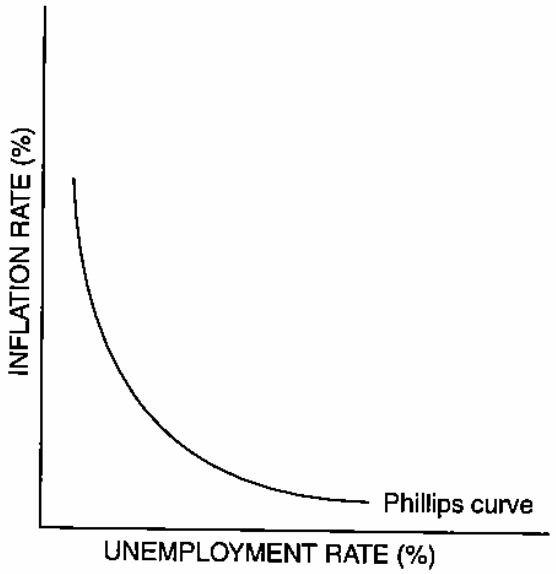
Short-Run Phillips Curve

A.W. Phillips studied the historical relationship between the rate of change in wages and the unemployment rate in the United Kingdom. In 1958 he published his findings, showing an inverse relationship between these variables. In following studies, other economists found that the inverse relationship held when a change in the level of prices (inflation) was used in place of the rate of change in wages. In other words, when inflation increased, the unemployment rate decreased; and when inflation decreased, the unemployment rate increased. A graphic representation of this trade-off became known as the *Phillips curve.*

In Figure 46.1, an example of the Phillips curve illustrates the trade-off between inflation and unemployment, or all of the different possible combinations of inflation and unemployment that exist along the curve.

Figure 46.1
Phillips Curve

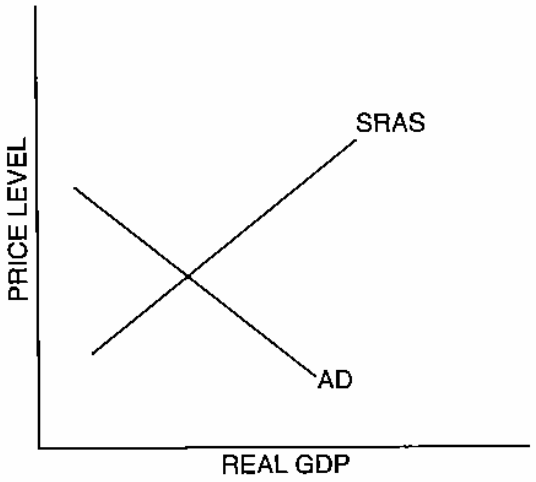


The economy of the 1960s appeared to support Phillips' hypothesis. The economy was sluggish, inflation was low and the unemployment rate was high. Since the unemployment rate was higher than the natural rate of unemployment, the economy was not operating at its potential GDP. The Phillips curve suggested to some economists that if policy makers wished to lower unemployment, the trade-off would be higher inflation.

Activity written by Joanne Benjamin, Los Gatos High School, Los Gatos, Calif.

1. Suppose government policy makers want to increase GDP because the economy is not operating at its potential. They can increase aggregate demand by increasing government spending, lowering taxes or a combination of both. Using an AD and SRAS model, draw a new AD curve that will represent the change caused by government policy designed to increase real GDP.

Figure 46.2
Expansionary Fiscal Policy



(A) What happens to the price level in the short run? _____

(B) What happens to real GDP in the short run? _____

(C) What happens to the rate of unemployment in the short run? _____

(D) The Federal Reserve can use monetary policy to try to stimulate the economy. It can encourage bank lending by _____ bonds on the open market, _____ the discount rate and/or _____ the reserve requirements.

A Phillips curve would tell the same story. Inflation is low at high levels of unemployment, but inflation begins to increase as the unemployment rate decreases. The Phillips curve is useful for analyzing short-run movements of unemployment and inflation. See Figure 46.3.

