THE POWER OF PRINCIPLES: AN HISTORICAL PERSPECTIVE

This book identifies general economic principles that underly strategic decisions of firms. We have already encountered several in the Economics Primer—pricing rules, basic concepts in game theory, and the importance of economies of scale. By definition, principles are enduring. The applications change, but only because the environment changes. As the business environment continues to evolve, managers will rely on the same principles to guide their strategic choices.

We illustrate the enduring power of principles by examining how the scale and scope of the firm have evolved over the past two centuries. We focus on three points in time: 1840, 1910, and today; the first two dates represent milestones in the evolution of the business environment. While some aspects of business infrastructure developed prior to 1840, limited transportation and communications constrained firms to operate in small localized markets. Changes in infrastructure and production technology between 1840 and 1910 encouraged the growth of national and international markets and corporate giants such as British Petroleum, U.S. Steel, and Bayer Chemical. Even the largest and best-managed firms, however, were constrained by problems of coordination and control—how to gain sufficient information on a timely basis to manage large-scale operations and adapt to market changes. Since 1910, and particularly in the last 30 years, changes in communications, data processing, and networking have revolutionized firms’ abilities to control their operations and interact with suppliers, customers, competitors, and other stakeholders.

Although we have witnessed fundamental changes in nearly all aspects of the business environment, principles for business decision making have not changed. When one applies these principles to the ever-changing environment, the remarkable evolution of business practices over the three generations that we discuss makes perfect sense.

Doing Business in 1840

Before 1840, businessmen managed their own firms in ways that today’s managers might point to as damning evidence against the durability of business principles. The experience of John Burrows was typical. Burrows was an Iowa merchant who bought potatoes from nearby farmers and cleaned and packaged them. Hearing that potatoes were fetching $2 a bushel in New Orleans, he loaded an Illinois River flatboat and floated downstream.
On the trip, he was offered 50 cents a bushel for his potatoes but rejected it in hope of getting a better price in New Orleans. While floating south, he was joined by other potato merchants seeking the same high prices. Soon, the New Orleans market was glutted. Supply and demand dictated that potato prices would plummet. After a six-week journey, Burrows sold his potatoes to a Bermuda ship captain for 8 cents a bushel. Viewed from a modern perspective, this way of doing business makes little sense. But in 1840, Burrows’s way of doing business represented a very sensible response to the infrastructure and technology of the time.

Burrows was a merchant known as a “factor.” Farmers in the United States and Europe sold their output to factors like Burrows, who brought the goods to major markets, such as New Orleans or New York, in search of buyers. Some of these buyers were local merchants, looking to stock their grocery stores. Most buyers, however, were “agents,” representing out-of-town merchants, including some from Europe. Factors and agents rarely dealt directly with each other. Instead, they enlisted the help of “brokers” who served as matchmakers between factors and agents. Brokers possessed specialized knowledge of market conditions that individual factors and agents lacked, including the names of factors and agents, the availability of supplies, and the magnitude of demands.

Selling was informal. Transactions were relatively infrequent, the cast of potential transaction partners changed constantly, and timely information about the sales of comparable goods and the prices obtained for them was often unavailable. These problems increased with the geographic distance between buyers and sellers. As a result, factors and agents sought out brokers with whom they had done business before. Terms were rarely set in advance or specified in a contract. Instead, the brokers tried to arrange a price that best balanced supply and demand for a given situation.

This way of doing business was transacted in 1840, and it was the best anyone could do under the circumstances. The brokerage arrangement no longer dominates the American business landscape, but it does survive in various forms, in businesses such as real estate. An important modern example of the broker role is the “market maker” in securities transactions. Market makers in the New York Stock Exchange (NYSE) match the buy and sell orders of parties who do not know each other, facilitating transactions that would otherwise be difficult to complete.

Buy and sell orders for shares traded on the NYSE are filled almost immediately, giving both parties to a transaction reasonable certainty about the price. John Burrows’s experience shows that this was not the case in 1840. Factors and agents faced considerable price risk—that is, the price that they expected when they began doing business (e.g., when Burrows started floating his potatoes downstream) may have been very different from the price received when the transaction took place (e.g., when Burrows reached New Orleans). This risk obviously increased with the distance between the site of production and its final destination. European merchants trading with the United States ran even larger risks than those Mr. Burrows faced.

The lack of knowledge about prices, buyers and sellers, and the associated risks dramatically shaped the nature of business. Farmers faced the most risk, and they relied on factors like Burrows to assume some of it, by selling different farm products at different times of the year, and by selling specific products at various times on the way to market. Presumably, Burrows was more willing to bear risk than most farmers, which may have been why he became a factor rather than a farmer. Once Burrows reached the market himself, he relied on brokers to find buyers for his potatoes, a task that he could not easily perform himself.

With few exceptions, such as in textiles, clockmaking, and firearms, most “firms” in 1840 were very small, exemplified by the individual and family-run businesses that dominated the potato industry. This stands in stark contrast to today, where a firm employing 50 workers is considered small, and there is often a clear distinction between
owners (shareholders), managers, and employees. Given the local nature of markets and the uncertainty about prices, it is not surprising that individuals in 1840 were reluctant to use their own limited resources to expand the size of their businesses. For similar reasons, banks were also unwilling to finance business expansion, leading to underdeveloped capital markets. Because of problems with transportation and communication, which we describe, firms could not justify investing in the acquisition of raw materials or the distribution of final products, even though this might have allowed them to coordinate the production process more efficiently. As a result, production and distribution required the coordination of many small, local firms. Market conditions at the time made any other system impractical.

**Business Conditions in 1840:**
**Life without a Modern Infrastructure**

The dominance of the family-run small business in 1840 was a direct consequence of the infrastructure that was then in place. Infrastructure includes those assets that assist in the production or distribution of goods and services that the firm itself cannot easily provide. Infrastructure facilitates transportation, communication, and financing. It includes basic research, which can enable firms to find better production techniques. The government has a key role in a nation’s infrastructure because it affects the conditions under which firms do business (e.g., by regulating telecommunications), and often supplies infrastructure investments directly (e.g., national highways). Government investments in infrastructure are especially important for public goods, where individual firms are unable to capture more than a fraction of the benefits and are therefore reluctant to bear the costs.

