

# What Is Macroeconomics?

## Overview

In this chapter we show you what macroeconomics is about by looking at some of the big questions that macroeconomists ask: Why do some countries enjoy a standard of living many times greater than others? What impact do changes in interest rates have upon the economy? How does growth in productivity evolve over time? We draw out what is distinctive about macroeconomics and contrast it with microeconomics, and illustrate this distinction by focusing on the types of risk that affect companies.

## INTRODUCTION

### 1.1

#### What Is Macroeconomics About?

Most books begin by defining their subject. But definitions are tricky and often are not the best way to introduce a subject. Imagine trying to interest people in tennis by defining what tennis is and describing how it is played. Better to let them watch a match or try to play themselves. This approach also applies to macroeconomics. Understanding how the economy works helps us interpret the past; it makes our world more comprehensible; and it helps us to think intelligently about the future. Because of this a knowledge of macroeconomics has clear commercial implications. However, we think offering a sophisticated definition of macroeconomics is a poor way to convince you of these things. To demonstrate its relevance, we prefer to illustrate the types of issues macroeconomics deals with.

At the start of the twenty-first century, the world's financial markets were anxiously examining every comment that Alan Greenspan, the chairman of the U.S. Federal Reserve Board, uttered in public. The markets were concerned that Greenspan was going to raise U.S. interest rates to prevent inflation; they were afraid that this would be bad for stock (or equity) prices and could end the long rise in U.S. financial asset values. The following questions raise macroeconomic issues.

These are all questions that macroeconomics tries to answer, and this textbook should give you the intellectual apparatus to participate in the debate. After reading it, you will be able to offer your own informed opinion about whether Greenspan did the right thing in 2000.<sup>1</sup>

But macroeconomics is far more than just an intellectual toolkit for understanding the business pages of newspapers and the daily rumors that surface on TV news wires or the Internet. It is also about understanding the long-term forces that drive the economy and shape the business environment. Between 1870 and 1999 the real value of the output of goods and services produced *per person* in the United States increased more than nine-fold.<sup>2</sup> Over this same period, the U.S. population increased more than six-fold, and the total amount of goods and services produced in the United States increased by nearly 6000%. Not all countries have grown so swiftly. For example, over the same period, output per person in the Australian economy increased only slightly more than four-fold. Had Australia grown at the same rate as the United States over this period, it would have produced enough extra output to roughly double the standard of living for *every* man, woman, and child in the country. Politicians out for votes can only dream of that kind of largesse.

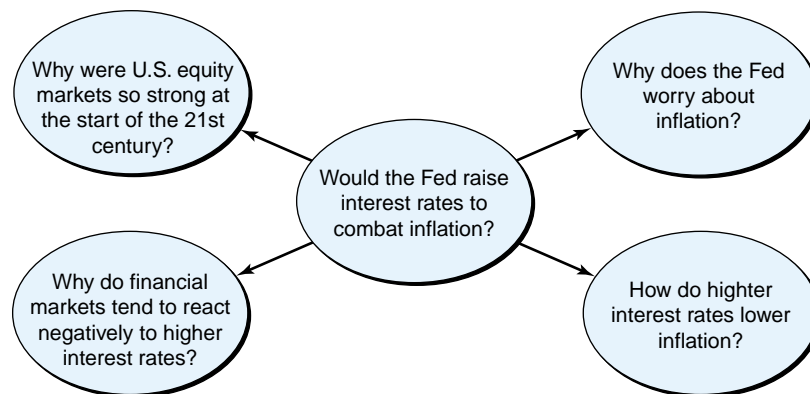


FIGURE 1.1: Macroeconomic Questions.

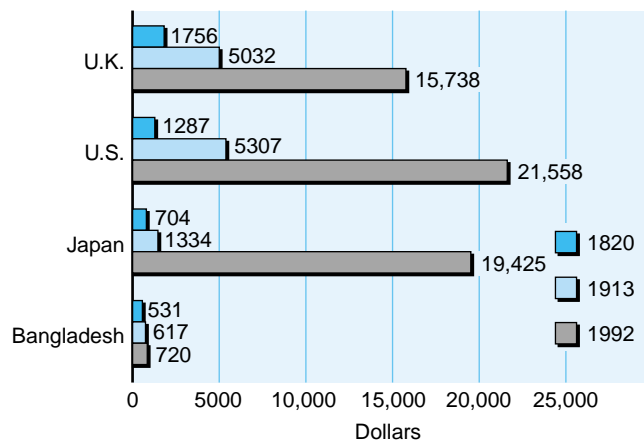
<sup>1</sup>The Fed increased interest rates gradually over the course of 2000 by just over 1%. At the start of 2001 this process was suddenly put into reverse.