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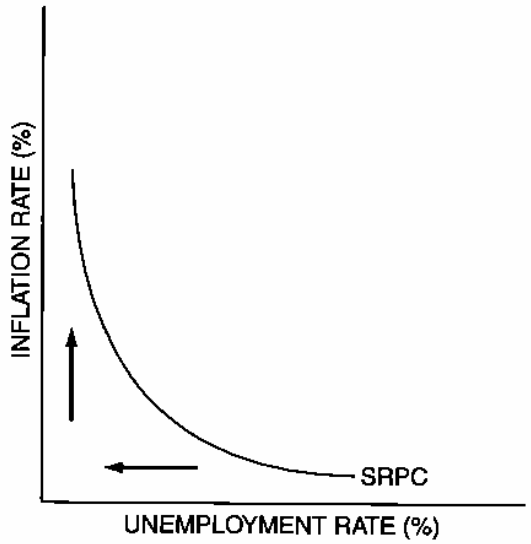
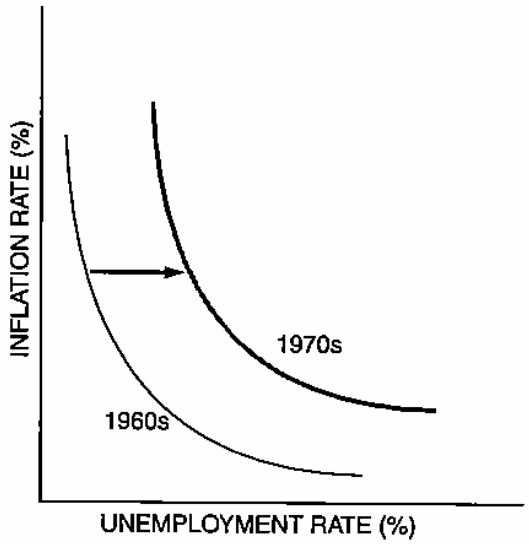
Figure 46.3
Short-Run Phillips Curve



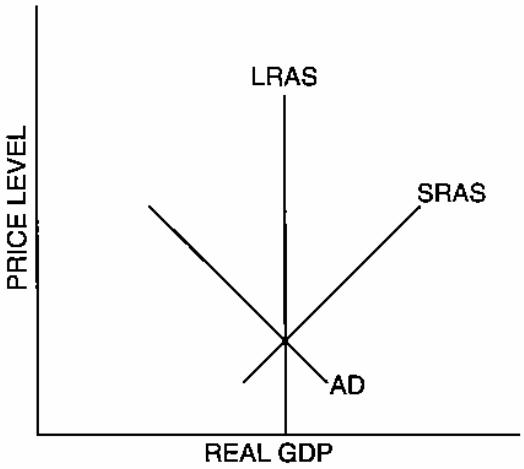
In the late 1960s, some economists such as Milton Friedman and Edmund Phelps published papers that concluded there were two Phillips curves: one for the short run and one for the long run. The controversy continued as the economy of the 1970s experienced high inflation and high unemployment at the same time. The relationship appeared to be less stable than previously thought; the short-run Phillips curve had shifted to the right.

Figure 46.4
Short-Run Phillips Curve During the 1960s and 1970s



2. Aggregate supply shocks resulting from the oil embargo imposed by Middle Eastern countries (OPEC) and worldwide crop failures helped to bring about higher inflation and higher unemployment rates. The economy, with rising prices and decreased output, was in a state of *stagflation*. Using an AD and SRAS model, draw a new SRAS curve that will represent the change caused by the OPEC oil embargo.

Figure 46.5
Effects of Oil Embargo



(A) In the short run, based on the new SRAS,

(i) what happens to the price level? _____

(ii) what happens to real GDP? _____

(iii) what happens to the rate of unemployment? _____

(B) As the economy moves to the long run,

(i) what happens to the wage rate?