Limitations in transportation, communications, and finance created the business environment with which John Burrows and others of his time had to cope. While we discuss the situation in America in this and subsequent sections, European businessmen faced similar limitations, often made worse by political factors.

**Transportation**

The harnessing of steam power revolutionized transportation in the first half of the nineteenth century. Although the Romans had made attempts to develop roadbeds by means of rails of different sorts, the modern railroad did not add value to commerce until the introduction of the steam engine and the use of iron and steel rails. By 1840, the railroads began to replace the horse and wagon for the shipment of raw materials and consumer goods. Rails in the United States took time to develop, however. As late as 1836, only 175 miles of railroad track were laid in one year.\(^1\) By 1850, U.S. railway systems were still too fragmented to foster the growth of national markets. Few rails ran west of the Appalachian Mountains, “connecting” lines often had different gauges, and schedules were seldom coordinated. The development of an integrated transportation infrastructure through railroads in the United States would not be complete until after 1870.

Until the railroads developed, manufacturers used the waterways to transport goods over long distances, even though water transportation left much to be desired. For example, while the new steamships plied major American rivers and the Great Lakes as early as 1813, no direct route connected the major Atlantic seaboard cities to the Great Lakes until the completion of the Erie Canal in 1825. Steamships could not unload in Chicago until the 1840s. The trip from New York to Chicago was both lengthy and risky, especially during bad weather. Possible waterway routes were limited, and constructing and maintaining canals was expensive. Nonetheless, the opening of the Erie Canal led to startling growth. For example, between 1830 and 1840, the population of Illinois tripled, from 157,000 to 476,000, and the population of Chicago grew eightfold, from 500 to more than 4,000.\(^2\)
EXAMPLE 1.1 The Emergence of Chicago

The emergence of Chicago as a major commercial center in the 1800s illustrates the core concepts that we have discussed, albeit for a city rather than a business. In the 1840s, growing cities in the Midwest, including Cincinnati, Toledo, Peoria, St. Louis, and Chicago, were all competing, as vigorously as firms in any other markets might compete, to become the region’s center of commerce. Their success would ultimately be decided by the same conditions that determined the horizontal and vertical boundaries of business firms. Significant changes in infrastructure and technology enabled Chicago’s business organizations, and with them the city’s financial fortunes, to outstrip other cities. For example, by 1860 the Chicago Board of Trade bought and sold nearly all the grain produced in the Midwest. Similarly, two Chicago meatpackers, Armour and Swift, dominated their industry.

Chicago prospered because it conducted business differently from competing commercial centers. Chicago businesses were the first to take advantage of new technologies that reduced costs and risks. For example, Swift and Armour simultaneously adopted the refrigerated train car, which had first been used by Illinois fruit growers. (Lining a standard freight car with ice from Lake Michigan produced the refrigerator car.) This allowed cattle and hogs to be butchered in Chicago, before they lost weight (and value) on the way to market. Cyrus McCormick and others took advantage of the recently invented grain elevator to inexpensively sort, store, and ship grain bought from midwestern farmers. They reduced the risk of dealing with large quantities of grain by buying and selling grain futures at the newly founded Chicago Board of Trade.

The businesses run by Swift, Armour, McCormick, and other Chicago entrepreneurs required substantial investments in rail lines, icing facilities, grain elevators, the futures market, and so forth. These businessmen recognized that they could not recoup their investments without high volumes of business. This would require throughput: the movement of inputs and outputs through a production process. The meat-packing and grain businesses of Chicago required large supplies of ice and large ensured movements of grain and livestock from the farmlands and grain and butchered meat to eastern markets. The need for throughput explains why Chicago emerged as the business center of the Midwest. Only Chicago, with its unique location as the terminus of rail and water routes from the East and West, had the transportation infrastructure necessary to ensure throughput. Chicago thus emerged during the mid-1800s and remains today the “market leader” among midwestern cities.

Ocean transport at this time was still dominated by sailing ships, and innovations such as the steam engine and the screw propeller were new to this mode of travel. The White Star line, the famous British steamship firm and eventual owner of the Titanic, was founded during this time (1845).

Communications

The primary mode of long-distance communication in 1840 was the public mail. The U.S. Postal Service had developed into the largest postal system in the world by 1828. Even so, as late as 1840, the postal service depended almost exclusively on the horse and stagecoach, and had difficulty adjusting to the volume of communication that followed western U.S. expansion. It was not until the establishment of the Railway Mail Service in 1869 that the postal service shifted to railroads as the principal means for transporting mail nationally. This was hardly the instantaneous communication we have come to associate with a modern infrastructure.
Using the mails for business correspondence proved expensive and unpredictable. For example, correspondence from the Waterbury, Connecticut, headquarters of the Scovill Company in the 1840s took one day to reach New York City and two days to reach Philadelphia in good weather. In bad weather, it could easily take a week. To send a one-sheet letter from Waterbury cost 12.5 cents to New York and 18.5 cents to Philadelphia. The absence of postmarks on some letters from this time suggests that high postage rates encouraged Scovill owners and their agents to hand-carry items. Business mail volume increased after the U.S. Postal Service significantly lowered its rates twice, in 1845 and 1851, in response to the growth of competition from private delivery services.6

The first modern form of communication was the telegraph, which required laying wires between points of service. In 1844, Samuel Morse linked Baltimore and Washington by telegraph on a project funded by the U.S. Congress. While Morse’s venture quickly proved unprofitable, other telegraph lines soon flourished. By 1848, New York was linked to both Chicago and New Orleans. By 1853, a total of 23,000 miles of line had been strung.

By the 1860s, transatlantic cables connected the United States and Europe. These cables and their descendants remain important infrastructure elements today. After a period of explosive growth, the industry consolidated around a dominant firm: Western Union.