<sup>2</sup>These calculations are based on figures from Maddison's *Dynamic Forces in Capitalist Development* (Oxford University Press, 1989). We have used output and population trends from 1989 to 1999 to update estimates presented in that volume.

Compared to many other countries, Australia's performance was good. In 1913 the output produced per person in the Bangladesh economy was worth roughly \$617 and by 1992 this total had risen to only \$720.<sup>3</sup> By contrast, over this period the value of the output produced per person in Japan had increased from \$1,334 (under three times the Bangladeshi level) to \$19,425 (almost 30 times the Bangladeshi output). These calculations show why a leading macroeconomist and Nobel prize-winner says that, "Once one starts to think [about questions of economic growth] it is hard to think about anything else".<sup>4</sup>

Why have some countries grown so fast while others have stagnated? Can government policy boost a country's growth rate? These questions force us to examine key economic issues—the role of investment in machines and infrastructure (e.g., roads) in fostering growth, the importance of education and skills, and the critical role of technological progress (e.g., inventions). These are important issues, both for individual firms and for society. These issues are as relevant to households and businesses as the short-term considerations about what the U.S. Federal Reserve Board will do with interest rates; in fact they are probably much more important.

The above examples (the conduct of monetary policy and the sources of overall economic growth) suggest that macroeconomics is about the economy as a whole. In part this is correct: macroeconomics does focus on how the whole economy evolves over time rather than on any one sector, region, or firm. Yet macroeconomics also considers the important issues from the perspective of the firm and/or the individual consumer. It is the overall, or *aggregate*, implications of tens of thousands of *individual* decisions that companies and households make that generates the macroeconomic outcomes. A good example of this is training or providing skills to a workforce. Evidence



**FIGURE 1.2** Output Difference Over the Long Term. The average level of output per person differs dramatically across countries. *Source:* Maddison, (1995) *Monitoring the World Economy 1820–1992*, (OECD, Paris, 1995).

<sup>3</sup>These figures are quoted in terms of what are called "constant prices." We shall go into more detail about this in the next chapter, but essentially it means that everything is measured in terms of what a dollar could buy in the United States in 1985. We should also stress that cross-country comparisons of historical data are not among the most reliable aspects of economic measurement.

<sup>4</sup>Lucas, "On the Mechanics of Economic Development," *Journal of Monetary Economics* (1988).

shows that education, training, and skills are important in determining productivity. From the firm's perspective, however, the important issues are:

- Does such training increase the firm's productivity?
- If so, does it also improve the firm's profits, or is increased productivity simply reflected in higher wages?

As part of our discussion of rising productivity over time, we will examine the extent to which workers, firms, or society benefits from increased education and training.

Throughout this book we shall consider many such macroeconomic issues from the perspective of firms, governments, and society. We will approach issues by analyzing the aggregate implications of the decisions many firms and consumers make, decisions that are generally interdependent.

## 1.2 But What about That Definition?

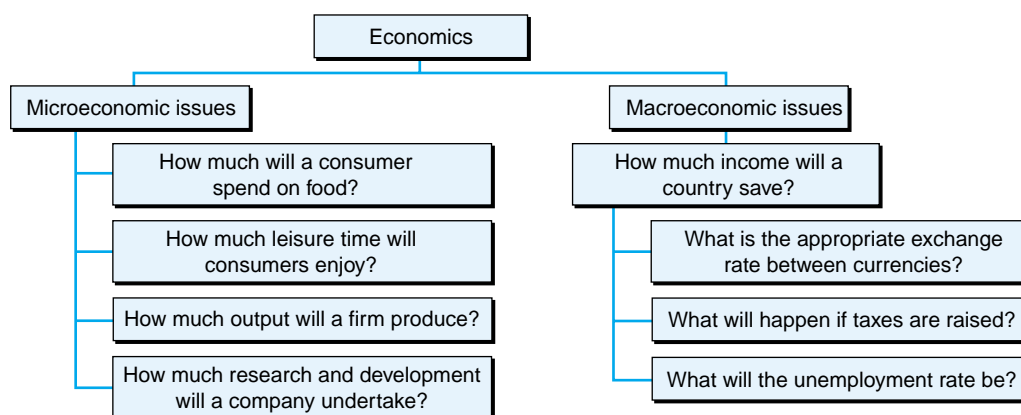
These examples have given you some ideas about the issues macroeconomics addresses, and they may even have aroused your interest in the subject. We hope so, because at this point we need to give you a more detailed insight into macroeconomics and its relationship with its sister discipline, microeconomics. In other words, it is time to turn to definitions.

