

WHERE ECONOMISTS WORK AND WHAT THEY DO

Learning Objective 4:
explain what economists do

Economists work in many aspects of business and government. You will find economists

- working in private firms such as insurance companies, large manufacturing companies, banks, unions, service associations, telephone companies, etc.
- teaching in high schools, colleges, and universities
- working in different departments of government and government agencies
- employed as researchers in various research institutions
- working for a variety of non-profit organizations
- working for themselves as consultants
- working for international organizations and agencies such as the United Nations, the World Bank, and the International Monetary Fund.

You have a good idea of what your economics instructor does. But what other kinds of jobs do economists do? A large corporation such as General Motors or your telephone company might hire economists to estimate the demand for its products or to figure out what effects a change in price will have on its profits. A bank might employ economists to forecast interest rates or the demand for loans. The federal government or a provincial government might hire economists to determine the effects of certain taxes on the government's revenue and on the level of economic activity. Finally, a union might employ economists to study matters relating to wages and employment. Economists serve as presidents, vice-presidents, general managers, and executives of a wide variety of organizations.

THE SCIENTIFIC METHOD

Learning Objective 5:
the nature of scientific inquiry

There is a certain appeal to anything that is said to be "scientific." This is perhaps due to the fact that we are living in a scientific age. In our definition of economics, we used the term science, but is economics really a science? We shall answer this question in this section.

Before we can determine whether or not economics is a science, we must understand the meaning of science and the scientific method. Everyone knows that economics is not a science like physics or chemistry are sciences. Physicists and chemists can conduct controlled laboratory experiments, while economists and other social scientists cannot. Science refers to a particular method of inquiry: **the scientific approach or method** is the systematic investigation and observation of phenomena and the formulation of general laws or tendencies therefrom, after testing and verification of hypotheses. We can discuss the main elements of the scientific approach under the headings of observation and measurement, formulation of hypotheses, and verification.

Scientific investigation comprises observation and measurement, the formulation of hypotheses, and verification.

OBSERVATION AND MEASUREMENT

One of the basic tasks of scientists is to observe, measure, and record facts about what they are investigating. This is the descriptive or **empirical** aspect of science. In order to facilitate this aspect of their work, scientists use certain technical terms which have very precise meanings. The development of such a particularized vocabulary is an important step in the development of any field of scientific inquiry. Scientists must also exercise judgment in gathering information or facts relevant to the phenomenon that they are trying to explain.

Empirical: descriptive; as in observed, measured and recorded.

Hypothesis: an expression of the relation among variables.

HYPOTHESES

The next task of scientists is to specify some relations among the variables that have been selected for investigation. Such specifications are called **hypotheses**. A hypothesis is not a statement about some fact that has been observed, but a statement about something that is observable. For example, the statement "Sixty students passed the economics examination" is not a hypothesis, but a statement about a fact that has been observed. On the other hand, the statement "If two extra review classes are given, at least sixty students will pass their economics examination" is a hypothesis. Student performance in an examination following review classes is observable. Note that the latter statement (the hypothesis) can be tested by giving (or not giving) two extra review classes and then observing the results. The statement "Review classes should be given before a final examination" is not expressed in a testable manner, because it does not express any specific relationship. A hypothesis must be stated in a testable (verifiable) manner so that it can be confirmed or disproved.

VERIFICATION

Once scientists have formulated their hypotheses, they proceed to test these hypotheses to see the extent to which they are supported by empirical evidence. Relating questions to evidence sets scientific inquiry apart from other types of inquiry.

ECONOMIC METHODOLOGY

Model: A simplified version of reality that facilitates our understanding of complex economic relations.

Learning Objective 6: how economists study the economy

We have now examined the basic components of the scientific method. Our next task is to see how economists follow the scientific approach in their attempt to explain economic phenomena. The factors involved in real-world economic events are often quite complex. The scientific economist comes to grips with these complexities by constructing models. Simply stated, a **model** or theory is an abstraction from the real world and consists of the factors that appear to pertain most to what is being studied. Details that do not pertain directly to the question that is being studied are simply stripped away in the model. The principle of stripping away irrelevant detail is often referred to as the principle of Occam's razor, named after the fourteenth-century philosopher William Occam.