Even when modern communication capabilities became available, firms did not always adopt them, since their potential value was unclear at first while their start-up costs were high. Firms initially used the telegraph for its value in bridging distances with agents over matters such as pricing. Although using the telegraph was expensive, important time-sensitive messages justified the cost. Railroads used the telegraph for these reasons, but were slow to adopt it for regular scheduling. The New York and Erie Railroad was the first to do this in the United States in 1851, following the example of British railroads.7 In time, however, telegraph lines came to parallel most major train lines and proved indispensable for railroad scheduling and operations. Some modern telecommunications firms, such as Sprint, saw their beginnings in these types of arrangements.

Finance

Few individuals could afford to build and operate a complex firm themselves. Financial markets bring together providers and users of capital, enabling them to smooth out cash flows and reduce the risk of price fluctuation. In the first half of the nineteenth century, however, financial markets were immature at best. Most businesses at the time were sole proprietorships or partnerships that found it difficult to obtain long-term debt. In addition, stocks were neither easily nor widely traded, which diluted their value and increased the cost of equity capital. Investors also found it hard to protect themselves against the increased risks of larger capital projects.

The major role of private banks at this time was the issuance of credit. By 1820, there were more than 300 banks in the United States. By 1837, there were 788. By offering short-term credit, banks smoothed the cash flows of buyers and sellers and facilitated reliable transactions, although considerable risk from speculation and inflation remained throughout the nineteenth century. There was a recurring pattern of boom and bust, with periodic major depressions, such as the Panic of 1837.

Many smaller firms had difficulty getting credit, however, and if it was available at all, credit was often granted informally on the basis of personal relationships. Government or private consortia—groups of private individuals brought together to finance a specific project—funded larger projects. All told, from 1820 until 1838, 18 states advanced credit of $60 million for canals, $43 million for railroads, and $4.5 million for turnpikes.
As the scale of capital projects increased after 1840, government support or larger public debt or equity offerings by investment banks increasingly replaced financing by private individuals and small groups of investors as the principal sources of capital funds for businesses.

In 1840, no institutional mechanisms were available that reduced the risk of price fluctuation. This would require the creation of futures markets. Through futures markets, individuals purchase the right to buy and/or sell goods on a specified date for a predetermined price. Futures markets require verification of the characteristics of the product being transacted. They also require that one party to the transaction is willing to bear the risk that the “spot” (i.e., current) price on the date the futures transaction is completed may differ from the transacted price. The first futures market was created by the Chicago Board of Trade (CBOT) in 1858 and profoundly affected the farming industry, as we discuss in Example 1.1. The CBOT would not have been possible without the telegraph; in this way we see how one form of infrastructure facilitated another.

Production Technology
Production technology was relatively undeveloped in 1840. Where factories existed at all, they produced goods in much the same way they had been produced in the previous century. Textile plants had begun to be mechanized before 1820 and standardization was common in the manufacture of clocks and firearms, but the “American System” of manufacturing through the use of interchangeable parts was only just beginning to be adopted. Many of the scale-intensive industries most associated with industrial growth, such as steel, oil, chemicals, or automobiles, developed volume production only in the late nineteenth or early twentieth century.

Government
The economics underlying public works projects like the Erie Canal are similar to the economics of the prisoners’ dilemma, which we described in the Economics Primer. The economy as a whole benefits if all citizens chip in to bear their cost, but no one individual or firm finds it worthwhile taking on the project alone. Thus, the government steps in and provides the public good on behalf of everyone. Aside from such infrastructure investments, the U.S. government was not much involved in the economy prior to 1840. During the Civil War, President Lincoln’s administration sponsored the competition between the Union Pacific and Central Pacific Railroads to build the first transcontinental railroad, which was completed in 1869. This project arguably had an equal or a greater effect on the economy of the time than did the creation of the Internet, another government infrastructure project.

By the end of the nineteenth century, the U.S. government was becoming more actively involved in the business environment. The first major industry regulatory agency, the Interstate Commerce Commission, was created in 1887 to regulate the railroads. The Sherman Antitrust Act was enacted in 1890. Another important but less well-known example of government involvement in building commercial infrastructure during this time occurred in 1884, when the U.S. government hosted the Prime Meridian Conference in Washington, D.C. This led to the nearly worldwide adoption of a system of standard time, including the now-familiar 24 standard time zones, the location of the Prime Meridian in Greenwich, England, and the adoption of an International Date Line. This system was necessary to meet the demands for coordination in transportation, communication, and contracting that arose out of the worldwide expansion of markets due to improvements in transportation and communications. It is now commonplace for government to relax antitrust laws to allow erstwhile competitors to meet and establish technology standards.
The transcontinental railroad was built between 1863 and 1869, and connected Omaha (the eastern end of the Union Pacific Railroad) with Sacramento (the western home of the Central Pacific Railroad). This project was the Internet of its time. Together with the telegraph, which accompanied it along the route, the transcontinental railroad reduced the time and expense of moving people, goods, and information from the population centers in the East to California. Before its completion, trips to California took months by sea or over land, cost thousands of dollars, and were fraught with risks from disease to Indian attacks. Within months of its completion, a trip from New York to San Francisco took seven days, was much safer, and cost under one hundred dollars. Mail to California, which had been priced at dollars per ounce before 1869, cost pennies per ounce shortly afterward. The railroad fostered the growth of a national and continental perspective, such that a national stock market and national commodity market developed, all working on a system of “standard” time, the impetus for which came from the railroads. This set the stage for the growth of national retail markets by the early years of the twentieth century.

The U.S. government heavily subsidized the builders of the railroad with financing and land grants. Since it crossed the continent in advance of settlement, this railroad was an infrastructure project that individual firms would not have found profitable to undertake. Literally everything associated with the railroad had to be brought to the construction site as part of the venture. To ensure completion of the railroad, Congress structured the venture as a race between two firms (Central Pacific and Union Pacific) that started from opposite ends of the country and were built toward each other. The more miles of track that each firm graded and laid, the more the government would reimburse the firm for its costs. As one firm completed more of the route, there was less available to the other firm for reimbursement. Competing this way forced each firm to choose its strategies to lay the most track mileage in the shortest time. Managers emphasized speed at the expense of building the best or highest-quality road.

