Chapter 19

Negotiating the world information economy

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The world is in the midst of a new economic revolution equivalent in scope to the industrial revolution of the eighteenth century. The strategic resource in this new economy is information. The strategic infrastructure is the telecommunications system. And the strategic territorial unit for organizing production is the world.

In the industrial revolution, the harnessing of energy for production made it possible to expand exponentially the physical power available for manufacturing. The application of human labor in the manufacturing process was reinforced by machinery driven by the water mill and the steam engine. The simultaneous application of the new energy technology to land and sea transportation created the larger markets necessary for achieving economies of scale in manufacturing. Together, the factory and the steam locomotive created the industrial nation states of the nineteenth and early twentieth century.

Over the last few decades, the harnessing of the electron for information processing tasks has made it possible to expand exponentially the information processing capacity available for the production of goods and services. The application of the human mind to production tasks could now be reinforced by computers that can make millions of calculations per second; store, sort, analyze, compare, and retrieve billions of bits of information instantaneously; control whole factories; evaluate alternative designs or scenarios within minutes; and safely guide airplanes, ships, and trains to their destination.

The simultaneous connection of the computer to the telecommunications network created the global enterprise and the global market. Today, global enterprises use computers and telecommunications to combine inputs from around the world in the production of global goods and services. The marriage of computers and telecommunications is

thus creating the global village of the twenty-first century, in which everyone is linked by electronic information flows.

The fiber optic cables, microwave transmitters, communication satellites, and computers that make up the modern-day telecommunications network serve as the electronic highways for a new global information economy, driven by the creation, processing, and electronic distribution of information. This new global information economy increasingly controls the production and distribution of the goods and services produced around the world.

The new global electronic highways do several things. They make it possible for global computer manufacturers to produce the same computer parts in many different locations, and to implement the design changes in facilities around the world. They enable global construction companies to assemble equipment, materials, engineers, skilled workers, and managers from around the world at the right time at the right place. They allow global professional services firms to establish project teams made up of management consultants, computer programmers, engineers, and lawyers located in many countries. They permit global manufacturing enterprises to coordinate production and assembly in a dozen countries. They make it possible for global enterprises to coordinate research efforts carried out simultaneously in several laboratories, and to channel the results into coherently designed products.

They enable the information and entertainment industry to reach a global audience from central locations. They permit the creation of truly global electronic markets in which buyers and sellers from around the world trade twenty-four hours a day. In this global electronic market, world prices reflect changes in supply and demand conditions anywhere in the world. Policies that affect the operation of the telecommunications system inevitably influence the global flow of information and thus global trade of goods and services. More than ever before, telecommunications policy can affect the location of jobs and the competitive position of firms.

Telecommunications policies influence international trade in two fundamental ways. First, they can affect the operating costs of global enterprises that use telecommunications services to distribute information-based services or to coordinate global production and marketing activities. Telecom policies will change the competitive position of firms to the extent that they affect the cost of transmitting information, the kind and form of information that can be transmitted, the accuracy and reliability of the transmission, the confidentiality of information,

and the capacity of the network through which it is transmitted. Second, telecommunications policies can affect market access where the provision of certain services is open to domestic but not international competition. Telecom policies can determine what can be sold in competition with the monopoly, the conditions in which such services can be provided outside the monopoly, the terms on which the monopoly can compete in the provision of services that fall outside the scope of its monopoly, and how much foreign providers can supply such services.

The technological advances in computer and telecommunications technologies that have given birth to a new economic revolution have also given birth to a revolution in the regulation of telecommunications. Before the marriage of telecommunications and computer technologies, telecommunications was based on a network of copper cables that connected universally black telephone receivers. Since one set of copper cables could meet everyone's needs, it made economic sense to create national monopolies that could provide all the telephone services required within a geographic region. These companies also could jointly provide telephone service between geographic regions by interconnecting their networks. Little differentiation in the services being offered was either necessary or desirable, and under the concept of universal service everyone was charged the same price.

