Introduction to Economic Growth- I

Dr. Sohini Sahu

Department of Economic Sciences

Indian Institute of Technology Kanpur

Lecture-3

Short-run fluctuations versus the long-run economic growth

So, let us take a brief look at these cycles. Why? The reason being that, as we said, when we talk about the CPI and the SPI of a student, it is the same student that we are talking about, and the two things are happening simultaneously. So, in an economy also the short run and the long run that happen simultaneously. So, this is one picture that I have drawn based on, you know, my understanding, that explains the short-run feature. Here, we will be talking more about the short-run feature. Which will be followed by the long-run features.

So, how do we understand the cycles, and if we are looking at data or if we have plotted the data, how would we identify whether there are cycles and what is the timing of that cycle, okay? So, here, for instance, if we look at this figure on the x-axis okay? That is, on the, you know, parallel axis that we see, the horizontal line that we see that is the x-axis, here we are measuring the year. Now, this is not for any particular country; this is a very general figure that I have drawn for understanding, but if we have the data, we can plot it for any country. So, on the x-axis we have the number of years, right? So, here, for instance, we have these that started from 1950, then there is 1960, 1970, 1980, and so on and so forth. So, we are measuring years or time on the x-axis.

What are we measuring on the y-axis? On the y-axis, we measure economic activity. Now, so far, I have not really talked about GDP. That will be our topic of discussion in the second week, where we would talk about GDP at length. Right now, I am keeping it very general by calling it economic activity. But yes, if you would like to say that economic activity is generally measured by GDP or per capita GDP of a country.

If you are already familiar with it, then yes, on the y-axis, we are measuring GDP or per capita GDP. I would like to keep it very general as something that is measuring economic activity, right? So, imagine this for every year starting from 1950. If you would like to visualize an example, we can think of India, an economy that we are very, you know, familiar with. So, say for 1950, we have the GDP numbers for India. For the year 1951, we have the GDP numbers of India.

I am not going into details of whether this is what kind of GDP is this, what is the base year, as we said these are topics of discussion for the next week. So, like this, we have GDP numbers for India for every year until, let us say, 2023. And here what we are doing, we are just plotting it. If you are familiar with Excel or any other software like this, you can just plot this data and you will get a scatter plot. But since we are doing it for every year, if you just connect the dots, you will kind of, you know, get a smooth kind of a line, which is denoted by this black line here that is labeled as data.

So, I hope I have made it clear. As to how we generate this particular line, right? Now, this is how the economy, any economy, again, for that matter, because this is not based on any data; this is just a free hand drawing I have done just to be familiar with the concepts that we are talking about here. So, this black line labeled as data represents the economic activity of an economy for the number of years that we are considering here. And if we look at this line, we will see that it is not an entirely smooth line in the sense that it is not like it has always been upward rising or always downward sloping. As we can see there are times when it has gone up, it has gone down again, it has gone up once again.

So, it keeps moving, right? Now, suppose someone asks the question, well, how has this particular economy done for the last 7 decades? Because we have plotted this particular thing here. What would be the answer? How would we arrive at one single answer? It is not easy to arrive at one single answer. Why? Because we see there are times when the economy, you know, has taken a dip, and there are times when the economy has done very well. So, how are we going to give one single answer to this question? So, this is like saying how has a student performed? What do we generally do to understand how has a student performed? We look at his or her average grade score for the last few semesters that the student has been doing a particular course or a degree. So, same thing here, in order to understand how an economy is doing, we look at its average performance.

How do we arrive at that? We arrive at that by drawing what we call a trend line here. This is the blue line that we see in this figure, here labeled as trend line. Now, without going into much details here, what we can say is we can think of it like this. The trend line is like the average performance. This is like the CPI of a student.

So, this is like the overall health status. That analogy that you know we had talked about. And what is this trend line showing us? It is showing us an upward rising straight line. Why? Because although there have been some dips here and now, but overall, the economy has shown an upward trend. The economic performance has increased over time, okay? So, I hope both these things are clear.

So, one is data that we get directly by plotting the data. How do we get the trend line? Well, if you are using excel, you can give the command there, it can generate the trend line for

you. If you are familiar with econometrics, you can also run a regression on time and you can generate this trend line, okay? So, we have to generate the trend line, right? Now, as we see that we have data and we have trend lines, we have all the tools that we need to understand cycles and the different features of these cycles. Now, there are times, as we can see here, where the economy has gone below the trend line, right? And that is generally termed as a trough. Some people also use the term valley.