### DEFINITION

Economics is the study of the allocation of scarce resources.

The basic idea is simple: each of us has an almost inexhaustible list of desires, but most of us have a finite amount of money (or, more generally, resources) with which to satisfy these desires. The British economist Adam Smith, whose “Wealth of Nations” was arguably the first treatise on economics (published in 1776), famously phrased this discussion in terms of whether a country should produce guns or butter. Today the choice is between more esoteric items—we would all like to buy a new top of the line laptop *and* regularly eat steak or lobster for lunch, but household finances dictate one or the other (and you had better get used to the crummy sandwich from the snack bar if you go for the laptop). Economics studies the best way to allocate the resources that are available across these competing needs. Not all these needs can be satisfied, but economics should be able to help you (and society) meet as many of them as possible.

A key way in which economies allocate resources is through prices. Prices tell producers what the demand for a particular product is—if prices are high, then producers know the good is in demand, and they can increase production. If prices are low, producers know that demand for the product is weak, and they should cut back production. Thus the market ensures that society produces more of the goods that people want and less of those that they do not. By studying prices consumers decide which goods to purchase and which to avoid; by examining prices and chasing profits, producers determine which goods to provide. This is why economics focuses so much on the determination of



**FIGURE 1.3** Macroeconomic Issues and Microeconomic Issues. Macroeconomics focuses on aggregate outcome; microeconomics looks at individual markets, firms or households.

market prices and whether how they are set helps allocate resources effectively. Prices are not just dropped from heaven; they are determined jointly with other economic decisions at the firm level.

But what is *macroeconomics*? Broadly speaking, economics has two components: microeconomics and macroeconomics. Essentially microeconomics examines how individual units, whether they be consumers or firms, decide how to allocate resources and whether those decisions are desirable. Macroeconomics studies the economy as a whole; it looks at the aggregate outcomes of all the decisions that consumers, firms, and the government make in an economy. Microeconomics is about how consumers and firms allocate resources. By contrast macroeconomics is about the aggregate variables—for example, the overall levels of output, consumption, employment, and prices—and how they move over time and between countries.

In terms of prices, microeconomics focuses on, for instance, the price of a particular firm's product, whereas macroeconomics focuses on the exchange rate (the price of one country's money in terms of that of another country) or the interest rate (the price of spending today rather than tomorrow).

## 1.3 The Difference between Macro and Microeconomics

These distinctions show that a gray area exists between micro and macroeconomics that relates to aggregation—at what point do the actions of a number of firms cease to be a microeconomic issue and become a macroeconomic issue? To answer that question, let's think of another way of outlining the differences between microeconomics and macroeconomics. In microeconomics the focus is on a small group of agents, say a group of consumers or two firms battling over a particular market. In this case economists pay a great deal of attention to the behavior of the agents the model is focusing on. They make assumptions about what consumers want or how much they have to

spend, or about whether the two firms are competing over prices or market share, and whether one firm is playing an aggressive strategy, and so on. The result is a detailed analysis of what particular firms or consumers should do in a given situation.

However, this microeconomic analysis does *not* explain what is happening in the wider economic environment. Think about consumers' choice of what goods to consume. In addition to consumers' own income and the price of the goods they wish to purchase, their decisions depend on an enormous amount of other information. How high is unemployment? Is the government going to increase taxes? Is the exchange rate about to collapse, requiring a sharp increase in interest rates? Or consider our two firms competing over a market. If one firm is highly levered (i.e., has a lot of debt), it may not be able to adopt an aggressive price stance if it fears that interest rates are about to rise sharply because then the losses from a price war might bankrupt it. Similarly, if imported materials are important for the firm's production process, then a depreciating currency will lead to higher import costs, reducing profit margins even before the firm engages in a price war. While none of these background influences—shifts in interest rates or movements in the exchange rate—are under the control of the firm or consumer, they still influence decisions.

#### KEY POINT

Macroeconomics analyzes the backdrop of economic conditions against which companies and households make decisions.

