Spending = Q x P Module

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Grade Levels: 9,10,11,12

Document Type: Lesson Plans

Description:

This module explores the relationship between total spending in the economy, production, and prices. It illustrates how increases in spending generate increases in production when the economy is producing below capacity. At capacity, output cannot grow. At this point, increases in spending can only show up as higher prices or inflation.

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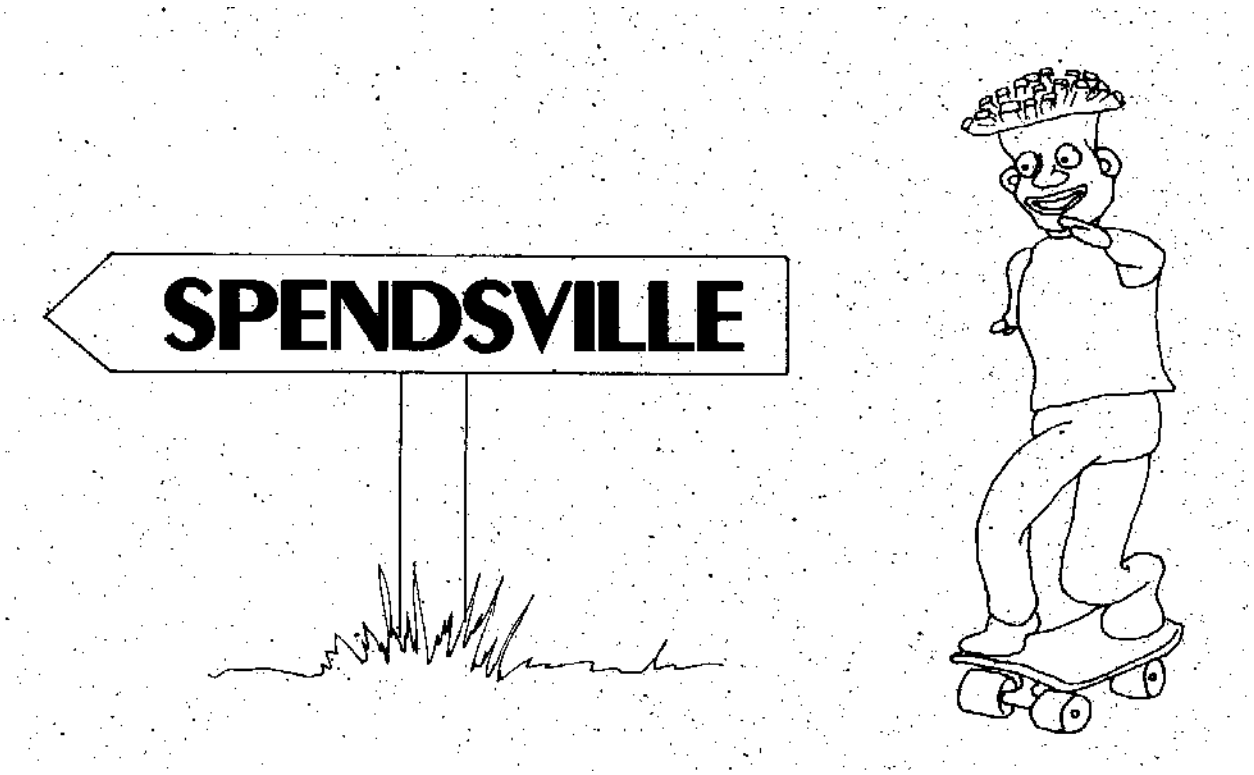

SPENDSVILLE

SPENDING = Q X P, THE CAPACITY MODULE CURRICULUM MATERIALS

THE PROGRAM

"Spending = Q x P," the Capacity Module, is part of a computer-animated series of 4 to 5 minute modules illustrating standard concepts in high school economics.

This module explores the relationship between total spending in the economy, production and prices. It illustrates how increases in spending generate increases in production when the economy is producing below its capacity level. But when the economy reaches its production capacity level, output cannot grow. At this point, increases in spending can only show up as higher prices or inflation.

To simulate this relationship in the real economy, the module follows the path of spending through the mythical town of Spendsville. Spendsville citizens shop and spend. Each dollar they spend recirculates to become someone else's income for that someone elseto spend again. Town production factories expand production to meet the increased aggregate demand for goods and services. Dollars continue to recirculate fueling the spending/economic growth cycle until the Spendsville economy overheats reaching its production capacity level. Now, prices in Spendsville can only rise in response to increases in spending. This continues until the town production factories can develop their inherent potential for increasing production.

A second sequence examines spending's relation to production and prices within the mathematical equation, Spending = Q x P.

