

# CHAPTER

# 11

## Industrialization and Economic Development

### IN THIS CHAPTER

**Summary:** This chapter reviews the spatial nature of industrial economies and contemporary global patterns of industrialization and resource extraction. The world's industrial regions and major industrial location theories are largely based on human behavior, as well as the workings of a market economy. What is happening now in the world's industrial regions is not always the same as what occurred in the early days of the Industrial Revolution. Today, as industrialization occurs in one region, deindustrialization happens in another.

### KEY IDEA

#### Key Terms

agglomeration effects  
backwash effects  
commodity chains  
creative destruction  
deindustrialization  
dependency theory  
developed countries (DCs)  
developmentalism  
export-processing zones (EPZs)  
fixed cost  
footloose firm  
Fordism  
globalization  
gross domestic product (GDP)  
gross national product (GNP)

import substitution  
Industrial Revolution  
least-cost theory  
less-developed countries (LDCs)  
localization economies  
locational interdependence theory  
maquiladora  
Millennium Development Goals  
neocolonialism  
Neo-Fordism  
offshoring  
outsourcing  
quaternary economic activities  
quinary economic activities  
Rostow's model of economic development

secondary economic activities  
spread effects  
sustainable development

tertiary economic activities  
transnational corporations (TNCs)  
world-systems theory

## Introduction

Although industries existed long before the Industrial Revolution, after this amazing event the economies of Europe and, later, all countries, would never be the same. As the more advanced countries deindustrialize, newly industrialized countries (NICs) compete for global markets. What are the factors guiding economic behaviors in an economy, and how do they influence location, profits, resource allocation, and other important aspects of industry?

## Industrialization and Development

KEY IDEA

Economic development is spatially very uneven. **Developed countries (DCs** or “the core”) have the highest levels of economic development. Countries such as the United States, Great Britain, Australia, Germany, France, etc., comprise the core countries. **Less-developed countries (LDCs)** are located on the semi-periphery or periphery of the global economy and include the former communist countries (such as Romania and Bulgaria, for example) and Third World countries (such as Nigeria and Kenya, for example) (see Fig. 11.1 below). These countries are seeking an improved standard of living that is often achieved by industrialization of the economy and the transition from an agrarian-based system to one centered on manufacturing or trade.

The level of development in a country is measured by using the **gross domestic product (GDP)** and the **gross national product (GNP)**. The GDP is an approximation of the total value of all final goods and services produced by a country per year. “Final” refers to the finished end product to avoid double counting. For example, raw steel sold to General Motors is not counted since the finished automobile is counted in GDP when sold to the consumer. The GNP is the GDP plus the value of income from abroad such as earnings from a US company like Intel, which produces silicon chips in Leixlip, County Kildare, Ireland.

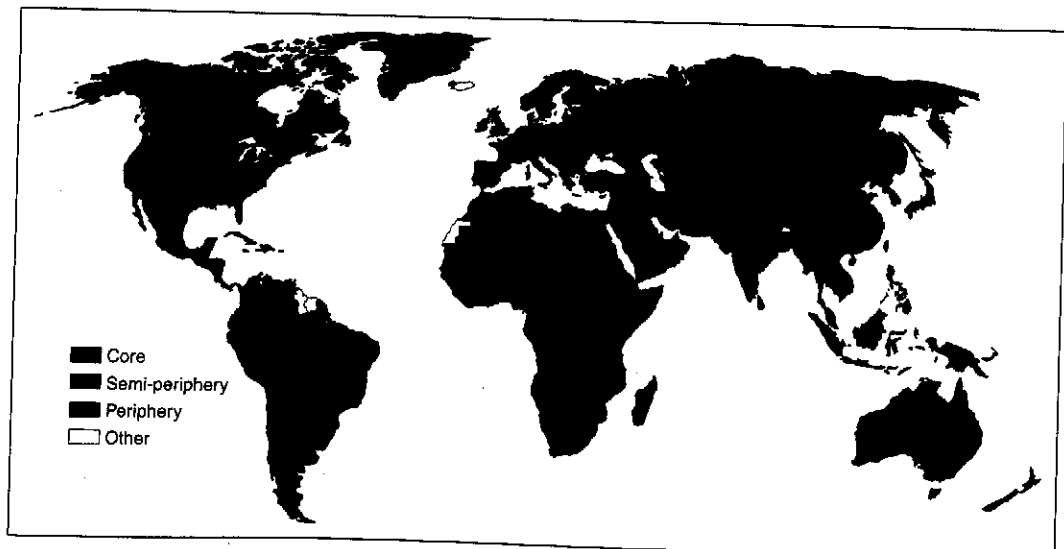


Figure 11.1 World map of countries by trading status in the late twentieth century.