Economists use models in much the same way that engineers use them. An engineer who has the job of building a bridge would, most likely, design a model before building the real thing. The model allows the engineer to study certain aspects of the bridge before it actually exists. For example, the model bridge could give information about how the actual bridge would look, how it would accommodate traffic, and what modifications might be necessary to make it safe. Similarly, economists construct and use economic models to understand how the real economy works.

The following example will help to illustrate how economists use models. People can travel from point A to point B either by air, which takes 50 minutes, or by car, which takes 4 hours. Let us assume that people are alike in terms of their preference for air travel and car travel, and that, except for the time factor, one mode of transportation is just as good as the other. What kind of people will be likely to fly, and what kind will be likely to travel by car? One of the factors that would influence a decision to travel by air or by car would be the cost involved. But here we are not talking only about the price of the plane ticket, or the price of gas and oil, and wear and tear on the car. We must consider also the cost of time. To a passenger who earns \$50.00 an hour, the cost of his or her time is estimated at \$50.00 an hour. To a passenger who earns \$10.00 an hour, the cost of his or her time is estimated at \$10.00 an hour. The greater the cost of your time, the less time you will want to spend travelling. The model predicts that the more you earn, the more

likely it is that you will fly. On this basis, a decision could be made to start a plane service from A to B if there were many high-income earners travelling between points A and B.

An economic model or theory may be expressed verbally, mathematically, or graphically. Whatever form an economic model takes, it has the following components: a set of definitions, a set of assumptions, one or more hypotheses, and one or more predictions or generalizations. Let us briefly discuss each component in turn.

Definitions, assumptions, hypotheses, and predictions are important aspects of a model.

Definitions identify the model's variables.

Assumptions describe the model's operating conditions.

Ceteris paribus: other things being equal.

An economic prediction is general while an economic forecast is more specific.

Definitions

The various terms and phrases that economists use must be clearly defined. Economists have developed an impressive number of terms and concepts that form a part of the specialized language or jargon of the discipline. As you work through this book, many of the terms and concepts that are a part of the economist's vocabulary will become familiar to you. The main purpose of the set of **definitions** is to identify the variables of the model so that measurement can be facilitated. For example, it would be extremely difficult to measure the amount of consumer spending in an economy if that variable were not clearly defined.

Assumptions

Assumptions are statements about the conditions under which the model operates. Basically, we usually make two types of assumptions in economic theory. One type of assumption relates to what motivates economic behaviour – for example, the objectives of consumers and producers. It is assumed that consumers try to maximize satisfaction, whereas firms try to maximize profit. Another type of assumption made in economic theory is aimed at simplifying the task of economists. For example, if economists are not currently concerned with an economy's external trade relations, they may simplify their analyses by assuming that the country does not engage in trade with the rest of the world. Abstractions of this nature are necessary because of the complexities of the real economy. An assumption of particular importance in economic theory is the idea of ***ceteris paribus***, which means *other things being equal*. By assuming that other things are equal, economists keep all other factors constant while investigating a particular relation. We shall look at this assumption more fully in a later section.

Hypotheses

We have already briefly discussed hypotheses. Recall that hypotheses specify the relations between variables. Economists have formulated a number of important hypotheses, many of which will be introduced throughout this book.

Predictions

We formulate theories so that we can make predictions with them. Economic predictions usually take the form, "If you do this, then such and such will result." Economic prediction should not be confused with economic forecasting. Economic forecasting assigns future values to certain economic variables on the basis of known relations. An **economic prediction** is a statement about the general direction of events resulting from fulfillment of certain conditions, while an **economic forecast** gives us the specific value expected for a particular variable. The following examples help to illustrate the difference between a prediction and a forecast.

Prediction: If the rate of interest increases, the level of investment spending will fall, other things being equal.

Forecast: By the end of the year, the rate of unemployment will rise to 15%.

Economists, in attempting to explain economic events, follow the scientific procedure outlined above. They gather information, analyze it, and select what they consider to be most relevant. They formulate and test hypotheses and thus arrive at general statements or laws concerning economic phenomena. Economics, therefore, has a legitimate claim to be considered a science.

THE GOODNESS OF A MODEL

When is an economic model or theory considered to be "good"? The whole purpose of an economic model is to explain some aspect of economic reality and to predict certain outcomes. A model that does this well is a good model. If model A explains and predicts economic phenomena better than model B does, then model A is judged to be better than model B. If a model fails to explain what we observe (that is, reality), then it may be rejected.