As is also the case with the Internet today, managers, investors, government officials, and others were very uncertain regarding how to harness the commercial and transformative potential of the transcontinental railroad so that it could become profitable. Public optimism about the growth prospects of the railroads made financing available in the early years, and overbuilding of railroad lines was common. In 1872, a major scandal erupted over the financing of the transcontinental railroad and the misuse of funds for securing political influence regarding it. This was followed by a major national recession, the Panic of 1873, during the course of which sources of financing for railroads dried up. In the 1870s, many of the major railroads went bankrupt and fell under the control of speculators, such as Jay Gould.

It was not until the 1890s that the transcontinental railroad was nationalized, unprofitable operations were closed, and remaining operations were upgraded and standardized. This allowed economies of scale in railroad network operations to be better realized. The result was an efficient and profitable industry that dominated transportation until the advent of the automobile.
occur. There were forces in play, however, that would change the conditions in which business operated and greatly increase its scale of operations and quality of management.

**Doing Business in 1910**

Business changed greatly from 1840 to 1910, and the business practices and organizations of 1910 would seem much more familiar to the modern businessperson than those of 1840. The evolution of business resulted not from newly developed management principles but from changes in infrastructure and technology. No change was more important than the development of mass-production technologies, such as the Bessemer process for making steel, or the continuous-process tank furnace that facilitated the mass production of many products, such as plate glass. These new technologies made it possible to produce goods at costs far below what firms using older technologies could achieve. The fixed investments required to develop these outlets were justified only when large volumes of goods flowed through them. In other words, firms needed to ensure a sufficiently large throughput to make the expansion of productive capacity economical.

The needed throughput was ensured by developing infrastructure: railroads for shipping inputs and finished goods; telegraph and telephone for communication, control, and coordination of materials over expanded areas; and banking and accounting practices to provide the investment capital needed to finance production and distribution facilities. The combination of scale economies and throughput enabled corporate giants to reach many more customers at lower costs per customer than their smaller competitors.

Product line and volume expansion altered relationships among manufacturers, their suppliers, and their distributors. Manufacturing firms increasingly chose to vertically integrate—that is, they chose to produce raw materials and/or distribute finished goods themselves, rather than rely on independent suppliers, factors, and agents for these tasks. Chapter 3 discusses the costs and benefits of vertical integration in depth. In a nutshell, manufacturing firms found it desirable to vertically integrate because the high volume of production made them more vulnerable to gaps in the chain of supply and distribution.

In the years immediately following 1910, many firms, such as DuPont, General Motors, and Alcoa, expanded horizontally by using established production technologies to offer a wider variety of products. Some of these firms found that the increased size and complexity of multiproduct operations necessitated a further reorganization into semiautonomous divisions. For example, the divisions of General Motors made operating decisions for each car line, while corporate management controlled corporate finance, research and development, and new model development. This organizational form, known as the multidivisional or M-form, became characteristic of the largest industrial firms until the 1960s.

The expansion of mass production was also associated with the subsequent growth of mass distribution firms in such sectors as groceries, apparel, drugstores, and general variety merchandising. While chain stores dated to the mid-nineteenth century, they greatly expanded in number and market share after World War I. In the United States, the number of A&P food stores tripled, as did J.C. Penney stores, while the number of Walgreens drugstores increased twentyfold. By 1929, the national market share of the top three grocery chains (A&P, Kroger, and Safeway) approached 40 percent. (The growth of national chains came more slowly in Europe, which had been beaten down by the First World War.)

The growth of vertically and horizontally integrated firms often reduced the number of firms in an industry and increased the potential for collusion to restrict competition and increase profits. Around 1910, the U.S. government directed antitrust activities toward breaking up firms that appeared to be national monopolies. Among the major cases during this time were those involving Standard Oil (1911), American Tobacco (1911), DuPont (1912), International Harvester (1918), and Eastman Kodak (1920).
Integrated firms employed more individuals in more complex and interrelated tasks than had earlier firms. They responded by standardizing jobs and tasks, monitoring worker compliance with management directives, appraising worker performance, and testing and training employees. These approaches spread widely among large firms, under the influence of a new type of specialist, the management consultant. Perhaps the best known of these approaches was “Scientific Management,” developed by Frederick W. Taylor, which sought to identify the most efficient ways of performing tasks through “time-and-motion” studies and then to motivate workers to adopt these ways of working through the use of incentives, rewards, and sanctions.

As firms grew larger, the functional areas of business—purchasing, sales, distribution, and finance—grew more important. The owner-manager could no longer perform these tasks alone. Firms created dedicated central offices staffed by professional managers, who ensured that production went smoothly and finished goods made it to market. As Alfred Chandler describes, the resulting hierarchy substituted the visible hand of management for the invisible hand of the market.

These changes in the nature of the firm and its managers caused problems and conflicts. The development of internal controls needed for coordination and efficiency could easily turn into excessive bureaucracy. Newly expanded workforces resisted the controls on their behavior and the standardization of their work habits that were needed to foster greater and more predictable throughput. This aided the growth of unions, and with them increased labor-related conflicts.

Business Conditions in 1910: A “Modern” Infrastructure

A substantially new infrastructure for business had emerged by 1910, notably in transportation and communications. These developments fostered the growth of national markets by enabling firms to count on the fast and reliable movements of goods, along with instantaneous and accurate communication over vast areas.

Production Technology

Most people did not begin to hear about mass production until after 1913, the year in which Henry Ford began producing the Model T. Mass-production processes permitted high-volume, low-cost manufacturing of many products, including steel, aluminum, chemicals, and automobiles, to name only a few. These products proved to be of more than sufficient quality to compete with the lower-volume custom products they replaced. The technology of producing “management services” also developed. Innovations in document production (typewriters), copying (carbon paper; photocopying), analysis (adding machines; punched-card tabulators), and organization (vertical file systems) enabled managers to coordinate the increased volume of transactions. Supplying these products spurred the growth of such firms as IBM, Burroughs, and Remington Rand.

