PART II: Emerging Policy Issues

The five chapters in Part II examine some policy-related issues that influence patterns and trends in the globalization of the processed-foods sector. Chapter 5 discusses technological advances in two key infrastructural sectors, communications and transportation, relates these to global commerce in foodstuffs, and demonstrates the impacts of domestic deregulatory policy. Chapter 6 examines the interrelationships between international trade policies, in particular multilateral trade agreements such as the World Trade Organization and the North American Free Trade Agreement, and patterns of global food marketing. Chapter 7 addresses efforts to achieve international accord on national policies dealing with food process and product standards and related regulations and delineates how resolution of national differences influences the evolution of global patterns of commerce. Chapter 8 examines the case for multinational agreement on policy issues related to protection of environmental quality and investigates the incentives and costs to the food sector in bringing about greater international convergence. Chapter 9 discusses national public policies that influence the creation of intellectual property and international policies that protect firms' related investment in intellectual property, investment that is critically related to the relative importance of a nation's firms in the global market for processed foods.

CHAPTER 5
Transportation and Communications

In Chicago in 1865, a bushel of wheat sold for about 60 cents, while in London that bushel sold for $1.20; the difference reflected the costs of getting the wheat from Chicago to London, first to the Atlantic coast via rail or Great Lakes shipping, and then to London via ship, with provision made for storage at the several links in the transport chain (Harley, 1980). Of course, the wheat was not grown in Chicago, so the Chicago price already reflected the costs of transportation and storage between the grower and Chicago. Transport and storage costs accounted for most of the price of the product at the consumption point in London.

Between 1865 and 1900, transport rates between Chicago and London fell to 10 cents a bushel, because of dramatic improvements in the technologies of transportation (as larger, faster, steam-driven ships replaced smaller, slower, sail-driven ships and as successive generations of larger and faster trains were introduced). Transportation improvements allowed for lower food prices and increased consumption in European cities, higher prices at the farm, expanded areas of grain production, a wider margin of western settlement in the United States, and improved access to durable manufactured goods in those settlements. Those western settlers had left other regions; improved transportation to fertile farmland of the Corn Belt and Eastern Great Plains led to reduced use of hilly and less productive farmland in the Northeast.

Innovations in Transportation and Communications

Today, transport costs are less important barriers to global trade, precisely because of the dramatic improvements made over time. But innovations continue to reduce real transportation costs for most modes, products, and regions, thereby reducing the economic distance among countries, and gradually increasing trade flows.

Moreover, recent improvements in telecommunications and in transportation quality allow for faster and more reliable transit, and thereby expand the range of sensitive and perishable value-added goods that can be traded in a global economy. For example, freight trade between Asia and Europe commonly moves via large containership to the U.S. West Coast, then onto “doublestack” container trains across the country to the East Coast, and finally aboard ship for transit to Europe. This innovation allows for the use of very large (lower cost) ships that could not pass the Panama or Suez canals (Muller, 1988). By shortening transport distance, this innovative use of container shipment also improves service quality (reducing transit times) while reducing costs and rates.

The prime benefit is consolidation of container traffic at U.S. ports, thereby making larger, faster ships and trains available for international and domestic U.S. trade, which in turn provides new trade opportunities. Today, U.S. exports of chilled beef move across the country on refrigerated container trains, to be transferred to ships for movement to Japan (James, 1992). New developments in refrigeration technology allow the beef to remain fresh while being shipped at a fraction of the air freight cost.

Total transit time of 2 weeks would not have been possible a decade ago, before dense container flows allowed the use of frequent train and ship departures. But trade is also dependent upon improved communications technologies, principally the electronic retention of information and low-cost reliable transmission of voice and data communications.

Shipment of chilled beef requires precise coordination among several enterprises, from the slaughterhouse to a trucker, then onto a railroad, through a port, onto a ship, through a Japanese port, and onto truck again before final delivery. Improved communications technologies allow shippers to tailor perishable shipment volumes and delivery dates to the precise immediate needs of importers; to rapidly shift movement among alternate routes and modes to avoid congestion; to electronically track the progress of the shipment to avoid loss or delay; and to rapidly coordinate the associated information and payment flows among the parties.

Improved communications technologies allowed shippers to take advantage of the large declines in rail shipping costs in the United States in the 1980's (average real rates fell by 40 percent between 1980 and 1994). Costs fell because railroads succeeded in consolidating traffic into larger, more intensively utilized trains and onto densely traveled mainlines. Such consolidation allows railroads to move freight with far less equipment, track, and labor. In turn, railroads were able to consolidate traffic because regulatory reforms (The Staggers Rail Act of 1980 and The Shipping Act of 1984) gave carriers the opportunity to develop a set of pricing tools that gave shippers strong financial incentives to consolidate freight flows (MacDonald and Cavalluzzo, 1996).