Microeconomics tends to focus on variables that an individual or firm can influence—for example, how much labor to offer, what prices to set, and how much to produce; macroeconomics focuses on employment, prices, and output in the whole economy. However, the whole economy represents the outcome of millions of individual decisions that millions of firms and consumers make. Therefore, while each particular firm does not significantly affect inflation or the growth of output in the whole economy, the economic performance of an economy does reflect the overall decisions firms make. For instance, the chairman of the U.S. Federal Reserve will be concerned about rising inflation and consider the need to raise interest rates. No doubt many highly leveraged firms would rather the Federal Reserve did not raise rates. But the inflation rate determines whether interest rates increase, and the inflation rate reflects the number of firms that are increasing prices and the amount by which each firm is raising prices. In other words, all the individual pricing decisions that millions of firms make determines the macroeconomic environment. While microeconomics is mainly concerned with studying in detail the decisions of a few agents, taking as given the basic economic backdrop, macroeconomics is about studying how the decisions of all the agents who make up the economy create this backdrop.

Consider, for instance, the issue of whether a firm should adopt the latest developments in information technology (IT), which promise to increase labor productivity by, say, 20%. A microeconomic analysis of this topic would focus mainly on the costs the firm faces in adopting this technology and the likely productivity and profit gains that it would create. Macroeconomics would consider this IT innovation in the context of the whole economy. In particular, it would examine how if *many* firms were adopting this

technology, then costs in the whole economy would fall, and the demand for skilled labor would rise. Combined with the resulting increase in labor productivity, this would lead to an increase in wages and the firm's wage bill. It might also shift demand away from unskilled towards skilled workers, causing the composition of unemployment and relative wages to change. This example reveals the differences between the two approaches. The microeconomic analysis is one where the firm *alone* is contemplating adopting a new technology, and the emphasis is on the firm's pricing and employment decisions, probably holding wages fixed. In other words, the analysis assumes that the firm's decisions do not influence the background economic environment. In contrast, the macroeconomic analysis examines the consequences when *many* firms implement the new technology and investigates how this affects economy-wide output, wages, and unemployment. Both forms of analysis have a role to play, and which is more appropriate depends on the issue to be analyzed and the question that needs answering.

## 1.4

### Why Should People Interested in Business Study Macroeconomics?

When one of us first agreed to teach at a business school, an eminent microeconomic theorist told him that macroeconomics should not be taught to MBA students. Of course, the theorist argued that microeconomics, with its detailed focus on the behavior of individual firms, should be compulsory for students. But only macroeconomic issue business people needed to know, he argued, was what the economy would be doing over the next few years. They could best find this out by buying a macroeconomic forecast. Taking a course in macroeconomics was a waste of time.

The excellent wines at dinner no doubt fueled such bold statements, but it seems too good a challenge to refuse, so here is why we think students interested in business need to understand macroeconomics.

#### UNDERSTANDING ECONOMIC POLICY ISSUES BETTER

The one argument the critical microeconomist would accept for teaching macroeconomics to students interested in business was that it enabled them to sound knowledgeable about current affairs at social events—the intellectual equivalent of not sounding dumb when being interviewed on CNN. But going to college—and certainly studying for an MBA or other degree—seems an expensive way to gain such an ability; it would be much cheaper to buy *The Economist*.

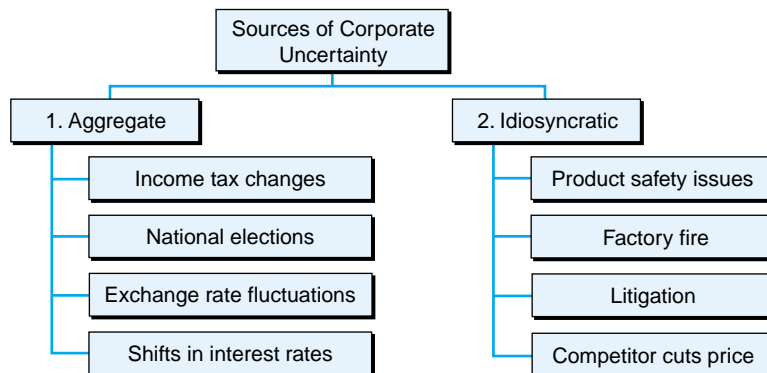
But macroeconomics is much more than just an analysis of what the chairman of the Federal Reserve says each day. And educating business people to talk knowledgeably about macroeconomics is not as trivial as this discussion makes it appear. Chief executives of large companies, politicians, or top government workers are expected to participate in the debate about economic policy (often on CNN!). Careless or poorly thought out comments can have unfortunate repercussions on a firm or a government and can damage people's reputations. When people become successful in a company, they show that they have good knowledge about their own market and are then ex-

pected to show similar knowledge about other markets and the whole economy. It can be unfortunate if they demonstrate that they know little beyond their own niche.