Transportation

The continued consolidation and rationalization of the railroads after the initial period of growth ensured the throughput necessary for economical mass production. By 1910, railroads dominated passenger and freight transportation. Travel by rail became faster, safer, and more reliable. Manufacturers could obtain raw materials from distant sources and swiftly ship their products to customers hundreds or even thousands of miles away. Smaller manufacturers sold to the new mass-distribution firms, such as Sears, which could cheaply distribute via the rails vast arrays of goods to scattered customers. Motorcars were also developing as a fundamental means of transportation, but trucks would not displace the U.S. railroads until the development of an extensive system of interstate highways following World War II.
Communications
The main components of the communications infrastructure in 1840—the postal system and the telegraph—were still important in 1910 and were increasingly becoming part of the management and communications systems of large firms. During this time, however, the telephone grew more important. Phone calls to suppliers and distributors could instantly ensure managers that large production runs were feasible and that there were markets for their output.

The growth of American Telephone and Telegraph (AT&T) illustrates how the development of large firms depended on market and technological conditions. When the telephone was invented in 1876, its technological potential (and hence its profitability) was uncertain because some devices essential for telephone service as we know it, such as the switchboard, were unknown. The market conditions facing the telephone were also uncertain because of patent conflicts. This led to local competition to provide service. By the 1880s, patent conflicts had been resolved, and new technology made consolidation possible. In 1883, under the leadership of Theodore Vail, AT&T adopted a strategy of merging local telephone companies into a national system. The resulting network reduced the costs of interconnecting large numbers of users, and the telephone quickly replaced the telegraph as the communications technology of choice.\(^\text{11}\) The telephone also had implications for how the emerging firms of this era were organized. For example, it is hard to imagine the growth of the multistory headquarters office building without the telephone to connect all headquarters employees with each other and with field offices.\(^\text{12}\)

Finance
Since the 1860s, large investment banking houses had been underwriting most stock transactions that were essential for the financing of large firms. In 1910, securities markets publicly traded the shares of the largest industrial firms. The development of a financial infrastructure was further aided by the systematization and circulation of credit information (credit bureaus), the availability of installment financing, and the development of the communications infrastructure.

During this time, owners, managers, and investors realized that the growing scope of business required new ways of keeping track of a firm’s activity and reporting its results. For example, the railroads produced major innovations in cost accounting to manage their requirements of operating efficiencies, while mass-marketing firms such as Sears developed new accounting concepts, such as inventory turnover, to link profits to fluctuations in sales volume.

Accounting developments also focused on the idea of public accounting—the public disclosure of details of a firm’s operations to ensure that investors were not being cheated by managers and that capital was being maintained. Laws enacted in England between 1844 and 1900 required the presentation of a “full and fair” balance sheet at shareholders’ meetings, the payment of dividends out of profits, the maintenance of a firm’s capital stock, and the conduct of compulsory and uniform audits of all registered firms. Similar developments occurred in the United States. The first U.S. independent accounting firm was founded in New York in 1883, and the American Association of Public Accountants was formed in 1886.

Government
Government regulation of the conditions under which business was conducted, in such areas as corporate law and governance, antitrust, provisions for disability insurance and worker safety, and insurance for widows and children, increased during this period. (Securities markets and labor relations were not fully regulated until the 1930s.) This increased regulation affected not only how firms behaved toward competitors and employees but also how they were managed, since government forced managers to collect detailed data on their operations that had not been gathered before and that were
EXAMPLE 1.3 Evolution of the Steel Industry

In the first half of the twentieth century, success in the steel industry required both horizontal and vertical integration. Traditionally, the leading firms, such as U.S. Steel, Bethlehem Steel, and Republic Steel, produced a wide array of high-volume steel products and controlled the production process, from the mining of ore through the production of the finished steel products to marketing and distribution. But in the early 1950s, changes in market demand and technology transformed the industry.

The most significant change in market demand was driven by shifts in the economy. In the 1950s, “lighter” products, such as strips and sheets used to produce appliances, automobiles, and computers, became relatively more important than “heavier” products, such as rails and plates used for railroad and ship building. But the large steel producers, particularly U.S. Steel, were committed to the “heavy” products. Much of the steelmakers’ capacity was also poorly located to meet the new demands for lighter products. These factors allowed foreign producers to penetrate U.S. markets.

The most notable technological advances were the basic oxygen furnace, the continuous casting process, and scrap metal processing with the electric arc furnace. The basic oxygen furnace, which was commercialized in 1950 by an Austrian firm, Linz-Donawitz, replaced the open-hearth process as the fastest way to convert iron into raw steel. Continuous casting, a German invention that was perfected in the early 1960s by a small U.S. company, Roanoke Electric, allowed steel producers to bypass the costly process of pouring molten steel into ingots and reheating them for milling and finishing. The electric arc furnace was available before World War II but was little used before 1960. However, the increasing availability of scrap steel from discarded automobiles changed that, and by 1970 the electric arc furnace had become a viable way of producing nonalloy steel.

These technological advances had two profound effects. First, in postwar Japan and Germany, and later in Brazil and South Korea, start-up steel firms quickly adopted the basic oxygen furnace and continuous casting. By contrast, in the United States the established integrated mills had made nonrecoverable investments in the older technologies, in terms of both physical capital and expertise. These firms were therefore reluctant to shift to the new technologies. As late as 1988, 93 percent of all Japanese firms and 88 percent of South Korean steel firms had adopted continuous casting, while only 60 percent of U.S. firms had done so, and nearly half of these U.S. firms had made the changes only in the 1980s. This allowed foreign producers to become competitive threats to the large integrated U.S. producers.

