Week 4 Transcript

And.
Okay.
Good afternoon, everybody.
We're gonna get started.
Uh, okay.
So good news is that we're done with growth theories.
Uh, growth theories, really?
About the long run.
Right.
Economic growth in the long run, where a country is going, what country's potential income is?
Why is there catching up?
We'll be looking at the grand scheme of ten, 20 years, 30 years.
And what we know from the solo model is that these things depend on the ultimate factors, which is capital, labour and productivity.
Right.
But obviously if macro is just about that, then we can be done that as long as country has capital, labour and good technology, we really figured most of the things out.
But that's not clear.
That's clearly not the case.
One reason is that we see fluctuations in the short term.
So business cycles we have recessions, we have booms, we have busts.
We have financial crises.
Right.
That has nothing to do with economic growth in the long run necessarily.
But these are real macro questions that we also have to answer.
So economic growth was really about the very long run.
And we're going to try to transition our way into really understanding about the economy in the shorter run or medium run.
So today is going to be about one of these courses about the medium run.
And we're going to focus on a very important topic which is labour markets.
We want to focus on labour market because there's one thing that's very relevant to all of us, hopefully not to all of us, but to our daily lives and what we observe.
And that is the prevalence of unemployment.
Okay.
Currently, the world has really high youth unemployment.
That's probably relevant to people of your age, you know?
Um, why do firms choose to hire you or somebody else or person of more experience?
Uh, why is it that in recessions.
Um, why is it that in recessions, uh, there's higher youth unemployment?
Okay, now, if we just look at, uh, different countries.
We've all experienced unemployment.
For instance, if you take the US now, let's call it high unemployment, something like 10%.
What's the norm?
Unemployment rate.
It's around 3 to 5% okay.
And we'll see that this unemployment rate might be very

different across countries.
We know that European countries have higher unemployment rates.
Why is that right?
And why is it the fact that during booms and
bust there are higher and lower unemployment rates?
And why is it not zero?
So if we look at a really ultra high unemployment
rate of 10% above, then if you look at the
recent history of the US, let's say 1970s, the oil
shock, right, unemployment rate went about to 810% then in
the 1980s.
Here's a brief economic history for those of you who
are interested.
I think this is very relevant.
The 1980s, there was a big recession in the US.
Very high interest rates.
We've seen that with, um, you know, interest rates being
extremely high and therefore recessions.
That was the second episode.
The third episode, as we know, is the Great Recession,
right?
Prior to 2007.
The unemployment rate was around 3.5% and 4% in the
US.
By the time you got to the recession 2007 to
2009, and actually years afterwards, it became something like, I
think it was like 12%.
I have to check these numbers, but, uh, yes, 12%
around.
During Covid, the unemployment rate went to something as high
as 17%, right.
That's in the US, but very, very similar trends in
the UK.
We're going to see that in the data.
Right.
Why is unemployment not unemployment rate is not zero.
Is that actually desirable that it's not zero.
Right.
Okay.
So hence the next two lectures is about the labour
market and really studying the unemployment rate.
Okay.
So first of all, in this lecture we're going to
focus on a few definitions and really trying to understand
the classical theory of unemployment.
And when that occurs in the next lecture we're going
to try to understand well where does the theory fall
short of explaining the reality?
Whenever there's a gap, we're going to try to revise
the theory.
Right.
That's how the thinking goes.
Now you're going to be very confused about some of
these definitions, okay.
What counts as potential workers?
What counts as employee people.
What counts as unemployed people.
So repeated practice or a careful study of the definitions
obviously very useful.
And then we're going to look at for this this
lecture.
Maybe we'll carry over to the next lecture depending on
time.
We're going to look at the competitive labour market what
that means.
So just, uh, just, uh, reiterating what I was saying.

This is unemployment rate for the US.
We see that it really goes up.
Uh, it really shot up to 11% during the financial
crisis.
And what we see that even after the end of
the quarter.
So this grey bar is during recessions, okay.
Recessions is the grey bar.
We see that in recessions we have high unemployment, higher
unemployment rate.
And then interestingly enough, um, after even years after the
end of the recession, 2009, unemployment rate stayed up.
Okay.
This is the total.
Total is the blue line.
And this is for men, this is for women.
And it really slowly came down.
Okay.
And also unemployment rate didn't shoot up immediately at the
onset of the unemployment as a recession.
But it went up, climbed up and came slowly down
so that by 2012 we're still having a high unemployment
rate of 9%, which is much higher than the 3
to 5% average.
And that really started gradually coming down until 2018.
Ten years on.
Okay, return to normal.
Now, why do we care about unemployment in the first
place?
Well, it's probably not relevant to you.
You're here in this prestigious institution.
You're going to have jobs and have great jobs.
But there's a sense of, you know, deep social costs,
right?
With unemployment, um, the angst, the anxiety, uh, of loss,
of loss of job or having no job.
And indeed, you know, the current whole debate about artificial
intelligence and the impact on the economy is precisely about
what's going to happen to the jobs.
Right?
But again, this what you're going to learn today is
going to be able to be very precisely defined by
what we mean by jobs, employment and people's choices and
what firms do.
Okay.
But this dynamic, imagine that this is very painful for
for the economy, but also the kind of things that
we observe is that even after these big recessions, unemployment
rate, or people who people just start dropping off of
the out of the labour force, they don't look for
jobs.
And this is that kind of discouragement, which is part
of that social angst.
And this is why we care, obviously, about unemployment rate
above and beyond just the immediate economic implications.
Now, this is the euro area unemployment rate in the
United Kingdom.
Now, of course, they follow some patterns.
During the recessions they all climbed up.
But what you also notice that the natural rate of
unemployment, or the normal rate of unemployment in the euro
area is higher than in the UK and indeed in
higher in the than in the US.
Right.
Why could that be?
Well, we're going to discuss about this, but we're going

to look at the impact of various regulations labour unions,
laws, labour laws.
And you think about the strikes that we are seeing
now with the trains.
This actually has an impact on potential equilibrium unemployment rates
and and wages as well.
Right.
So these are all you know, we're trying to we're
trying to use this framework to start explaining some of
the real world dynamics.
Okay, so let's start with a few definitions.
Now I want to talk about definitions because, you know,
lots of people don't really understand what it means to
be unemployed.
Lots of my friends would say, oh, they quit their
job or they decide to do something amazing.
They said, you know, we're just I'm training opera right
now.
I'm unemployed, actually.
Wrong.
That's not the right definition.
Unemployed.
You're not actively looking for a job, so you're not
unemployed.
In fact, you just dropped out of the labour force.
So when I tell people that, they say, oh, I
totally misunderstood the concept of employment, right?
So here, here, let's draw this in.
So among the people, total population in the country, there
are only a certain number of them who are potential
workers.
Okay.
Who do we count as potential workers and who don't
we.
Who do we emit?
And among the potential workers.
So let's talk about potential workers for now.
First, it's civilian non-institutional population over certain age.
What does that mean?
Children obviously are not part of the potential workers, or
at least I hope not.
Otherwise we'll be exploiting child labour.
Right.
Non-Institutional population.
Well, this refers to people like people who are in
jail, okay?
They are not part of the potential workers, people in
the retired homes.
They're also not part of a the potential workforce, people
who take care of other people also not part of
the potential workforce.
Okay.
So this very long winded way of saying these people,
civilian non-institutional population over certain age, um, uh, count as
an obviously civilian meaning as opposed to military, right?
If you're an army, you're not part of the potential
working workforce.
Now, among the potential workers, uh, is the labour force.
Okay.
We're going to focus on the labour force.
Okay.
This is the people in this, uh, in this.
Right.
And, um, so, so, for instance, potential workers, everybody included
in that category, but that not everybody is going to
be part of the labour force.

I just explained to you how a friend of mine
decided to get out of banking and wants to start
singing opera.
She's a potential worker.
She's not part of the labour force.
She's not actively looking for a job.
Okay, uh, somebody who's on maternity leave who just had
a baby.
She's again a potential worker, but not in the labour
force.
Okay, so that is that is a distinction.
And now with the labour force, then you can categorise
into unemployed and employed people.
Okay.
So just to reiterate, let's say in the US, uh,
these people are potential workers because everybody else is either
children active in military or institutionalised persons.
Right.
And that big chunk is not a potential worker.
So again, among potential workers, only a portion of them
will be part of the labour force.
Um.
So these are the people who are not counted as
a potential working age population is a potential workers.
So, um, according to the International Labour Organisation, working age
population is everybody above 15.
But of course, depending on country to country where, you
know, there's a norm of who at what age you
retire, it's normally 15 to 64 is part of the
working age population.
Okay.
Okay.
Now employed people.
Employ people or those who hold a full time or
a part time job.
So even if you have a part time job as
an Uber driver, you are employed.
Okay.
Um, if you are working for your family business and
paid by your family business, you are employed.
If you are a mom and pop shop and you
have your own one person business, you are employed.
Okay, so emphasise part time as well.
Now the more difficult is to define what's unemployed.
Unemployed.
A person is somebody who is actually actively searching for
a job.
Sometimes they want to talk about time frames.
Okay, so maybe in the last four weeks, but I
don't want to attach a specific definition, but you want
to think about actively looking for a job as being
an unemployed person.
So the friend who is retraining to be some professional
opera singer is not unemployed because she's not actually actively
looking for a job.
Okay.
If you're if you are a mechanic trying to be
retrained as a nurse, okay.
And you're being retrained, you are not unemployed.
You're not actually part of the labour force, but you
are a potential worker.
Okay.
Um, so not in the labour force are people who
are without a paid job and not actively searching for,
for for, um, a job.
Okay, so let's try this.