Aside from contributing to the policy debate, senior management in any international company also needs to understand the institutional structure of the global economy. Government policy and the structure of government provide the framework of rules within which firms operate. Any firm that wants to succeed must understand the behavior of other organizations that affect its market. Viewed in this light, firms are involved in a game in which the prizes are profits. The other players in the game include governments (whether it be a national government or an international organization like the International Monetary Fund) and other firms. In Chapter 9 we will discuss free trade and the battle between Airbus of Europe and Boeing of the United States. For each firm, success in the marketplace requires not just understanding the products and strategy of the opposition but also the policy stance of European and American governments as well as the attitude of international organizations like the World Trade Organization. Understanding the interests and behavior of the government and its policies is therefore an important part of corporate strategy, and this requires a firm understanding of macroeconomics.

#### THE RELATIVE SIGNIFICANCE OF AGGREGATE AND FIRM-SPECIFIC UNCERTAINTY

Understanding macroeconomics is not simply a useful aspect of the PR role of the business person; nor is it solely related to better understanding government policy. The health of a company depends on the macroeconomy. Macroeconomic events like changes in interest rates, fluctuations in exchange rates, and shifts in the overall level of stock market prices affect individual companies. More local events—like a rise in the wages of the company's workforce or the bankruptcy of a competitor—are also important. Both these types of factor—the localized and the general—are uncertain. Economists distinguish between two types of uncertainty: aggregate and idiosyncratic. Aggregate uncertainty affects all firms and sectors in the economy; idiosyncratic uncertainty affects only a few firms or industries. Macroeconomics is essentially about the aggregate sources of uncertainty that affect firms.

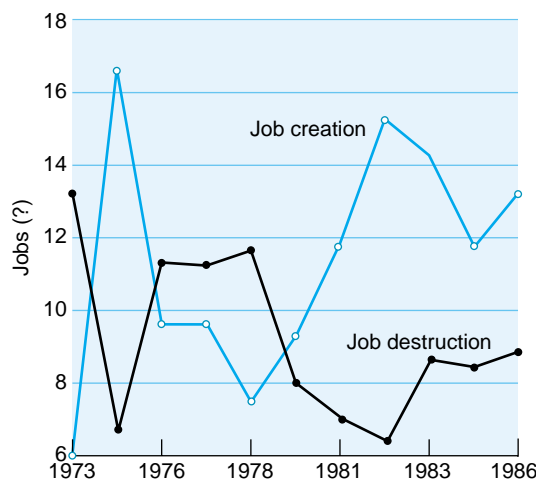


**FIGURE 1.4** Macroeconomic and Microeconomic Uncertainty. Risks can be idiosyncratic—specific to the individual—or aggregate—common to everyone.



But which source of uncertainty is more important for corporate health—idiosyncratic or aggregate? Evidence (covering firms and consumers) shows that the biggest source of uncertainty in the short term for most firms is the idiosyncratic component. All firms should worry about loss through illness of key personnel, major clients cancelling contracts, loss through litigation or fire and theft, and so forth. However, while idiosyncratic shocks are a dominant influence on the typical firm, the evidence also suggests that on average around 10% of the short-term risk that a company faces is of an aggregate nature.<sup>5</sup> For households, or individuals, idiosyncratic risk is also generally more important than systematic (or aggregate) uncertainty. Whether you pass an exam; how well you get along with your first boss; whether you avoid serious illness in your forties and fifties—for most people these things are likely to be more important for their standard of living over their lifetime than fluctuations in aggregate output or in inflation.

Yet macroeconomic fluctuations are also important. The business cycle—the regular pattern of movements in the overall levels of output and employment in an economy—does affect firm or personal behavior. Consider unemployment. In recessions unemployment rises, but not everyone becomes unemployed—many people also find jobs and many firms are hiring. Most people carry on with their regular job even through the worst recessions. Figure 1.5 shows employment trends in U.S. manufacturing over a volatile 13-year period (1973–1986). It shows that every year U.S. manufacturing had large inflows into work (job creation) and into unemployment (job destruction). For instance, 1975 was a recession year in the United States and 17% of manufacturing jobs were lost. However, even during these enormous layoffs, around 7% more new jobs were being created. Exactly what happens to unemployment depends on whether the flow into work is larger than the flow of people moving out of work. For instance, in 1975 unemployment increased sharply because the job destruction rate was more than twice the job creation rate.