(ii) what happens to the price level?

(iii) what happens to real GDP?

(iv) what happens to the rate of unemployment?

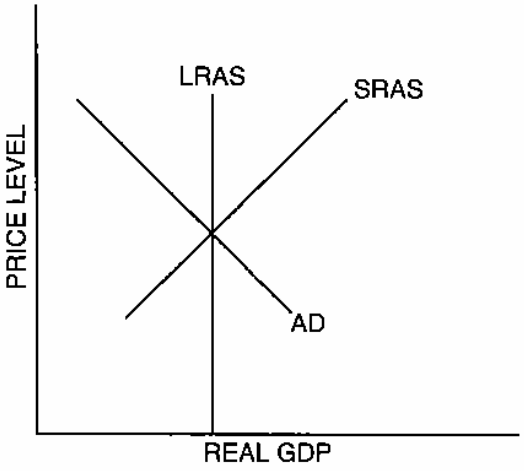
3. Use the AD and SRAS model in Figure 46.6 to show the appropriate policy response to the oil-price increases in the following instances. Be sure to show on the graph the effects of the oil-price increase.

   (A) If unemployment were the main concern of policy makers

   (B) If inflation were the main concern of policy makers

   (C) If inflation and unemployment were of equal concern

Figure 46.6
Policy Response to Oil Embargo



4. As inflation in the 1970s continued to increase, economists argued that, for a reduction in money growth to be fully effective in lowering inflation, the Federal Reserve would need to convince people it was serious about reducing money growth — in other words, the Fed would stick with a lower money growth policy until inflation decreased. Why would it be important for the Fed to establish this credibility?

5. In 1980, the unemployment rate was no lower than it had been in 1960, but inflation was much higher. Between 1980 and 1982, the economy experienced a recession and unemployment rose. Explain the general effect of a recession on unemployment and inflation. Then explain why the recession of 1980-82 was accompanied by high inflation.

6. Eventually the OPEC cartel was weakened, and energy prices decreased. Several U.S. industries, including communications and transportation, were deregulated. This caused greater competition. Explain and illustrate the effects of a weakened oil cartel and deregulation using both the aggregate demand and aggregate supply model and the Phillips curve.

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Economic Growth and the Determinants of Productive Capacity

The limit of an economy's ability to produce real goods and services is set by the quantity and quality of its basic productive resources and technology. At any given moment, an economy's total productive capacity may be fixed, but over time an economy can increase (or decrease) its capacity to produce real goods and services by increasing (or decreasing) the quantity and/or the quality of its productive resources.

An economy's productive resources can be classified in several different ways. Some of our resources are physical or tangible: things that we can see, count, weigh or measure. Other resources that are useful in the production process are intangible. Intangible resources are more difficult to identify and measure, but no less important than tangible resources.

At any given time, an economy's productive capacity is determined by the quantity and quality of its

- **Human Resources:** labor resources, but not all labor is equal. Different people have different skills, based on their investment in *human capital.* Human capital (education and skill level) and entrepreneurship are difficult to measure.
- **Natural Resources:** the gifts of nature that are useful in producing goods and services. There are fixed, exhaustible and renewable natural resources.
- **Capital Goods:** the plant, equipment and machinery needed to make other goods and services
- **Technological Progress:** when production becomes more efficient, producing more output without using any more inputs: additional capital or labor
- **Public Policy:** the basic social, economic, legal and political values and institutions supported by a society that either aid or hinder efficient markets and the production of goods and services

In practice, economic growth is usually measured by changes in real GDP or, better still, changes in real GDP per capita: gross domestic product per person adjusted for changes in prices. The rate of economic growth is the average annual percentage change in real GDP per capita. Economists use real GDP per capita to measure living standards across time and between countries.

To summarize, economic growth occurs because an economy experiences technical progress, increased investments in physical capital and increased investments in human capital. In the most fundamental sense, economic growth is concerned with increasing an economy's total productive capacity at full employment.