With the integration of computers into the telecommunications system, telecommunications is no longer an undifferentiated service. Computers make it possible to offer a variety of telecommunications services to different users. They also enable large users to achieve extraordinary economies of scale in their utilization of the telecommunications infrastructure. Finally, since the computers can be attached anywhere in the network, it has become technologically and economically feasible to supply such services competitively from different geographic locations - sometimes across national frontiers.

Government regulations that were designed for an earlier era of undifferentiated telephone service are today often constraints on the provision of the highly differentiated telecom services made possible by computer technology, including coding the telecom signal, switching the signal through alternative routes to maximize requirements, distributing and storing messages, specialized billing arrangements, and customized communications software packages that control the user/supplier interface for certain subscribers.

No single enterprise can supply all the services desired by individual business users, or even households. Since the computers that can

generate these diversified services can be connected to the network at any point and need not be provided by the same enterprise that supplies transmission facilities, telecom regulations based on a monopoly model often unnecessarily limit competition in the provision of computer-based telecommunications services. These services do not have the same characteristics of a natural monopoly as does the provision of transmission facilities. Fundamental changes in transmission technologies, such as microwave transmitters and communications satellites, have also eroded the natural monopoly characteristics of transmission services, but the scope for international competition is, at this time, less clear.

Government officials responsible for regulating telecommunications have responded to the changes in technology. Making regulatory changes is difficult, however, because it involves tradeoffs between the maintenance of long-standing social objectives and new economic opportunities. The tradeoffs are not only between abstract notions of the public good, but between the economic interests of different groups, between households and large business users, between traditional local suppliers of services and new long-distance suppliers, between the employees of the traditional communications monopolies and new competitive suppliers.

Within a national context, the economic tradeoffs between policy objectives and different social groups are worked out in legislative and judicial proceedings and in regulatory processes. In the international arena, these economic tradeoffs become trade issues because they affect the commercial interests of different countries, and trade negotiations are the primary tool used by governments to reconcile conflicts in commercial interests. My objective in this article, then, is to spell out the trade policy dimension of the telecommunications debate, to put it into a broader public policy context, and to examine how current multilateral negotiations on trade in services might deal with these issues.

The objective of trade policy and negotiations is twofold: To establish rules that are mutually advantageous and to expand opportunities for trade by dismantling government barriers to trade. Trade officials recognize the legitimacy and sovereign right of individual countries to apply regulations in order to achieve domestic social objectives. At the same time, the aim of trade negotiations is to eliminate or alter trade-restrictive measures that are inessential for legitimate domestic objectives.

International trade agreements can take one of two forms: Either to establish principles, rules, and procedures for determining which

government measures should be prohibited, or to change existing policy measures. When negotiating agreements, trade officials act as intermediaries between business interests and regulatory authorities. Their objectives are to reduce barriers, to establish fair and mutually beneficial rules for trade among commercial enterprises operating in a market economy, and to establish principles and procedures that minimize how much domestic regulations distort trade.

The GATT rules for multilateral trade assume that trade based on market competition is fair and mutually advantageous, and that government intervention in commercial transactions should be kept within agreed limits. The GATT system gives competing enterprises from different countries considerable freedom to make commercial transactions within the framework established in trade agreements.

In summary, the strength of a trade policy approach is in its emphasis on mutual commercial advantage, competition on a market-oriented basis, and removal of obstacles to mutually beneficial trade. Trade officials thus have a dual role in the government: To guard the country's commercial interest and to guard a system of trade rules that permit competition among enterprises from different countries.

