

Chapter 5

Human Capital in the Market Economy

There is an important difference between human capital to the isolated actor and human capital in the market economy. The isolated actor possesses all of the knowledge that exists in his situation. In the market economy, the knowledge is dispersed. The reason is specialization and the principle of lowest opportunity cost, which we discussed in the last chapter. Each member possesses some share of the total knowledge that is relevant to causing wants in the society to be satisfied. Each is in some measure a specialist.

The fact that specialized knowledge is dispersed has two implications for the study of economics. First, because the knowledge that exists in the market economy is in the minds of a countless number of separate specialized individuals, we must realize that we can never fully comprehend it. After all, each of us has only one mind. The best we can do is (1) to try to imagine what all the knowledge would be like *if* we could comprehend it and (2) to give some examples. Second, we must recognize *the coordination problem*. This refers to the problem of coordinating the actions of all of the specialized individuals. To solve this problem, individuals must have knowledge that enables them to coordinate. We discuss coordination and coordination knowledge in chapters six and seven.

The isolated actor in Chapter Three possessed four types of human capital: knowledge of his own wants; technical knowledge; knowledge, or beliefs, about his knowledge; and knowledge of how to acquire knowledge. Our aim in this chapter is to identify and give examples of these types of specialized knowledge in a market economy. Part 1 describes knowledge of wants. Part 2 describes technical knowledge produced by others. Part 3 deals with knowledge of others' knowledge. And part 4 describes knowledge of how to acquire knowledge.

1. KNOWLEDGE OF WANTS

The ability of the isolated actor to satisfy his wants depends on his knowledge of his wants, the resources he possesses, and his technical knowledge. He must rely on his own resources and initiative. In the market economy, where everyone is a specialist, a person's ability to satisfy a want depends on the money he can acquire. One way to acquire money is to first supply some specialized good or service that someone else wants. To be successful, a person must know not only his own wants but also the wants of those to whom he wishes to sell his specialized good or service. If he fails to learn about others' wants, he may produce a good or service that they will not buy, in which case he will earn no money to buy the goods he wants.

Wants and Demand

Actually, an individual in a market economy is not interested in wants, as we usually understand that term. He is interested in *demand*. Demand refers not only to the desire a subject has for a good or resource but also to his ability to pay for it. A subject is said to have a demand for peaches, for example, if he is willing and able to pay some amount of money to buy peaches. We shall develop a more formal analysis of demand later in the book. For the moment, we want to show how extensive this knowledge is in the market economy.

Knowledge of Horizontal Demands

A convenient way to characterize knowledge of demands in a market economy is along two separate dimensions: horizontal and vertical. Consider first the horizontal dimension. We can understand this dimension best if we assume that there are specialists who produce each consumers' good from start to finish. For example, suppose that a baker not only bakes, he also mills flour, manufactures the ovens, mines the iron ore used to make the ovens, runs the farm on which the grain is grown, builds the tractors, produces the fertilizer, and so on. We assume that the butcher, the shoemaker, the clothier, the fisher, the homebuilder, and so on also produce their consumers' goods from start to finish. We call a producer who produces goods from start to finish *fully vertically integrated*. Such a producer buys only basic resources such as labor and the mining rights of land. He buys no material capital. The discussion in this subsection assumes fully vertically integrated producers.

Under this assumption, each producer of a consumers' good would want knowledge of the demands for his consumers' good by all consumers who might decide to buy. Knowledge of horizontal demands refers to knowledge about the consumers' demands for each separate good.

Diversity of Demands

The nature of specialization in the discovery of demands for consumers's goods depends in large measure on the diversity of demands. Diversity varies among societies. To understand the diversity of demands for consumers' goods, it is useful to begin by imagining its opposite. This is a hypothetical market economy in which everyone has the same demands, including the same demands for near future consumers' goods and distant future consumers' goods. If two individuals in such an economy earned the same income and had the same opportunities to buy all of the various goods, they would demand the same quantity of each. An individual who earned less income would accept offers that were different from one who earned more.

Assuming that sellers know that all demands are alike, their task would be relatively easy. They would only need to try to discover the demand of one person and the distribution of income. Then they would produce the goods that fit the pattern they had discovered.

Suppose now that there are a number of different similar-sized communities of such individuals. If a producer developed a profitable new business in one town, he could expand to a different town merely by duplicating his effort. So long as the other town did not have a similar business already, he would be assured of success. Alternatively, suppose that someone visited a neighboring town of similar size and observed a profitable business that was not present in his own town. He would be confident that if he studied the business carefully and copied it in his home town, it would be successful. Because copying is profitable, we would expect the goods and services available in the different towns to be similar. We conclude that in an economy comprised of individuals with similar demands, but living in different towns, there would be a tendency for the consumers' goods supplied in the various towns to be similar.