Generally, technology transfer from core countries to periphery and semi-periphery countries leads to advanced participation in the world's economic system. If the country fails to achieve technology transfers, the quality of life for its inhabitants does not usually improve. The standard of living is influenced by economic progress with analysis of multiple criteria (GNP, per capita energy consumption, percent of workforce engaged in agriculture, and calorie intake per capita) required to correctly evaluate a country's economic progress.

Regions *within* countries also differ in terms of levels of economic development. Some regions are substantially above the national income average whereas others fall short. Scarcity of resources, lower levels of skills, and a shortage of investment all combine to produce a region with lower economic performance. Sometimes the physical geography of a region combines with lack of infrastructure (such as decent roads) to cause regional economic inequality. Even portions of DCs are often underdeveloped and lack adequate economic resources. The Appalachian region of the United States is an example of a region that has continually lagged behind the rest of the country in terms of economic growth and standard of living. The export-oriented coast of China is far more economically advanced than the less-developed interior provinces.

## Women in Development



Changes in the global economy have resulted in a rapid increase in the number of women engaged in industrial employment in LDCs. Women are paid lower wages than men for the same work (even in DCs such as the United States) and are required to work *in addition* to their family responsibilities. Women also work longer hours than men in every country (both in paid and unpaid labor), except the United States, Canada, and Australia. The increased job opportunities for women have led to better healthcare, education, and childcare for women worldwide. Women in many LDCs now have access to microcredit (Grameen Bank microcredit loans in Bangladesh, for example) that gives them the opportunity to start small businesses. Similar practices cropping up around the world are helping families and individuals rise out of poverty. The United Nations has recently also developed a mandate called the **Millennium Development Goals (MDGs)** designed to erase poverty by the year 2015. The eight development goals that comprise this mandate are targeted at the promotion of gender equality and the empowerment of women through the provision of better healthcare, hunger eradication, and basic universal education.

The impact of growing numbers of women in the labor force has taken its toll on world families, too. Children in LDCs have always been required to assist with both paid and unpaid family labor needs, but the absence of the mother at home has seriously impacted the family structure. Children not only babysit younger siblings but are increasingly employed in the economic sector of the economy instead of going to school. Child labor is a tremendous problem in the world today with the United Nations International Children's Fund (UNICEF) estimating 1.5 million children between the ages of 5 and 14 work in fields, factories, and quarries.

## The Role of Natural Resources

The economic development of a country is greatly influenced by its endowment of natural resources. The amount of fertile soils, supply of energy sources, and stores of valuable minerals all contribute to a country's level of economic development. However, natural resources are unevenly distributed throughout the world with some countries possessing more than others. Core regions where the highest demands often occur do not possess

adequate supplies for their needs and depend on periphery countries to fulfill their needs. Trade is very helpful in supplementing a country's resource base. Core countries such as Japan, with its lack of minerals and cultivatable farmland, make up for their deficit through trade. Energy sources and other natural resources can also be exchanged sometimes, should a shortage in one resource occur. Countries that depend on a single raw material's export are in trouble should the global market for that resource drop (see Fig. 11.2 below).

Natural resources are unequally distributed throughout the world. While high levels of natural resources and energy are necessary to fuel continued development on a world scale, concerns are growing about the impact this is having on the environment. Rainforests and fragile ecosystems are destroyed, natural environments are polluted, and biodiversity is lost on an alarming basis in the world today. The preservation of biodiversity is vital to ensure that species extinction slows down. Future implications on the world's demographics, including mass migrations, famines, and civil unrest will rest largely on the stabilizing influences of sustainable development practiced on a global scale. Core countries increasingly acknowledge the need to address resource issues in periphery and semi-periphery countries to maintain global stability and survival.