The use of computers has enabled economists to manipulate huge amounts of data in an incredibly short time. Thus, it is relatively easy to test economic theories against observed phenomena. The branch of economics that deals with the use of statistics to test economic theories is called **econometrics**. This has become such an important branch of economics that most schools require their economics majors to take at least one course in economic statistics or econometrics.

The goodness of a model depends on how well it explains and predicts reality.

Econometricians use statistics to test economic theories.

POSITIVE AND NORMATIVE ECONOMICS

Learning Objective 7: the difference between positive and normative economics

Positive statements are statements of facts expressed in a testable (verifiable) manner.

Normative statements are value judgements about what ought to be.

Before we continue, we must make sure that we understand the difference between positive and normative statements. This will help us to distinguish between positive and normative economics. Economists conduct both positive and normative analyses. **Positive statements** are about *what is*. A positive statement is a statement about some fact, and is therefore conceptually verifiable. The statement that the student population of your school is 5000 is a positive statement, even if your school has only 3000 students. The point is, it is a statement about some fact – the student population. The statement can be verified (or disproved) by the simple process of counting. Note that a positive statement may be true or false. Since a positive statement relates to facts, it can be verified (or disproved) by examining the facts. A statement such as "an increase in the money supply will lead to a higher rate of inflation" is an example of a positive statement in economics.

On the other hand, **normative statements** are value judgements or statements of opinion about *what ought to be*. Normative statements cannot be verified by examining the facts. A statement such as "the money supply should be reduced" is a normative statement. Try to compose examples of your own to illustrate the distinction between positive statements and normative statements.

Obviously, normative statements are not scientific because they cannot be subjected to empirical testing. This does not suggest that the scientific economist is never concerned with normative issues. In fact, concern with the normative aspect of economics is a major focus for disagreement among economists. Most economists, for example, would agree on the effects of a tax on textbooks, but would likely disagree on whether a tax *should* be imposed. Value judgements, though not scientific, are therefore important. Economists should indicate, however, when they are dealing with positive statements and when they are dealing with matters of opinion.

This discussion of positive and normative statements should help us to understand the difference between positive and normative economics. **Positive economics** deals with the behaviour of economic units and with the operation of the economic system. Positive economics attempts to explain what will happen under certain conditions, but does not

Positive economics is the study of the state of the economy.

Normative economics suggests what the economy should be.

explain what the economic situation ought to be. It does not seek to make any judgments about whether the result of any economic action is good or bad. The concern of positive economics is to describe the economic system as it is and how it actually works. What causes the prices of television sets to rise? What are the effects of the GST? How has the Canada-U.S. trade agreement affected employment in Canada? These types of questions fall within the subject of positive economics.

Normative economics is concerned with what the economic situation ought to be. It attempts to judge whether economic outcomes are good or bad, and to what extent they can be improved. Should the Government of Canada invest public funds in an airline company to keep it in business? Should the government sell some of its property? Should farmers be subsidized? Should the price of milk be set by government? Should there be a ceiling on the amount of profits that foreign firms are allowed to take out of Canada? Normative economics deals with answers to such questions. Note that the issues of normative economics are policy-oriented.

Obviously, normative economics often relies heavily on positive economics. Let us consider the following normative economic issue: Should Canada remain a part of the North American Free Trade Agreement? One could conceivably answer this question on the basis of emotion, but an answer based on an economic analysis of the situation would probably be preferable. What are the likely benefits of this agreement? What are the costs? Answers to these positive questions will help to answer the normative question about the trade agreement.

DISAGREEMENT AMONG ECONOMISTS

Learning Objective 8: the reasons for disagreement among economists

It is probably normal to expect economists to disagree about normative economic issues. They have different values, and they judge economic situations and events differently. When economists are asked to make judgments about some economic action, they may try to be objective, but their objectivity might be coloured by their own sense of what is right and what is wrong. One economist might argue that cigarette smoking is bad for your health, hence a heavy tax should be imposed on cigarettes in order to discourage smoking. Another economist might take the position that there are other products that are also dangerous — why single out cigarettes? The same economist might argue, moreover, that if people want to smoke cigarettes, it is their business and that the government has no right to interfere with a person's lifestyle.

Economists disagree because they have different values, and because they use different models.

It is not only on normative issues, however, that economists disagree. They also disagree over the positive, scientific aspects as well. Often, there are different explanations of how the economy operates, and it is not always clear which explanation is best. In other words, economists may disagree over the appropriate model of the economy. One would think that it should be easy to settle the disagreement simply by confronting the theory with the data. Unfortunately, the available data might not be such as to allow definitive conclusions.