BEFORE THE VIEWING

Explain to the class that they are going to watch a program simulating what happens in the economy when there is too much or too little spending. Specifically, the program will follow what happens to the production of goods and services and their prices. To help students understand the impact of increases in spending on economic growth and prices,lead them through the following discussion. Ask the class what they would do if their allowances suddenly tripled and they had more money to spend. Ask them what effect this increased spending would have on the stores they patronize focusing on a few popular items they frequently purchase. You may want to steer them towards a supply/demand analysis if it does not occur to them. Expand the discussion to the national economy and askwhat they think the impact would be on the economy as a whole if everyone suddenly had more money to spend.

Ask the class to look for the answers to the following questions as they view the program.

1. What happens in Spendsville as spending increases? ....to the production of goods and services? ....to prices?

2. What does it mean when the economy is overheating?
3. What does the term production capacity mean?
4. What happens in the economy when there is too much spending? ....too little spending?

AFTER THE VIEWING

Write the equation Spending = Q x P on the blackboard. Ask the class to define the variables in the equation and then review what happened in the Spendsville economy as spending increased. Incorporate the **BEFORE THE VIEWING** discussion and questions in your review. Emphasize the idea that "too much spending in the economy can lead to inflation, while too little spending in the economy can lead to a recession."Explain that the type of inflation which occurs in Spendsville is called demand-pull inflation, "too many dollars chasing too few goods." This type of inflation is characterized by the inability of production to keep up with aggregate demand which results in higher prices or inflation.

To reinforce and expand upon the economic concepts contained in the Capacity Module, assign the activities which follow to your class.

SPENDING = Q X P
ECONOMIC BACKGROUND

The Capacity Module opens with the question, "What would you do if suddenly you had more money to spend?" Most people would probably spend more on the goods and services they want. For the economy as a whole, this increase in spending generates a rise in aggregate demand for goods and services which sets in motion a cycle of events affecting production, output and eventually prices. The level of spending in the economy is important because too much spending can lead to higher prices, while too little spending may lead to higher unemployment and a reduction in business activity. This relationship between total spending in the economy, production and prices can be expressed in the mathematical equation:

$$\text{Spending} = Q \times P$$

Where Q represents the quantity of final output for all goods and services sold in the economy within a given time period and P is their average price. Thus, the product of Q x P equals the total amount spent in the economy for final goods and services within the specified time period. This product is also called the gross national productor GNP for short. GNP is defined as the sum of the money values of all final goods and services produced in the economy within a specified time period.

From the equation, we can see that when spending increases in the economy, the increase can show up as more output or higher prices. Whether an increase in spending shows up as greater output or higher prices depends on how close the economy is producing to its full capacity level. Greater spending implies an increase in aggregate demandfor goods and services. If production factories are producing below their capacity level and there are unemployed workers and idle resources available to employ, the factories can respond to this increase in aggregate demand by producing more goods and services without raising prices since their production costs haven't increased. But when the economy reaches its capacity or full-employment level, production cannot increase in response to greater aggregate demand. At this point, businesses will start raising prices in response to increased aggregate demand because output cannot grow. The result is inflation: too many dollars chasing a relatively fixed quantity of goods and services.

It is important to emphasize that a key component of this spending/economic growth cycle is the idea of money being spent over and over or recirculating. This idea isembodied in the term the "velocity" of money. The velocity of money is defined as the number of times an average dollar bill is spent for final output during a given time period. As a medium of exchange, money changes hands frequently among households, businesses and the government as they spend money. Each dollar spent in the economy becomes someone else's income for that someone else to spend again. And as each dollar recirculates, it adds to aggregate demand every time it is spent on final output. For example, the money paid to the grocer does not disappear. From the store cash register, it is spent to pay farmers for vegetables, producers for

goods to stock the grocers' shelves and the clerks'wages, who each in turn, spend this money to purchase final goods and services. Thus, these dollars recirculate over and over again adding to aggregate demand every time they are spent on final output.

In the long run, the economy will be able to expand its production capacity. How long this takes will be determined by the economy's inherent potential to add to its stock of capital, to develop new technologies, and to attract more workers into the workforce.

TOPIC: EXAMINING INFLATION ECONOMIC BACKGROUND

Inflation occurs when there is a persistent rise in the general level of prices in the economy. It is measured as a rate - the percentage increase per month, per quarter or per year. Not all prices in the economy will rise concurrently by the same amount during inflationary periods. The price of specific goods may rise or fall during inflationary times without regard to the average price level. For example, when the newspaper reports that prices, on average, have jumped 10 percent over the past year, the price of some goods may actually have increased by 15 percent or more, while others may have fallen.

Inflation decreases the purchasing power or value of money. When there is a general rise in the price level, the same amount of money will buy less. Inflation does not have to skyrocket to produce a substantial decline in the value of money.