**Sustainable development** is the concept that it is possible to balance economic growth without jeopardizing the environment and equitable human access. It is important to determine what level of development a country can maintain without jeopardizing the future of its inhabitants to continue at that level. Unfortunately, many governments support development strategies that fuel resource usage at the expense of the global environment. Until very recently, global organizations such as the World Bank have provided loans for this type of economic development. Geographers believe that the global environment can be protected while economic development continues in the periphery. They also believe that humans must continue to develop renewable resources as supplies of nonrenewable resources dwindle.



## Economic Activities

The economic activities of a country can be classified according to the table shown here.

| ECONOMIC ACTIVITY | DEFINITION   | EXAMPLES   |
|-------------------|--|--|
| Primary           | Extraction of natural resource                                   | Farming, mining, forestry  |
| Secondary         | Processing of raw materials into finished goods by manufacturing | Steel manufacturing, furniture production, food processing   |
| Tertiary          | Provision of services  | Retail, restaurants, tourism, police and fire provision, sanitation, advertising                   |
| Quaternary        | Information and knowledge processing                             | Education, data processing, research and development, banking and finance, medical, entertainment  |
| Quinary           | Highest-level decision making                                    | Top-level government officials and business executives, research scientists, financial consultants |



Figure 11.2 Countries dependent on the export of a single commodity.

Countries on the periphery employ the majority of their workers in primary economic activities such as mining, fishing, or agriculture. **Secondary economic activities** that add value by changing a material into a more useful product (form utility) are generally performed in the core and semi-periphery countries. **Tertiary economic activities** are those that provide services such as wholesale and retail jobs, tourism, and restaurant work. **Quaternary economic activities** are really high-order tertiary activities that the most developed countries abound in such as white-collar workers in education, information processing, and government. The highest level of quaternary economic activities is sometimes classified as quinary. **Quinary economic activities** are reserved for those who are the highest-level decision makers in both the government and private sectors of the economy. Sometimes there is disagreement about how to classify an economic activity, but in general, primary refers to basic extraction of a resource from the earth, secondary is the processing of that resource into a finished product, tertiary refers to the service sector, and quaternary deals with information handling and processing. Core countries have the highest levels of economic development and employ workers in the quaternary and quinary groups whereas primary economic activities dominate in the peripheral countries.

## Theories of Economic Development

### KEY IDEA

**W.W. Rostow's model of economic development** (also called modernization theory) is based on stages of economic growth and modernization (see Fig. 11.3). The first stage of development is a traditional subsistence economy based mainly on farming with very limited technology. When the levels of technology within a country develop and the development of a transportation system encourages trade, the second stage—preconditions for take-off—is reached. During the third stage—take-off—more transportation systems and infrastructure are built and manufacturing industries grow rapidly. Growth poles emerge as investment increases. By stage four—the drive to maturity—growth is self-sustaining, and leads to an increase in the number and types of industry. During this stage, more complex transport systems and manufacturing expand as transportation develops, rapid urbanization occurs, and traditional industries may decline. In Rostow's fifth and final stage—the age of mass consumption—a rapid expansion of tertiary industries occurs while manufacturing declines. Rostow's model assumes periphery countries only need to modernize to achieve

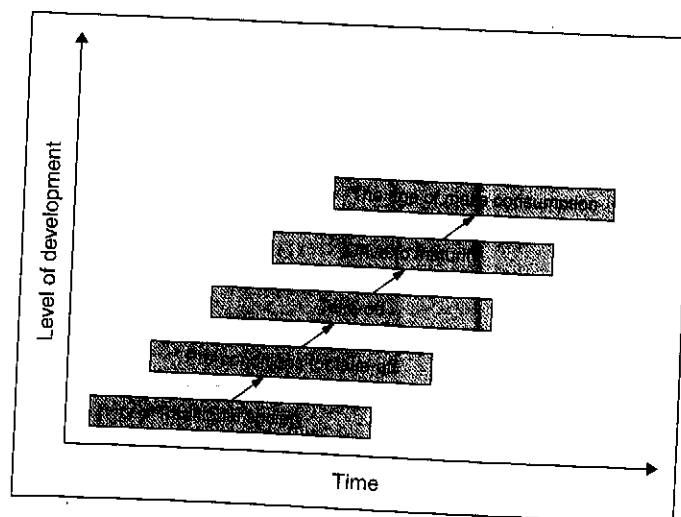


Figure 11.3 Rostow's stages of economic development.

greater economic development and that the role of core countries is to provide foreign aid and industrial technology to help them. The Green Revolution with its transfer of agricultural technology from core to periphery is an example of this theory in action.