Economists may also disagree about quantities, even when they use the same model.

Economists may disagree even though they use the same economic model. They may agree over the qualitative aspects, but disagree over the quantitative aspects. Two economists might agree that a fall in interest rates will increase investment. They might disagree, however, over the magnitude of the increase, one claiming that it will rise only slightly, the other claiming that the increase will be significant. Again, this type of disagreement may be prolonged because of the lack of relevant data.



PROBLEM SOLVING 1-3

If economics is so scientific, why is there so much disagreement among economists?

VARIABLES

A variable can vary, but a constant does not vary.

Endogenous variable: value determined within the model.

Exogenous variable: value is predetermined.

We have seen that economists construct economic models to facilitate their understanding of economic phenomena. An economic model is a system of relations among economic variables. In general terms, a **variable** is anything that can assume different values under different circumstances. We call anything that does not vary a **constant**. Whether or not we consider something to be a variable or a constant depends on what we are investigating. The following are some economic variables that we shall encounter as we progress through this book: price, income, consumer spending, interest rates, demand for money, investment spending, exports, imports, taxes, and government spending.

When economists construct models to explain real world phenomena, some variables will be explained within the models, while others will be determined by factors outside the models. Those variables that are explained within a model are called **endogenous variables**. Those variables that are determined by factors outside a model are called **exogenous variables**. It is a serious mistake to assume that the exogenous variables whose values are predetermined are not important. In fact, they are extremely important. Exogenous variables affect endogenous variables.

Economists do not have a set of variables that they label endogenous and another set that they label exogenous at all times and under all circumstances. Whether a particular variable is endogenous or exogenous depends on the problem being studied. It is important to note also that we cannot determine whether or not a particular variable is endogenous or exogenous without the model.



PROBLEM SOLVING 1-4

You are constructing a model to explain consumption of goods and services in Canada. You specify that consumption depends on income and on the rate of interest. You believe, however, that changes in wealth and income distribution will have some effect on consumption. Identify the endogenous and exogenous variables.

Stock variables have no time dimension. Flow variables do.

STOCK VARIABLES AND FLOW VARIABLES

Before we proceed, we should understand the difference between **stock variables** (or stocks) and **flow variables** (or flows). A **stock** is a quantity existing *at a particular time*. A **flow**, on the other hand, is a measure of the change in a variable *per unit of time*. The number of books on the shelves of a college or university library on May 10, 1999 (that is, at a particular time) is a stock. The number of books taken out of the library each day is a flow. Note that a flow is a rate and has a time dimension (per day, per month, per year, etc.). A stock has no time dimension. Examples of economic flow variables are: income, consumption, and the interest that you earn on your savings account. Examples of economic stock variables are: the amount of equipment owned by a company, the number of dollars in circulation in Canada at 11:00 a.m. yesterday, and the amount of money in your bank account.

CAUSE-EFFECT RELATIONS

Learning Objective 9: relations among variables

Economists study economic variables to discover causes and effects. One must be careful, however, not to confuse correlation with causation. Two variables may be correlated, that is, they change together, even though a change in one does not cause a change in the other. A change could be a chance occurrence, or it could be the effect of a third variable. If it can be determined that a change in one variable causes a change in another, then we know that by changing one, the other will change. This conclusion may not hold

if there is only a correlation between the variables. We must remember the age-old warning that correlation does not imply causation.

The post hoc fallacy

The discussion above is closely related to a common fallacy. When two events happen in sequence, one is tempted to conclude that the first event caused the second to occur. This, of course, may not be the case. This error is referred to as the **post hoc, ergo propter hoc** fallacy, which means "after this, therefore because of this." Let us assume that you began to read your economics textbook and then it began to rain. If you concluded that it rained because you started to read your textbook, then you would have fallen into the post hoc ergo propter hoc fallacy.

Post hoc, ergo propter hoc: the error in thinking that A causes B because A precedes B.

THE CETERIS PARIBUS ASSUMPTION

Economists concern themselves with the effects of changes in economic variables. How does a change in income affect consumption? How does a change in the price of a product affect the quantity that will be purchased? Do changes in the quantity of money affect the rate of interest? Do changes in interest rates affect other variables? Can certain policies be instituted to control certain economic variables? These are some of the questions for which the economist tries to find answers.