COSTS OF INFLATION

Inflation doesn't treat everyone equally. Inflation redistributes income and wealth so certain individuals and businesses may actually gain while others will lose. For the nation as a whole, inflation creates uncertainty about the future, distorting economic decisionmaking and hampering economic growth. Inflation discourages saving while encouraging investment in speculative short-term ventures and nonproductive assets such as antiques andjewelry. Inflation uncertainty also impedes business' and industry's ability to plan and invest for the future.

People living on fixed incomes, savers, and lenders are among those who have the most to lose from inflation. During inflationary times, the cost of living increases.For many people, this increase does not present a problem because their incomes are indexed toincrease with the cost of living. They do not experience a decrease in their standard of living as inflation rises. But for those on fixed incomes, such as senior citizens living on retirement pensions, it is very difficult to increase their incomes by an amount sufficient enough to offset the decrease in the purchasing power of their money which results frominflation.

Inflation may discourage people from saving. Because the real rate of return from savings is reduced by inflation, households may be discouraged from saving. This reduction in the supply of savings diminishes the pool of money available for industry to borrow from for investment in new factories and equipment. As a result, lagging productivity in the domestic economy also reduces the competitiveness of U.S. products in the foreign market.

Those who lend money face the same dilemma as savers during inflationary times. Unless the interest rate they charge is greater than the inflation rate, their outstanding loans will be repaid in dollars that are worth less than those dollars which were originally lent. Thus, when inflation is unanticipated, short term loans offer more protection to lenders. Certain types of mortgage loans, called adjustable rate

mortgages, tie the interest rate charged for the loan to an index in order to protect lenders from rising inflation.

Borrowers and people who have the ability to increase their incomes are amongthose groups who can gain during inflationary times. Long term borrowers gain because they pay off their debts in money which is worth less than that which they borrowed. Those professions and labor groups who can easily increase their incomes during inflationary times can also benefit from inflation. Workers whose annual incomes include cost ofliving adjustments which compensate for are greater than the relative price increases of the goods they like to buy will gain from inflation.

ACTIVITIES: EXAMINING INFLATION

OBJECTIVES

Students will be able to:

1. Define inflation as a rise in the general level of prices and learn that, during inflationary times, all prices in the economy don't necessarily rise or rise by the same amount.
2. Understand the idea that inflation decreases the purchasing power or valueof money.
3. Identify who gains/loses from inflation.

ACTIVITY 1 - DEFINING INFLATION

1. Ask the class to read the Economic Background: Examining Inflation. To reinforce what they have read, lead them through the following discussion. Display Table 1 to your class. Ask the class to define inflation from the information presented in the Table. They should respond that inflation is an increase in the general levelof prices in the economy. Ask the class to take another look at Table 1 and ask them ifthey can infer any other aspects of inflation from the Table. Some students will be able to distinguish that between 1989 and 1990, the price of a double cheeseburger remained the same. Explain to the class that in the real economy, a 10% jump in prices from one year to the next doesn't usually mean that the prices of all goods will rise by 10%. During inflationary times, some prices will rise, while others may actually fall.

TABLE 1

ITEM	1989	1990
DOUBLE CHEESEBURGER	$1.89	$1.89
JEANS	$25.99	$29.99
MOVIE TICKET	$5.50	$6.00
CAR	$10,000.00	$11,000.00

ACTIVITY 2 - IMPACT OF INFLATION

1. Most of your students probably don't realize that inflation doesn't have to skyrocket to produce a substantial decline in the purchasing power or value of their money. To reinforce this idea, take a poll among your students as to how many get allowances or have part-time jobs. Ask the class to speculate as to how many years it would take for the purchasing power or value of their allowances/part-time incomes to be cut in half at a 5%, 10%, or 15% annual rate of inflation. Record their answers.

2. Explain to the class that the Rule of 72 is a mathematical formula which can be used to approximate how many years it takes for the purchasing power or value of the dollar to be cut in half at various rates of inflation. To calculate the Ruleof 72, divide 72 by the inflation rate. For example, at an annual inflation rate of 8%, it would take 72/8 or 9

years for the value of the dollar to be cut in half. In other words, at an annual inflation rate of 8%, a $1 purchase today will cost $2 in nine years or $1 will buy only half as much in nine years as it does today. Using the Rule of 72, ask the class to perform the calculations for a 5%, 10%, and 15% annual inflation rate.

3. Discuss with your students how their speculations compared with the actual calculations. How will this impact their future saving and planning decisions? Reemphasize the definition of inflation as a rise in the average price level.Further emphasize that although the prices of specific items might not increase by the same percentage as the inflation rate, the overall impact of inflation is to decrease the purchasing power of their allowance/part-time income if their income doesn't increase enough to keep up with the inflation rate.