Rostow's theory is criticized for the following reasons:

- It attempts to fit all countries into the Western/European historical mold.
- It is geared toward large countries, thus leaving out small ones, such as Gambia and Burundi.
- It is linear when many times economic development occurs nonlinearly in "fits-and-starts."
- It is based on high-consumption Western ideals.

Countries and regions are interdependent in the world's current global economy. The fortunes of a country are increasingly linked with those of many others. Rostow's model keeps alive the myth of **developmentalism**—the notion that every country and region will eventually make economic progress toward a high level of mass consumption if they only compete to the best of their ability within the world economy. The chief weakness of developmentalism is that it is not fair to compare the prospects of periphery countries to the experience of countries that were among the first to reach take-off. The early starters arrived in a world free of effective competition, obstacles, and precedents. Today's less-developed countries must compete in a crowded global economy while facing numerous barriers.

During the 1970s, a new approach to examining the world's economies began. Andre Gunder Frank's **dependency theory** is a theory of economic development based on the periphery's dependence on the core. He believed that the core exploits resources in the periphery resulting in the periphery's dependence on the core as it imports the core's finished products. The periphery is then forced to take on a dependent role in the global economy, starting in colonial times and continuing today in the form of **neocolonialism**. Frank proposed that the periphery is underdeveloped today because of the development of the core and the uneven trade, profits, and resource and labor exploitation that resulted. Following in this line of thinking, Immanuel Wallerstein developed the **world-systems theory** at a time (1970s) when the Third World and the Cold War were commonly accepted terms. He claimed there is only one world—a complex world-system—in which nation-states compete for capital and labor. He saw the global economy as a market system with a fluid and dynamic flow of countries and economies from periphery to semi-periphery to core.

## Location of Industrial Development

We have already reviewed how von Thünen's theory explained the location of agricultural activities based on market location in Chapter 10. In similar fashion, location of an industry is also based, in part, on market access. However, other locational factors must also be considered. For example, the best location is also based on relative costs of input needed to produce the product. The following principles help determine the location of industrial activity:

1. Accessibility to material inputs such as raw materials and energy
2. Relative importance of the following inputs:
  - a. Labor needed to produce the product
  - b. Cost of land, plant, machinery (fixed costs)
  - c. Wages, salaries, utility bills, local taxes, etc.
  - d. Demand of the market for the good or service
  - e. Transfer costs (transporting inputs from sources and outputs to markets; costs of storing, insuring, unloading, etc., of raw materials and finished goods)

3. Influence of government policies and cultural factors
4. Influence of behavioral considerations

**Least-cost theory**, developed by Alfred Weber, states that three main expenses must be minimized in locating an industry—labor costs, transportation costs, and agglomeration costs, with transportation costs being the most important. He used a locational triangle diagram to determine the optimal location using the approximate weights of raw materials and finished products along with distances.

**Agglomeration effects** are also important in determining where to locate an industry. They are the cost advantages (external economies) for an individual company gained by locating near similar functional industries or companies. For example, a tanning salon might choose to locate in a strip mall containing a hair salon, dress shop, and shoe store since these stores attract a certain type of customer. **Localization economies** are cost savings for individual industries as a result of grouping together in a certain location. For example, Silicon Valley (see Fig. 11.4 below) and its software and electronics industries clustered together to take advantage of a highly skilled and specialized labor force and intense competition among competing firms.

Gunnar Myrdal, a Swedish economist, called this buildup process of advantages by agglomeration and localization cumulative causation. He proposed that flows of people and investment dollars from other regions (often the closest) into the location accumulate and cause economic growth of that region. Sometimes this also causes a negative spiral of economic disadvantage as nearby regions lose talented workers and suffer reduced capital flows. The **backwash effects** (negative impacts) to the peripheral regions often include a reduced local tax base, which means fewer dollars for schools, highways, and other activities. **Spread effects** also occur in which the peripheral region benefits from the economic growth of the core region by growing too. The need to provide more goods and services often outstrips the core's ability to provide them, leading to a trickle-down effect that provides the periphery regions with the opportunity to step in and do so.