Consolidation means that railroads offer reduced services to points off the mainline. In recent years, trucks have continued to pick up more of that short-haul service along more lightly traveled routes. Truckers of large shipments (truckload carriers) have increasingly acted as "spokes" in joint ventures with railroads, amassing freight at a hub for long distance rail shipment to a distant hub, with truck distribution to users. By massing containers at a small number of major hubs, railroads can offer frequent departures of high-speed trains between hubs. By relying on trucks for initial consolidation and final distribution, shippers can obtain flexible service at lower rates.

The container traffic examples offered above emphasize ship, rail, and truck moves. Yet, processed food products increasingly move among countries by air. In 1980, ships carried 55 percent of U.S. exports (measured by value), and airplanes carried 21 percent. By 1993, planes accounted for 29 percent of exports and ships for 36 percent, with surface transport to Canada and Mexico accounting for the rest. Air freight's share of imports grew from 12 to 21 percent from 1980 to 1993 (Eno Transportation Foundation, 1994). Growth in air freight reflected a shift in trade toward lower-weight, higher-value products (for example, from feed corn to chilled shrimp), but developments in air freight also encouraged the expansion of that trade. Deregulation in the United States led to lower costs, as it allowed airlines to restructure route networks for greater utilization and easier entry and exit. More competition and lower cost reduce fares (and fare reductions feed back to increased utilization, and often, even lower unit costs).

Each of these innovations consists of three components. First, there are ongoing improvements in the technology of transportation: more powerful and efficient units; larger, lighter, better-constructed, freight-carrying units; and faster, more capacious loading and unloading equipment at terminals.

Second, innovations in management occur when firms recognize new ways of organizing existing technology to move freight. Examples include the initial steps toward containerization of freight as well as the ongoing actions to extend the idea; the development of aircraft hub-and-spoke systems for passenger and freight service, as well as the extension of the concept to rail and ships; and the initiation of joint ventures among transport firms from different modes, aimed at providing shippers with “seamless” long-haul service.

Third, government policies influence the opportunities for innovation. Examples include investments in port, terminal, and roadway facilities; procurement policies that influence the development of new carrier technologies (particularly for aircraft); and regulatory policies that affect private pricing and investment decisions. The latter have come into increased prominence since the late 1970’s, when the United States introduced major regulatory reforms in airlines (1978), railroads (1980), trucking (1980), shipping (1984), and telecommunications (beginning in 1984).

Privatization, Regulation, and Technology

Some of our major trading partners have embarked on privatizations of state-owned firms, including Japan (telecommunications, airlines, and railways) and the United Kingdom (telecommunications and airlines). Governments in Chile, Argentina, Mexico, and Venezuela have privatized state-owned airlines and telephone monopolies (OECD, 1992; Kikeri, Nellis, and Shirley, 1992). The principal goals of privatization include lower operating costs, expanded investment in infrastructure, and improved service. But because privatized telecommunications and transport firms are often monopolies, privatization carries a risk of substantial price increases. In consequence, privatizing governments often introduce regulatory programs that aim to include incentives for efficient pricing, investment, and operation, while constraining the realization of monopoly power.

While introducing regulatory schemes for privatized monopolies, many governments have been relaxing restrictive regulations in competitive industries, such as trucking. Indeed, between 1975 and 1990, Austria, Canada, Denmark, Finland, France, Ireland, Japan, New Zealand, Norway, Spain, Sweden, and Turkey all introduced regulatory reforms in trucking. In most cases, the reforms allowed for easier entry and more flexible pricing, and ought to lead to declines in prices, an expanded range of services, and lower costs.

Communications costs have also declined steadily in response to continuing technological change and, more recently, regulatory changes in both developed and less developed countries. Improvements in switches (which are essentially computers and hence show the same sorts of development) and in transmission media (with the diffusion of fiber optics) have led to sharp declines in the costs of traditional landline telecommunications services. Falling prices and innovative new uses for telecommunications have led to exploding demand. Between 1984 and 1992, interstate calling within the United States increased by 135 percent (measured by minutes of calling), while the volume of international calling in and out of the United States grew by 235 percent. Newer communications technologies, such as the radio-based use of pagers, cellular phones, and other mobile technologies, have grown even faster. By 1993, mobile technologies accounted for 10 percent of all revenues of telecommunications companies (FCC, 1995).

Improvements in communications allow for more reliable monitoring of distant transactions. Most important for communications, as in the transportation examples, is not just that the costs of existing ways of doing business are reduced, but that communications improvements create opportunities for new ways of providing services. If congestion or weather blocks traffic on a route, transport firms can more easily identify and reroute high-priority goods with the help of instantaneous communications. The resulting flexibility makes for far more reliable long-distance transportation of perishable and other time-sensitive items, and in some cases creates international markets in those items. The newer communications technologies also allow for rapid delivery of information between a producer and an ultimate distributor; that information may be very time-sensitive information relating to consumer demands or to inventory depletion. By allowing virtually instantaneous communication and response, the new communications technologies allow producers to respond much more quickly and complement new transport technologies in creating international markets.