4. Expand the discussion to incorporate which groups in our economy are most likely to lose or gain from inflation and why.

ACTIVITY 3 - WHO GAINS, WHO LOSES FROM INFLATION?

1. To reinforce what students have read in the Economic Background: Examining Inflation and the concepts presented in the preceding Activities, distribute copies of the Handout, **Who Gains, Who Loses from Inflation?**

ACTIVITY 3

WHO GAINS, WHO LOSES FROM INFLATION?

Practice your inflation reasoning by determining whether or not each group/individual listed in the chart below is most likely to gain or lose from unanticipated inflation. Explain your reasoning.

GROUP	GAIN/LOSE	REASONING
United Auto Workers negotiate a hefty annual cost of living adjustment as part of their new contract.		
A savings and loan association which has a loan portfolio consisting mainly of low interest, fixed rate loans.		
A recently married couple buys their first house with an adjustable rate mortgage.		
A high school freshman plans to save $3,000 over the next four years in a passbook savings account to pay for a trip to Europe when she graduates.		
Spendsville, USA sells municipal bonds to finance a new skateboard amusement park.		
A retired consultant living on a fixed pension.		
ABC Manufacturing borrows one million dollars, on a 20 year loan, to finance a new plant.		
A British Corporation negotiates a contract to purchase U.S. computer equipment at current U.S. prices over a 5-year period. The inflation rate remains relatively stable in Britain over the 5-year period.		

GROUP	GAIN/LOSE	REASONING
United Auto Workers negotiate a hefty annual cost of living adjustment as part of their new contract.	Gain	The annual cost of living adjustment will most likely keep up with or possibly be greater than the actual rate of inflation.
A savings and loan association which has a loan portfolio consisting mainly of low interest, fixed rate loans.	Lose	The loans will be repaid in dollars that are worth less than the dollars originally loaned.
A recently married couple buys their first house with an adjustable rate mortgage.	Lose	The couple's martgage payment will increase as interest rates rise with inflation.
A high school freshman plans to save $3,000 over the next four years in a passbook savings account to pay for a trip to Europe when she graduates.	Lose	Generally, passbook savings accounts pay a low interest rate which does not keep up with inflation. Unless the student has included in her travel budget an andustment for inflation over the next four years, her $3,000 will be worth less than she anticipated and she might not be able to financer her trip.
Spendsville, USA sells municipal bonds to finance a new skateboard amusement park.	Gain	If inflation is unanticipated, Spendville will pay off its debt with dollars that are worth less than the amounbt originally borrowed.
A retired consultant living on a fixed pension.	Lose	The purchasing power of his fixed pension will fall as a result of inflation.
ABC Manufacturing borrows one million dollars, on a 20 year loan, to finance a new plant.	Gain	If inflation is unanticipated, ABC will repay its loan in cheaper dollars.
A British Corporation negotiates a contract to purchase U.S. computer equipment at current U.S. prices over a 5-year period. The inflation rate remains relatively stable in Britain over the 5-year period.	Gain	Even though the price of U.S. computer equipment will rise, the British Corporation negotiated a fixed 5-year contract so they don't have to pay higher prices for their purchases.

TOPIC: THE EQUATION OF EXCHANGE, M X V = Q X P ECONOMIC BACKGROUND

The Federal Reserve, our nation's central bank, conducts monetary policy based upon the assumption that an important relationship exists between the amount of money circulating in the economy, the production of goods and services and the price level. Spending = Q x P is the second half of a simple equation, called the equation of exchange, which economists use to explain this relationship. Total spending in the economy links the twohalves of the equation. Bringing the two halves together, the equation of exchange is expressed as:

$$M \times V = Q \times P$$

Where M equals the total amount of money circulating in the economy and V equals the velocity of money or the number of times an average dollar changes hands during a given time period. Q equals the quantity of final output sold in the economy withina given time period and P is their average price. Simply stated, the equation of exchange tells us that the total amount of money spent in the economy for final output equals the total amount of money received in the economy for final output.

The equation of exchange is a useful economic framework for understanding howmonetary policy works. If we assume that V is relatively stable* and that Q has reached its production capacity level, then a sustained increase in the money supply will put upwardpressure on prices. When the growth of the money supply decreases, the inflation rate will fall and prices will stabilize or possibly even decrease. It follows that during a recession,the Federal Reserve will try to decrease the money supply to stimulate spending and production. During inflationary times, the Fed will try to decrease the money supply to put downward pressure on prices to lower inflation. The essential steps to trace this relationship between the amount of money circulating in the economy, production and prices are:

(*) Economists debate how stable and predictable the velocity of money actually is. In the short-run, the velocity of money is erratic and unpredictable. Even so, the equation of exchange is a useful economic framework for understanding the relationship between the money supply and the price level. Although many factors may contribute to inflation in the short run because of the instability of velocity, economists generally agree that inflation can only be sustained in the long run if the money supply is allowed to grow at a faster rate than the growth of output.