What it means is that the economy has gone or the performance of the economy has gone below its long-run performance or average, that is known as a trough. Whereas, there are also times again shaded in red, as we can see in this particular figure. So, the economy has done exceedingly well. How do we know it has done exceedingly well? Because the data line is now above the trend line, okay? And it peaks at some point. So, these are known as peaks.

And then it is followed generally by a slowdown, and then it might dip again, and after some time, it will rise again, right? So, this is what we mean by fluctuations. So, it is not like the economy is always doing well or perpetually not doing well; it just keeps on fluctuating. So, this is generally how we understand the cycles. So, the things that we would like to keep in mind one is the trend line, okay? Which we generally, how do we generate this? This is based on data. So, we first need data, we can plot the data.

The second step is that we generate a trend line, a software will do that for you. If we are not familiar as to how to generate a trend line. And once we have a combination of the data and trend line, we can identify the times when the economy had gone below the trend line and the times when the economy had gone above the trend line as well. I hope these features are clear.

Okay. Then what are cycles? Now, coming back to the definition. So, by definition, a complete cycle is from one peak to the other, okay? So, to move from one peak to the other, an economy also has to go through a trough. So, peak, trough, peak this is one complete cycle. Or if we begin from a low point, then it is trough peak to the next trough, okay? Any one of those we can take. So, this is known as a cycle.

And this we can see why it is known as a cycle. Cycle is a complete thing. So, this is also like a complete thing. The thing to remember here is that this is a short-run phenomenon. Why is it a short-run phenomenon? Because, as we just said, it is never the case that an economy is perpetually doing well, okay? Or an economy is perpetually not doing well.

So, these are generally temporary features, although by temporary, it can be months, it can be years. That is another question altogether, but these are what we call the short-run phenomena and this is how we define cycles. So, the thing that we have to remember is that fluctuations or cycles they are short-run phenomena. And they are generally caused by

what we call shocks in the economy. Shocks are like sudden impacts, sudden events that create these things in an economy.

Okay. So, this is an example. So, that previous one was a free-hand drawing that I had done. This is actually based on data, okay? What do we see here? This is in context of the US economy. These are the different phases of recessions. Now, recessions are severe slowdowns.

There is a technical definition of recession, okay? So, how do we interpret this particular figure that we see in front of us? So, as we had noted earlier also in that freehand drawing that on the x-axis that is on the horizontal axis, we mark the years, as we can see here in this figure as well, starts from 1950 moves to 1955, then 1960 so on and so forth till about 2020. What is measured on the y-axis is the vertical axis; it is the unemployment rate, and you know that it is being measured on the y-axis. Remember, that is why I had kept that term very general as an economic activity because you can represent economic activity by many things. GDP is, of course, the most common representation. But to know how an economy is doing, we can also use other variables.

Unemployment rate is another such crucial variable, okay? So, in this particular case, they are measuring the unemployment rate on the y-axis. And what do we see here? I think the pattern of fluctuation is very clear here, is not it? Because there are times where we see that, you know, the blue line, this is the line that we are. It is very high, then it dips. So, if we start from 1950, we see that it is peaking, and if you are wondering that what are these bars that we see here every now and then? Can you guess what are these bars representing? These bars are representing recessions in the US context. And why is the width of the bar varying? I think you have guessed it by now.

The width of these bars, they are varying because the duration of the recessions are never the same, right? So, if a bar is very wide, it means that the duration of that recession was quite long compared to a much thinner bar, okay? I hope this picture is now making sense and this is based on real-life data. This has been taken from NBER, which is the National Bureau of Economic Research in the US, and this is, as I said, the data equivalent of the free-hand diagram that we just saw before. So, what do we see? We see that wherever we see these bars, these grey-shaded bars. The blue line is almost peaking just there or just immediately after that. There is a slight lag in the movement of macroeconomic variables.

So, that is why sometimes it is just after these bars. What is it indicating? It is indicating that during the time of recession or during recessionary phases, unemployment rates are very high in the US, okay? And I hope this is making sense. And this is true not just for US, here I am just showing the data for the US economy. But this is true across most nations of the world. If we were to plot it for other countries, high chances we are going to find a very similar graph here.