Before the technological revolution in telecommunications blurred the distinction between regulated telecommunications services (usually provided by a monopoly) and unregulated computer services (usually provided by competitive firms) the question of market access and fair competition for foreign suppliers would have been considered a non-issue, and trade officials would have been summarily dismissed had they raised the question of market access to regulated telecommunications services, which were reserved for the monopoly. The integration of computer and telecommunications has blurred the lines of distinction between regulated, non-competitive services and non-regulated, competitive ones. Regulatory changes have opened up computer-based telecommunications activities to competition in many countries, and this has created differences in the level of market access for telecommunications services. At the same time, the monopoly suppliers of non-competitive services have been allowed to provide competitive telecommunications services in competition with their customers, thereby raising questions of fair competition.

In a similar sense, before the revolution in computer technology opened up new applications in telecommunications, the issue of user access to telecommunications services and equipment would have been considered largely a non-issue. All that was available to business users

was the basic telephone service and the universal black telephone receiver which the monopoly provided. On rare occasions the telephone company, under the influence of local business people, might drag its feet in providing a new foreign company with telephone service; but under the concept of universal service these occasions were limited.

The connection of computers to telecommunications networks has tremendously increased the usefulness of telecommunications for managing a global business and delivering services to customers. The problem is that many of these business applications are highly customized and the monopoly suppliers of services could not provide all the products needed. Moreover, businesses found that they could reduce costs and increase the performance of the network by connecting their computers to leased telephone lines rather than paying the telephone company for the transmission of individual message units.

We can thus summarize the reasons for the new trade policy dimension to telecommunications issues as follows. The emergence of domestic competition has opened up the possibility of trade and the need for a trade policy. International competition among commercial enterprises from different countries must be based on commonly accepted rules provided by trade agreements. The need for rules has become particularly apparent in light of regulatory differences among countries, which create differences in market opportunities.

The increasingly varied application of computer and telecommunications technology to the operation of international businesses and to international trade in services has added another trade dimension to telecommunications policy. Manufacturing and services businesses are using international telecommunications facilities to coordinate the activities of production units located in different countries and to centralize many managerial and administrative functions. The telecommunications system has also become the foundation for international trade in information-related services: data processing and databases, computer-based telecommunications, finance, entertainment, and professional.

One can gain insights to the role of trade negotiations in forming telecommunications policies by considering the results of a recent survey on the trade dimension in telecommunications. Russ Pipe, the publisher of the *Transborder Data Reporter*, conducted the survey and reported his findings in the November 1989 issue of that periodical. A questionnaire was sent to 502 individuals residing in 48 countries; recipients were selected on the basis of their involvement in telecom or trade policy and their professional responsibilities in international

organizations, national governments, businesses, higher education, research, journalism, and consultancy. A total of 197 responded, a little less than half from Europe, 35 percent from North America, 15 percent from Japan, and a smattering from other parts of the world. About 80 percent of the respondents agreed that enhanced and value-added services were tradeable and therefore subject to trade negotiations. What is more remarkable is that 45 percent agreed that basic telephony was tradeable.

Tradeability was seen as related to the nature of information flows. Approximately 90 percent thought that on-line commercial information processing and retrieval services should be viewed as trade issues, as compared with 76 percent who thought that EDI systems which communicate with customers and suppliers should be so viewed, 62 percent who thought that closed user groups such as SWIFT and SITA should be so viewed, and 50 percent who thought that intracorporate networks should be so viewed. About 60 percent regarded telecom primarily as an intermediate service that supports aviation, banking, insurance, or other services.

Participants in the survey were asked to consider the relative importance of several objectives of trade agreements covering telecom services. Some 75 percent from the telecom and trade policy area saw the ability of users to acquire new services where they do business as the most important objective. Other objectives having almost the same importance were selling telecom services in foreign markets on an equitable basis, accelerating the deregulation of telecom services, and expanding world trade.

The results of the survey were quite remarkable as an indication of a shift in opinion on the trade dimension in telecommunications. Of course, that trade dimension, as made clear elsewhere in this article, goes far beyond the issue of whether telecom services are tradeable across borders, and in some ways tradeability in this narrow sense of the word is beside the point. The large positive response in the survey to the question of the 'tradeability' of telecom services needs to be interpreted broadly as recognition of the growing international competition in the provision of many telecom services rather than a conclusion that locally consumed telecom services are being provided across national borders from other countries.