Emergence of Specialists

Now suppose that individuals and communities are very different in their demands for consumers' goods. Then much more knowledge would be needed to predict what people would demand. We might expect specialists to emerge who possess specialized knowledge of the demands of community members that is not possessed by outsiders. To help them acquire this knowledge, a specialist would try to put himself in the shoes of the buyers. To learn their demands, he may even offer below-cost introductory prices or free samples to consumers who had not yet tried the good he hoped to sell to them in the future. He is also likely to advertise in the general media since he would be uncertain who the demanders are.

We would expect specialists in knowledge about demand to emerge for each of the different types of consumers' goods, since each producer wants to know consumers' demands. The specialists would be hired by the fully vertically integrated producers.

Knowledge of Vertical Demands: The Structure of Production, Sales and Marketing Knowledge

We now turn to the vertical dimension of the knowledge of demands. In the case of the fully vertically integrated firm discussed in the last sub-section, we assumed that a single individual employs workers at all the stages in the structure of production with respect to the consumers' good. He employs workers to explore for raw materials and to gather them, to purify the raw materials, to convert the purified materials into either physical capital or into forms that are ready to be processed with the capital, and to actually process the materials so that the result is a consumers' good. Then he employs additional workers to sell the good directly to consumers. In such a business, all of the stages in the structure of production with respect to the particular good are under the control of a single producer. The producer operates in only two kinds of markets: the markets for fundamental resources and the market for the consumers' good he produces.

Contrast this with a situation in which one individual owns and manages an exploration company; another owns and manages a mining company; a third owns and manages a refinery; a fourth owns and manages a company that uses the refined raw materials to produce material capital; a fifth owns and manages a company that uses material capital, raw materials, and workers to produce consumers' goods; a sixth owns and manages a company that buys consumers goods and distributes them to retailers; and a seventh owns and manages a retail outlet. In this case, the demands for consumers goods like fruit, bread, etc. would have to be discovered by those who produce and sell these goods. In addition, the producers of each of the higher-order goods -- the ladders, steel, wheat flour, etc. -- would also have to learn about these demands so that they could effectively plan their production. It is convenient to call the structure that contains such sales and marketing relationships a *structure of production, sales and marketing knowledge*.

In this structure, retail sellers try to acquire knowledge of the demands of the consumers' goods buyers, wholesalers try to acquire knowledge of retailers' demands, producers of consumers' goods try to acquire knowledge of wholesalers' demands, producers of resources try to acquire knowledge of producers' demands, and so on. This is what we mean by the knowledge of vertical demands. Let us consider this knowledge in greater detail.

Specialization in the Production, Sales and Marketing Knowledge

Before demands can be met, communication must occur between (a) consumer-savers, who possess the demands, and (b) the numerous specialists who participate in causing the goods to be produced that meet the demands. The first step in this process is the communication between the consumer and the retailer.

The Retailer

We define a retailer as the owner-manager of a business who buys goods from a wholesaler (or distributor) and makes them available for sale to consumers. Her prices to consumers are called *retail prices*. In some cases, the retailer uses advertising to inform consumers of the nature of the goods and their prices. In others, she merely meets consumers' expectations that she will have the goods available at the usual place and at "reasonable" prices.

The retailer has specialized knowledge of two major kinds: (1) consumers' demands and (2) various goods that she can purchase from wholesalers to satisfy those demands. She aims to buy various goods from wholesalers or producers in order to make them available for consumers to purchase.

The Wholesaler

The wholesaler buys goods from producers and sells them to retailers. Ordinarily, the wholesaler also delivers the goods to retailers. Hence, he is sometimes called a "distributor." We can imagine a situation in which a wholesaler deals in a single product or narrow range of products like cigarettes, liquor, or a particular brand of cosmetics. For example, the wholesaler of cosmetics may visit, say, sixty retailers once a month for the purpose of taking their orders. In a particular city there may be, say, a thousand retailers and ten wholesalers of the given product. The wholesalers would handle volume equal, on average, to a hundred times that of the retailers. Some wholesalers may deal in all of the products of a specific set of brand-name producers. Others may deal in all of the products that are demanded by a specific set of retailers, say local grocery stores. In the latter case, a wholesaler may have the option to buy from a wide

range of different producers. A given retailer may deal with only a single wholesaler. Alternatively, she may order her products from a wide range of different competing wholesalers.