A unionised electrician.
What are we talking about?
Employed.
Unemployed.
Not part of the labour force.
What is it?
Employed.
Thank you.
Part time coffee shop.
Barista employed.
Former auto worker seeking new employment.
Unemployed.
Very good.
You guys are getting very good at this.
Former auto worker collecting disability.
Not in the labour force.
Very good.
Full time college student.
You guys.
Unless you have a part time job, right?
Okay.
You're not in the labour force unless you have a
part time job.
Retired grandmother.
He's not in the labour force.
Stay at home, father.
Not in the labour force, but certainly a potential worker.
Okay.
Okay.
Very good.
Excellent.
So, um, this is just looking at the US, but,
you know, look at the UK, look at any number
of countries.
You know, just this is an example.
You guys don't have to memorise any of the facts.
So just for the sake of argument, um, there are
quite a few people.
That's really a lot, you know, out of, um, 200
million, almost 250 million people, uh, almost a hundred.
Are not working right.
And this is not in the labour force.
Actually a small a small share of that is actually
unemployed.
A lot of them are actually not in the labour
force.
And we we want to have a measure of labour
force participation.
Right.
How many potential workers are actually in the labour force?
That's a measure of labour force participation.
And think about countries where women are not part of
the labour force, right.
They are potential workers, but they're not part of the
labour force.
So labour force participation is actually very low in these
countries.
Okay, so there we go.
Labour forces reset.
Includes employed and unemployed people.
The definition of unemployment is.
The unemployed.
Divided by the labour force, right?
Not divided by potential workers divided by labour force.
Labour force participation is labour force divided by potential workers.
Okay.

Or let's, let's try to make some make sense of
this.
So.
Now again, if only men were working in certain countries.
I don't know, some sometimes in the Middle East, sometimes
in certain Asian countries.
Then you have a very low labour force participation rate,
right?
If you add women, you can potentially double the labour
force participation.
Okay.
Um, what else can affect labour force participation rate?
Uh, well, you know, some people just decided to not
be part of the labour force because, you know, I
don't know, they have changed their preferences.
They have changed their lifestyles.
They don't want to work as much anymore.
So we see that labour force participation also changes after
recessions sometimes, you know, after long recessions because it's so
painful.
Lots of people tried to find jobs.
They didn't find jobs.
And what happened, they just dropped out.
Okay.
So this is some of the the whole, you know,
kind of death of despair kind of argument.
Why why unemployment is so harmful.
Because you can also imagine that some of these people
during recessions, you know, some of their industries disappeared and
they never were able to transition into new industry or
they didn't leave their, um, home.
Right.
Let's say there's a geography.
And all of you guys in that geography is doing
furniture.
Okay.
Then suddenly you have imports from other low, low income
countries like Mexico, China, Vietnam and that entire geography of
furniture industry got destroyed.
So what happened with these American workers is that, you
know, they were really tied to that geography, and they
just dropped out of the labour force, not able to
find another job within their vicinity.
And that tends to lead to lots of, you know,
other social consequences.
Right?
So that's the idea of labour force participation.
Now, as we mentioned in the very beginning, uh, grey
area represents recessions.
And this is taking a look back in history since
1948, um, of the unemployment rate for the US.
Now, what do we see with these grey areas?
And then the blue line, which is the unemployment rate?
Well, it coincides that during recessions, unemployment rate spikes up.
Right.
And then I would go down, you know, to norm
of 3.5%.
So then the kind of the, the, the recessions I
was talking about here, the oil recession, the oil price
shock and the 1980s recession here, very, very large unemployment
rate above 10%.
And then here was a dotcom bubble burst recession.
Um, there was a small recession in the 2000 and
then a massive recession during the, um, Great Recession, which
is financial crises.
All of that led to higher unemployment rates.

Okay, let's do some math.
Or in other words, some calculations.
I'm going to bring out my calculator.
Um, now.
The first thing we want to look at is here
is the total number of people in the US okay,
in zero eight compared to zero four.
Now national population went from 305 million to 318 million.
Then these people are the children active military installation person.
So who are the potential workers?
Well, this minus this, right.
This minus this gets you the potential workers.
Not that much difference between zero eight and 14 2014,
right?
Which is surprising given that population growth was positive.
Right.
Um, so that's potential workers and who are not in
the labour force.
Right.
So this is the people, not these are the people
not in the labour force.
So the labour force is this subtracting this this minus
this, right.
These are the people in the labour force actually again,
not much change.
Right.
Why is that?
Even though there are more people, 18 million more people.
Um, and then among the labour force, there's employed people
and unemployed people.
Okay, so let's calculate the labour force participation rate.
Okay.
Labour force participation rate is labour force, which is 154,
let's say divided by potential workers.
Two, three, four.
That's 65.8%.
Okay.
Um, I hope you guys can remember that.
Let's say it's 66%.
Now let's look at 2014.
Okay.
Labour force participation is 156 divided by 248.
Which is 62.9.
Okay, so 63% compared to 66%.
So the reason why we're not actually getting more people
in the labour force despite having 18 million more people
or sorry, it's 14 more million more people.
Is that the labour force participation.
Participation fell okay.
People probably dropped out of the labour force.
Now how do you calculate the unemployment rate?
Unemployment rate is the unemployed people per 9.5 divided.
Sorry, 9.5 divided by what?
Divide by what?
Unemployment rate is unemployed people divided by what?
By labour force.
Thank you.
And that's 155.
And that is 6.1% okay.
6.1% unemployment rate.
So 24.
Sorry 2014.
We have 9.3 divided by 156.
Um, it's about 6% or five point.
Yeah.
6%.

Okay.
So obviously unemployment rate, um, actually stayed pretty high, uh,
in this, uh, over this period.
Okay.
So that's how you calculate the labour force.
Now consider a different counterfactual.
We know that between, uh, 28, 2008, at the end
of the world, we're kind of in the middle of
the crisis.
In 2014, labour participation rate fell.
Okay.
Labour force.
So now we're going to perform what's called a counterfactual.
So let's pretend something else happened.
All right.
And the thing we're going to pretend is that let's
suppose that we have exactly the same labour force participation
rate, okay.
If we have the same labour force participation rate out
of this number of potential workers, which we know is
fixed, then what is the counterfactual labour force?
If we had the same labour force participation rate and
we can back out this number, okay.
This number.
So it's 164 divided by potential workers.
This number has to equal 66% right.
So we're able to back this out.
And then.
Then we were able to back out.
Um.
Uh, if, if that were the total number of employed
people, uh.
Oops.
Okay.
This, we're told, the number of unemployed people we can
back out the unemployed people and that would be this.
Right.
So unemployment would be 17.5.
Let's look at so it was formerly 4.5.9 unemployment rate.
So if we have 17.5 divided by uh potential workers
sorry.
Labour force 164.
The unemployment rate then would be what, 10.7, almost 11%
unemployment rate.
Okay as opposed to 6%, which we calculated.
Here's something really important.
It seemed as if we kind of recovered from the
crisis, right?
The unemployment rate was around 5.9%, which wasn't shocking.
But have we recovered?
No, because in principle, if the labour force participation was
the same, we would get something over 11% of unemployment.
What does that mean?
Well, that means that probably a lot of people just
fell out of the labour force, not out of their
own volition, but because maybe things have changed.
There was some permanent damage.
Right.
So if people still participated, if we if we expected
that there are no changes in behaviour or it's not
people's desire, then we would get a really high unemployment
rate of 11%.
So that suggests that these recessions are not that innocuous,
that even if on the surface we see just look,
by just looking at the unemployment rate, it's become lower.
It doesn't mean that all things are recovered.

