

## Video Transcript for “Why did Japan Stop Growing?”

Online at <https://spice.fsi.stanford.edu/multimedia/why-did-japan-stop-growing>

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Japan used to grow very rapidly. So the question “Why did Japan stop growing?” is a more interesting thing. So if you look at this graph, let’s start by looking at this graph which is on the slide, and this shows the real GDP growth rate for Japan from 1956 to 2000. And real GDP is a broad measure of output of the economy. And GDP growth shows how fast the economy is growing. And this shows in the 1950s and 1960s, Japanese economy grew very rapidly, at a rate of 9% a year. So 9% of the economy, or 1/10, or almost 1/10 of the economy was added additionally, added newly to the economy every year. So that means every seven years or so the economy doubled. So that was a period of a so-called rapid economic growth. And Japan grew very rapidly. So from ‘56 through ‘73, the average growth rate according to this graph was 9.2%.

Then in the mid-1970s, the Japanese growth rate declined to around 4%. Still a respectable rate, but nowhere close to 9% or 10%. And that continued for 15 years or so, and then 90s came and the Japanese economy really stopped growing. The graph shows from 1991 to 2000, average growth rate was just a little bit above 1%. So it’s a huge decline from almost 10% to 1%. And this graph stops at 2000, but the next graph looks shows us a growth rate from 1995 to 2015. So a more recent period.

In the last 20 years, how much was the Japanese growth rate? And the red line in this graph shows a zero, which means the economy didn’t grow at all. And we can see that the GDP growth rate for Japan was mostly a little bit above zero, but sometimes below zero, which means overall the Japanese economy didn’t grow very much, stagnated.

So that’s a big question. Why a Japanese economy which used to grow very rapidly — like the Chinese economy recently — why did it stop growing over time? And in economics, we approach this question, the growth of economy, how the economy grows over time or how the growth rate changes over time, using growth theory or using the notion of production function. And the notion of the production function is that a production function relates the level of output in the economy, the things the economy produces, to the inputs of the economy, that something the economy needs to produce output. Like labor is one big thing, and capital is another thing.

And this slide shows a typical formulation of a production function.  $Y$  here is output of the economy,  $L$  is the amount of labor—we can consider that as a number of people—and  $K$  is the amount of capital. So what this production function says or relates is relates capital divided by labor, which is amount of capital or machines each worker has to the level of output,  $Y$  divided by  $L$ . It's a level of output per worker or output per capital.

So this production function says there are two ways the economy can increase the output per capital: one is to increase the amount of capital, the amount of machines that you can use for production; the other way is what is called  $A$  here. And  $A$  is usually called the level of technology. And  $A$  shows for each capital and labor what kind of an output per capital production is possible. So if  $A$  increases, the increase in  $A$ , which is called technological progress, means that the economy can produce more without adding any more inputs.

So the economy can grow for two reasons. One is adding more capita, called capital deepening, and the other is improving their technology, called technological progress. And the next equation, if you understand math, tells you that the output per capital growth, or the growth rate of the economy, can be decomposed into two parts. One part explained by capital deepening, the other part explained by technological progress.

And what happens is when the economy is catching up to a more advanced economy, which was the case for the Japanese economy in 50s and 60s, and to some extent, in 70s as well, they were a more advanced economy like the U.S. or some European countries. And Japan lagged behind in their technology to create the goods and the services. So during the catch-up phase, Japan, or any other country, can grow by adding more capital and importing technology from more advanced countries. But as Japan caught up with the more advanced countries, it becomes difficult to grow by just importing technology. They have to come up with their own technology. So usually what happens is when the economy matures, the importance of technological progress increases. And that becomes the more important part of the growth.

So if we decompose Japan's growth rate into the contribution of capital deepening and the impact of technological progress, we get a graph like this, titled "Growth Accounting for Japan from 1970 to 2010." And this graph for four decades—1970s, 1980s, 1990s and 2000s—decomposes the Japanese growth rate per capita into two parts, the part explained by capital deepening, and the part explained by technological progress. And what we see is we know the Japanese growth rate dropped over time. And we can see the one important thing, or especially important thing that happened to Japan that explains the decline of growth rate, is the decline of technological progress. So even though the technological progress becomes more important part as the economy matured, for Japan, the technological growth rate declined, especially in 1990s and continued into 2000.

So the question is, why did the technological progress decline? And what recent economic research shows is for advanced economies, what is important for technological progress is what the economists call economic restructuring. And economic restructuring is an important concept in economics, and usually defined as a process in which old and inefficient production arrangements, maybe production units or firms, are destroyed. They go out of market and are replaced by new and more efficient production arrangement, maybe factories or firms and so on. Or in other words, this is a process of creative destruction.

So the recent research in economics shows that for a mature economy, like U.S. or Japan and many advanced economies, that economic restructuring is a very important part of technological progress, of productivity growth. And that's what Japan lacked. And that's the most important reason why Japan stopped growing. And what we can find is the important reason why that happened is the lack of economic restructuring. As I said, economic restructuring is a process where old and less productive production units are replaced by new production units and new, more efficient production units. And for Japan, that process was not functioning very well.

To see that in numbers, we can decompose this time the technological progress part of the economic growth into four parts. And one is the technological progress happens because the existing firms or existing production units improve their technology or improve their productivity. So that's one way. But another way is economic restructuring: there are some old unproductive or less productive production units go out of the market, and that can improve the productivity of the remaining economy, remaining firms. And that impact is called exit effect. And also a new company, which is more productive than existing companies, comes into the economy and it increases the productivity. And that is called entry effect. And also there is a reallocation between the existing companies and the high productivity companies produces more and low-productivity companies produces less, then the overall productivity increases.

So we can decompose the productivity growth into those four parts: one coming from the productivity growth of existing individual production units; the second part is a productivity growth which comes from reallocation or the change in the shares of a production of existing firms; and the third part is the production, productivity growth, which comes from new companies entering the company; and finally, the fourth part is the exit effect, which the productivity growth comes from the low productivity production units go out of the market.

And the result of such a calculation is shown on this slide, decomposition of productivity growth for Japanese manufacturing industries in 1980s and 1990s. And there's really one thing I want to stress in this slide. That is, we see negative signs on exit effect. That means the Japanese exits—exits of the companies and production units in Japan—reduce the productivity growth. So what it means is usually what happens is

low productivity firms go out of the market and increase the [overall] productivity. What happened in Japan suggests it wasn't the low productivity firms which exited the market, but the better than average firms exited the market.

In other words, the very low productivity firms stayed in the market and dragged down the productivity growth. And that's really an important key to understand why Japan stopped growing. The low productivity firms continue to stay, and these firms are often called zombie firms, using the analogy from the zombie movies, the living dead, and those companies really dragged down the Japanese economic growth. So that's a very important reason why Japan stopped growing.