1. An increase in M or the money supply implies that some individuals and businesses have more money.

2. Some of this additional money exceeds what these businesses and individuals normally keep on hand. As a result, they will spend some or all of their excess money.

3. This increase in spending generates an increase in aggregate demand for goods and services. Over a period of about 12 months, the economy responds to greater spending by producing more goods and services (Q) if it is operating below its production capacity level.

4. At some point, the economy will reach its production capacity level. That is, it will become increasingly difficult to find more workers and other idle resources to employ to increase production at factories operating close to their peak levels. Theeconomy has reached its capacity utilization limit. When the economy enters this zone, wages and other operating costs begin rising, which causes prices to increase in response to greater aggregate demand.

5. Beyond the capacity utilization limit, increases in spending show up entirely as rising prices, that is, inflation.

6. In the long run, the economy will be able to increase its capacity utilization limit, but it will take time to build new factories, develop new technologies, and to trainmore workers.

ACTIVITY 1 - APPLYING THE EQUATION OF EXCHANGE

OBJECTIVES

Students will be able to use the equation of exchange as an economic model for understanding inflation and how monetary policy works.

1. Explain to your students that Spending = Q x P is only one-half of the economic picture. The complete picture includes an explanation of how the amount of money circulating in the economy relates to spending, production and prices. Write the equation M x V = Q x P on the blackboard and indicate that this equation summarizes this relationship. Define the variables, emphasizing that M x V equals the total amount of money spent in the economy on final output in a given year, (M x V = Spending). Total spending in the economy, in turn, reflects the quantity of goods and services purchased times their average price, (Spending = Q x P)*.

(*) M x V = Spending, The Velocity Module, outlines a more in-dept discussion of the equation of exchange and the velocity of money.

2. Display or handout copies of the "too many dollars chasing too few goods" diagram. Explain that the diagram depicts the type of inflation characterized in Spending = Q x P, demand-pull inflation. To reinforce the definition of demand-pull inflation, review inflation in the Spendsville economy emphasizing two major points: 1) Production in Spendsville could not keep up with aggregate demand which put upward pressureon prices causing inflation. 2) Sustained growth of the money supply beyond the economy's capacity to produce leads to inflation. Incorporate into your discussion where the changes in the money supply come from to influence spending. Banks create money as they recycle their deposits and create new checkbook dollars.TheFederal Reserve increases and decreases the money supply primarily through the buying and selling of government securities in the open market.

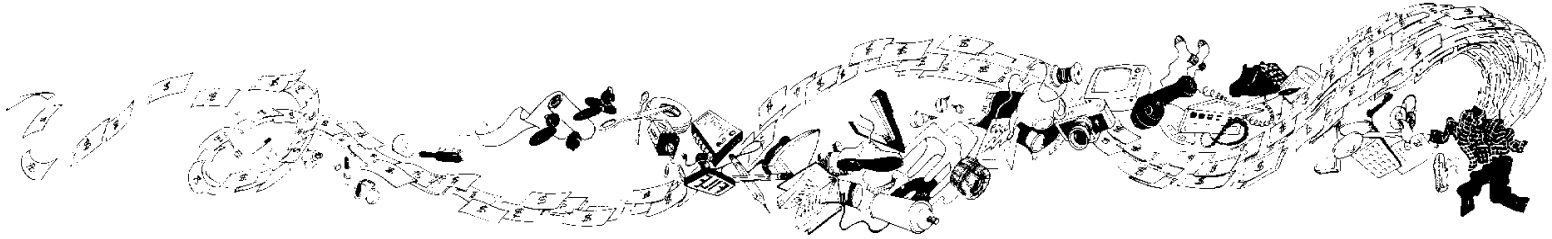
3. To reinforce the concepts presented in the discussion, distribute the Handout, **Applying the Equation of Exchange,** to your class.

As the money supply increases . . .

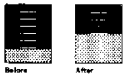
The economy responds in the short term . . .

But the economy has a limited capacity . . .

And eventually prices go up.



Money Supply Increases and . . .

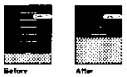


An increase in the money supply provides people with more money.

Spending Increases.

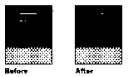
When people have more money, they generally spend more. Spending increases.

Output Increases and . . .



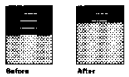
Over a year or so, the economy responds to increased spending by producing more goods and services.

Prices Remain Unchanged.



Initially prices do not increase.

Money Supply Increases and . . .