And the last one that we see in 2020, I hope this requires no explanation. This is the on start of COVID-19 pandemic. You see how this blue line had shot up like anything, right? So, almost touching 14 percent, that is a very, very high rate of unemployment, okay? So, a few things that we have mentioned earlier, which we can check from this particular figure here as we can see that you know it is never the case that perpetually unemployment rates are very high, okay? It has been high, but then it came down after some time, and maybe it rose again, right? So, this was the point that we were trying to make that these are that is the reason why these are known as fluctuations, okay? It is never the case that unemployment is perpetually high all the time. Or it is perpetually low all the time; it is fluctuating, sometimes it is going up, and sometimes it is coming down. The second thing that we observe from here you see the difference in timing between the two peaks.

In this case, it is not constant. So, this is what we meant that we cannot say for sure that, you know, every two years, unemployment rates are going to be very high in the US. The duration we can never predict that with 100 percent certainty. So, that is why these recessions are very, you know, dreaded because no one really knows when this is going to happen. So, this is also another feature of cycles that, with 100 percent certainty, we can never predict, and this is definitely not seasonal in nature, okay? So, I hope by now, you know the data that we see here that corroborates the free-hand drawing that we had seen earlier; now, this is making sense, okay? Okay. Moving on, I just thought you know it is a good idea to see some representation of these cycles and one of the worst recessions that the world has ever experienced, rather the US, is the Great Depression.

Some of us we might be familiar with this term. So, the Great Depression, as the term suggests, is a very, very severe recession, okay? It started in the year 1929 in the US and lasted for almost over a decade. That is a fairly, you know, long time, and you know, we will not go into the story of why it lasted possibly so long. But yes, this is one of the most severe recessions that the world has ever seen, which is the Great Depression, and as we can see from this particular picture here, how grim it was. So this is people queuing up for free coffee and donuts, and some of you might have watched some movies based on, you know, the Great Depression, and standing today, it is very difficult to imagine that you know what severe recessions can do.

But this is reality, and this is again another reason why a good macroeconomic understanding is very important because when events like these occur, they affect everyone, and no one is spared from these events, okay? Okay. so, lastly comes the fundamental question that what really causes these fluctuations, as we just saw from this particular, you know, photo here that you know these fluctuations or these recessions. In this particular case, the Great Depression has severe repercussions, right? No one wants high unemployment rates, no one wants, you know, low GDP, but still, these things occur. So, naturally, people ask the question, that well, what are the factors that cause these

fluctuations? Well, sometimes they are caused because of economic events like, let us say, in the case of India, you know, there was sudden demonetization.

So, that was a very sudden move. The economy was not ready for that. That is an example of a shock. But sometimes, it can also be caused because of climatic conditions like, you know, droughts, like maybe floods, like cyclones, or an earthquake, which totally could not be predicted. Those can also cause these kinds of fluctuations. And, of course, more recently, it is COVID-19 that led to a huge reduction in consumption demand.

People were not investing. The world had kind of come to a standstill. So, not much trade is taking place. All these factors were responsible in recent times. So, what causes these fluctuations? These factors vary from time to time. No one again can predict with 100 percent certainty that this is the reason why we are going to have the next recession.

And of course, lastly, how do economies come out of recessions because as we said, the good news is that no economy is ever perpetually in the same state, be it both good or bad. So, generally, it is because of fiscal and monetary policy. Why are we talking about these things? Because I hope by now you can already relate to this that in basic macro courses, we have already covered these things in the form of ISLM. So, when we study the ISLM model in macroeconomics, what are we actually capturing there? Are the different shocks given to the economy? What happens to output? What happens to interest rates? What happens to government expenditure? What happens to money supply? I hope you can all recall that. Those are all in the context of the short run of the economy.

And there we have also seen how monetary policy works, how fiscal policies work, right. So, they are all in the context of the short-run fluctuations in the economy. And I am sure in the basic macro course, these are things that we have already covered thus far. So, this is a quick recap of the short-run fluctuations.