Some retailers are *franchisees*. A franchisee is an independent businessperson who makes a contract with a producer to sell his brand name products exclusively. The contract typically specifies standards of quality and service that the franchisee must meet in order to continue to sell the franchiser's products. An example is a Kentucky Fried Chicken franchise.

The wholesalers get much of their knowledge about retailers' demands simply by setting prices and observing how much of the different products the retailers order. They get additional knowledge on a face-to-face basis by sending representatives to meet with retailers to discuss consumer buying trends and potential new product lines.

Wholesalers play an important role in transmitting information between producers and retailers. First, they inform retailers of new products and new producers. Second, they inform producers of trends in retail sales so that the producers can more effectively plan their production schedules. Third, they inform some retailers of the products sold by other retailers and of the success or failure in selling them. Fourth, they inform producers about their competitors and about other producers who produce complementary goods. They learn about these in discussions and visits with retailers.

The separation of wholesale from retail may entail costs that can be avoided. If there is a sufficient number of large communities or if the small communities have similar consumers, knowledge of diverse demands may be less important. In these cases, it may be more important for a profit-seeking enterprise to possess knowledge of the kinds of products available and of their prices. Wholesale and retail may be joined. The wholesaler may simply expand into the retail business by starting a series of large department stores. Each store would sell more or less the same set of goods as the others. They may also sell goods that are special to the community but their main products would be the same for all communities. Chances are that the branches would be managed by people who were more familiar with community members' specific demands than by outsiders. However, the local managers would have to first be trained in the general practices of the company.

The Producer and Resource Supplier

In order to obtain the good that will satisfy a retailer's demand, a wholesaler must order it from a producer. The producer, in turn, has demands for the materials and other resources needed to produce the good. Some modern production organizations use market researchers to acquire knowledge of demands for consumers' goods. Market researchers study patterns of choices over a broad range of cultures and geographical locations. They search for regularities that will enable them to predict whether individuals in a particular place are likely to buy a particular product from a particular type of retailer. They conduct surveys by mail and telephone. They also learn about demands by evaluating the results of different advertising campaigns.

As we trace the knowledge of demands for goods beyond the producer, our vision begins to encounter a level of complexity that is difficult to fathom. Some producers order all their materials from other producers, while some try to produce some of their materials. Most fall somewhere in between. It would be convenient for economists if there was a separate producer for each specific, identifiable type of material capital. In this case, there would be a separate, specialized producer at each juncture in the structure of production, as depicted in Chapter Three. The economist could then discuss the demands by producers in different industries for different types of material capital, the demands by material capital goods producers' for other material capital, and so on. However, economists cannot even identify all of the different kinds of material capital; and many producers produce more than one kind. Thus the usual procedure adopted by economists is to ignore this complexity.

We could make similar remarks about producers' demands for different kinds of skills, including bureaucratic management skills. Producers demand these skills. In some cases, they even produce them themselves, as they do when they provide on-the-job training and experience. In other cases, however, the owner of the skill produces it herself or she purchases an education through formal schooling or qualifies for apprenticeship training.

Finally, we could discuss raw materials in the same way. Some producers, such as large oil companies, spend large sums of money on exploration. However, many raw materials are often discovered by specialized explorers, mined by specialized mining companies, and refined by specialized refineries.

In each of these cases, information about demands for consumers' goods gets transmitted in some form back through the chains of markets to those suppliers of resources who lie at the deepest recesses of the structure of production. Specialists may emerge at all levels to do market research, to give advice, and to convey information.

For a concrete example, put yourself in the shoes of a supplier of a particular resource, say leather. You know that the buyers of your resource (shoemakers, belt makers handbag makers, etc.) are also producers. Their demands depend on the particular methods of production they use. They also depend upon the prices of complementary and substitute resources, such as rubber soles, shoelaces, and metal for belt buckles. The shoemakers' demands demand for your leather depends on the consumer demand for his product. This, in turn, depends both on consumer wants and on the prices and availability of complementary and substitute consumers' goods, like socks, fine suits, of clothes, and other types of shoes. Knowledge about all of these things would help you predict the demand for leather. A moment's reflection suggests that there is no limit to the knowledge that might be helpful to you in predicting the demand for your resource.