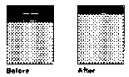


For awhile, the economy meets further increases in money and spending by producing more goods and services.

Output Increases to Capacity.

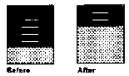
At capacity, all land, labor and capital are fully employed. When the economy reaches the limit of its capacity to produce, the amount of goods and services cannot increase.

Money Supply Increases and . . .



If money continues to increase, the additional spending it generates can only be met by higher prices for goods and services. Prices rise.

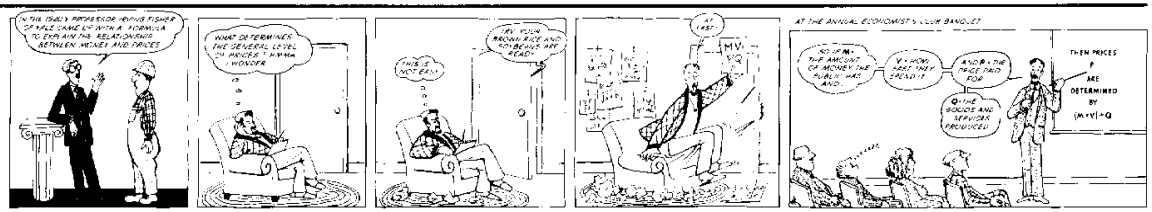
Prices Increase.



This is the classic case of "too many dollars chasing too few goods".

"Too Many Dollars Chasing Too Few Goods"

Excerpt from the "World of Economics" Lobby Exhibition



ACTIVITY 1 APPLYING THE EQUATION OF EXCHANGE M X V = Q X P

M x V = Q x P, the equation of exchange, describes the relationship between the amount of money circulating in the economy, production and prices. Where,

M = the total amount of money circulating in the economy
V = the number of times the average dollar is spent in a given year
Q = the quantity of final output sold in the economy in a given year
P = the average price of all final output sold in a given year (the general price level).

The Federal Reserve conducts monetary policy based upon the assumption that an important relationship exists between the amount of money circulating in the economy and the price level. The equation of exchange is a useful guide for understandinghow the Federal Reserve conducts monetary policy. To learn more about the equation ofexchange and its application to monetary policy, please answer the following questions:

PART 1 - THE EQUATION OF EXCHANGE, M X V = Q X P

1. Assume in our simplified economy, that M = $600, V = 4, Q = 300 units, and P = $8.00.

Therefore, the amount of money spent for final output in the economy in a given year = _____.

The amount of money received for final output in the economy in a given year = _____.

2. If M increases to $1200, V remains constant at 4, and the economy is producing at its capacity level so that Q = 300 units, what will happen to the price level, P?Why?

3. If M increases to $1200, and the economy is producing at full capacity so that Q = 300 units, what will happen to the price level, P, if V drops to 2? Why?

4. If M increases to $12000, V remains constant at 4, and output, Q, increases to 600 units, what happens to the price level, P? Why?

5. a. When are increases in the money supply inflationary? Explain your answer in terms of the equation of exchange.

b. Are there any situations in which increases in the money supply are not inflationary? Explain your answer in terms of the equation of exchange.

PART II - THE EQUATION OF EXCHANGE AND MONETARY POLICY

You've been asked to help formulate monetary policy. What recommendations would you make to the Chairman of the Federal Reserve Board based on each statement presented below.

1. Recent economic evidence suggests that the economy may be overheating and growing too rapidly. The economy is producing near its full capacity level with the velocity of M2 increasing.

2. Real GNP growth for the 3rd and 4th quarters has been sluggish with unemployment rising steadily and the velocity of M2 falling. Although inflation surged briefly during the first half of the year, it has remained relatively constant since.

ACTIVITY 1

APPLYING THE EQUATION OF EXCHANGE
M X V = Q X P

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PART I - THE EQUATION OF EXCHANGE, M X V = Q X P

1. Assume in our simplified economy, that M = $600, V = 4, Q = 300 units, and P = $8.00.

Therefore, the amount of money spent for final output in the economy in a given year = $2,400.00.

The amount of money received for final output in the economy in a given year = $2,400.00.

2. If M increases to $1200, V remains constant at 4, and the economy is producing at its capacity level so that Q = 300 units, what will happen to the price level, P?Why?

The price level will double to $16.00. Since the economy is producing at its capacity level, output cannot grow to keep up with aggregate demand. Therefore, priceswill rise in response to the increase in the money supply.

3. If M increases to $1200, and the economy is producing at full capacity so that Q = 300 units, what will happen to the price level, P, if V drops to 2? Why?

The price level will remain the same, $8.00. The increase in the money supply was offset by a decrease in the velocity of money. Even though people had more money to spend, they spent it less frequently.

4. If M increases to $1200, V remains constant at 4, and output, Q, increasesto 600 units, what happens to the price level, P? Why?