Right.
And this is why looking deeper at the numbers, including
labour force participation, potential workers and so forth, we can
get a sense of the truer picture.
Right.
So hence, again, the difference between these, um, definitions, I
say I think everybody has got this, um, uh, tells
us a very different, uh, important, uh, um, picture.
Okay.
Um, so during the to to to reiterate what we
just saw during the Great Recession, unemployment rate increased from
5% to a peak of 10% in 2009.
Example one shows that the official unemployment rate has reduced
to 6% by 2014, but many have argued that this
is an illusion, right, because people have fallen out of
the labour force.
Example two shows that the main reason that unemployment rate
was low in 2014 was because of the decrease in
participation rate from 66% to 62.7%, that there are fewer
people actively looking for work in the prior four weeks.
Okay, that's counted as unemployed, right?
And this is the phenomenon of what we call discouraged
workers, right?
Something is not right.
So it could be that these have searched for a
long time okay.
Maybe for a year, maybe for longer.
But then they stopped searching.
They stopped searching because they don't think they would be
able to find a good job.
Not only that, they don't think any jobs were available,
but that they wouldn't be able to find something appropriate
for them.
So now they're not there counters, not in labour force.
But does it mean that they just dropped out because
they chose to?
No.
They really want to be working, but could not.
Maybe because of some consequences.
And these are discouraged workers.
So that's a different concept.
Right here we introduce a new definition.
Apart from the potential workers and labour force of discouraged
workers that have just simply stopped looking for a job.
Um, these workers are relevant during the Great Recession because
the long term unemployment rate has increased from 1% to
the peak of 4.4%.
Longer term unemployment.
Right.
Remember when we talked about unemployment's people actively looking for
a job over the short term?
That could be for weeks, let's say longer term.
This means that they're searching for longer.
And remember that we saw in the picture of the
recession that unemployment rate really only gradually fell, right.
The recession ended in 2009.
Why does the unemployment rate just go back to the
original level of 3.5%?
Right.
It only adjusted over a very long period of time.
It took ten years, ten years.
And you hear Obama and people like that talking about
this, that, you know, at the end of his term,
um, there was still it was not a full recovery
by lots of different measures.
Now, an interesting pattern is that this also is correlated

with not only gender.
Okay, going back to this picture, I forgot to comment
on this.
Let's just look at this for sex.
We saw that men were more, um, subject to men,
had a higher unemployment rate than women, right at every
point in time during the recessions.
Anybody have a reason why we can think of a
reason why?
Yes, please.
Financial sector are.
Well, that's a very so you're getting exactly the right,
right point of which industry.
Okay.
And you might be right that there were some in
the financial industry.
But what you're exactly right is we have to think
about the industries.
Now finance I would say probably represent a small portion
of this, because what the financial crisis did was not
just affect finance.
Actually finance was relatively okay compared to everybody else, right?
The real impact of the financial crisis, everybody else got
hurt and probably more than the bankers in the financial
industry.
But what these men were involved, and you exactly answer
in the right direction, is that they're employed by highly
cyclical sectors like property construction.
Okay, maybe finance is part of the story, but in
other recessions we also see this difference.
And that was not a financial crisis, but it was
a recession.
Okay.
Um, so that is, um, a potentially, uh, you know,
the and also women, right?
Women.
I don't know.
We have to think about this, but there's more of
a substitution going on for women, right?
Um, they could substitute more into home, uh, home economy.
And maybe if their husbands lose work, they will go
and find a job.
Right?
And whereas if the husbands have a job, then they
probably can stay home.
So we have to think a little bit more through
about these properties.
But in that sense, women who choose to work are
probably the ones who are really, you know, not in
these highly substitutable positions.
So they were less sensitive to these cycles.
But I think the majority of the reasons still what
we said intended on the industry, which men belong and
these industries were highly cyclical.
When we say highly cyclical, it means that it's subject
to the booms and busts, right?
For instance, property is a highly cyclical, uh, sector in
the sense in booms it goes up and then in
bust it really contracts.
Right.
Or construction, which is related to property.
Um, because, you know, you see buildings everywhere and you
see cranes everywhere when times are good and you see
less of that in when times are bad.
So that's what we mean by cyclical properties.
Okay.

So that was just a detour because I forgot to
comment on that.
So it's also related to your um education level.
Right.
So we see that unemployment rate tends to be higher
for people who are less educated.
Um, so, uh, what is this?
So this is Bureau, I should point out, Bureau of
Labour Statistics in the US is the agency that, uh,
uh, collects data on employment, unemployment, labour force and so
forth.
Right.
So BLS is the most important situation and looking at
age 25 and over, because under 25 you consider a
youth unemployment, which is also, you know, very, very, um,
maybe not representative of the working age population.
And we see that actually if you have a bachelor's
degree and higher.
So please finish your degrees here.
Um, you see that you're less likely to have a
high unemployment rate then compared to, uh, the lowest degree,
which is no high school diploma.
Right.
Why might that be?
Why are the less educated, more prone to having a
higher or kind of being fired during recessions or losing
their jobs?
Um, I don't know if anybody wants to answer.
Yes, please go ahead.
Okay.
So that's an excellent answer.
So one conjecture is maybe some of these jobs are
automated.
But let's think about this right.
What you're referring to is is a is a change
in technology, which is exactly true and exactly right.
Over time automation happens.
Okay.
So what we saw is that in the 1990s when
there was the IT revolution.
Okay.
Um, there was a lot more automation going on.
And at that point, if you're a job, if you're
a firm and you were in recession.
And everything had to cut back.
What are you going to do?
Where are you going?
To start firing some people.
But in normal times you hire them back.
Once you went to a boom and, you know, things
normalised.
But the point about technology is that over this time,
because of this recession shock, this is most likely this
is the time exactly when you're likely going to make
major changes, right?
Where there was a good technology, you'd probably invest in
adopting this technology, okay.
Firms into their comfortable positions don't really change.
You don't think everything is going well.
There's no pressure.
You don't change things.
And after recessions, you might change things for things like
potentially automation or whatever.
It's true that these firms tend to adopt them during
and after recessions, or have this structural change, that some
of them would be a jobless recovery.

Okay.
So that's that's one.
And and and and so how is it related to
skill.
Well the technology and skill are complements right.
Think about the arrival of it.
In computers.
You need skill labour.
Right.
And so these people are more resilient to changes in
technological reforms.
So that could be a good reason a good factor.
But that's happening over the long term even.
But the argument is even without any technological change this
is also true.
So one potential straightforward example is just the opportunity cost
of time.
Right.
And we learned about human home production.
So what's my opportunity.
You know if I'm a if I have a high
bachelor's degree.
And I, um, let's say just.
I lost a job.
Right.
I'm going to go straight into looking for another job
because I'd be paid, I don't know, £50 an hour.
Right?
If I hire a nanny, I pay them £10 an
hour.
Okay.
But if you are, you know, less educated, then your
opportunity cost of time is lower.
Okay, then in these recessions, maybe you're going to just
substitute and do home production, okay?
Instead of going actively looking for, um, another job.
In other words, if I'm highly skilled, I know that
I'm going to I'm more likely going to find a
job with a very high pay, so I'm not going
to drop out of the labour force, whereas some others
well, it's not clear.
Maybe, you know, um, the cost of waiting and finding
jobs.
Think about it.
There's a cost involved, right?
If you're looking for a job, you're not at home
doing home production.
So there's a cost involved.
Maybe it's not worth it anymore.
And I switched to doing home production, so that could
be one reason.
Admittedly not the only reason, because we tend to think
about these people as a bit more, you know, having
a higher demand for their labour, uh, that's related to
their skill.
Okay.
Um.
Okay, so we've all laid out these these kind of,
uh, patterns in the data, right?
Now we need a theory.
Okay.
Just like the soul model is a theory of growth.
We need a theory about the labour market.
And this is going to borrow from your knowledge of
micro.
Okay, just a little bit.

Um, so unemployment comes from the labour market, right?
So what market are we talking about here.
We're talking about the labour market and what goes in
this labour market.
Well there's a labour demand function and there's a labour
supply function okay.
So labour demand and labour supply.
And what's the price okay.
That equilibrate the market.
What's going to be wages.
Okay.
So let's look at this in turn.
So the first assumption is that firms are going to
hire labour and firms are profit maximising.
Right.
So they're going to make optimal decision okay.
That's an optimality.
Remember solo model.
There was no optimality okay.
Because you didn't make an optimal choice.
You just had I was giving you a saving rate
and that's what you were giving at.
So you found a steady state here.
There's a real optimality decision here.
How many firms how many people do you want to
hire?
That's the demand for labour.
On the firm side, labour supply comes from the household
side.
Okay.
For a given wage, how much?
How many hours do you want to work?
Do you want to take the job or not take
the job.
Now, when firms seek to maximise profits, they're going to
think about one key decision.
Okay, the marginal benefit of hiring this additional worker and
the marginal cost okay.
What's the marginal benefit.
Well, it's how much more revenue does this one additional
person bring to your firm?
Right.
That's the marginal product of labour.
If you hire one extra labour, how much more revenue
do you get?
What's the cost?
Well, what you pay them.
So you're going to hire as long as the marginal
benefit is greater or equal to the marginal cost.
Right.
Okay.
Now the marginal benefit is the margin.
So this will be talked about.
And marginal cost is a more marginal wage.
And you're going to hire up until this is equalised
okay.
Marginal product labour is equal to marginal market wage.
Now let's take an example.
Okay.
Let's take an example.
So how many cooks will the firm hire.
So if you have one cook one cook is going
to produce four meals.
That's going to be sold.
Okay.
Produce four.