**FIGURE 1.5** Job creation and job destruction in U.S. manufacturing. In any one year many new jobs are created and many existing jobs are lost. *Source:* Davis and Haltiwanger, *Macroeconomics Annual* Cambridge, Mass: MIT Press (NBER, 1990).

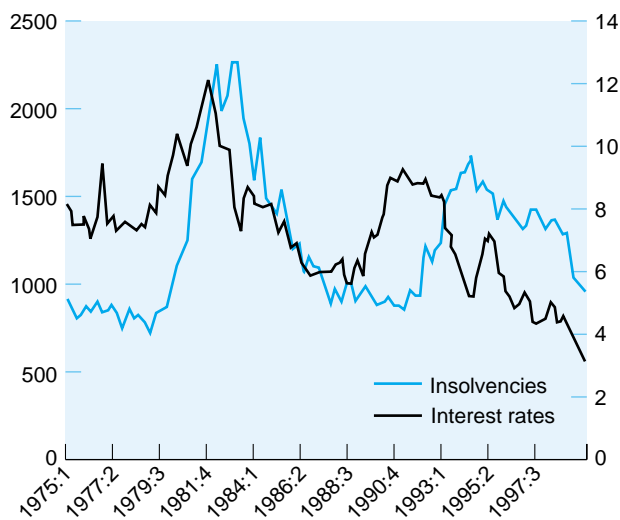
<sup>5</sup>The economist Mark Shankerman undertook extensive statistical analysis of company behavior to reach this conclusion.

However, the aggregate measure of unemployment, while important, gives an incomplete picture of what is happening to individuals in the labor market. Idiosyncratic factors are significant—even during the worst recession some firms will be doing well (bankruptcy administrators?) and hiring workers; it is just that more firms are doing badly. In other words, business cycle peaks and troughs represent what is happening to most firms, but because idiosyncratic factors are important, even in the worse recessions, many firms will be doing well. But it is much harder for a firm to succeed in a recession when the overall business climate is poor.

This does not mean macroeconomics is unimportant to business. Even if aggregate uncertainty only generates 10% of a company's short-term risk, 10% is still a lot of uncertainty and can dramatically affect corporate well being. For instance, in the early 1980s, and again in the early 1990s, the Netherlands experienced a recession where high interest rates combined with extensive corporate debts led (with a lag of a few years) to many corporate bankruptcies. As Figure 1.6 illustrates, these insolvencies can largely be accounted for by aggregate factors.

Aggregate uncertainty is important to firms and households because it generates a type of risk that, by definition, all firms and consumers share. Most people today are unlikely to spend their entire career within one firm, or even in one industry; the only source of uncertainty that is fully portable between jobs in different industries is aggregate uncertainty. Understanding macroeconomic uncertainty will prove useful to all future employers and in all future occupations. We think that the knowledge obtained in this course will be relevant throughout your life.

Aggregate uncertainty is more important the more diversified a firm's activities are. A large firm diversified across several markets finds aggregate uncertainty relatively more important because the firm is less dependent on any one product or market. Take, for instance, News International, a highly diversified organization both in terms of its international spread and the media with which it is involved. While profits might be harmed by, say, a mechanical shutdown in one of its plants, the health of the whole



**FIGURE 1.6** Interest rates and insolvencies in the Netherlands. Interest rates have a major impact on the number of bankruptcies.

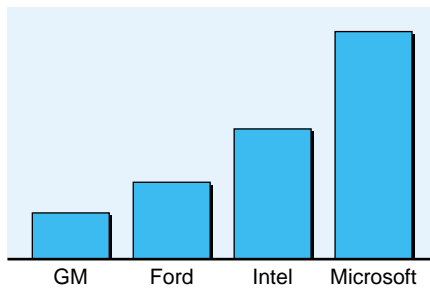
company would not be seriously affected. But in the early 1990s, rising interest rates in the world economy combined with a big outstanding debt to generate a substantial negative impact on News International's cash flow. The bigger the firm, the more important macroeconomic risks are relative to idiosyncratic factors. For *all* firms, the macroeconomy contributes to business volatility, but for large firms like News International, it is a *dominant* factor.