**Growth poles** are locations for economic activity that are specifically grouped around a high-growth industry. The location of dynamic, high-growth industries in a region gives

KEY IDEA



Figure 11.4 Silicon Valley benefited from agglomeration effects.



that region a valuable economic “boost.” French *technopoles* (high-tech industrial sites) are an example of this type of growth pole.

Sometimes profits influence locational decisions even more than costs. **Locational interdependence theory** is a theory developed by economist Harold Hotelling. This theory suggests competitors, in trying to maximize sales, will seek to limit each other’s territory as much as possible by locating close to each another in the middle of their combined customer base. If both sellers are equidistant from their potential customers, neither has a greater advantage.

**Profit maximization** theory is the third important theory in locating a new industry. It is based on finding the location where net profit would be greatest. Sometimes the substitution principle is used to determine if a less expensive input can be substituted for a more expensive one. The spatial margin of profitability is computed based on transport costs of raw materials and finished product and the firm could be located anywhere within this margin and operate profitably. If the firm produces something that requires minimal transport costs, it is called a **footloose** industry (for example, computers).

Import **substitution** is the production of goods and services internally by the periphery country that were once supplied by the core. By subsidizing local industries and using taxes and tariffs to protect them from outside competition, countries like Brazil and Peru have successfully enabled their economic development. When a core region witnesses decreased industrial employment as industries respond to decreased profits, **deindustrialization** occurs. The decline in industrial employment that occurred during the 1960s and 1970s in the Rustbelt of the northeastern United States is an example of this concept. This also occurred in the older industrial regions of Europe and the United Kingdom during this time period.

**Creative destruction** is the reinvestment of funds in new, profitable ventures and regions that once were used to fund older, less profitable ventures and regions. The US Sunbelt now benefits from receiving funds once invested in the Rustbelt region. Capital flows from one region to the other sometimes occur when a declining region reinvents itself. Pittsburgh experienced a postindustrial renaissance during the 1980s and 1990s after its demise as a steel-producing giant. New investment capital powered the city to transform into a high-tech, cutting-edge software and medical research giant (Fig. 11.5).

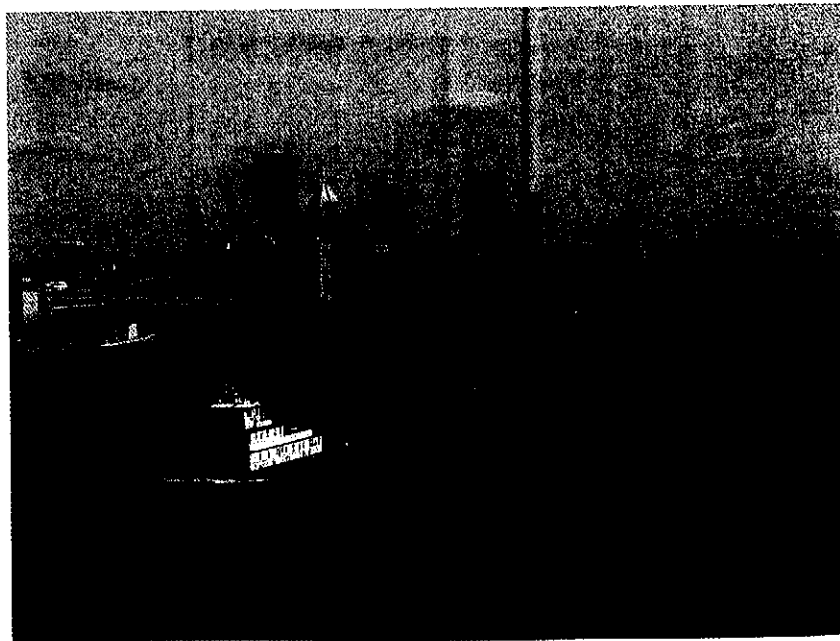


Figure 11.5 Pittsburgh—product of deindustrialization and Renaissance.