That will be sold.
So what's the total revenue.
Well four times 1040.
Okay.
If you hire two cooks seven will be produced and
sold.
That's 14.
Right times ten 140.
Right now 327 times ten 270 4400.
Okay.
So that's the total revenue.
And you can see you can calculate that each additional.
So how many how many how much of marginal value
are we adding here.
With one cook.
We're adding three meals.
So that is 30.
Right.
What about here.
So that's the marginal value of this one.
Workers 30 here from 9 to 10.
We're only adding ten.
Okay.
What do we see from here?
We see that there's a diminishing returns to hiring more
workers, right?
Just like our diminishing returns to capital, there's a diminishing
marginal returns to labour.
So as we said, this is the additional one, one,
um, marginal product value.
If you had the first look, that marginal product value
is 40, okay.
It's greater than the market wage.
So you keep on hiring, you add you go to
two.
And we said that was 30.
So that's greater than wage.
You keep on hiring.
You go to three and that is 20 right.
Additional revenue.
And you get um 20 okay.
Oh so did I, did I just totally mess up
here.
Total, uh, meals produced.
Sorry.
It's 70 okay.
4070 9100.
Okay.
Sorry about that.
Um, I was assuming that this is each.
So this is a total number of cooks produce.
2 to 2 cooks produce seven in total.
So this revenue is exactly this okay.
And so the marginal value marginal value of product labour
when you get to three is 20.
And that's equal to the market wage.
When you get to for one additional person that's only
ten.
So up until how many workers do you hire.
Three.
Okay.
So that's that's what we're saying is setting the marginal
marginal product of labour equal to the market wage we
hire into at this point.
And again, the idea here is that there's a diminishing
marginal return to more workers just like capital.

Now this graph exactly what we we basically if we
graph this curve, okay, the MPL with the number of
workers, you're going to get a downward sloping curve just
like this.
So at this point, okay, when the market wage, if
the market wage is here.
Okay.
Exactly.
At this point is how many workers you want to
hire.
So the wage is given to you, right?
Your firm you take that as given.
Okay.
You don't decide on how many wage what's the wage
of the market.
The market decides.
So you know a wage and I'm going to just
hire when this wage is exactly equal to my MPL.
And that's the number of cooks or barbers or whatever
it is that you're going to hire.
But Mark will note that this is downward sloping from
the demand side.
It's downward sloping because of the diminishing marginal returns.
Okay.
Now, very importantly, okay, whether you remember this from micro
or don't remember, this is going to be very critical
when we look at these curves is when we talk
about shift shift movement along the curve and shifts in
the curve.
I did already talk to talk to you about this
when we, you know, shift the production function because of
changes in A and so forth.
Right.
Savings.
Right.
So I hope this is clear.
But this is for a given.
So let's say that you're here right.
This is a given wage.
This is how many, um, workers you're willing to hire.
And as you increase the number of people, you're moving
along the curve.
But what would lead to a shift of the curve?
What is a shift of the curve mean?
Well, it means that for the same wage I want
to desire, I want to I want to hire less
or more people.
That's a shift in the curve.
Right.
So for this given wage, I suddenly wanted to hire
fewer people.
This is a shift of the curve to the left.
I want to hire more people.
Shift of the curve to the right.
So now we're going to look at what happens when
we shift the labour demand curve okay.
So let's say the demand for the good of service
changes.
So suddenly you were um, your haircut.
You're a barber.
Suddenly people just love to go to the hairdresser all
the time.
Okay.
What's going to happen to this curve?
Shift.
Right or up right, you should say right because you

basically say for the same level of wages, I want
to hire more people.
Why?
Because suddenly everybody's coming to my shop, right?
In the past, when I was sorry, when I was
here, this is exactly how much is demanded.
If I hire more, I'm not going to be able
to sell this product.
But suddenly now I have more customers.
So this shifts to the right.
Okay.
So technological product progress and higher productivity.
So now this again depends on what happens to Labour.
Your demand for Labour for instance, if you had more
machines and machines were cheaper than labour, what would happen
to the labour demand curve.
It's going to shift left right for every wage.
I'm going to demand less labour because some progress, some
technological progress.
I can tell you the opposite story, though.
I can tell you that because of the arrival of
computers were suddenly even more productive.
Okay.
And we have, you know, all kinds of new products.
We're going to hire more labour.
So technological, technological progress could even shift the labour demand
curve out.
Now that comes to a central discussion we have today
or a debate is AI good for work or is
I bad for work?
Or some people say it's going to be substituting people.
Others are going to say it's going to create more
jobs because of this.
Right?
This is exactly the shifts of the curve that we're
talking about.
And the tension that we said is a shift left
or right, um, input prices of capital and same thing.
If things became cheaper right then you have, you know,
you can make more profits.
Okay.
Then you're going to shift your labour demand curve, right?
So, um, that's a shift of the curve.
Now, what we're missing here is the labour supply curve.
Because in equilibrium, they're going to determine the equilibrium level
of wages.
Now labour supply is coming from you guys coming from
the households right.
Now when I when there's an increase in wages, do
you want to provide more labour or less labour.
More is only part of the answer, and that is
called the substitution effect.
Okay, the price goes up.
I want more of it.
Right.
So I'm going to supply more labour.
There's also an income effect.
I'm richer because all the wages go up.
So I want to consume more leisure and I want
to reduce my labour.
So labour supply would not be shifting up okay or
going up.
But here we're going to have this special assumption that's
consistent with the data, that the substitution effect is going
to outweigh the income effect, so that when you see
a higher increase or increase in wages, you're going to

supply more labour.
Okay.
This is why we have an upward sloping curve of
do I not have one here.
Okay.
So this is why we have an upward sloping supply
curve.
Okay.
So again as wages shifts along the curve when wages
go up I'm going to supply more labour okay.
That's moving along the curve.
Now in equilibrium they're going to determine the market wage
rate.
Okay.
So that's the equilibrium in this labour market.
And that's the equilibrium number of people working.
Okay.
And this is how we determine this labour market friction.
So now what changes the labour supply curve or shifts
labour supply curve.
Taste or preferences.
Okay.
There was the kind of a an interesting inquiry as
to whether the arrival of video games made young men
want to supply less labour for every given wage rate.
Okay, suddenly these things preferences shifted.
You'd rather work less.
Okay.
And enjoy your hobby of playing video games.
And there was some effect in the in the labour
force.
You can see that.
Right.
So that would shift the labour supply curve to the
left.
Right.
Because for every given um, for every given wage I
want to supply less labour.
So that shifts to the left.
Okay.
If I want to enjoy more leisure again, that shifts
left.
Okay.
Opportunity.
Cost of time.
Um, what does that mean?
Well, we can tell lots of stories, um, of this.
Right?
Uh, you know, if, let's say, uh, let's say things
like services became really expensive.
So, look, if you look at the female or female
workers, right?
If suddenly nannies and all these service workers became more
expensive, then, um, I'm going to shift my own labour
force supply curve to the left.
Right.
Give them the same wage.
I'm going to supply less labour.
Right, because I have to spend more time in home.
Now let's look at demographics.
Let's look, look, look at an ageing population okay.
Um, how might that change things?
Well, one is, um, we could change the potential or
people in the labour force or potential workers.
Right?
Because if you have, let's say.

Just the fraction of people in your economy is all
16 and above, then you're going to have fewer potential
workers, right?
And let's say that they are the ones who supply
the labour.
And for every given market age and market wage, an
ageing population is going to have fewer labour supply hours.
Okay.
We want to think about labour supply as not just
the number of people working but also potentially hours.
Right.
So that would shift the labour supply curve to the
left.
Okay.
So anything that is outside of these two x axis
and y axis is going to represent a shift of
the curve.
And in equilibrium we have the optimal wages okay.
So this is we're going to conclude here.
And this is the classical theory I'm going to leave
you with one thought.
And this model everything is going to happen instantaneously.
If you want a job you're going to find it
at the prevailing wage rate W okay.
If you are a firm, you're going to hire instantaneously
at the prevailing wage.
W now, of course there's no one market wage, right?
There's going to be different wages for different sectors.
But in general it's this idea.
Then I'm going to leave you.
The question is why do we see unemployment okay.
So we're going to revisit that question on Friday.
Guys please remember next lecture is on Friday.
And please check timetables.
Okay.
I know.
I don't really think.
Yeah.
Sometimes.
Not only.
Do I like work with my stuff around.

So again, you can think of it as the risk
per share rises.
So.
Hi.
Sorry.
Okay.
Sorry, I didn't realise.
Um, let's talk about this outside.
That's right.
Wasn't it?
I mean.
I think you might say that.
At the moment.
If you still.
That's.
Okay.
Okay.
They probably have that.
Much money.
How do you.
What is?
That we have.
What is this?