Second, the new technology spurred the development of minimills, small nonintegrated producers that convert scrap metal into finished steel products. The success of minimill producers, such as Nucor and North Star, is emblematic of the significance of this new way of producing steel. Minimills have eliminated the advantages of high-volume manufacturing in product lines, such as steel bars, structural shapes, and wire rods, and with Nucor’s recent breakthrough in thin-slab casting, they may also take away the advantages of scale in the production of hot- and cold-rolled sheet. Although the large integrated producers have not disappeared, their importance has clearly diminished.

useful to professional managers. Nearly universal mandatory secondary school education also became the norm for industrialized nations in the first half of the twentieth century. This produced a workforce able to meet the specialized needs of large bureaucratic firms. Finally, through continued infrastructure investments, along with increasing military and shipbuilding expenditures, government became an important customer and partner of industry. These different roles embodied numerous potential conflicts and did not always fit together well in the new economic terrain.
Summary  The business infrastructure in 1910 made it efficient for firms to expand their markets, product lines, and production quantities. New technologies permitted a higher volume of standardized production, while the growth of the rail system allowed the reliable distribution of manufactured goods to a national market. The telegraph enabled large firms to monitor and control geographically separate suppliers, factories, and distributors. The growth of futures markets, capital markets, insurance companies, investment banks, and other financial institutions enabled business to be transacted on a scale that would have been impossible in 1840. By one estimate, the “transaction-processing sector,” which included transportation, communication, and financial institutions, had become one-third of the U.S. economy by 1910.\(^\text{14}\) To achieve the cost savings afforded by mass production and distribution, many firms reorganized and became more vertically and horizontally integrated. Increasingly, a new class of professional managers developed during this period and made critical decisions for firms. These managers became expert in functions that had not previously been handled by individual owners and entrepreneurs. The skills of those managers became a source of competitive advantage for firms in industries that could benefit from expansion.

Doing Business Today

Two world wars took their toll on global economic development, and the business world in 1950 had changed only incrementally over the previous 50 years. (An important exception is the automobile industry.) Since then, and particularly in the last 30 years, the ways of doing business have changed profoundly. Again, innovations in infrastructure are at the heart of the revolution in business practices. Computerized production processes allow specialized niche firms to offer tailor-made products at costs previously enjoyed only by larger firms exploiting scale economies. Modern telecommunication facilitates global business ventures, and the so-called BRICS economies (Brazil, Russia, India, China, South Africa, and other nations at a similar stage of economic development) have taken advantage by offering highly skilled, low-wage workers to Western companies looking to reduce production costs. These forces are encouraging large firms that once dominated the economy to increasingly prefer global alliances and joint ventures to domestic mergers and acquisitions.

Perhaps the most notable change in the business environment has been the decline of the large vertically integrated corporate giants. In helping to explain this decline, Adam Smith’s theory of the division of labor (described in Chapter 2) is proof positive of the power of principles. In a small growing economy, a firm must perform all of the tasks in the vertical chain because the market cannot yet support specialists in accounting, marketing, distribution, and such. Specialists emerge as markets grow, and firms no longer need to perform these activities in-house.

The twentieth century also saw firms expand and then shrink their horizontal boundaries. While some firms had begun to diversify beyond traditional product lines as early as 1890, the pace of diversification increased significantly after World War II, as firms like DuPont and General Foods discovered that their capabilities and skills were not exhausted by their historical product mix. Other firms, such as ITT and Textron, acquired portfolios of unrelated businesses. Senior management ran these firms as holding companies and delegated most strategic and operating decisions to the individual business units. While diversification was initially popular during the 1960s, the subsequent performance of conglomerates disappointed investors; the trend of subsequent mergers and acquisitions has been toward “deconglomeration” and a focus on core markets and enhanced linkages among business units.

Even with reduced conglomeration, firms have continued to form linkages across diverse businesses. Nowadays, diversification often takes place by strategic alliances and
joint ventures as well as by merger and acquisition, and today’s managers must manage global supply chains in much the same way that managers in 1910 coped with domestic supply chains. This has been facilitated by the growth of data processing, telecommunications, and networking capabilities.

Firms have also taken a fresh look at their internal structure and the organization of the vertical chain of production. Until the 1960s, most large diversified firms followed the General Motors model and employed the M-form. But as these firms diversified into less related businesses, they eliminated layers of hierarchy and reduced corporate staffs. Some firms, such as Dow Corning, Amoco, and Citibank, had difficulty coordinating complicated production processes across different customer groups and market areas using traditional multidivisional structures. These firms adopted complex matrix structures, in which two or more overlapping hierarchies are used simultaneously. Other firms, including Benetton, Nike, and Harley-Davidson, simplified their internal hierarchies, controlling product design and brand image but leaving most other functions, including manufacturing, distribution, and retailing, to independent market specialists.

**Modern Infrastructure**

Infrastructure today is marked by communications, transportation, and computing technologies that ensure coordination of extensive activities on a global scale. This, in turn, increases the interdependence of geographical markets and has magnified the costs of infrastructure failure. The interdependence of contemporary infrastructure was made tragically apparent in the aftermath of the September 11, 2001, terrorist attacks on New York and Washington. These attacks simultaneously halted two critical infrastructure sectors of the world economy: financial markets and air traffic. In addition, the attacks placed huge strains on other sectors whose influence cuts across the world economy—for example, insurance and leisure resorts.

**Transportation**

Automobile and air travel transformed the transportation infrastructure. Interstate trucking has become a competitor to the railroads in the shipment of freight. Air, rail, and ground travel have become better coordinated. Increasing demands from shippers of large volumes of goods for efficient and reliable transportation over long distances, coupled with more sophisticated communications and data processing technology, have allowed goods to be shipped in containers that move from ships to railroads to trucks. The widespread use of air travel for both freight and passengers has reduced the need for cities and firms to be close to railroads and waterways. What Chicago was to the second half of the nineteenth century, Atlanta was to the second half of the twentieth, despite its relatively poor rail and water connections.

**Communications**

Although fundamental developments in broadcasting, telecommunications, and computer technology occurred before World War II, many observers argue that the growth of these areas since 1950 has defined the economic infrastructure in the late twentieth century and set the stage for the twenty-first century. Observers struggle with how to characterize this new infrastructure, a recent effort being Thomas Friedman’s discussion of a “flat” world that combines globalization, technological change, and post-9/11 world politics. In particular, telecommunications technologies, such as wi-fi and broadband, have made possible the nearly instantaneous transmission and reception of large amounts of complex information over long distances, creating global markets for a wide range of products and services. This technology, coupled with continuing improvements in data processing, has also drastically increased worker productivity, and has made the
paper-based coordination and control of older integrated firms obsolete. The Internet has increased the possibilities for interfirm coordination via contracts, alliances, and joint ventures.