The price level will remain the same, $8.00. Since the economy was able to expand its production capacity, output could increase as the increase in the money supply triggered increases in spending and aggregate demand.

5. a. When are increases in the money supply inflationary? Explain your answer in terms of the equation of exchange. If the economy is producing at full capacity and velocity is relatively constant, then increases in the money supply will show up as higher prices or inflation.

b. Are there any situations in which increases in the money supply are not inflationary? Explain your answer in terms of the equation of exchange. If the velocity of money falls to offset increases in the money supply and ifthe economy is producing below its capacity level.

PART II - THE EQUATION OF EXCHANGE AND MONETARY POLICY

You've been asked to help formulate monetary policy. What recommendations would you make to the Chairman of the Federal Reserve Board based on each statement presented below.

1. Recent economic evidence suggests that the economy may be overheating and growing too rapidly. The economy is producing near its full capacity level with the velocity of M2 increasing.

Decrease the money supply

2. Real GNP growth for the 3rd and 4th quarters has been sluggish with unemployment rising steadily and the velocity of M2 falling. Although inflation surged briefly during the first half of the year, it has remained relatively constant since.

Increase the money supply

TOPIC: INFLATION AND CAPACITY ECONOMIC BACKGROUND

Economists generally agree that when the economy grows too rapidly, it is cause for alarm because of the possibility of inflation. The capacity utilization rate is onemeasure economists follow to judge whether or not the economy is overheating or growing too rapidly. The capacity utilization rate measures how much of industry's resource capacity for producing goods is being employed.

Economists have identified an equilibrium level of capacity utilization that is associated with a constant rate of inflation. In other words, when our nation's factories operate at rates above this equilibrium level, inflation takes off, and below it, inflation

falls. Economists have determined the equilibrium capacity rate or level to be approximately 82 percent. In actuality, there exists a range or zone of rates hovering around 82 percent within which the equilibrium level will fall.

Research indicates that, since 1954, the equilibrium capacity utilization rate at which inflation neither rises or falls, has tended to remain relatively constant within the 82 percent zone up until the mid 1980's. The exceptions to this general tendency can be traced to outside shocks, such as the 1972 wage and price controls and the 1975 OPEC price changes.

ACTIVITY: GRAPHING INFLATION AND CAPACITY

OBJECTIVES

Students will gain experience graphing and interpreting economic data relatedto inflation and production capacity.

1. Review with your class what it means when the economy reaches the limits of its production capacity. When the economy is producing at capacity, the resourcesof production, land, labor and capital, are fully employed and production cannot increase. Expand upon this definition to explain what economists mean by the term capacity utilization rate - this rate measures how much of the economy's resource capacity for increasing production is being employed.

2. Distribute a copy of the Handout, **Graphing Inflation and Capacity.**

ACTIVITY 1 GRAPHING INFLATION AND CAPACITY

The capacity utilization rate is one indicator economists use to judge whether or not the economy is overheating or expanding too rapidly. This rate measures how much of the economy's resources of production, land, labor and capital, are being used toproduce goods and services.

Economists have found that when the capacity utilization rate is approximately 82%, inflation is stable, it neither rises nor falls. This is called the equilibrium capacity utilization rate. Above this 82% rate, inflation takes off, below 82% inflation falls. From the information presented in the tables below, graph the inflation and capacity utilization rates from 1975 to present and answer the questions which follow.

TABLE 1
INFLATION AND CAPACITY(*)

Year	Capacity Utilization Rate(**) (percent)	GNP(***) Implicit Price Deflator (year to year percent change)
1975	73.2	9.8
1976	78.5	6.3
1977	82.8	6.7
1978	85.1	7.3
1979	85.4	8.8
1980	80.2	9.1
1981	78.8	9.6
1982	72.8	6.5
1983	74.9	3.8
1984	80.4	3.8
1985	79.5	3.0
1986	79.0	2.6
1987	81.4	3.1
1988	83.9	3.3
1989	83.9	4.1
1990	82.3	4.1

(*) Source: Economic Report of the President, 1991.

(**) Capacity Utilization in manufacturing.

(***) The GNP Implicit Price Deflator is a comprehensive measure of the overall inflation rate. It is defined as the ratio of nominal GNP to real GNP. It tells us how much of any change in the average price of all final goods and services included in our economy's GNP is due solely to a change in prices.

Graphing Inflation and Capacity - Continued

1. During which years did inflation tend to rise? Fall? Remain relatively stable?

2. What happened to the capacity utilization rate when the rate of inflation was rising? Falling?

3. From your answers to questions 1 and 2, what can you conclude about the relationship between the rate of inflation and the level of capacity utilization?