Okay.
I like it.
It's good as.
Laura.
No, it does not.
Huh?
But you were.
You do that again.
I know this is.
Pretty.
Exciting.
Yeah, he's positive about Tesla.
It's such a big accomplishment and everything.
And then say that the military action is short and
short right now.
Yeah.
You type that out.
For the first.
Folks.
Don't say that.
Because I was looking over.
They cut it out and I said, no.
No, no, no, no.
Oh, no.
I said you're so triggering.
Change starts on.
How do.
I turn out?
I was so.
Stupid.
Oh, I'm actually not as I am.
I could be dead because I felt like I was
going to kill yourself.
Maybe I'll save it.
So, 9.5 thousand.
Yeah.
Yeah I know.
Sorry.
What?
I love.
I also.
Okay okay.
Good afternoon everybody.
Um.
Thank you.
Thank you all for, uh, showing up.
We're in a big, big lecture room.
You're kind of.
You guys are kind of all scattered somewhere.
So anyway, we'll have, um, a little bit more time
to discuss, given that there's few of you.
Um, so we're continuing on our unemployment, uh, topic.
Right.
This is going to be the second and last of
the topic on unemployment.
Uh, we know why it's important.
We talked about what counts as employed, uh, unemployed.
Um, and the various definitions.
So now we're going to take that into practice and
try to understand some of the observations we see in
the data.
Better stay away from this, Mike.
So first of all let's look at the labour supply
curve now.
We left off of last time at the labour supply
curve where we just showed it as an upward sloping,

uh supply curve.
Something is going on here.
Um, let's see this one.
Um, and, um, we basically just showed this part of
the curve and saying for every wages there's this is
the quantity of labour that you're willing to supply.
And as wages increase, you're going to willing to supply
more labour.
But that's obviously based on the assumption that the substitution
effect is going to be greater than the income effect
or income effect.
You're going to feel wealthier and you're actually going to
do less labour supply, less labour and more leisure.
Now, what this kink represents now, of course, in reality
doesn't look like this.
But we want to, uh, at this point, um, this
line is vertical, okay.
At this quantity of labour, it's vertical.
What that means is basically you've exhausted all potential labour.
Okay.
At this point, at any given wage, you have the
same amount of labour.
You can think about it as full employment or whatever
you'd like to.
Um, however you'd like to think about this as, you
know, total potential workers or labour force participation etc..
Um, is at this point you have everybody who is
willing and able to work already working.
Okay.
This is why we're denoting this as an upward kind
of vertical line.
So the labour market, uh, together is a labour demand
curve and labour supply curve put together.
And we have the equilibrium.
Now let's talk about the equilibrium for a second.
We said the labour demand curve is a downward sloping
uh curve because uh, the wage for every given wage,
you know, the, the, the, the the greater the lower
the wage, the the more the labour is demanded.
We saw this based on an example of marginal product
of labour.
Right.
You're going to hire up to the to the point
where wage is equal to your marginal product of labour.
Remember that if one additional worker provides $20 or £20
extra revenue, well, you're going to and the wage is
20, then that's up to the point that you're hiring
that that labour.
Right.
And this equilibrium is simply when labour demanded is exactly
equal to labour supply.
Okay.
So that's that determines equilibrium wage.
Now market is in perfect equilibrium.
But what do we call this.
Horizontal distance here between L star, the equilibrium and the
labour supply.
At which there is a maximum amount of labour possible.
We call this?
Sorry, this is a typo.
This should be a typo.
I'm going to fix this later.
This is voluntary unemployment.
What does that mean?
At this point to the right of this equilibrium.
Are you still willing to supply additional labour, or are

there more labour or workers willing to supply labour?
Well, yes, only if you pay above.
The equilibrium wage.
Right.
So at this point, people are still willing to supply
labour, but not at that wages.
Right.
Um, if you look at below this L star, people
are willing to, um, to supply more, uh, more labour
because the, the current the wages is below the W
star.
But for these guys okay.
For these guys they're only to they're only willing to
supply labour if the wage is above the W star.
So that's called voluntary unemployment.
I'm you know my reservation wage.
The wage above which I'm willing to work is is
above w star.
So this is just to clarify.
And by the way, if you have any questions, please
feel free to shout out given that we have a
small a smaller group today.
So this is a classical theory of labour markets right.
It's an equilibrium.
It's competitive okay.
It's a competitive labour market means that you kind of
pay the marginal product labour, you pay the market wages.
And the intersection of labour demand and labour supply both
determines the equilibrium wage and the equilibrium amount of labour
provided in the country in the in the economy.
Now notice that this goes back to our growth theory.
There's a natural link because growth.
Remember the production function is based on a k and
L right.
L is employment.
It's labour force.
Right.
So now we're determining how much labour is there in
the economy.
Well this picture shows you it's the equilibrium.
That's how much labour supply depending on the wage.
Now with the frictionless markets, wages will adjust instantaneously to
clear the market.
Right.
If a.
Uh, if you're here.
What does that mean?
Your labour demand is less than your labour supply.
Right.
So there's unemployment here.
If you're here below the equilibrium wage at this point,
for every given wage, at this point, the amount supplied
is less than the amount demanded.
Right.
There's excess okay.
Labour supply at this point.
Sorry.
There's excess labour demand at this point.
So what happens.
Well the wages are going to adjust to rise until
labour demand is exactly equal to labour supply.
And at this point wages are going to fall until
um.
There's until there's enough demand to meet the supply.
So wages will just.
Wages is the price that equilibrate demand and supply in

this market, right.
If you think about goods market, it's the prices that
equilibrium goods demanded and supplied here.
The labour market is this thing is going to frictions,
is going to automatically adjust so that you're always in
equilibrium.
That is the classical theory.
That is the frictionless theory of the labour market.
So shortages and surpluses don't persist.
Why?
Because wages will adjust instantaneously.
So anyone who wants to work is able to work
okay.
And there's no unemployment as we've seen, because wages again
are always going to adjust to the point where exactly
this is exactly how many people are willing to work
will meet the demand of the of the firm side.
Right.
So there's no unemployment.
And what does that mean?
Well, obviously this is not going to explain the real
world.
Last lecture.
We've seen that there's high unemployment.
We've seen there's really high unemployment during recessions.
We've seen unemployment rose during Covid.
We've seen that there is a slow adjustment of unemployment
from from the high rate back to the natural rate.
So all of this suggests that we can't work with
the classical theory, this instantaneous adjustment.
It's a good benchmark, but we can't use it to
understand our real world phenomenon.
So what it can't explain, for instance, in the US,
is that there's 7.7 million unemployed persons in the US
in 2016, um, you know, similar levels at this point
and also for all other countries, the same idea.
Um, and then I can't I can't also explain some
of the trends.
So this is a lecture slides from Chris Pistorius, who
is a professor in the economics department who is a
Nobel Prize laureate who won his Nobel Prize for his
work on labour markets.
And basically based on some of the observations he made,
first of which is unemployment post-World War two.
And by the way, of course, unemployment during the Great
Depression in the 20s, right, was extremely high.
Something like 25%, 30% of people were unemployed, right?
Much higher than the 10% we're seeing in current recessions.
But it kept on rising unemployment.
post-World War two rose from 2%, with about 2%.
That's very, very low.
We've seen in the US around 5 to 6%, 3.5
to 5%.
Um, in European countries, we saw that it was actually
higher.
This country's unemployment rate is around the same as the
US levels.
Natural rate.
And then 10% in ten years.
Um.
Uh, in the since after 1974, it just kept on
going up.
Right.
And this is a very interesting fact.
Right.
How can you have both job vacancies and unemployment?

Think about that.
Firms are looking for workers.
At the same time, there's still a lot of unemployed
people.
So obviously obviously our frictionless labour market can't explain that,
right?
You have no unemployment, no employment, first of all.
And second, there should be no job vacancies right now.
That's a puzzle.
Um, and another observations.
Actually, it went up together when unemployment started rising rapidly
over this period.
Job vacancies also started rising.
It's kind of interesting, you know.
So this suggests that we need to introduce frictions in
the market.
Okay.
We have a competitive equilibrium as we've seen so far.
But there are frictions.
Can only explain these puzzles by introducing some some things
that are not adjusting.
Okay.
And so this lecture is going to focus on the
frictions so as to, for us to be able to
understand why there is unemployment, why there is coinciding with
job vacancies.
And, you know, and everything else we observe between this
country and Europe, really high unemployment rates compared to the
US and why during recessions we have higher unemployment rate.
None of that can be explained by the labour market
equilibrium so far.
And also other things that can't be explained which motivated
his work, uh, leading to his Nobel Prize, uh, achievements.
So why did people change jobs very frequently, right.
Why do firms grow, shrink, move in and out so
frequently and at such different rates?
Why is there unemployment and why are there job vacancies?
So if I just get you to think about some
of these questions, does anybody have a gut feeling or
an observation?
And we can see if we can map these explanations
that you have onto the theories that we're going to
explore.
Anybody.
Want to venture a guess.
Yes.
I hope this.
Okay, so people might take time to find jobs because
they don't have full information about, you know, what jobs
are available.
Okay.
Absolutely.
That's something we're going to look at.
There's a friction about there's something about information.
What about on the companies side?
It would be the same, right?
It takes company.
It takes time for you to find exactly the right
person, the right kind of skills, maybe the right kind
of personalities, the right kind of motivation, the right kind
of, you know, so it's kind of like a dating
market, right?
It takes time to find the right match.
Okay.
Um, you don't have full information about the other person,
so you take time to figure it out.