Adapted from Phillip Saunders, *Introduction to Macroeconomics: Student Workbook*, 18th ed. (Bloomington, Ind., 1998). Copyright 1998 Phillip Saunders. All rights reserved. Activity revised by Elaine McBeth, College of William and Mary, Williamsburg, Va.

Part A
Measuring Economic Growth in Hamilton County and Jefferson County

Figure 47.1

Year	Hamilton Real GDP	Hamilton Population	Jefferson Real GDP	Jefferson Population
1	$2.1 billion	70,000	$500,000	15
2	2.5 billion	80,000	525,000	16
3	2.8 billion	90,000	600,000	17
4	2.7 billion	86,000	650,000	18

1. Using Figure 47.1 as a reference, fill out the tables in Figures 47.2, 47.3 and 47.4.

Figure 47.2

Time period	Hamilton % Change in Real GDP	Jefferson % Change in Real GDP
From Year 1 to Year 2		
From Year 2 to Year 3		
From Year 3 to Year 4		

Figure 47.3

Year	Hamilton Per Capita Real GDP	Jefferson Per Capita Real GDP
1		
2		
3		
4		

Figure 47.4

Time period	Hamilton % Change in Per Capita Real GDP	Jefferson % Change in Per Capita Real GDP
From Year 1 to Year 2		
From Year 2 to Year 3		
From Year 3 to Year 4		

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2. When did Hamilton County experience the largest growth in real GDP? _____

   In per capita real GDP? _____

   Are these growth rates different? Explain.

3. When did Jefferson County experience the largest growth in real GDP? _____

   In per capita real GDP? _____

   Are these growth rates different? Explain.

4. The residents of Hamilton County believe they live in a wealthier community than small rural Jefferson County. Based on these numbers, do they? Explain.

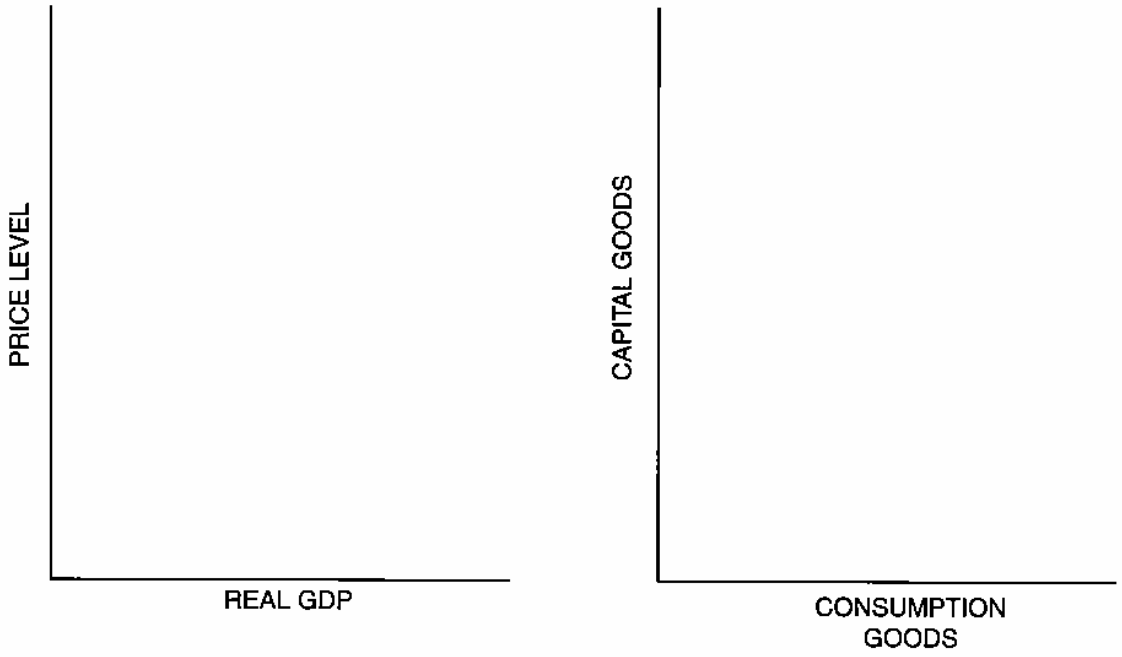
Part B

Analyzing the Reasons for Economic Growth

Economic growth can be illustrated by a rightward shift of the long-run aggregate supply curve or a shift outward of the production possibilities curve of consumption goods vs. capital goods.