Transport and communications costs continue to fall in real terms. They fall because of the combined effects of technological improvements, organizational and managerial innovations, and investment in public facilities. Government regulatory and ownership policies can limit or encourage the productivity improvements that underlie efficiency improvements.

Declining real costs generally lead to declining real prices. In turn, opportunities for trade are expanded because the prices of existing traded goods fall, but also because it becomes feasible to initiate trade in products that previously were considered local. Among foods, bulk grain and oilseed products (such as flour and soybean meal) have long been traded among countries. But improvements in refrigerated containers, and in the methods of moving them, have allowed for wider trade in processed foods such as meat and dairy products as well as for the development of widespread year-round markets in fresh and chilled food products.

Transport improvements do not occur at the same pace throughout the world. Recent rail and ship improvements primarily affect the major routes linking the world’s industrialized economies. There, major port and terminal investments, and enormous flows of goods, allow for the realization of scale economies through the use of larger vessels and trains. These sorts of improvements allow for greater trade in bulk products. Poorer countries rarely possess the infrastructure or traffic flows to allow the use of these technologies; nor are they likely to obtain them in the future. But it is possible to develop dedicated airfreight terminals with much more modest bases of investment and traffic flows. Consequently, recent technological developments in transport favor trade in higher-value products (perishables and highly processed food products) with low-income partners.

Communication Technology and Foreign Direct Investment

The discussion thus far emphasizes trade. But continuing developments also influence the possibilities for foreign direct investment, which has historically accounted for most foreign food sales by U.S. companies. Through the early 1980's, grain and oilseed products accounted for the dominant share of U.S. exports of agricultural and food products. Global transactions for those products tended to be "arms-length" in that U.S. exporting firms traditionally sold to independent foreign importing firms. One could then be a major exporter without having a major physical presence in a foreign country. Exports of branded, more highly processed food products were relatively unimportant, although that did not mean that U.S.- branded products firms had no overseas interests. The larger U.S. firms have long had significant overseas interests, but those interests have traditionally taken the form of foreign direct investment, rather than exports.

Companies such as Sara Lee or General Mills, when selling branded products overseas, clearly are not manufacturing all of those products in the United States, nor many of the resources embodied in them. Rather, those firms have exported their expertise to other countries. In this context, the term "expertise" primarily means skilled managers. U.S. firms operating overseas affiliates replicate, in important ways, the methods used in the parent: these include large-scale production facilities, with associated large and steady flows of raw product, the design and use of sophisticated financial controls, the distribution of large volumes of processed product to retail concerns, and the pricing and advertising of the processed product.

Transfer of management skills under FDI has traditionally had to satisfy three criteria to make economic sense. The skills must have some applicability in the new culture (hence FDI in consumer products concentrates in countries that are close to the host country, spatially, linguistically, or culturally). Parent firms must have some reliable means of monitoring performance. And, particularly if the FDI requires that a significant investment be made, the investment should have a low risk of expropriation.

Recent technological developments influence the performance-monitoring criterion primarily, with some additional influence on cultural adaptability. Improved quality and lower costs of telecommunications allow for more frequent and reliable flows of voice, data, and document communications between parent and foreign subsidiary, thereby reducing the costs and risks of FDI. But again, the indirect, less obvious effects may be the most important. For example, falling transport and communications costs have served to export U.S. culture and U.S. brand names around the world. In some important aspects of consumption, the rest of the world is becoming more like the United States. In principle, that development should lead to enhanced opportunities for foreign direct investment by U.S. firms, according to the first criterion above.

One should be careful, however, about generalizing on the basis of a particular set of historical circumstances. American firms' periods of most rapid foreign expansion occurred when those firms possessed a unique set of skills for managing large manufacturing operations. Some of those skills may no longer be valuable, and the valuable skills have likely diffused across most established firms in industrialized countries today. In short, American firms may no longer possess an unusually valuable set of management skills to be applied worldwide. If that is true, then the continuing innovations in communications may not herald important changes in FDI. Rather they may allow independent organizations to more easily coordinate the flow of time-sensitive (often branded) products between countries. That is, the major effect may be on trade.

Policy Issues

What public policy issues are likely to come to the fore in the future? Recall that past changes in technology and policy have had two types of effects. One type lowers the costs of transporting goods that are already traded internationally. These effects tend to be small and incremental because transport costs are now small parts of total costs for most of these goods. But the second type expands markets, turning local and seasonal products into global and regularly available products. We are likely in the midst of a series of market expansion shifts now, as communications technologies improve and as firms learn how to apply the technologies to introduce new products to retail distribution.

Public policy should aim to design an environment within which innovation and investment can take place. Toward that end, two issues are paramount today. First, technological change has undermined the old regulatory framework for telecommunications. Policymakers need to decide how to design a new regulatory framework that will not discourage investment in the system and the development of new applications. Second, policymakers need to take steps to ensure that major terminals and transshipment points do not become overly congested, especially in the light of the extraordinary growth in movement of time-sensitive freight.