It also takes time to even meet somebody.
Okay.
You guys have very good matching currently because you're in
a university.
But in the real world, it is much more difficult
if you want to think about it that way.
It's kind of like that, that same, same idea.
Um, so frictions is is one thing.
And we're going to, you know, talk about one important,
uh, idea is about information.
Are there any others that you can think of, other
kind of frictions?
Anybody.
Why do we see unemployment?
Yes.
You know.
What?
So some kind of mismatch.
Um, so this is coming back to our longer term
structural unemployment idea of, okay, let's let's think about an
economy that is primarily manufacturing, okay.
And all all the work, all the people that are
trained as service workers.
Right.
In that case, you just don't find people you want
to hire.
Right?
This is kind of different from, uh, misinformation because information
could be corrected over time, but the skill mismatch don't
necessarily have to be corrected over time.
It's just a mismatch.
Right.
We're seeing a lot of mismatch of youth unemployment because
of the skills that you guys learn here compared to
what companies are demanded okay.
What about labour markets institutions.
Well, we'll see that minimum wage is also one of
the the reasons.
Okay.
So let's so exactly so all the explanations that you've
provided is we're going to be able to map on
to 1 or 2 of these um answers that we're
going to give.
So the different kinds of concepts of unemployment that you
will have to master.
Okay.
Last lecture we focus a lot on definitions right.
Labour force participation, employment potential workers and so forth.
Here there are some conceptual issues that you're going to
need to distinguish.
So the first is called frictional unemployment.
Okay.
Some of the frictions.
We're going to talk about this more specifically jobseekers looking
for the right job.
Companies looking for the right people.
It's going to take time.
It's going to it's going to um take more to
figure out.
Second is what's called structural unemployment.
So it's not because of frictions, not because of short
term frictions, but some longer term mismatches, if you will.
So for instance there was an answer about skill mismatch
here.
There's unemployed workers would be willing to work at the
prevailing wage rate, but are unable to find employers who

will find who hire them.
Okay.
And that could be because of a skill mismatch.
That could be because after the recessions, after the pandemic,
lots of people lost their jobs.
And, you know, there were they were not suitable after
the recession ended.
For instance, if you think about technology, a lot of
these companies decide to adopt automation, right?
And, um, uh, robots.
And these people are still willing to work at the
prevailing wage.
But guess what?
They're not able to find the jobs anymore because of
these changes.
So these are structural unemployment.
Um, meaning it's longer term due to some mismatch.
So let's look at frictional unemployment more specifically.
So we talked about not enough complete information right about
about skills about experiences preferences of job seekers I mean
this is also easy to understand.
You accept a job in banking and then decide, oh
gosh, this is really not for me.
Two months into your job and then you quit and
you want to look for a different industry, right?
So that is, um, a kind of frictional unemployment.
Uh, and job seekers do not have complete information on
the specifics of each job opening, and vice versa, as
firms don't have complete information on the skills of the
people.
So workers must undertake a time consuming job search.
It does take time.
Um, this is why when we talk about unemployment, you
have to be actively looking for a job for a
period of time because it takes time.
Unemployment that rises because workers have imperfect information about job
openings and need to engage in a time consuming job
search is called frictional unemployment.
Right.
And these this is this means that there has to
be.
So this gives us an idea of why there's unemployment
in the first place.
Right.
Because at every point in time there are people who
separate from their jobs and there are job openings, right?
Think about it.
The the matching problem this way.
Job separations and job findings.
Okay.
Job separations could be a variety of reasons.
You're fired because you're not suitable or you don't want
to, or you leave the job.
Job finds as you find another job.
And that matching, um, that, that that process of matching
is going to it means that there will be unemployment
at every single point in time.
Okay.
And there could also be wage rigidity now.
Second, um, when we talk about structural unemployment, right, there's
some inherent mismatch going on that you cannot resolve.
Frictional usually means it's the frictions are in the short
term.
And then you kind of overcome them with time.
So wage is rigid.
Okay.

When we talk about wages being rigid or wage rigidity,
the market wage is held above the market clearing wage.
W star.
So here we know that this is the market clearing
wage where labour supply exactly equals labour demand.
Okay.
Now when wages are above this point we see that
way labour supply is greater than that demanded and that
causes unemployment.
But why do we say wages?
Wage rigidity means that wages are above the market clearing
wage.
We don't worry about wages being below.
Because when wages are below, there's more demand than there's
supplied.
So there's no unemployment.
Right?
That's why when we talk about wage rigidity, it can't
fall.
We just can't adjust to the market clearing wages.
So it can't come down.
That's called wage rigidity.
So what are some of the reasons there are there
is wage rigidity in the real world.
Well, as I mentioned, minimum wages are one such, uh,
factor.
Okay.
Minimum wage laws are imposed now.
Lots of places have minimum wages.
Different cities, different states in the US have different ideas
on what minimum wages should be.
It could be higher or labour unions okay causing wage
rigidity.
We'll talk about that.
And firms paying higher wages.
So this is a summary.
Of the four types of wage rigidity that we're going
to go through.
Okay, it's probably useful to go through them one by
one before coming back to, um, each of them.
So the first is a minimum wage.
So if you take the US, US federal government, most
states, many, many cities, many countries have minimum wage laws
which prohibit.
Employers from higher hiring workers for a less than minimum
hourly wage rate.
That's called the minimum wage, right.
And this can create structural unemployment.
So let's look at the minimum wage imposed.
Okay.
So minimum wage is imposed here, we said.
If it's below the market clearing wage it doesn't bind
right.
It doesn't matter.
Right.
Because wages are going to clear at a point above
minimum wage.
So everything's good.
It's only when it's above the market clearing wages that
it creates a problem.
And we said that here you have that's the labour
supply less the labour willing to be supplied at this
given wage rate.
This is the labour demand at this wage rate.
And so how much unemployment do you have?
Well, before you had no unemployment.

And suddenly that gap.
This is labour demand and this is labour supply is
called involuntary unemployment.
And as we mentioned between.
This wage and or this amount of labour supplied at
this wage and the labour, um.
Uh, you know, a saturating labour force if you, if
you will, full employment.
This is the voluntary unemployment.
Right.
Otherwise, voluntary unemployment would be this gap.
But instead involuntary unemployment rose.
And that's obviously welfare reducing.
Right?
Because if people don't want to work, they can choose
not to work because the wages are too low for
them.
Then obviously it's better for them not to work.
Then for people who actually wanted to work and couldn't
find a job, which is coming from the unemployment.
So this becomes involuntary unemployment.
So we've seen just by putting a minimum wage here,
we're getting unemployment.
Okay, so minimum wage laws cannot be the main cause
of unemployment though.
We have one theory about unemployment, but it can't be
the main cause.
Why is that?
Because they're too few of them who are actually face
the minimum wage problem, or for which the minimum wage
actually applies.
It's obviously the lower skilled workers.
Right?
Um, it depends obviously on the minimum wage, $8, $9,
an hourly wage.
Some, some places are higher.
But how many workers are actually getting paid only $8
or $9 or below that.
Right.
In the US it was only 1% of the total,
uh, employed.
So in 2013, about 1.5 million workers were paid the
minimum wage.
So if that's the case, that cannot be the most
important explanation of unemployment.
Right.
Um, because that should be able to explain why there
are many, many, many more unemployed workers than than the
people who are facing the minimum wage problem.
If you look at another example of graduates, college graduates.
Um, their hourly wage rate was close to $30 per
hour.
They don't face the minimum wage problem, right?
But they were still unemployed.
Okay.
There were still unemployed even when the wages were that
high.
Um.
So that can't be.
That's a good explanation, but cannot be the most important
explanation.
Uh, the next is wage rigidity and structural unemployment.
Um, coming from labour unions.
So labour unions negotiate contracted wage rates through collective bargaining
that may be above the market clearing wage rate.
So here I don't know which which parade we're seeing.