5. Draw a graph that includes AD, SRAS and LRAS and then draw a graph of a PPC.

Figure 47.5
Relationship Between LRAS and PPC: Increased Investment in Education



(A) On each graph you drew, show the effect of an increased investment in education that makes the work force more productive. Explain your reasoning.

(B) Of the five factors that affect economic growth, which factor is increased by this investment in education?

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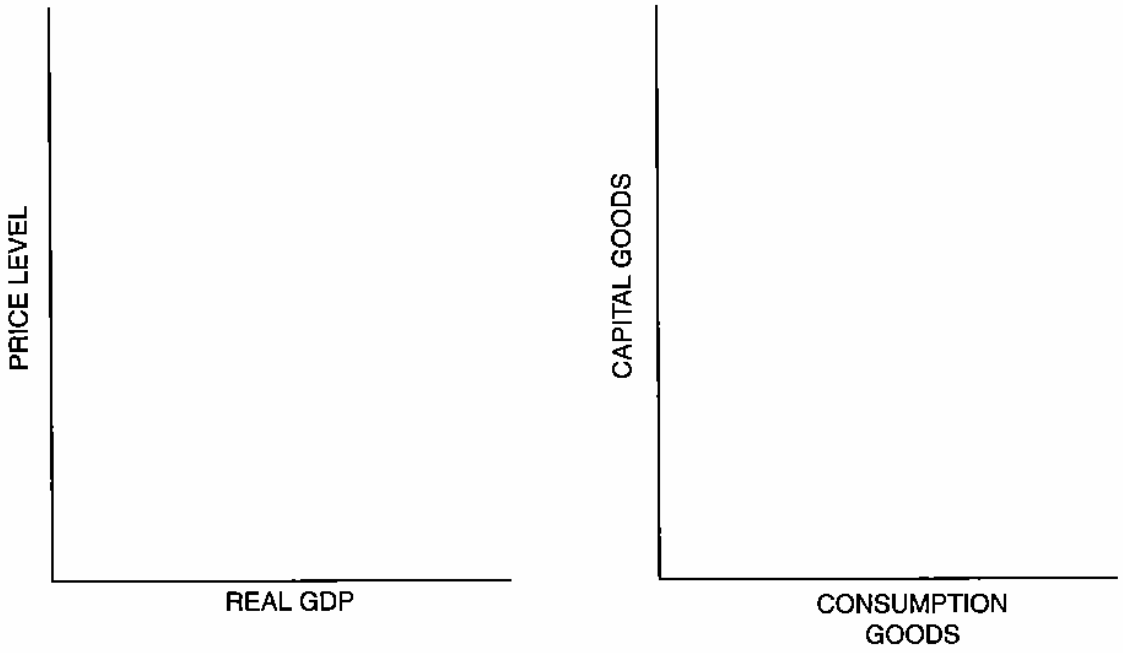
6. Explain how fewer government regulations will affect economic growth. Cite an example to support your explanation. Show the effect of fewer government regulations on the graphs in Figure 47.6.

Figure 47.6
Relationship Between LRAS and PPC: Fewer Government Regulations



7. Briefly explain how the following policies will affect economic growth and why.

   (A) Higher taxes on businesses

(B) Improvements in technology

(C) Less savings by people who want to enjoy the good life

(D) Higher productivity of labor because of improved management styles

(E) Lower interest rates