DISCUSSION GUIDE FOR

“WHY DID JAPAN STOP GROWING?”

A DISCUSSION WITH PROFESSOR TAKEO HOSHI

Organizing Questions

- Why did the Japanese economy stop growing over time?
- Why did technological progress in Japan decline?

Introduction

In this lesson, students consider gross domestic product (GDP) growth in Japan since the 1950s by critically viewing a lecture by Dr. Takeo Hoshi, an economist at Stanford University. The lesson begins with an introduction to economic-related terms that are utilized by Dr. Hoshi in his lecture. The class then views a video lecture by Dr. Hoshi that addresses the question, “Why did Japan stop growing?” Students respond to prompts while viewing the lecture and then engage in a class discussion following the lecture. In pairs, students complete a crossword puzzle that reinforces the terms used by Dr. Hoshi. Finally, students are assigned a project for homework.

Objectives

In this lesson, students will

- learn the definitions of terms related to economic growth theory;
- understand the trajectory of Japan’s economic growth from 1956 to 2015;
- examine several reasons for why Japan’s growth slowed beginning in the early 1990s; and
- gain an understanding of the central role technological progress plays in economic growth.

Materials


Handout 1, Terminology, 15 copies
Handout 2, Real GDP Growth Rate: 1956–2000, 15 copies
Handout 3, Real GDP Growth: 1995–2015, 15 copies
Handout 4, Crossword Puzzle, 15 copies
Answer Key, Crossword Puzzle
Teacher Information, Video Lecture Transcript

Equipment

Computer with Internet access and a Flash-enabled or HTMLS-supported web browser
Computer projector and screen
Computer speakers
Teacher Preparation

Instructions and materials are based on a class size of 30 students. Adjust accordingly for different class sizes.

1. Make the appropriate number of copies of handouts.
2. View Video Lecture, “Why Did Japan Stop Growing?,” by Dr. Takeo Hoshi (duration: 13 minutes, 8 seconds).
3. Become familiar with the content of handouts, answer key, and teacher information.
4. Set up and test computer, projector, speakers, and streaming video lecture. Confirm that you are able to play the video lecture and project sound audibly to students.

Time

One or two 50-minute class periods, plus homework

Procedures

1. Inform students that they will be viewing a lecture, “Why Did Japan Stop Growing?,” by Dr. Takeo Hoshi, Director, Japan Program, Shorenstein Asia-Pacific Research Center, Stanford University. Point out that Dr. Hoshi is an economist and that his lecture focuses on gross domestic product (GDP) growth in Japan. Mention that before viewing the video lecture, students will first become familiar with some terminology that Dr. Hoshi uses in his lecture.

2. Divide the class into pairs of students, and distribute one copy of Handout 1, Terminology, to each pair. Point out that these 16 terms are used in the video lecture. Assign each pair of students to conduct Internet-based research on one of the terms. Ask them to add a sentence or two to the definition provided on Handout 1. The additional sentence or two can provide further clarification of the term and/or describe an example of the term. Allow students 10–15 minutes to work on Handout 1.

3. Reconvene the class and ask each pair of student to share the sentence or two that they added to the definition provided on Handout 1.

4. Distribute a copy of Handout 2, Real GDP Growth Rate: 1956–2000, to half of the class and Handout 3, Real GDP Growth: 1995–2015, to the other half. Inform students that these are graphs that Dr. Hoshi will reference in his lecture. Point out to students that in his lecture, Dr. Hoshi notes that GDP is a “broad measure of the economy” and GDP growth “shows how fast the economy is growing.”

5. Ask the students to consider the following question (in reference to either Handout 2 or 3) while viewing the lecture:
   
   What comments does Dr. Hoshi make about Japan’s economy during the 1950s and 1960s? the mid-1970s? the 1990s? the mid-1990s to 2015?
   
   You may want to write this question on the whiteboard.

6. Begin viewing Video Lecture, “Why Did Japan Stop Growing?” Ask students to jot down at least two points from Dr. Hoshi’s lecture in reference to either Handout 2 or 3.

7. After viewing the lecture, have students share their responses to the question above.
8. Discuss the following questions as a class.
   • Why did the Japanese economy stop growing over time?
   • Why did technological progress in Japan decline?

9. To reinforce the terms used by Dr. Hoshi, distribute one copy of
    Handout 4, Crossword Puzzle, to each pair of students. Ask students
to complete the crossword puzzle without referring to Handout 1,
Terminology. You may want to review the crossword puzzle as a class
or collect it for assessment.