But now with the strikes we're seeing and all that,
uh, labour unions can collect, can coordinate together to argue
for a much higher wage rate.
Right.
So again, that causes unemployment because again, you want to
think about companies who are willing to hire at some
prevailing wage rate.
If it's too high then you're going to get unemployment.
And potentially part of the reason that Europe has a
higher unemployment rate than observed is the power of the
labour unions.
Um, it's potentially the minimum wage, uh, being much higher,
causing a higher natural rate of unemployment.
Than, than is uh, than in other countries.
But collective bargaining also cannot be the main cause of
unemployment in general, because again, it's only 11% of total,
okay, 1% of the total population was facing the minimum
wage debate.
But in terms of, um, collective bargaining, there were only
11% that were part of unions, public and private sector
unions.
So that obviously was not um, uh, it cannot be
one of the main reasons as well.
Okay.
So let's look at a scenario.
And here you're going to have to master these graphs
right.
Again just emphasising on shifts along the curve and shifts
of the curve.
So let's look at two scenarios.
Okay.
And two markets.
The first market for is for a low skilled worker.
And the right hand side is for everybody else.
Okay.
So here we're talking about a low skill versus everybody
else.
And the two scenarios we're going to look at is
if you set a relatively low minimum wage compared to
the case, if you set a relatively high minimum wage.
Okay, so at the low minimum wage for low skilled
workers, what we see is this is going to be
the amount of unemployment right between the difference between labour
supply and labour demanded.
Obviously labour supply is greater than labour demand.
So this small part is unemployment okay with a low
with with a low minimum wage.
And if you have the high minimum wage, it is
this gap here.
Okay.
So obviously with a higher minimum wage you're going to
have a higher unemployment.
But look at the impact on the rest of the
labour market.
So on the rest of the labour market.
What happens when you have a low minimum wage?
Does it affect this market?
No.
Right.
So it has no impact on this market because the
wages fall below the equilibrium wage rate.
However.
A higher minimum wage is going to be very negatively
impacting everybody else.
Okay.
And because this will be the unemployment with a higher

minimum wage for the rest of the world.
I mean, the debate really is when different cities and
different states decide to argue whether we should even raise
the minimum wage, not even just have a minimum wage,
but even to raise a minimum wage.
So at some point, New York was debating about a
$15 minimum wage per hour.
But if you have a low minimum wage, it obviously
only impacts a certain part of the population and creates
unemployment at the lower skill.
But if you impose a higher minimum wage, it creates
unemployment for the rest of the labour markets.
Okay.
So that is obviously a problem with higher minimum wage.
Now.
A third.
So we have minimum wage.
We have collective bargaining, right?
A third, um, source of wage rigidity is called downward
wage rigidity.
So if you think about it this way, people don't
like to see wage cuts.
Right.
Look, you know, when there's inflation.
What do what do you do?
First of all, with your companies, you negotiate a higher
nominal wage, write wage rate because there's inflation that is
flexibly going up.
But what happens in recessions?
Are you happy with a 30% pay cut?
You have a very strong usually have a very strong
psychological resistance to wage cuts.
But instead what they do companies do is to freeze
it, to have wage freezes.
So if we look at the data, um, you know,
across companies, what you see is the majority of cases,
you know, obviously wages can go up without any rigidity,
but there are very little, very, very few wage cuts.
Okay.
We observed in a company, um, and the primary or
majority are just wage freezes.
Okay.
So this downward wage rigidity, people don't like wages to
fall.
That is another source of, um, the friction.
So most firms would rather fire some workers than cut
wages of all, of all, of all or many workers.
That also creates unemployment during recessions, right?
Rather than, say, everybody take a 30% pay cut.
They'd rather just fire a few of them and then
everybody else remains the same or have wage freezes, rather
than saying everybody takes a pick.
So then that could also create some more unemployment.
Okay.
So let's look at, um, and apologies for this non-high,
uh, quality a picture, but this is also in your
textbook.
Let's look at how we graph downward wage rigidity.
If we look at labour demand curve it's the same
downward sloping labour demand curve.
This is old labour demand curve.
What happens during recessions.
Right.
We're talking about recession when they're facing these wage cut
problems.
Recessions.

There is a leftward shift of the labour demand curve.
Why?
Because for every given wage, companies are going to hire fewer workers.
Right.
So that represents a that's represented as a shift of the labour demand curve leftwards.
Again, for every single wage you want to hire fewer workers.
Now that's the labour supply curve, right?
Upward sloping etc. and then becomes vertical.
Now a recession comes.
Her swift left.
You were originally at this E1 equilibrium where you have wages at this point.
Okay.
And if markets were frictionless.
Then how does that market adjust?
Well, wages are going to fall.
Why?
Because companies want to hire less, fewer people.
So equilibrium wages fall.
To clear the market where labour supply is exactly equal to labour demand.
And you don't get unemployment there.
Because you've got a lower wage.
That's usually what we talk about.
Adjustments.
Right.
Frictionless adjustments.
Now what happens when there's perfect downward wage rigidity.
And what that means is that wages don't fall at all.
Okay.
Wages can only go up.
It can't go down.
That means that if you look at the labour supply curve.
It doesn't look like this upward sloping curve anymore.
It's exactly 90 degree angle.
Why?
Because wages can't fall below this rate.
There'll be nobody working.
Okay, so the labour supply curve that you're tracing out is just a horizontal line.
It means for every for this level of wages, you're willing to supply labour.
You know, in the past it was for every given wage.
There's a certain number of people who are willing to supply their labour right at this point, when you have perfectly downward wage rigidity.
It means only at these wages are you willing to supply labour.
Okay.
So that's a, that's a, that's a representative of what happens in a recession.
You know, when wages just don't fall then this is your effective labour supply curve.
So look at what happened when we were originally E1.
We were now we are now at the equilibrium E2.
Why.
This is the the same wage as before.
And this is how many people companies will want to hire at this wage right at this point.
Now.

How many people are there?
This this point labour supply minus labour demand is going
to be, uh, the, uh, the, uh, unemployment.
Okay.
Um.
So at this point this is Labour demanded and this
is Labour supplied.
So that's going to be the unemployment rate.
Now notice that the unemployment rate increased dramatically.
Um, this this is originally the voluntary unemployment rate.
Right.
Because the market clears.
But there are lots of these people who are willing
to work at a higher wage, but suddenly became much
wider because of the downward wage rigidity.
So there is a further decrease in employment with a
fixed wage because wages can't adjust.
And there's also a decrease in employment.
So fewer people get hired and wages still get stuck
at the same level.
Okay.
So the fourth idea of some wage rigidity or some
frictions is the idea of efficiency wages.
Now imagine a scenario, right?
This is a real world scenario where you're trying to
hire somebody.
Okay.
Let's say that you are going to be, you know,
a very important, uh, employee at some important corporation, and
you want to find somebody to take.
You want to find a personal assistant, okay.
You're going to find a personal assistant to take care
of your personal stuff so that you can have more
time to to work.
Now the average personal assistant rate is, let's just say
make it up, I don't know, £20 per hour.
Okay.
Is it possible that you might want to pay higher?
£30 per hour.
Well, some of you might decide to do that.
Why?
Because first of all, you want to attract.
The more productive or higher quality workers who are willing
to work.
The other is from the flip side.
If you pay a higher wage, then these people might
be less willing to, you know, or these people might
be more willing to do a better job, because why?
Because if they lose the job, the cost or the
opportunity cost would be very big, right?
You lose £30 per hour.
How you pay them, the more they don't want to
lose their job.
So in that sense, you can also motivate and incentivise
people.
It's very true with, you know, lots of, you know,
service workers etc. or households that you want to make
it very painful for them to lose the job.
Now the example that was given um, in the textbook,
apart from some historical uh eh examples, is, you know,
for instance, if you look at the tech industry today,
the likes of Google and Facebook are paying engineers above
the market rate, uh, for which they can be hired.
Why is that?
This is called efficiency wages.
The idea that you're going to pay above the market

clearing price for all kinds of reasons, by either attracting
the best or making it very painful for them to
shirk their job.
Um, or variety reasons.
So this could increase productivity by reducing worker turnover.
If you have lots of people, you know, turning around.
Remember that there are frictions.
So their cost every time you want to hire a
new worker, it's costs both time costs productivity losses.
You don't want to be hiring workers all the time.
Um, so when we talk about the fact that there's
a lot of worker turnover, observing the data must be
because there's not very perfect matching, right?
Matching is not great until you find out and learn
more.
Reduce shirking is what I was mentioning.
It hurts if you lose the job and motivates workers
to work harder, you pay them a high wage.
So there are all kinds of benefits of paying a
higher, um, wage than the market clearing way to to
increase productivity that's not captured by the competitive equilibrium.
Okay.
So just looking at what we are, you know, kind
of just summarising what we have talked about today.
It talks about today.
First of all, classical theory can't explain unemployment.
It can't explain the fact that there job vacancies at
the same time.
Um, so what can well first answer to structural unemployment
is wage rigidity, right.
Minimum wages, labour unions, efficiency wages or downward wage rigidity.
These different four different sources of wage rigidity could explain
unemployment.
Now, how do we explain the fact that there's unemployment
and job vacancies at the same time?
Well, coming back to our frictional unemployment, right.
It takes time for workers to find jobs and job
openings could be happening all at the same time, but
it takes time for the matching.
And then we want to be able to, you know,
really master this graph and look at what's the change,
what are the shifts, the curves that shift, and what's
the kind of unemployment that results from these shifts, right.
Due to minimum wages or efficiency wages or of the
like.
So now, now that we have an idea, a theory
of, um, unemployment, let's take a look at the real
world situation of Covid.
So what exactly happened during Covid that made, uh, unemployment
go up by that much?
16% or higher?
And how did unemployment and wages respond to the pandemic?
That's our most recent recession or most recent shock, right?
So first of all, as we mentioned in the US,
it's the Bureau of Labour Statistics that collects employment and
employment and wage data and unemployment insurance.
And by the way, we haven't mentioned one thing, right.
Um, before we start talking about the Covid example, this
thing that's not really emphasised in the book, but we
can use a similar reason to think about this is
welfare, unemployment, welfare insurance.
Right.
And that's something also very, very high in, um, Europe.
So here's I'm going to introduce a concept that's important
that's not in the textbook.
It's a concept of what's called a reservation wage.