I hope you remember them by now. So, the thing that we have to remember again, we should not be hard on ourselves and have to force ourselves to remember. But as we said, these are things that happen, or they occur around us all the time. So, we can also relate to these situations. So, short-run fluctuations they are generally caused by temporary shocks to the economy, which can be both economic shocks or they can be the cause of non-economic factors. There is a sudden decline or a sudden expansion in various economic parameters.

And mostly we talk of the decline part of it because recession is what worries us the most. And in this context, the fiscal policies and the monetary policies. That we are more familiar with, they are generally talked about in this regard because that is how economies they overcome these fluctuations. I hope we are good so far. Well, if that is the case, then we move on to the next component that we were talking about, which is now the long-run perspective of an economy which is also known as long-run economic growth.

What is long-run economic growth? It is really a long-run concept. I marked this in red so that you know you do not forget these terms. This is like the CPI of a student. This is like the overall health status of a person as we said.

This is the average long-term performance of an economy. This is the economic performance over a significant period of time, and the term significant here is very, very important. So, when we talk of economic growth is generally not a matter of 5 or 10 years, or even 20 years. Economic growth stretches for over 50 years, maybe close to a century, sometimes even over a century. We will look at some of those data later in some of the latest slides here. Just to give an example, this is the long-run economic performance of India.

Do we see this line here? This data has been taken from FRED, okay? And what we see here is starting from about 1950, that is post-independent India, until about 2020. So, as to say, we see this line is a positively slope line, and this is what we mean by long-run performance. So, this is how the economy has performed over the long run, and as we said, the long run is not just about 5 to 10 years. This is over, you know, quite a few decades, so as to say, and this is the meaning of long-run performance. Now, naturally, people ask the question, what is it or what are the factors because of which? Let us say we see this line continuously increasing or that the slope is positive and it is also becoming steeper over time.

Now, what is the reason you know it cannot be just a natural phenomenon? There has to be reasons as to why, initially, the line was much flatter, and then it picked up. In other words, people ask the question, that what are the different factors because of which we observe this long-run performance? Well, the factors are varied in nature, but broadly, we can club them as economic factors and non-economic factors. So, what the literature has shown us is that physical capital accumulation is very, very important. Countries that have been successfully able to do this have also grown much faster.

Their long-run performance has been great. Productivity, growth or innovation is another such factor. Human capital, which includes education and health that is also another such factor. Government expenditure plays an important role. International trade plays an important role.

Infrastructure also plays a very important role. And in recent times, you know, there is evidence of how geography and climate that is the location of a particular country because, you know with geography and climate, they are all intertwined together. How that plays an important role because that affects our productivity, which in turn affects economic performance right, and also culture. The kind of culture we come from that also has an impact. So, if we are asked the question that why is it that we see the steep rise in economic performance of any country? Here, we are just showing the data of India, but it can be

either a steep rise. By the way, but remember, in one of the observations, we said that for some countries, this picture can be reversed actually.

They were doing well earlier, but now they are not doing that well. So, it can be just the reverse of what we see. So, there we have to ask ourselves a question: that what went wrong amongst these factors here? By the way, this list is not exhaustive, okay? These are just some of the instances or factors that I have mentioned here. There are many, many factors that can be responsible for economic growth or for long-term performance of an economy. Now, this particular thing, I thought that for quite some time, we are going over quite a few concepts. Let us take a quick break in terms of trivia also and little bit of checking our GK as well.

And if we can answer this, this particular thing is also tied up to the first question that we asked at the beginning of this lecture that well: Why study economic growth? Because economic growth is mighty important. Let us see why and how. So, if we are trying to understand the power of the long-run performance of an economy, which is the economic growth, let us try to guess the name of this country. So, you do that. I will give you few information, why don't you try to guess this: which country are we talking about here? In this country, life expectancy is less than 50 years.

1 out of every 10 infants dies before the age of 1. More than 90 percent of households, they have no electricity, no refrigerator, no telephone, no car, and fewer than 10 percent of adults, they have completed high school. So, these are some of the features of this country that we are talking about, and your task is to guess the name of this country. I will give you two seconds, or you can pause the video for a while before I reveal the answer to you. Do you have a name in mind? And is this what you have in mind? I do not think so.

It takes most of us by surprise. The country that we are talking about is the United States of America. But in the year 1890, okay? I will just go back now to the slide that we saw here before we can digest this fact. It is very difficult to digest this fact standing here today, right? And what happened? In just a century, the US is completely transformed. And how could it transform itself in over just a century? How did the picture change so much? The reason is due to long-run economic growth.