The key issues from a trade point of view are market access and fair competition. Market access issues focus on the ability of foreign enterprises to sell services in a country's market on the basis of market considerations; that is, the right of foreign providers to sell to domestic users purely on the basis of production costs. Fair competition (or fair trade) issues focus on the terms of competition between foreign and

domestic suppliers, or more specifically on whether foreign suppliers will be competing with domestic suppliers purely on the basis of market considerations or whether the domestic government has established regulations or programs that favor the domestic supplier.

Telecom regulations raise issues of market access and fair competition with respect to the provision of computer-based telecommunications services and the access of business users to services and equipment. Trade policy concerns in telecommunications more specifically center on the ability of providers of computer-based telecommunications services to sell such services competitively and equitably in foreign markets, and the ability of foreign users of telecommunications services to acquire services and equipment in a country where they want to do business on a competitive and non-discriminatory basis.

Market access issues with respect to the provision of computer-based telecommunications services arise principally in connection with domestic regulations that prohibit competition in the provision of certain services, or regulations that prohibit or limit foreign providers from supplying these services. As a rule, market access issues do not arise with respect to the provision of basic telecommunications services (i.e., services involving the provision of transmission facilities) since the economic rationale for the exclusive provision of these services is still widely accepted.

Computer-based telecommunications services are often referred to as value-added or enhanced telecommunications services, though these terms have come into use in the course of national regulatory decisions and often are given a much narrower definition than implied by the term 'computer-based telecommunications services,' which is used in this essay. In fact, much of the current trade debate over market access concerns the definition of value-added or enhanced telecommunications services in different countries.

Other market access issues with respect to suppliers of competitive computer-based telecommunications services concern mandatory standards that unjustifiably discriminate against technical specifications used by foreign providers of telecommunications equipment or services. What is unjustifiable in this connection? Any standard that establishes narrow technical parameters when broader ones would equally well accomplish a desired social objective.

Arguments over standards in telecommunications have revolved around some of the following issues: Whether equipment attached to the public telecommunications network should meet only a harm-to-the-

network standard or whether they should meet a higher quality of service to the customer standard established by the telecom authorities; whether communications protocols, which interconnect publicly accessible networks, and software interfaces, which allow different computer programs to talk to each other, should adhere to mandatory standards, or whether each user should be able to use whatever protocols or software interfaces that best meet the user's need. Since the issues in the debates over standards are highly complex and technical, the debate over standards often focuses on the procedures that should be followed in the setting of standards and who should have a right to participate in setting standards.

Other market access issues relate to the purchasing practices of telecom monopolies. Such monopolies often maintain a close relation to favored domestic suppliers of service inputs to the exclusion of competitive foreign suppliers. Since the monopolies are not under competitive pressure to minimize costs, they are not under any economic pressure to consider foreign bidders, while at the same time they might be under considerable political pressure to purchase from local suppliers.

Fair competition issues with respect to foreign suppliers of competitive telecommunications services usually revolve around the terms under which the monopoly suppliers of non-competitive services are also allowed to provide competitive services. At issue are the ability of the monopoly to subsidize the sale of competitive services with profits obtained from the sale of non-competitive services and the ability of the monopoly supplier to deny a competitor access to the telecommunications network on a non-discriminatory basis. That is, the basic issues are cross-subsidization and monopoly power. The aim of trade officials is to assure an arms-length relationship between competitive foreign suppliers and a domestic monopoly where they are allowed to compete with each other. The same trade policy considerations also call for an institutional separation of the regulatory authority from the telecommunications monopoly. After all, if an entity is able to regulate and compete with other suppliers of computer-based telecommunications services, the temptation to use regulations to disadvantage the competition will be difficult to resist.