### CHOOSING PRODUCTION LOCATION

Understanding macroeconomic forces is also useful in another way to large international firms. Over the last few decades, many countries have rejected central planning in favor of more market-based economies. Lack of domestic sources to finance investment has often meant that the firms in these formerly socialist economies required investment from international companies. This created both new business opportunities for Western firms and dilemmas—should a Western firm locate a new factory in, say, Poland or the Czech Republic? As the economy becomes increasingly integrated, and barriers to trade and overseas investment fall, such decisions will become more frequent. These decisions involve assessing what relative productivity will be between the two countries over the ensuing decades (precisely the topic of economic growth that we address in the first part of this book). These issues are the central focus of macroeconomics.

### LONG-RUN FACTORS

However, the most important reason for studying macroeconomics is its long-run significance. In the previous section, we suggested that only around 10% of corporate uncertainty in any one year is due to aggregate or macroeconomic uncertainty. However, the further ahead one looks, the more important aggregate uncertainty becomes. As we stressed earlier, macroeconomics reflects the decisions and actions of all agents in the economy. For instance, if one firm or sector makes a significant technological innovation, then eventually this will spread to the rest of the economy. Thus macroeconomics is about dynamics that eventually change the nature of a firm's markets, its competitors, and the demands the firm places on its own managers and workforce. Consider, for instance, the case of two U.S. car manufacturers—General Motors (GM) and Ford. Thirty years ago they were among the very largest U.S. companies. During this 30-year period, the managements of GM and Ford have had to cope with many changes in how the economy operates. For instance, one of the major technical innovations of the last decade has been the IT revolution. This has led to substantial changes in how cars are manufactured and marketed and also increased the importance of a skilled workforce. The world economy has also become more internationalized, and competition between car producers in different countries has become intense. Coping with this technical change, ensuring a sufficient number of suitably trained workers, and battling against foreign competitors have been an important part of how GM and Ford have tried to remain profitable. The longer-term factors that GM and Ford have had to cope with (international competition, technological progress, training the workforce) are all macroeconomic compared to more short-term issues, such as whether to drop price, what the appropriate level of output is, and whether the firm should focus on niche sectors of the market.



**FIGURE 1.7** Stock market valuation January 2000. At the dawn of the 21<sup>st</sup> century the industrial giants of the past had been overtaken. *NOTE:* Market capitalizations are: Microsoft \$604 billion (bn); Intel \$275 bn; Ford: 60.75 bn; GM 46.5 bn.

The important forces that will influence whether the successful corporate organizations of today will be thriving in 10, 15, or even 20 years are probably already beginning to manifest themselves in the economy. We should never underestimate the ability of the economy to develop new products, new techniques, and new industries. Understanding how these factors develop over time and how they spread through the economy is a matter for macroeconomics. These dynamic processes have immense implications. As Figure 1.7 illustrates, even though GM and Ford have enormous annual sales and employ small armies, at the start of the twenty-first century the largest firms (in terms of market capitalization on the New York Stock Exchange) were IT-related. It was hard to foresee even in 1990, let alone 30 years ago, that in January 2000 a software company would be worth more than Ford and GM put together.

Economy-wide trends mean that corporate success today cannot guarantee success in the future, no matter how well a firm operates; new technology, new products, and new opportunities all threaten an established firm. Understanding these long-run forces and responding appropriately to them are crucial for the health of any company you might work for and for your family; it is the subject of much of this textbook.

## SUMMARY

Economics is the study of the allocation of scarce resources. Macroeconomics studies how the economy as a whole allocates resources—how the overall level of saving in an economy is determined; how the total level of investment is generated; how the level of unemployment evolves; the pattern of overall imports and exports; what determines the level of training. Macroeconomics is therefore essentially about the backdrop of economic activity against which firms, governments, and consumers make their decisions. However, this backdrop of economic activity represents nothing other than the overall effect of the thousands of decisions made by millions of different consumers and managers.

Depending on the size of the firm, macroeconomics is either a significant or a dominant factor in determining an individual firm's performance. Because macroeconomic factors have a huge impact on financial markets and on the demand for goods and services produced by companies, they are an important determinant of corporate performance. Busi-

nesspeople are increasingly expected to contribute to the policy debate, and because the long-run trends in the business world are driven by macroeconomic factors, a crucial part of a business education must be the study of macroeconomics.