So, this is the power of long-run economic growth. It can completely transform the fate of an economy. So, if this is taken as by surprise, at least it did take me by surprise when I first came across this data. This is supported by data as well. Starting from 1880, we see this graph here.

Well, GDP per person has grown by a factor of 15 since 1870 in the US. And all these facts and figures are taken from Charles Jones. So, I will also mention towards the end of today's lecture. What are the different resources from where I have taken all this information? So, you know these are facts and figures that are well-published, right? So,

this is the power of economic growth. This is the power of long-term performance, and as we said that this is long-term performance.

Why? Because this is not a matter of 5 or 10 years, or even 20 years. This is a matter of over a century, you know sometimes even more than that. So, that was the US example. If we look at growth around the world since 1980, this is more recent, and again, these data and figures have been taken from Charles Jones. So, this is how it looks like well; I would also like to mention here does not mean that US here has stagnated here it everything is relative to the US. So, we will learn more about studying these kinds of figures when we talk about data in week 2.

So, here, everything is relative to the US. US, that is why it has been taken as 100 here, okay? These are the different lines or movements for long-run performance relative to the US. How have these countries done relative to the US? We will find India in green here, okay? I would request that you pause your video here for a couple of minutes; please take a look at these different lines and see how these different countries have performed. Some countries have performed really well, as we can see that the lines are steeper for India and for China, and for sub-Saharan African countries as we see that there has been a dip, right? So, the variety of performances we get to see around the world, this is the point that. I am trying to drive from here. If we are talking of really long-run economic growth, then this is the kind of figure that we are looking at here, okay? So, this is the world growth over a very, very long run, okay? Not even, you know, one century or a couple of centuries more than that.

As we can see here, on the x-axis, we have the years, and on the y-axis, we have the index again. Here, the graph is slightly different. This is with respect to the initial year, where the initial year is taken as 1. So, there are different ways of drawing these graphs.

As we said, we will talk more about these in the second week. But I hope the message is very clear. And what is the message? The message is as we can see here, so if we follow the blue line here, which is the per capita GDP, we see that almost until about 1800, which is the early 19th century. The blue line was fairly flat and also, in terms of magnitude, is very, very low, okay? The slight increase we do see between 1600 and 1800, okay? But prior to that, it was quite flat, okay? And after 1800 we see a very, very steep rise this data is up to the year 2000. So, just the beginning of the 21st century, and here, as you can see from the x-axis, Many such centuries are here. So, it is not just a matter of a few decades even, right? What do we observe is after the starting of the 19th century, this blue line that represents per capita GDP, a very steep increase, has taken place here.

Well, so has the world population gone up simultaneously, as we can see, which is denoted by the broken green line, right? So, this is how the world, on average, has performed for the last few centuries. What is stark is starting now almost the 17th century, but much more

compared to even the 17th century starting, you know, in the 19th century, the world performance has gone up like anything. I think a part of the answer, of course, is looking at a graph like this. We would ask ourselves the question that, well, what might have happened due to which the world which had shown you know very little movement before the 17th century? Why do we see such a shooting movement, you can say, after the 19th century? Part of it is what we can all guess is due to the Industrial Revolution, and since then, it is like the world in general has taken off, right? So, these are the kind of questions we ask ourselves in this particular course, we try to find answers to these questions, okay? So, just to summarize what we have discussed so far so that we do not forget what are the points we made so far. Well, what we have talked about is the fact that there is a distinction between the short-run fluctuations and the long-run performance of a nation.

So, this is the long-run performance of the world overall, but vis-a-vis the short-run performance was that you know, that unemployment graph that we had seen for the US. So, just try to recall how much of fluctuations we saw there. Here, there is no fluctuation; it is more smoothened out, and in nature, it is more or less the average performance. And what we do in this particular course this is the reason for trying to distinguish between the short-run and the long-run. We should know what we are doing in this course because both the short run and the long run belong to the same economy.

As we said, CPI and SPI are about the same student, but it depends on which perspective we are talking about. So, in this particular course, we are going to concentrate on the long-run economic growth aspect of a country and not on the short-run fluctuations part.