## Growth and Diffusion of Industrialization

Industrialization involves the process of manufacturing products in a factory. The **Industrial Revolution** began in the late 1700s in England and led to the astronomical growth of population for the next two centuries as industrialization diffused outward first across the Atlantic Ocean into British colonies in North America and then east into Europe. Before the invention of the machines that enabled the Industrial Revolution to occur, there was industry but it operated at a very small scale in the homes of individuals (called a cottage industry). James Watt's steam engine expedited the processing of iron and the textile industry soon adapted various machines into its manufacturing processes. Industries began to cluster around coal deposits—the new fuel-of-choice for the growing number of steam engines that powered this new industrial growth.

Engineering developed new products and manufacturing techniques on an accelerating basis, fueling the fires of industrialization and contributing to transportation innovations such as railroads. Industry diffused into the countries of northern and western Europe first and into countries of southern and eastern Europe during the twentieth century. The chief areas of industrialization in western Europe are found in the United Kingdom, the Po River Basin of northern Italy, and the Rhine and Ruhr River valleys in Germany and France.

Changes streamlined the manufacturing process. **Fordism** is the process of using assembly-line techniques and scientific management in manufacturing and is attributed to Henry Ford. **Neo-Fordism** is the evolution of mass production with a more responsive system geared to the nuances of mass consumption. It uses flexible production systems that allow production processes to be shifted quickly from production of one product to another with very little “downtime” in the assembly line. Components are often delivered to factories “just in time” to be used so that parts inventories are minimal. **Export-processing zones (EPZs)** are small areas with exceptional investment and trading conditions that governments create to stimulate and attract foreign investment. China's coastline is made up of several of these (called Special Economic Zones or SEZs) and China has benefited enormously from the economic stimulus this creates to their economy.

A **commodity chain** refers to a chain of activities from the manufacturing to the distribution of a product. The clothing industry commodity chain begins with the growing of cotton, continues to the textile mills where cloth is made and the garment factories where clothing is stitched. The chain continues to firms that specialize in design, marketing, distribution, and finally the last link of the chain—retailing, or selling the clothing to the consumer. Peripheral countries such as Mexico and Turkey are low-profit, labor-intensive links in the clothing commodity chain while core countries (almost always) reap the high profits and function as the specialized links at the end of the chain. **Transnational corporations (TNCs)** (also referred to as multinational corporations or MNCs) are found at the high-profit end of the commodity chain and specialize in brand names, high technology, and design and marketing functions.

Transnational corporations (TNCs) are companies that have facilities and processes spread among several countries (global assembly line). A few examples of transnational, or global, corporations are Apple, Bayer, GlaxoSmithKline, and Xerox, but there are many, many more. Investment dollars flow unevenly in the global economy, however, and few investment dollars typically flow to LDCs. MDCs such as China, Brazil, and Mexico receive the lion's share of investment money because they are viewed as emerging economies that will become future markets for finished goods in the near future. Labor is cheaper in LDCs so the more labor-intensive operations are usually performed there. Final details and assembly are done in the DCs near the end markets for the products. Banking and finance are also global industries; they provide investment funds, thus controlling the economic direction of many LDCs. **World cities** (New York City, London, Paris, Tokyo) are those in which a very large proportion of global finance and banking transactions take place.



KEY IDEA

## Contemporary Patterns and Impacts of Industrialization and Development



### KEY IDEA

**Globalization** is more than just the homogenization of cultures and ideologies created by better technology and communications networks. It also involves the increasingly fluid movement of economic goods and services between and among countries and regions of the world. What does our future hold as globalization increases and our future is increasingly intertwined with that of others?

**Comparative advantage** is the production of a commodity by a country that has the most favorable ratio of advantage or the least unfavorable ratio of disadvantage compared to other countries. Countries can use specialization to gain an advantage in supplying or producing a commodity that they can exchange for another commodity more cheaply than they could produce that commodity within their own country. **Outsourcing**, the practice of shifting production of a product to a third party either in the country in which you are based or in another country, is an offshoot of comparative advantage. Taking advantage of less expensive labor and producing goods in another country angers some who view this as stealing jobs and production potential from one's own country. Outsourcing is often used to refer to sending service sector and production work to other countries where lack of labor unions keeps the labor costs low. **Maquiladoras** are foreign-owned assembly companies located in the United States–Mexico border region. These companies are able to take advantage of cheaper labor, favorable tax breaks, lax environmental regulations, and otherwise keep costs minimal while operating close to the core markets for the products. **Offshoring** is the practice of contracting with a third-party service provider in another country to take over or supervise part of the business operations. The offshore staff functions just like the employees in the home office, and customers may not even be aware they are dealing with staff overseas.