## CONCEPTUAL QUESTIONS

- Three important macroeconomic variables are:  
**Per-capita production:** the overall level of production in an economy divided by the population.  
**The overall rate of unemployment:** the percentage of people who want to work but are not working.  
**The ratio of the total imports of a country plus its exports to its total production:** a measure of the degree of openness of the economy.  
 For most developed economies two of these variables have risen fairly steadily over the past 60 years: production and openness. The third variable, the unemployment rate, fluctuates a good deal but has shown no general tendency to rise in developed countries. In the light of these trends, how would you assess the following claims:
  - "The more imports come into our country, the fewer jobs there will be for our people."
  - "If you produce more output with fewer people, then unemployment will rise."
  - "In the future robots will do most things; there will just not be enough work to go around."
- Suppose a government is considering cutting the rate of tax on corporate profits in half, say from 30% to 15%. An unsophisticated, but not necessarily stupid, forecast for the impact on tax revenue is that it fall by about 50%. It is likely that such a tax cut would affect incentives companies have to invest and to employ workers. This, in turn, would have knock-on effects upon the incomes of households and the profits of companies making investment goods. Think about how you might try to take account of all these factors in creating a more sophisticated estimate of the impact on overall government tax revenues.
- Suppose I am in my early thirties and own a modest house. I am about to start a family and contemplate moving to a bigger house. I check out the value of my current house at the local real estate agent. To my horror their valuation is only about 60% of my guess. My guess was based upon my recollection of house values when I purchased the house about 5 years earlier; since then I have not kept in touch with house prices at all. Then I ask about valuations of houses in general and find that the expert valuations are pretty consistently around 60% of my own guess. What I had considered to be a nasty idiosyncratic shock to the value of *my* house appears to be a systematic shock to all house prices. How does this affect my position now and what does it tell you about how to measure the risk of investing in housing?
- Suppose you live in an economy where most companies borrow money from banks to finance investment and most households have some savings in the form of bank deposits. In this simple economy the banks direct the savings of households towards corporations who use the funds to finance investment expenditure. One day the central bank increases interest rates sharply. Representatives of many leading companies appear on the evening news explaining to the people how this is a very bad thing because it will inevitably slow the economy down. Are these corporate spokespeople missing something?

5. Consider the big economic stories in the newspapers over the past week or so. What proportion of these stories would you classify as being about microeconomic issues and what proportion are macroeconomic? How hard is it to make this classification?

## ANALYTICAL QUESTIONS

1. Two countries start out with the same level of per capita output. In the first country population grows by 1% a year steadily and total output grows by 2.25% a year. In the second country population falls by 0.5% per year and output rises by 1.0% a year. What is the difference in per capita output between the two economies after 10 years?
2. Suppose the chances of a person being unemployed in any year reflect both idiosyncratic factors and aggregate factors. Let the probability that person  $i$  is unemployed be denoted  $p_i$ :

$$p_i = 0.05 + bU$$

where  $b$  is a coefficient reflecting how sensitive to aggregate unemployment the chances of a person becoming unemployed are.  $U$  is the aggregate rate of unemployment. Suppose  $b$  is 0.25 and every person has the same probability of being unemployed. What is the aggregate unemployment rate?

3. A country decides to cut its consumption by the equivalent of 25% of total output for a year in order to make a massive investment in new information technology. As a result its rate of growth rises permanently from 1.5% per annum to 1.6%. How long is it before the level of total output is higher by 25% of current output? Does it take that long before the gain from higher output matches the lost consumption?
4. The more regionally diversified across a country the sales of a company are the more important aggregate, as opposed to idiosyncratic, risk becomes. Suppose that the percentage of a company's total risk that is aggregate risk (denoted Agg risk) is described by the following equation:

$$\text{Agg risk} = 10 + b^*(\text{regions})$$

where the value of "regions" is the number of different regions in the economy in which the company sells its output. Suppose the total number of regions in the country is 20. Would it make sense for the value of  $b$  to be 4.5? What would be the highest value for  $b$  that you would find plausible?

5. How long does it take an economy to double in size if the annual rate of growth of output is 3%? Suppose the growth rate falls to 2%. Now how long does it take for output to double? Finally, suppose that the economy suffers a decline in its annual growth rate from 3% to 2% which lasts for 25 years. Obviously the growth rate for the next 25 years will need to exceed 3% if the level of output by the end is to equal the level that would have been achieved with constant 3% growth throughout. By how much will growth in the second 25-year period need to exceed 3%?