**Finance**
The failure of financial markets in 1929, followed by worldwide recession in the 1930s, led to the creation of the modern financial infrastructure, through the separation of commercial and investment banking, the enhanced role of central banks, and the increased regulation of securities markets. The result was a stable financial services sector that supplied firms with equity and debt funding that the firms themselves could not provide through their retained earnings.

Deregulation of financial services in the 1970s and 1980s changed the role of the financial sector in the economic infrastructure. Since 1980, capital markets have more actively evaluated firm performance. The ready availability of large investment funds allowed mergers and acquisitions (M&A) to multiply in number and dollar amount per deal. Most recently, venture capitalists and investment banks are enabling entrepreneurs with good ideas to rapidly achieve the scale necessary to compete with larger rivals.

**Production Technology**
Computerization, the Internet, and other innovations have increased the sophistication of production technology, though with complex economic implications. Changes in production technology, such as the development of computer-aided design and manufacturing (CAD/CAM), have changed traditional ideas of price/quality trade-offs and allowed for the production of high-quality, tailor-made goods at low cost. In using new technologies, however, managers in the 2010s must choose between reformulating their strategies and reorganizing around new information and production technologies or using these technologies incrementally to reinforce traditional modes of production and organization.

**Government**
Government regulation of economic activities increased in the first half of the twentieth century, in response to two world wars and the Great Depression. Since the 1960s, the government has relaxed many of the traditional regulations on some industries while increasing them on others. The breakup of the Bell System; the deregulation of airline, trucking, financial services, and health care industries; and the weakening of banking regulations have been major influences in the economy since 1970. Intergovernmental treaties and agreements on the development of regional free trade zones, such as with the North American Free Trade Agreement (NAFTA) or the Eurozone, have greatly affected how firms compete in an increasingly global marketplace. Regulation of workplace safety, discrimination, and the environment became common in the 1960s and 1970s.

The government also spent vast sums on the military and public works. One area where the government has influenced infrastructure has been in support of Research and Development (R&D). Throughout the twentieth century, U.S. and European antitrust policy encouraged firms to develop new capabilities internally, through R&D efforts, rather than through M&As. Since World War II, a complex R&D establishment has developed that involves extensive government funding of basic research priorities in partnership with major research universities and private firms. Government policy has encouraged the diffusion and commercialization of R&D projects as well. The growth of the Internet out of the U.S. Defense Department and National Science Foundation origins is just a recent instance of the importance of government support of infrastructure R&D.

**Summary** Ever-rising demand in developed nations and globalization of trade flows have increased every firm’s potential market size. This has made it possible for specialized firms
to achieve the kinds of economies of scale that were once enjoyed only by vertically integrated corporate giants. Rapid improvements in transportation and communication make it easier for independent firms to do business with each other. As a result, modern businesses are more “focused” on a narrower range of activities. At the same time, changes in the financial sector speed the rate at which established firms may grow, but they also speed the rate at which new firms can enter and challenge incumbents for market superiority.

Infrastructure in Emerging Markets

The technologies that have revolutionized modern infrastructure are widely accessible, yet infrastructure hinders economic development in many emerging markets. The quality of transportation systems varies from nation to nation. Central Africa, for example, has few highways, and its rails have deteriorated since colonial days. Southeast Asian nations often boast ultramodern rail lines and seaports. But even there, transportation within urban business centers can be excruciatingly difficult.

Developing nations often lack other forms of infrastructure. Their businesses and consumers have limited access to the Internet, particularly through high-speed ISDN or broadband connections. They lack a diligent independent banking sector that provides financial capital and management oversight. Entrepreneurs must rely instead on micro-lending for seed capital but are hard pressed to obtain substantial loans to facilitate growth.

EXAMPLE 1.4 The Gaizhi Privatization Process in China

The modern privatization movement in China started in 1992, after President Deng Xiaoping gave a speech encouraging the development of private enterprises and a market economy. By the mid-1990s, most local governments began to privatize their small state-owned enterprises (SOEs), but some cities went further by privatizing almost all their state and collective firms. In 1995, the central Chinese government decided to keep 500 to 1,000 large state firms and allow smaller firms to be leased or sold, mainly through management buyouts. This process came to be known as gaizhi, or “restructuring.” By the end of the decade, nearly half of China’s 87,000 industrial SOEs had been through gaizhi or were being prepared for sale.

Managers who acquired their firms through the gaizhi process stood to reap substantial profits if their firms improved their performance. And gaizhi gave the managers considerable opportunities for such improvements. Managers could more easily hire and fire workers as well as decide how to deploy their staff. Managers also obtained greater control over investments and research and development.

A key feature of gaizhi is the purchasing process. Managers could purchase their firms at a price determined by independent accounting firms. By law, the accountants valued assets according to the earnings they can bring in or their current market value. China has poorly developed capital markets, however, so the latter option is usually not available. As a result, accountants often valued firms according to their current profitability.

Feng Susan Lu and David Dranove observed that the valuation process created a perverse incentive for managers. If they could reduce profitability prior to gaizhi, say by easing off on workers or purposefully ignoring market opportunities, that would depress the purchase price. Once managers acquired their firms, they could renew their efforts and restore (or even increase) profits to pre-gaizhi levels. In this way, managers could obtain profitable firms at bargain prices. Lu and Dranove found evidence consistent with such behavior. They examined profitability trends pre- and post-gaizhi while also examining a matched set of firms that were not privatized. The gaizhi firms saw profits drop in the year before privatization and then return to pre-gaizhi levels immediately afterward.
The economies of many developing nations have been crippled by their own governments. Businesses have been reluctant to invest in central and east Africa, for example, because of the lack of established contract law, government corruption, cronyism, and civil war.