Knowledge of Wants for Job Satisfaction

Employees work for pay. Thus, other things being equal, they want the highest pay they can get. However, employees may also want other benefits such as pleasant working conditions, greater safety, insurance and pensions, recreational facilities, and other programs. Some of these benefits can be bought with high pay. As a result, higher pay is partly a substitute for such benefits. Other benefits cannot be purchased. And still others can be provided at a lower overall cost by the employers than by the separate employees. Because of this, employers find it worthwhile to learn about some of their prospective employees' wants. By doing so they will be better able to attract the same quality of employees at the lesser pay or superior employees at the same pay. Each employer recognizes that if he does not provide an environment which, when considered along with pay, suits his employees' preferences; the employees may choose to work elsewhere. Because different employees have different wants for job satisfaction, we observe that some employers offer employment packages that include a variety of fringe benefits, while others offer high rates of pay without benefits.

We could say that for each employee there is an optimal tradeoff between working conditions and pay. The goal of an employer who wants to minimize pay is to identify all of the cases in which the costs of supplying more desirable working conditions are less than the benefits in terms of reduced wages and salaries. Finding such an optimum enables him to raise his profit, reduce price, and improve the working conditions-pay package offered to employees.

In many countries, employers are prohibited from offering the pay-benefit options they choose. They are required by law to maintain a certain degree of safety, to pay workers of similar ranks the same pay, to pay a certain minimum to all workers, to maintain clean work environments, and so on. Under these conditions, employers and workers might like to make a deal for higher pay and working conditions that are less expensive to maintain. However, they are prevented from doing so. Considered in relation to the satisfaction of consumers' wants, such laws by themselves raise costs of production and price, thereby causing consumers' wants to be less well satisfied. In the hypothetical market economy, there are no such restrictions on the exchange of services for money. The laws described here are market interventions.

Changing Wants: The Need for Continuing Knowledge about Consumers' Demands

In the market economy, demands are continually changing. As new people are born, grow old, and die; the overall wants of the population change. Moreover, there is a continuing stream of new products and newly-packaged old products; and the changing residences of individuals causes demands in local markets to continually shift.

Because demands are continually changing, retailers, wholesalers, producers, and resource suppliers must be continually alert to new opportunities. In a competitive world, a failure to attend to the changing demands is highly likely to bring business losses.

Advertising

The conditions of the market economy give individuals the right to exchange the specialized goods or services they produce or acquire in exchange. In order to profit from this rights, sellers must be permitted to announce their intention to sell, to describe their product, to tell where it will be offered for sale, and to quote a price. Because their product is likely to be similar to other products or to perform similar services for consumers, they must be permitted to tell consumers their views on what these differences are. Thus, advertising is a characteristic of a market economy.

Advertising performs two functions. It informs consumers of alternative ways to satisfy their wants and it helps them discover their wants. An example of both is the advertisement for a new movie or ice cream flavor. Some consumers may regard the movie or ice cream as a better way of satisfying their wants, which they otherwise would have satisfied in some other way. Other consumers may regard them as satisfying wants that they otherwise would not have realized they had. We can call this *informative advertising*.

It is often argued that advertising not only helps consumers discover wants, it also *creates* wants. This argument is based on a distinction between existing wants and potential new wants. When a specialist helps you discover an existing want, he is said to be like a psychiatrist who helps you uncover a subconscious urge that was causing you discomfort. But when he creates a want, he causes you to be less satisfied than otherwise if you do *not* buy the good needed to satisfy that want. For example, you may be persuaded that in order to avoid feeling so bad, you must switch to a more expensive brand of a similar product. After you switch, your level of satisfaction may be much higher or no higher, as you perceive it, than before the advertisement. Note that information about a previously unknown health hazard also may make you feel worse off than before. However, it makes you feel better off than you would have felt if you had not been given the information.

It is not the task of the economist to deal with these issues. The economist's concern ends with the observation that specialists emerge in the market economy to help consumers discover wants and means of satisfying them that are better from their point of view. The question of whether advertising causes greater or lesser happiness is beyond the scope of economics.

Laws that Hamper Advertising

Although economists do not ordinarily deal with advertising, they do explore the effects of laws that hamper it. Suppose that the right to advertise was hampered in some way perhaps because it is believed that wants in general or only particular wants, such as the want to smoke cigarettes, should not be created or discovered. Then fewer specialists would emerge to help individuals discover such wants.