10. For homework, ask each student to choose one of the two questions
    below as well as one of the three following project options:

Questions:
• Why did the Japanese economy stop growing over time?
• Why did technological progress in Japan decline?

Projects:
• Develop a political cartoon based on one of the two questions.
• Write a 300-word op-ed article on one of the two questions.
• Locate an economics-related article or political cartoon about
  Japan’s economy from one of the time periods mentioned by Dr.
  Hoshi (e.g., 1950s, 1960s, the mid-1970s, the 1990s, the mid-1990s
to 2015). Numerous examples in English can be found by searching
  “Japanese political cartoons in English” or searching Japanese
  newspapers in English, e.g., The Japan Times and Asahi Shimbun.
  Answer the following question: Does the article or political cartoon
  support the points raised by Dr. Hoshi? If so, how? If not, how is it
different? Limit your comments to 300 words.

Assessment The following are suggestions for assessing student work in this lesson:
1. Evaluate student responses to Handout 4, Crossword Puzzle, using
   Answer Key, Crossword Puzzle, as a guide.
2. Assess student participation in group and class discussions,
evaluating students’ ability to
   • clearly state their opinions, questions, and/or answers;
   • provide thoughtful answers;
   • exhibit sensitivity toward different cultures and ideas;
   • respect and acknowledge other students’ comments; and
   • ask relevant and insightful questions.
3. Assess students’ homework based on students’ creativity, artistic
   ability, and/or the quality of their writing. Ensure that their responses
   align with the information in the video lecture.
Directions: Your teacher will assign you and your partner one of the terms listed below. Conduct some Internet-based research on the term and write a sentence or two that augments the definition provided. The additional sentence or two can provide further clarification of the term and/or describe an example of the term.

**capital**—in classical economics, capital is one of three factors of production, the others being land and labor

**capital deepening**—a situation where the capital per worker is increasing in the economy

**catch-up phase**—period in which poorer countries grow faster compared to more wealthy countries and thus approach a similar level of per-capita income

**creative destruction**—the incessant product and process innovation mechanism by which new production units replace outdated ones

**economic growth**—a general increase in the market value (adjusted for inflation) of the goods and services produced by an economy over time

**economic restructuring**—refers to the phenomenon of Western urban areas shifting from a manufacturing to a service sector economic base; some old unproductive or less productive production units go out of the market

**entry effect**—the phenomenon whereby productivity is increased as more productive companies enter the economy

**exit effect**—the phenomenon whereby productivity is increased as low productivity companies (or production units) leave the market

**gross domestic product (GDP)**—the monetary value of all the finished goods and services produced within a country’s borders in a specific time period

**growth rate per capita**—the change in the national income per person, usually taken by dividing GDP (gross domestic product) by the number of people in a country.

**growth theory**—the part of economic theory that seeks to explain (and hopes to predict) the rate at which a country’s economy will grow over time

**labor**—the factor of production that accounts for the human physical and mental effort used in creating goods and services

**production function**—relates physical output of a production process to physical inputs or factors of production

**real gross domestic product (GDP)**—a macroeconomic measure of the value of economic output adjusted for price changes (i.e., inflation or deflation)

**technological progress**—the overall process of invention, innovation and diffusion of technology or processes

**zombie firm**—a media term for a company that needs bailouts in order to continue operating, or an indebted company that is able to repay the interest on its debts but not repay the principal
Real GDP Growth Rate: 1956–2000

CROSSWORD PUZZLE

ACROSS CLUES
2. A general increase in the market value (adjusted for inflation) of the goods and services produced by an economy over time
3. The phenomenon whereby productivity is increased as more productive companies enter the economy
5. In classical economics, ________ is one of three factors of production, the others being land and labor
6. A media term for a company that needs bailouts in order to continue operating
8. The part of economic theory that seeks to explain (and hopes to predict) the rate at which a country’s economy will grow over time
9. A situation where the capital per worker is increasing in the economy
10. The incessant product and process innovation mechanism by which new production units replace outdated ones

DOWN CLUES
1. Relates physical output of a production process to physical inputs or factors of production
3. The phenomenon whereby productivity is increased as low productivity companies (or production units) leave the market
4. Period in which poorer countries grow faster compared to more wealthy countries, and thus approach a similar level of per-capita income
5. The factor of production that accounts for the human physical and mental effort used in creating goods and services
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5. The factor of production that accounts for the human physical and mental effort used in creating goods and services
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 catches 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.