Three Different Worlds: Consistent Principles, Changing Conditions, and Adaptive Strategies

Businesses in 1840 focused on one or two activities. By 1910, integration was the name of the game, with many corporate giants extending their reach throughout the vertical chain. Modern businesses are once again narrowing their scope. Business gurus write about current trends as if they have just now discovered the virtues of focus. In doing so, they criticize the business practices of earlier generations of managers. Such criticism is unwarranted. The enormous differences in business practices among the three periods we surveyed illustrate a key premise of this book: Successful strategy results from applying consistent principles to constantly changing business conditions. Strategies are—and should be—the adaptive, but principled, responses of firms to their surroundings.

The infrastructure and market conditions of business do not uniquely determine the strategies that firms choose. In all three periods, there was considerable experimentation by firms, and various types of firms succeeded and failed. But market conditions and infrastructure do constrain how business can be conducted and the strategic choices that most managers can make. As these conditions change, so too do optimal business strategies. The world of factors, agents, and brokers was undone by the development of the railroad, telegraph, and telephone. Computers and the Internet reduced the need for vertical integration. If the past is prologue, then by 2050 if not sooner some as yet unimagined innovations will once again transform business infrastructure, and firms will reinvent themselves yet again.

Because circumstances change, one might conclude that an education in business strategy will soon become obsolete. Indeed, the survey in this chapter suggests that specific strategies that purport to work under a given set of market conditions (e.g., “Divest any business that does not have the largest or second-largest share in its market”) are bound to fail eventually. Principles, however, are different from recipes. Principles are economic and behavioral relationships that apply to wide classes of circumstances. Because principles are robust, organizing the study of strategy around principles allows us to understand why certain strategies, business practices, and organizational arrangements are appropriate under one set of conditions but not others.

In the remaining chapters, we develop principles that pertain to the boundaries of the firm, the nature of industry structure and competition, the firm’s strategic position within an industry, and the internal organization and management of the firm. Through the study of these principles, we believe that students of management can understand why firms and industries are organized the way they are and operate the way they do. We also believe that by judiciously applying these principles, managers can enhance the odds of successfully adapting their firms’ strategies to the environments in which they compete.

CHAPTER SUMMARY

• A historical perspective demonstrates that while the nature of business has changed dramatically since 1840, successful businesses have always applied consistent principles to their business conditions.
• In 1840, communications and transportation infrastructures were poor. This increased the risk to businesses of operating in too large a market and mitigated against large-scale production.
• Business in 1840 was dominated by small, family-operated firms that relied on specialists in distribution as well as market makers who matched the needs of buyers and suppliers.
• By 1910, improvements in transportation and communications made large-scale national markets possible and innovations in production technology made it possible to greatly reduce unit costs through large-scale production. Mass distribution firms developed along with the growth in mass production.
• Businesses in 1910 that invested in these new technologies needed to ensure a sufficient throughput to keep production levels high. This led them to vertically integrate into raw materials acquisition, distribution, and retailing.
• Manufacturing firms also expanded their product offerings, creating new divisions that were managed within an “M-form” organization.
• These large hierarchical organizations required a professional managerial class. Unlike managers in 1840, professional managers in 1910 generally had little or no ownership interest in their firms.
• Continued improvements in communications and transportation have made the modern marketplace global. New technologies have reduced the advantages of large-scale production and vertical integration and promoted the growth of market specialists.
• In many industries, small manufacturers can meet the changing needs of their clients better than large hierarchical firms. In other industries, market specialists use the Internet and telecommunications to coordinate activities that used to require a single integrated firm.
• Limited infrastructure hinders growth in many developing economies. The growing interconnectedness of firms in developed economies makes them increasingly vulnerable to global events and discontinuities beyond their normal scope of business.

QUESTIONS

1. Why is infrastructure essential to economic development?
2. What was the role of the factor in the mid-nineteenth-century economy? Does such a role exist in the modern economy?
3. How would John Burrows’s life have been different if he had access to the Internet? What if his contemporary farmers and retailers also had had access to the Internet?
4. What is throughput? Is throughput as important today as it was 100 years ago?
5. If nineteenth-century Americans had had the benefit of modern technology as they expanded westward, would Chicago, with its close access to the Great Lakes and Mississippi River system, still have emerged as the business center of the Midwest?
6. Two features of developing nations are an absence of strong contract law and limited transportation networks. How might these factors affect the vertical and horizontal boundaries of firms within these nations?
7. Fifteenth-century Florence was the birthplace of the Renaissance, home to artists such as Donatello, Botticelli, and Michelangelo. Why did so many great artists emerge from just this one city-state? Do you believe that a single city could become the Florence of the twenty-first century?
8. The advent of professional managers was accompanied by skepticism regarding their trustworthiness and ethics in controlling large corporate assets on behalf of the
shareholders. Today, this skepticism remains and has changed little since the founding of the managerial class a century ago, and new laws concerning appropriate governance, such as Sarbanes-Oxley, continue to be introduced. Why has this skepticism remained so strong?

9. There is considerable disagreement as to whether government regulation has largely positive or negative influences on economic growth. Compare and contrast the ways in which government involvement in particular industries may positively or negatively influence the evolution of those industries.

10. Some firms seem to last forever. (For an extreme example go to www.hbc.com.) In some industries, however, even the most effective firms may expect short lifetimes (lawn crews; Thai restaurants). Size certainly has something to do with longevity, but are other factors involved? How does size help larger firms or imperil smaller ones? What other factors besides size contribute to longevity?

11. How might a persistent global credit crisis affect the scale and scope of modern firms?

ENDNOTES

1We use the term businessmen literally. Few, if any, women were involved in business in 1840. This had not changed much by 1910.

2This example comes from William Cronon’s excellent history of the city of Chicago, Nature’s Metropolis, New York, Norton, 1991.


4Cochran and Miller, The Age of Enterprise, p. 42.

5This example draws from Cronon, W., Nature’s Metropolis, New York, Norton, 1991.


7Yates, Control through Communication, pp. 22–23.

8This example is based on information from Ambrose, S. E., Nothing Like It in the World, New York, Touchstone, 2000; and Bain, D. H., Empire Express, New York, Penguin, 1999.