A ban on all advertising would make it impossible for advertising to perform the functions described above. In the last subsection we distinguished between two classes of advertising, based on its effects: (1) advertising aimed at changing peoples' wants or at creating wants and (2) advertising aimed at (a) providing them with new means of satisfying their wants or (b) helping them to discover their wants. Some writers favor a ban on the first class but not the second. To impose such a ban, officials would have to be able to distinguish (a) between consumers' ends and their means and (b) between created wants and newly-discovered existing wants. There is no reason to believe that government officials could distinguish them very well. Moreover, even if they could distinguish, there is no reason to believe that government officials who were given the power to punish some advertisers while not punishing others would use their power in the best interests of consumers.

2. TECHNICAL KNOWLEDGE

Technical knowledge is *knowledge of physical causality*. This notion can be expressed in several ways. We can say that it is knowledge of how an individual's choice can cause changes in her observable physical environment. Alternatively, we can say that it is knowledge of how to accomplish observable goals by performing actions. Finally, we can call it scientific knowledge.

In the market economy, technical knowledge is possessed by millions of financiers, producers, and resources-suppliers. In other words, it is possessed by everyone. Each of these individuals is a specialist

in her field. Some have devoted many years of study and have extensive experience. Such technical knowledge becomes marketable human capital when its owners hire themselves out as employees. But much of it is possessed by heads of business organizations, who use it in an effort to make profit or as a basis for getting hired at large salaries as corporate executive officers and such by financiers.

The Growth of Technical Knowledge

In the past three centuries, we have witnessed a tremendous growth of technical knowledge. One cause of this growth is the relentless search for lower costs of production. Any producer who can discover a lower cost method of production, other things equal, can increase his profit. In many cases, the patent system operated as a catalyst in the discovery process. A patent system extends the profit-making period by deterring copying. A second cause of the growing technical knowledge is the efforts by producers to satisfy the great diversity of demands that exists in the market economy. Recognizing this diversity, producers have developed a greater variety of products. Each new product implies an increase in technical knowledge.

Much of the new technical knowledge that we have witnessed over the centuries is not about wants or about goods; it is about generalized resources and how they can be combined. This knowledge results from basic research. It has sometimes been produced by the research branches of large diversified businesses. Sometimes it has been discovered by military researchers and then transferred to peacetime applications. Another important source is the universities, both private and government. Also governments have authorized tax monies to be used to support basic research, although the higher taxes needed to finance such research also reduce business incentives to do research.

How Technical Knowledge is Acquired: Directly and Indirectly

Technical knowledge can be acquired in two ways: (1) directly through experience and (2) indirectly through communication with others. We can call the first type *direct* and the second type *indirect* technical knowledge. Direct technical knowledge is all that would be available to the solitary actor.

Direct technical knowledge begins to be acquired at the earliest stages of a person's existence. A young baby, for example, learns how to pull and push things, how to move from one place to another, etc. As this learning progresses, more complicated knowledge develops, such as how to walk, how to swim, how to ride a bike, how to dance, and how to play a specialty position on a sports team. Later in life, the adult may learn a trade or craft, how to operate machines, and how to use tools.

To an outsider, direct technical knowledge often appears to be acquired through simple trial and error. To some degree, it probably *is* acquired in this way. However, as outsiders, we can never be certain of this. First, we cannot know for certain the thinking processes that may precede the various trials. Second, we cannot know for certain an individual's previous experiences on which he bases his hunches about which trials to choose. In other words, it is possible that the behavior we observe is at least partly an experiment. We know from our intuition and experience that the trial and error process is facilitated by an active, receptive, and curious mind.

Indirect technical knowledge consists of the knowledge that an individual acquires from others by means of communication. The medium for communicating such knowledge is speech and the written word. Most scientific knowledge is acquired in this way. Consider a simple example. Most of us know that a copper pot can be molded from pure copper which, in turn, can be obtained by applying intense heat to impure copper ore. Copper ore can be found in various places in the earth. Although we have this knowledge, chances are that none of us has actually tried to make a copper pot. Our knowledge is probably due to our reading or to our being educated by others. It is indirect.

In recent years, we have observed the governments of lower-income countries promoting the indirect technical education of their citizens by sending them to higher-income countries in the hope that they will acquire technical knowledge which they will return to use in their country. Often, however, these countries restrict enterprise, making it more profitable for the citizens to employ their knowledge abroad. Unless the foreign students have strong cultural ties to their nation, a country that subsidizes foreign study without freeing its domestic markets to the necessary foreign investment is mainly providing human capital to other countries.