Suppose we are interested in finding out the effect of a fall in the price of apples on the quantity of apples that we will purchase. Obviously, factors other than the price of apples will affect the quantity that will be purchased. Some of these factors include our preferences for apples over other kinds of fruit, our incomes, and the prices of other fruit. We can hypothesize that if the price of apples falls, we will buy a greater quantity. If we observe that a fall in the price of apples is accompanied by an increase in the quantity purchased, can we conclude that the increase in quantity purchased results from the fall in price? Is it not possible that the increase in quantity purchased may result from an increase in income or some other exogenous factor?

The ceteris paribus assumption allows us to isolate the effects of changes in variables.

In order to determine how a change in one variable affects other variables, the economist must find some way of isolating the effects of other variables. In the above example, we must isolate income, preference (taste), and all other factors (except the price of apples) that may affect the quantity of apples that we will purchase. We can (almost magically) accomplish this task by making use of the ceteris paribus assumption. *Ceteris paribus*, a Latin phrase, means *other things being equal*. This assumption allows us to keep other factors constant while we examine the effects of the variable that currently interests us. Thus, we can investigate how a change in price affects the quantity purchased by assuming that income, taste, and all other factors except the price of apples remain unchanged throughout the process of investigation. We may emerge with a statement such as "If the price of a product falls, *other things being equal*, the quantity purchased will increase."



PROBLEM SOLVING 1-5

Why do economists put so much emphasis on the ceteris paribus assumption when it is well known that other things are not equal?

ECONOMIC POLICY

Learning Objective 10: the meaning of economic policy

A great deal of physical and human resources have been and are being devoted to the development and improvement of economic theory. These theories help us to understand how the economy functions and enable us to solve real-world economic problems. We

Economic policy is any action taken to achieve some desired economic goal.

can define **economic policy** as a course of action designed to achieve some specific economic objective. Every society usually agrees upon a number of economic objectives that it considers to be desirable. The following are among the economic objectives that most people in our society would like our policymakers to pursue: price stability; full employment; economic growth; an equitable distribution of income; economic freedom (freedom for consumers, workers, and businesses to pursue their own economic interests); economic security; and a satisfactory balance of payments equilibrium.

We should realize that some measure of conflict will occur among these goals. For example, a policy designed to reduce the rate of inflation (to achieve relative price stability) may increase the rate of unemployment. The objectives of price stability and full employment will then conflict. Similarly, the objective of an equitable distribution of income may conflict with the goal of a higher rate of economic growth. When such conflicts arise, choices must be made.

Not all of these objectives assume the same importance at any one time. Furthermore, the importance of each goal relative to other goals is likely to change from time to time. In a situation of severe unemployment, for example, it may be necessary to sacrifice another goal such as price stability. Priorities must be established, but the ranking of our priorities will change as circumstances change. For example, we are much more concerned with the environment today than we were twenty years ago, and inflation ranked higher in importance in 1975 than it does today.

MICROECONOMICS AND MACROECONOMICS

Learning Objective 11: distinguish between microeconomics and macroeconomics

Microeconomics, or price theory, deals with the behaviour of individual economic units.

Macroeconomics, or income and employment theory, concerns itself with the behaviour of economic aggregates.

The two major branches into which economics has been divided are microeconomics and macroeconomics. **Microeconomics** examines the behaviour of individual economic units and focuses on the allocation of resources. It concerns itself with what determines the composition of total output, and analyzes topics such as the behaviour of consumers and firms, the determination of relative prices, and the distribution of the economy's output among various groups. Microeconomics is sometimes called **price theory**.

Macroeconomics examines the economy as a whole rather than the individual units — the whole flock, so to speak, rather than the individual sheep comprising that flock. Macroeconomics concerns itself with the combined or aggregate behaviour of consumers and producers, and analyzes such topics as inflation, unemployment, and economic growth. Macroeconomics is sometimes called **income and employment theory**. A thorough understanding of the operation of the economic system requires knowledge of both microeconomics and macroeconomics.

CHAPTER SUMMARY

1. Economics is a social science because it is a scientific study of certain aspects of human behaviour.
2. Economics may be defined as the study of how people use scarce resources to satisfy their unlimited wants.
3. Scarcity forces us to choose. Economics is fundamentally concerned with scarcity and choice.
4. Some advantages of knowing economics are that it helps us to improve the performance of the economy and thus increases our well-being, and that it helps to sharpen our common sense.