Half of the world's energy resource consumption now occurs in semi-periphery and periphery countries, because of their rapid industrialization. This increased demand for scarce natural resources has already driven up market prices with the result that shortages are already occurring. In many periphery and semi-periphery countries, natural resources are being extracted and exploited in an unsustainable fashion. Unfortunately, developing countries are industrializing so rapidly that they are unable, or unwilling, to limit the corresponding high levels of environmental pollution. China's skyrocketing industrialization has led to their possessing 16 of the 20 most polluted cities in the world, according to the World Bank.

Technological advances are creating time-space convergence through transportation and communication on a scale once thought unattainable. Advances in materials technologies, biotechnology, and information technology are occurring at such a rapid rate that many researchers and social scientists no longer even attempt to predict what our future holds!

### > Rapid Review

Industries are spatially distributed throughout the world in an uneven pattern. Four major areas—Eastern North America, East Asia, Western Europe, and Eastern Europe dominate, but China is rapidly becoming more important than these regions. Factors influencing the location of industries are based on costs, labor markets, and proximity to markets. Industrial location theories discuss how the location of each industry is determined and overall concerns with resource distribution, usage, and sustainability are increasingly of importance.

## › Review Questions

- Advertising, legal services, and retailing are examples of
  - primary economic activities.
  - secondary economic activities.
  - tertiary economic activities.
  - quaternary economic activities.
  - quinary economic activities.
- The Industrial Revolution first diffused from Great Britain to
  - Germany.
  - Russia.
  - Italy.
  - British colonies in North America.
  - France.
- Which one of the following statements does NOT correctly describe commodity chains?
  - They usually begin in periphery countries.
  - They reap the highest profits for core countries.
  - They involve several locations around the world.
  - They are located near cheap sources of labor.
  - They are centered around periphery markets for finished goods.
- Which theory below explains why two competing pizza parlors both position themselves in the middle of their customer base?
  - Dependency theory
  - The stages of economic development theory
  - World-systems theory
  - Locational interdependence theory
  - The domino theory
- All of the following factors are important in locating an industrial activity EXCEPT
  - the cost of labor.
  - the cost of land.
  - the market demand for the good.
  - government policies.
  - climate.

## › Answers and Explanations

- C**—Tertiary economic activities are those that provide services. Primary economic activities (A) deal with the extraction of a natural resource and secondary economic activities (B) involve the processing of raw materials into finished goods by manufacturing. Quaternary economic activities (D) deal with information and knowledge processing, and quinary economic activities (E) involve high-level decision-making.
- D**—The Industrial Revolution began in Great Britain and diffused into Britain's colonies in North America first and then spread to Europe (A), (B), (C), and (E).
- E**—Commodity chains are centered around core markets for finish goods, not periphery markets. All of the other statements regarding commodity chains are true. They begin in periphery countries where the raw materials originate and labor is cheap (A), and reap the highest profits for core countries (B) since they are the ones to add the "finishing touches" and market the product. Commodity chains contain locations around the world (C), including locations near cheap sources of labor (D).
- D**—The locational interdependence theory was developed by Hotelling to explain what happens when competitors within a marketplace make locational decisions in an attempt to maximize their sales. Dependency theory (A) states that economic development is based on the periphery countries' dependence on core countries. The stages of economic development theory (B) was postulated by Rostow to explain the progression of economic development that a country goes

through as it modernizes and becomes competitive in the global marketplace. World-systems theory (C) states there is a world system of core, periphery, and semi-periphery countries that serve as actors in operating the global economy. Capitalist countries in the core dominate the periphery states using their skilled labor force, technological advantage, and control of business, banking, and trade while the peripheral countries with their low-paid labor force suffers unequal development opportunities. The domino theory (E) is the notion from the Cold War Era that once a country

falls to communism, neighboring countries are subject to falling to communism, too.

5. E—Climate is usually not an important factor in locating an industrial activity, but the cost of labor (A) and land on which to build (B) are very important. Generally, industries are located in a region where the market demand for the product (C) is high to minimize transportation and storage costs. Government policies (D) are always important in locating an industry. For example, areas with low taxes and trade tariffs attract industry.