Scientific Knowledge

Because we rely heavily on language in our society, there is an interesting relationship between direct and indirect technical knowledge. Consider the knowledge of physics, chemistry, and biology. The vast majority of people have acquired very little of this scientific knowledge directly. The few who have will nowadays have spent several years studying a specific subject and conducting experiments. Nevertheless, many of us have access to scientific discoveries through technical journals, encyclopedias, private consulting, formal education and specialized news reports in the popular media. When we acquire scientific knowledge in this way -- and few of us acquire it in any other way -- *our* knowledge is indirect. Thus, the scientific knowledge that is direct to the scientist who discovers it (and to others who verify it) is, to most people who acquire it, indirect.

In fact, our ability to communicate skills has revolutionized science education.¹ There was a time in history when the most important talent an experimental scientist could acquire was an ability to conceive of and carry out new experiments. Although this skill is still important, it seems to have taken a back seat to another skill -- that of locating and understanding the reports of experiments carried out by others. Experimental scientists in their daily activities continuously refer to books and scientific journals, they consult with colleagues, and they rack their brains and search their personal libraries in an effort to recall material that they read long ago but partially forgot or set aside. In fact, an important measure of the competence of a modern experimental scientist is his knowledge of the scientific literature. A scientist today is apt to be like a walking reference guide for finding scientific knowledge.

It is obvious why this is so. Modern scientific knowledge is so vast that no experimental scientist could hope to directly acquire all that she seeks. The best one can hope for is to learn the techniques of acquiring as much of it indirectly as he feels he needs at the moment with the least expenditure of his time and energy.

We can see now why it is so important for a future experimental scientist to be a student for so long. She must, of course, learn experimental methods. More importantly, however, she must learn the language of other scientists. She must do this before she can learn their various theories and the experiments that support them. And, if she is to make a major contribution to the "body" of scientific knowledge herself, she must learn how to *construct* theories (i.e., how to revise her views of relationships among material phenomena in light of new knowledge).

Although we have been talking about the knowledge possessed by experimental scientists, our argument applies with much the same force to non-scientists. Take the example of a homeowner who decides to undertake major home improvements or to build his own home. His best procedure is usually to purchase books that describe how to accomplish the various tasks. Such books are basically reports of the accumulated successful experiments of others. The do-it-yourselfer might not take the time to realize this. In fact, the reports of direct experiments may be presented as "expert advice." But this advice from experts is merely a report, written in everyday language, based on someone else's experiments.

In more formal science, information is often presented in the form of general theories. Theories are the language structures that scientists use to describe their real and hypothetical direct experiences.

Why Technical Knowledge is Acquired, Produced, and Communicated

Why do people conduct experiments and construct theories to report them to others? And why do others read these reports? In general, why do people acquire technical knowledge and why is it communicated?

It seems obvious that do-it-yourselfers acquire knowledge in order to better satisfy their wants. How about those who produce goods for others? In the market economy, they acquire knowledge because they expect to earn profit. They expect their knowledge to enable them to discover new products to sell, to improve the products they are already selling, or to produce their products at a lower cost. There are always some people who enjoy making new discoveries for their own sake. Accordingly, the profit incentive is not the only motive for discovery. These exceptions are overwhelmed by profit-driven discoveries.

¹Moreover, since the recent advances in telecommunications are greatly improving our ability to communicate, we can expect a further revolution in science education.

Perhaps the largest part of technical knowledge is acquired by people who expect to be employed by someone else. Producers know that they are limited in the knowledge that they themselves can acquire and in the time they have to apply that knowledge. So they hire technical personnel with scientific knowledge. The producers must still have enough knowledge to appraise these personnel. But they regard hiring them to perform duties as more profitable than acquiring the additional knowledge themselves. Because the employer's is willing to hire scientists for relatively high pay, students have an incentive to embark on a program of study in science. In addition, parents are motivated to promote a scientific career for their children.

3. KNOWLEDGE OF OTHERS' KNOWLEDGE

Perhaps the most important characteristic of the hypothetical market economy is that people can benefit from each others' knowledge without coming to know it themselves. In your daily activities you consume numerous goods and services that you could not possibly learn how to produce. The knowledge needed to produce them is located in the separate minds of millions of people. Think for a moment about the knowledge that is used to produce and distribute the good or service that you yourself specialize in helping to produce. If you have never been employed in producing a good or service, then think about a family member or a future job or business that you might expect to have. Now think about some others who are related to you in this production activity. These include the suppliers of human capital and skills that complement your services; those involved in marketing, distributing and selling this good or service; the consumers who buy your product; and the financiers of your enterprise. Each of these has knowledge that, in some measure, complements your own. You probably do not know exactly what that knowledge is. But if they did not have it, you would not be able to gain from your specialty.

