluctuations are just natural outcomes of the market economy, right?
Booms and busts and the shocks could be animal spirits.
It could be driven by productivity shocks.
It could be driven by money, monetary value and the
multiplier effect, as we talked about at length, coming from
downward wage rigidity or the relationship to consumers and banks
and affirms that goes in that circle, the multiplier effect.
And what we do with it is countercyclical policy, whether
it's monetary policy, changing interest rate or the federal funds
rate, which is the rate at which banks interest rate,
which banks lend to each other.
That's the supply part and the demand part.
And through lower interest rates.
We just mentioned about how that can stimulate the economy,
but is too much stimulus would generate inflation.
So the central bank has to be very careful in
terms of how much money is out there.
That's policy and quantitative easing when you hit zero.
Finally.
Lastly.
Fiscal policy.
Fiscal policy has the additional benefit of automatic stabilisers.
But government spending.
We don't know how much it multiplies, right?
It could be larger than one, or it could be
less than one.
If it's less than one, it means that government is

crowding out something could be crowding out private investment.
It also has long lags and there's potential waste.
But fiscal monetary policy is usually just part of the
tools, along with exchange rate policy, part of the tools
with dealing with these booms and busts.
Okay.
And in the last, last lecture we talked a lot.
Last few lectures, we talked about the open economy.
And this I won't repeat because we talked about this,
this course.
So this kind of broadly summarises what we have learned.
And hopefully that will be enough for you to retain
some of this after you leave this course to look
at economics more in depth, or to read more newspapers
with a greater understanding of what's going on.
Okay.
So thank you and congratulations on being a macro expert.
All right.
See you guys in the summer.
Thank you.
And please, please.
Do.
Fill out the survey.
We have a very low response rate for this course.
Thank you.
That's.
I want.
To.
Yes.
Oh, yes.
Yes.
Yes.
What we did.
You guys?
Yeah.
Uh, yeah.
I mean.
And I don't.
Right?
Huh?
Wow.