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GRAPHING INFLATION AND CAPACITY

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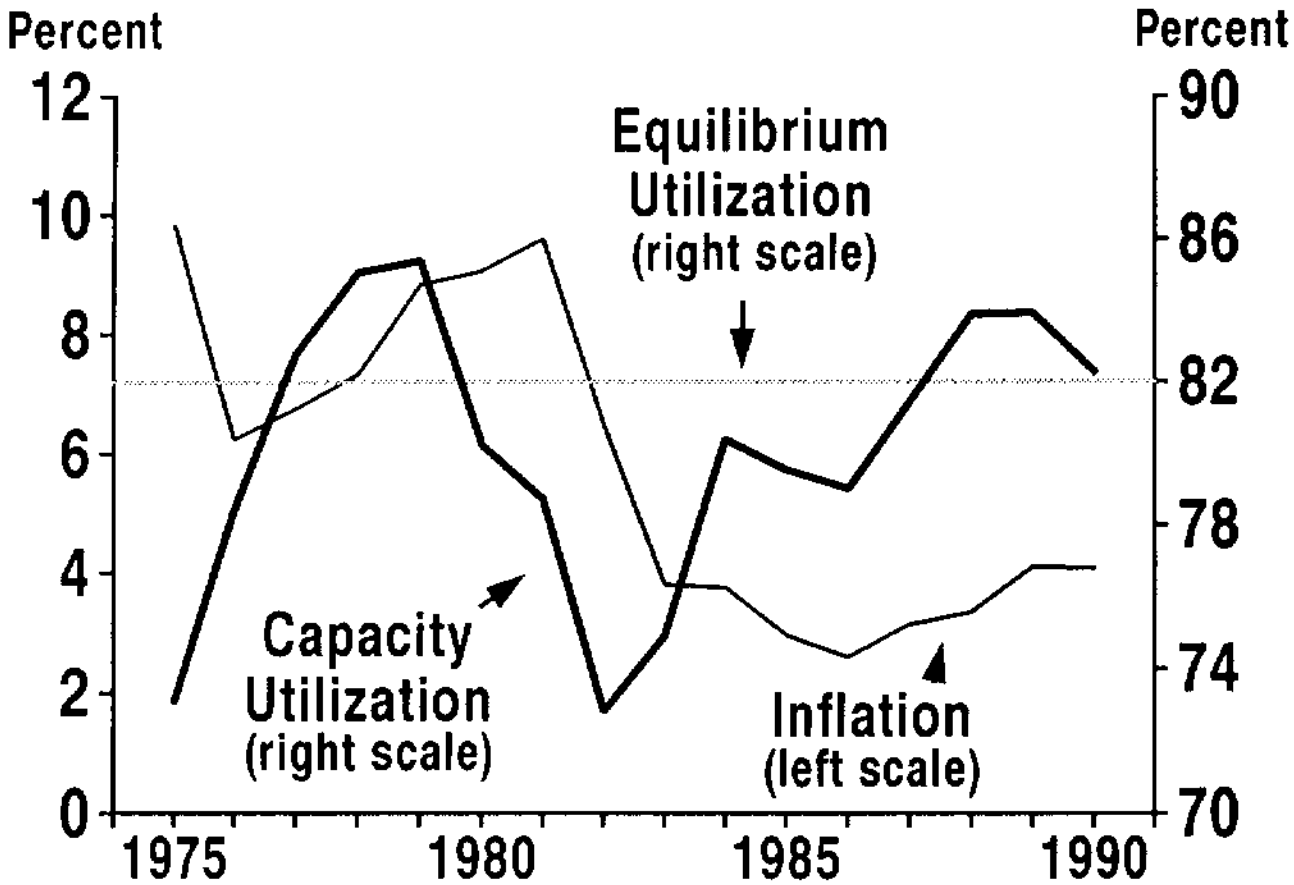
Graphing Inflation and Capacity - Continued

1. During which years did inflation tend to rise? Fall? Remain relatively stable?
Inflation rose steadily from 1976 to 1981 and then dropped steadily until 1986 when it began increasing again. From 1988 to 1990, inflation tended to remain relatively stable.

2. What happened to the capacity utilization rate when the rate of inflation was rising? Falling?

During the periods when inflation was rising, capacity utilization rates tended to exceed 82%. During the periods when inflation was falling, the capacity utilization rates tended to be less than 82%.

3. From your answers to questions 1 and 2, what can you conclude about the relationship between the rate of inflation and the level of capacity utilization?

Generally, there is a tendency for inflation to decline when the capacity utilization rate is below the 82% equilibrium level and to increase when the economy is operating at capacity utilization rates above this 82% level. When the economy is operating at capacity rates near 82%, the rate of inflation remains relatively constant.

Inflation and Capacity Utilization