It is evident from these reflections that the market economy contains an enormous amount of knowledge. Our focus in this section is on knowledge of that knowledge. Many people are unaware that this knowledge exists. They go about their business of supplying resources in resource markets and of buying goods in goods markets without ever considering the fact that they know nothing about how to cause their resources to be used or the goods to be produced. Our interest here is on those people who do know something about the knowledge that others have.

Let us consider four examples. The first is knowledge that is possessed by employers who hire employees. Assuming that the employee has specialized knowledge, the employer knows that the employee is capable of using her knowledge to benefit his business. Thus he knows that she has knowledge. He does not know exactly what that knowledge is. Nevertheless, his decision to hire her shows his willingness to bet that she will use it to raise the profit to his business. He trusts that she will use her knowledge and discretion in the interest of the company.

The second example is the knowledge possessed by the buyers of durable goods and resources. Ordinarily they have sufficient knowledge of the knowledge possessed by the producers to predict that the product will last as long as the producer has promised and perform the service it was said to be capable of performing.

The third example is of the knowledge possessed by employees who choose their jobs with an eye toward whether their employers will sustain their employment, give them higher wages in the future, or keep their interests in mind when making decisions about working conditions, safety, pension, etc. A worker knows that her boss has the knowledge to act in her interest in making these decisions and she trusts him to do so.

The fourth example is the financier's knowledge of the CEOs and other employees of a business in which she invests. The investor must know about the character and knowledge of the CEOs and other managers of enterprises before they are willing to participate in the financing. Investors consist of bankers and other lenders, stock purchasers, silent partners, and guarantors of loans. This knowledge is so important that specialists emerge to provide advice and to manage mutual and other investment funds. The mass media take advantage of the demand for this knowledge by persuading advertisers to finance business advisement and business education stories on TV, in magazines, newspapers, newsletters, and the internet.

Substitutes for Knowledge of Others' Knowledge

Because it is costly to acquire knowledge of others' knowledge, individuals seek out and take advantage of opportunities to economize. We can expect that individuals who can identify low-cost and effective substitutes for acquiring such knowledge to succeed where others fail. The best examples are in finance. Assume that B is a producer who has specialized knowledge of a profitable production-sales plan and that investor A possesses the means to finance the plan. Assume further that if A had the same knowledge as B, he would gladly finance the plan, expecting to earn a greater return on his investment than alternatives. But to acquire such knowledge is costly.

The prospective financier has two substitutes. First, instead of acquiring specific knowledge about the production-sales plan, he may *acquire general knowledge about the competence and trustworthiness of the producer* who seeks the financing. In this circumstance, the financier (1) may come to expect the plan to succeed even though he does not know the producer's specific knowledge and (2) may believe that the producer will try to repay the loan and interest even if the plan does not succeed. Second, the financier may be able to raise his confidence that the plan will succeed by *creating legal rights by means of a contract*. The importance of this second way depends partly on how well developed a nation's private property system is. Under a highly developed contract law system, the producer and financier could make an enforceable contract to the effect that if the producer failed to repay with interest because she did not take "due care" of the lender's funds, she would be liable to make restitution. Or, she would agree that if she could not pay it, she would be punished many fold for her failure. If such a contract could *not* be made -- for example, if there was a bankruptcy law that made it easy for a promise-maker to avoid responsibility, if the burden of proof that an individual did not exercise "due care" was excessive, or if the contract law system was not well developed -- this method of economizing on knowledge would not be so effective. These same two methods -- (1) acquiring general knowledge about competence and trustworthiness and (2) writing contracts -- can also be used in the other cases. Prospective employers, employees, and buyers of durable goods can economize on acquiring knowledge of knowledge in these ways.

Knowledge of Others' Knowledge is Indefinite

The knowledge that some people have about others' knowledge cannot be precisely described because it is indefinite. If we think about this problem abstractly, we can identify three apparent reasons for this. First, imagine two people: A and B. If A has technical knowledge, B may know about it. Similarly, if B knows that A has knowledge, A may know that B knows. Carrying the exercise a step further, B may know that A knows that B knows about A's knowledge.

We can describe this case of *infinite regress* in the following way: "A knows that B knows that A knows that B knows..." This illustrates that one person's knowledge of another person's knowledge must be an indefinite concept.

A second reason why the concept must be indefinite is that there are many individuals in a modern economy. Where many individuals are involved, we can imagine knowledge that we could describe in the following way: "A knows that B knows that C knows..." And indefinite number of people could know that others know.