Okay.
The reservation wage is basically at what point do I
decide to accept a job?
Is my reservation wage.
So above that reservation wage, you're willing to accept the
job below the reservation wage?
You're not willing to accept the job.
And this is obviously much more individualistic than what we're
talking about market clearing wages, right?
You can think about yourself.
You know, what is my reservation wage?
Um, so what happens to a person's reservation wage when
you introduce things like unemployment benefits?
Right.
Unemployment benefits obviously tend to raise your reservation wage.
Right.
Because I have to choose between unemployed or employed.
If I get a certain amount of support for just
not just being unemployed, then obviously the wage above which
I'm willing to work is going to be higher than
in a country where there are very little or no
unemployment benefits.
Right.
Your reservation wage now is a little bit more complex
than that.
I mean, you know, if you look at lots of
young people around the world, their reservation wages are getting
higher and higher.
That's why there's also a lot of unemployed young people.
Right?
First of all, maybe your parents are somewhat are doing
okay.
So you would be willing to take a longer time
to look for a job that you like, and that
pays better than somebody who is under pressure to find
a job, right?
If you now we see lots of moving back with
their parents kind of trend.
I don't know about this country, but certainly in the
US after the recession, lots of people moved in with
their parents.
Now, once you have a housing and all that, your
reservation wage could also increase because you don't need to
pay rent, right?
So reservation wage also depends on the time you think
it's going to take to find a job.
Right.
Um, if, uh, and the likelihood of you finding the
job.
Right.
So in boom times, you tend to have a higher
reservation wage.
Why?
Because you tend to think that I'm going to it's
not going to be too difficult to find a job.
So I'm willing to wait a little longer, search a
little longer.
And because the likelihood of being able to find a
job is higher, my reservation wage is higher.
So I'm not going to just you want to think
about the reservation wages?
Okay.
This is where I stop.
I go and I stop.
I stop at this point.
And you're willing to, you know, search more to find

the right match when you have a higher reservation wage.
And of course, that depends on a number of things,
including your own situation.
Also the economy.
Um, so we can use some of the real world
observations, like unemployment benefits, to think about why certain countries
therefore have higher unemployment rate.
Right.
Because natural rate of unemployment, um, is higher because potentially
of these welfare benefits.
So so here's what happened during Covid.
January 2020 Covid has spread across the globe.
By early March, the threat posed by the pandemic became
far clear and experts began to forecast that millions of
Covid 19 deaths would occur.
Um, so there were school closures, regional lockdowns and rapidly
intensified throughout the spring.
Tens of millions of consumers had drastically cut back on
their spending.
So obviously with the lockdown, the service industry really kind
of collapsed.
The restaurant industry itself is like $1 trillion industry, right?
So you can imagine suddenly there's very little demand for
their services and products.
So how do we map that onto the things we
learned?
Well, first there's a massive labour demand shift to the
left.
Right.
Because again, for every every the shock is coming from
the labour demand.
Right.
For every given wage.
Firms don't need to hire that many people.
They want to hire fewer.
Right.
Labour supply you can also say has shifted.
Why?
Why?
For every given wage, I might want to be less
willing to.
Supply the same amount of labour.
Because I don't want to be infected.
I can potentially say that.
So some people who are more risk averse say even
for this wage, I don't want to go to work.
So you can also see some see a labour supply
curve to the left.
Okay.
So this pushed the economy into sudden and deep contraction.
And in single month, US unemployment rate rose by 10.3%.
Uh, and this was 20 times more extreme than the
typical one month increase during a deep recession.
And 17 million US workers lost their jobs in just
one month.
Now, what does a classical theory tell us?
Classical theory just says, well, wages are going to fall
dramatically up until the point.
Everybody's willing to work and get hired, right?
Wages will have to adjust.
But this didn't happen precisely because of the downward wage
rigidity.
Now, it's it's not really exactly what we depicted where
there's perfect downward wage rigidity.
So it's a horizontal line, but it's very, very difficult
to cut down wages.

So, um, firms under pressure chose to pay pay off
workers rather than drastically cut wages.
So wages were fixed.
Okay, so this is exactly the same graph.
Just showing it again that basically when you have a
horizontal wage rate, you went from E1 equilibrium to E
two equilibrium.
And this distance is the increase in unemployment or the
overall equilibrium and employment.
Now it was also true.
Now here we're talking about worker heterogeneity right.
That different workers are different.
Right.
Sorry.
Obviously that's that's a that's that has to be true.
But for lower skilled for the service industry where they
had to have face to face contact, there was um,
they were hurt much more than those higher skills who
could actually work remotely.
So the composition of employed workers shifted towards higher wage
workers.
Um, so if we graph two different kind of skills
then obviously labour demand curve for the higher skilled shifted
left by less right, it might have fallen also but
shifted less by left by less.
And also labour supply could potentially not change based on
hours because they could work remotely.
So that would be lower levels of unemployment for higher
skilled.
That's how we should analyse these things.
So the consequence was unemployment rose very sharply in the
spring of 2020.
The unemployment rate rose from 4.4% to 14.7% in March,
as we said, and wages.
But wages barely changed.
So that should be good evidence that, first of all,
markets are not frictionless, that there's substantial downward wage rigidity.
And that's what's causing some of, um, the unemployment that
we're seeing.
Okay, so two more concepts of unemployment.
So what do we learn here.
We talked about frictional unemployment.
We talked about structural unemployment.
And we arrive at two more concepts of unemployment which
is natural versus cyclical.
So given that we know that there are frictions in
the world, right, in the labour markets and search and
all that, would you say a natural rate of unemployment
would be zero?
No.
There will be no case where there's a zero unemployment
rate at any point in time.
There are job separations and their job findings, and they're
not perfectly matched, right, because of these frictions.
So you don't want to think about.
And the natural rate of unemployment is not an optimal
amount of unemployment, right.
The natural rate of unemployment is just it's going to
be different from country to country.
Why?
Because we don't know how much.
Because there's a level of structural unemployment in the economy
that's going to be different, differing from, um, country to
country.
So for instance, we talked about the skill mismatch.
Uh, we talked about labour unions.

We talked about minimum wages and these if that creates
structural unemployment, that's going to be different for different countries.
So if we look at a country like Spain, okay,
Spain's natural rate of unemployment between 1977 and 2013 is
16%.
Compared to the US.
6.5%.
But that's the natural rate of employment.
It doesn't say it's optimal, but given the structural mismatches,
labour institutions, that's a natural rate of employment.
And we want to talk about this concept because we
want to separate it from what's called a cyclical unemployment
rate.
What's a cyclical unemployment rate.
So we're going to talk a lot about business cycles
okay.
In the next few weeks.
Business cycles as opposed to growth.
Growth is about long term business cycles about, you know,
ups and downs and recession booms and busts that all
these market economies experience.
Right.
So recessions.
Can cause cyclical unemployment.
How do you graph recessions on the, um, on the
on the labour market curve?
Well, it's a shift leftward shift of labour demand curve.
But in boom times labour demand will shift back.
Right.
So at this point cyclical unemployment just caused by booms
and busts.
Well let's just think about a highly cyclical sector.
That's property right.
Property tends to expand in boom times and tend to
contract violently during recessions.
And there'll be lots of unemployed people in construction.
And that's a big part of the economy in recessions.
But they're going to recover when the economy normalises.
So that's the cyclical matter, cyclical cyclical, uh, component as
opposed to the natural component.
There's a lot to do with business cycles, which we're
going to look in more.
So Spain had 26% unemployment in 2013.
If we look at the average unemployment rate, we can
think about that as the natural rate of unemployment.
It was 16%.
So the cyclical component was actually 10% in 2013.
Compare that to the US, where the natural rate is
much lower 6.5%.
In 2013 it had 7.4%.
So that cyclical component is 0.9 percent.
Okay.
So in conclusion, there's actually five different kinds of unemployment
rate.
Okay.
Just.
Coalescing some of the things that you gave me to
think about unemployment.
You talked about misinformation, right.
Asymmetric information.
So that's frictional.
You talked about skill mismatch.
So that's structural.
Okay.
Um cyclical component is in boom and bus business cycles
good times and bad times.

Natural unemployment kind of takes into account the institutions of the country and the people and, you know, reservation wages and so forth, uh, welfare benefits and all that.
And seasonal unemployment, which we didn't talk about, is also very easy to understand, right?
During Christmas time, lots of people will be hired in certain service industries, um, you know, ski resorts in winter time, lots of services.
And some of it is going to depend on the cyclical component.
Okay.
So that concludes our lecture on unemployment.
And next time we're going to move towards credit markets to look at not people but to look at money, which is going to build our way to understanding business cycles.
Okay.
See you on Monday.
Uh.
Oh oh wait, I yeah, I do have one out.
Yeah.
That's.
What you.
Got.
Oh, man.
It's.