A third reason becomes clear when we realize that to "know" something is itself an indefinite concept. Even if we only consider technical knowledge, we must take into account several factors, including the following. (1) A particular resource can always be broken down, at least conceptually, into parts and the relationship between the parts can be studied. (2) What constitutes a resource is continually changing, as demands change and as new resources and ways of combining them are discovered. (3) The relationship between any set of resources can be comprehended in an indefinite number of ways.

We have only scratched the surface of the problem of defining knowledge of others' knowledge, it is evident that it will not be a simple matter to describe it. Yet we must attempt to do so if we are to understand the market economy.

4. KNOWLEDGE OF HOW TO ACQUIRE KNOWLEDGE

Knowledge of how to acquire knowledge appears to consist mostly of the knowledge of how to conduct useful experiments and how to analyze previous experiences. Most people learn these things indirectly by observing or reading about the experiments and interpretation of experiments carried out by others.

Today we take experimentation for granted. However, for hundreds of thousands of years, although human beings certainly experimented, they were only dimly aware of modern, objective, and unbiased ways to conceive of and carry out experiments. The great advances in science that have occurred in the last three or four centuries are almost totally the consequence of learning how to more properly conduct experiments. This book is not the place to describe the process of learning by experiment. Our main interest is to recognize its great importance to progress. The vast experimentation and communication of interpretations of facts that have occurred in the laboratories of businesses, universities, and government institutions in last few centuries are unprecedented.

Most people seem to have learned how to experiment and to interpret experiences through communication. It follows that much of the increased knowledge about how to acquire knowledge has been the consequence of the invention, first, of written language and, second, of the printing press and its various refinements. These inventions acted as great catalysts for communicating the experiments performed by others and the various interpretations of experiments and experiences. They vastly reduced the toil and trouble of transmitting knowledge between people. The twentieth century saw the emergence of radio, television, taped recordings, computer technology, and the internet. Today, it is difficult to predict the future development of such communication devices but we can be confident that it will be in the direction of progress.

We should briefly discuss advances in the means of acquiring knowledge about peoples' wants. Modern techniques of acquiring such knowledge have progressed along with specialization. Since specialization is a continuing process, these techniques are still developing. Techniques of market research and knowledge of how to conduct revealing attitude surveys are in a continual state of change and progress. It appears that modern business schools are widely accepted sources of much of the general knowledge needed to discover wants. At the same time, interviews with successful marketers, advertisers, and salespeople suggest that there are many techniques of discovering wants that are either not currently taught in business schools or that are unteachable.

Study Questions for Chapter 5

1. Define: knowledge of the structure of production, sales and marketing; retailer; wholesaler; franchisee.
 2. Your text uses the term “horizontal knowledge of demands.” Tell the meaning of this term.
 3. Your text uses the term “vertical knowledge of demands.” Tell the meaning of this term.
 4. Describe the specialized knowledge of the retailer.
 5. Wholesalers play an important role in transmitting information between producers and retailers. Explain this role, according to your text.
 6. In a market economy, who regards it as important to possess knowledge of wants for job satisfaction? Why is it important for such people to possess this knowledge?
 7. Tell the two functions of advertising in a market economy.
 8. Evaluate a proposal to ban advertising that is aimed at creating or changing peoples' wants. In other words, do you think (a) that such a ban would benefit a society and (b) that such a ban is possible? Explain by discussing the arguments in your text.
 9. What are the causes of the tremendous growth in technical knowledge, according to the text?
 10. What conditions must be present for a country to benefit from subsidizing the education of its students at foreign universities and training centers?
 11. Distinguish between the two ways that technical knowledge is acquired: (1) directly and (2) indirectly by giving examples that are different from the text.
 12. Is scientific knowledge acquired directly or indirectly? Explain by example.
 13. Explain how our ability to communicate has revolutionized the way individuals acquire scientific ideas.
 14. Cite three reasons why the concept of knowledge of others' knowledge is an indefinite concept.
 15. Who possesses the knowledge of knowledge in the market economy? (Answer by giving three examples of people who possess such knowledge.)
 16. In a market economy, financing can occur without each financier learning about the details of each production-sales plan that he takes a part in financing. Tell two ways that this can occur.
 17. Tell the role of the contract law system in helping individuals produce substitutes for financiers' knowledge of business planners' knowledge.
 18. Tell generally how ordinary people in a market economy acquire knowledge of others knowledge? Are the methods the same today as they have been in the past. Explain.
 19. Imagine that an alien from outer space asked you for advice about how to learn about economic knowledge on Earth. What advice would you give him?
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