The principal user-oriented trade issues in telecommunications concern the acquisition and use of equipment and services by foreign firms to meet their global communications needs. At this most general level, the issue seems non-controversial. The controversies arise when a foreign enterprise wants to acquire its own equipment from the most competitive source in the world rather than being forced to buy or lease

equipment provided by the telecom monopoly. In a similar manner, controversy is generated when a foreign firm wants to lease private circuits to meet its communications needs on high volume routes rather than being forced to use the public network for all its communications needs.

The technical regulatory issues that arise in the context of these user-oriented debates include: Disputes over the right of private business users to purchase equipment from any supplier and to attach such equipment to the public network; to lease private lines; to establish a private network by linking together leased lines, privately owned lines within the premises of a firm, and privately controlled computer switching facilities; to interconnect private networks with other private networks or public networks.

A parallel set of issues arises over limitations placed by the regulatory authorities on the use of private networks. The question is whether private networks can be used to establish communications links within a single firm, to establish communications links between a firm and its customers or suppliers, to establish communications links within a closed user group (i.e., a group of users – such as SWIFT, an interbank settlement network or SITA, an air reservation network – that have a common need to exchange data for a particular purpose), to share communications facilities with other firms in the same geographic location for the purpose of obtaining better economies of scale, to resell part of the capacity of the private network to other users.

From the firm's point of view, the private acquisition of equipment and communications circuits can substantially reduce its communications costs and substantially increase its control over the technical performance characteristics of critical portions of the communications network. By controlling the flow of data or messages through its terminal equipment, computers, and circuits that constitute a communications network, an enterprise can maximize desired features such as security and reliability of transmission, the capacity and bandwidth of the network, and compatibility of the network with the company's computer software systems. By interconnecting its private network with other private networks a firm can reduce the cost and improve the quality of its communications links with suppliers, dealers, and major customers. By interconnecting its private network with the public network a firm can give widely dispersed customers or suppliers access to data banks connected to the private network.

A bank that wants to give large depositors the ability to manage cash balances held in branches around the world can offer this service at a

reasonable price only if the corporate treasurer can dial into the bank and access its internal network of leased lines that connect the bank's computers around the world. In a similar way, database providers that maintain different databases in computers spread over a wide geographic area can offer subscribers access to these databases at a reasonable price only if the customer can access the internal network of leased lines that connect together the firm's computers.

From the point of view of the local authorities, the acquisition of private circuits by individual enterprises leads to lower revenues and reduces the control of the telecommunications monopoly over the most rapidly growing portions of the communications network. Leasing private lines to businesses is less remunerative than charging businesses for individual toll calls. Moreover, allowing firms to connect their leased lines to the public network enhances the chances that the private network will be used for long-distance telephone calls, a service only the monopoly is authorized to provide in most countries. Finally, the introduction of private networks and equipment reduces the ability of the telecom monopoly to set uniform standards of quality and compatibility for the whole system, and creates a risk that private equipment or software could harm the public network.

The issues, then, concern income and control for the business user and the telecom monopoly, and the resolution of the conflicts requires public policy tradeoffs between economic efficiency and traditional regulatory concerns. These issues are not unique to foreign firms; domestic firms have the same problems in the domestic regulatory context.

Differences in the pace and direction of reform in individual countries have resulted in major differences in national regulatory practices. Why should trade officials concern themselves with these differences? Because what the regulations permit can effectively limit market access for internationally traded information services and competitively disadvantage global firms that have adopted the new computer and telecommunications technology to manage their international activities more efficiently.

Trade policy concerns in telecommunications tend to focus on competition and the terms of competition. These issues cannot be resolved through trade policy considerations alone; domestic regulatory concerns must be given equal weight. As previously mentioned, however, changes in technology have altered the economic conditions that supported a purely monopolistic market structure in telecommunications. The economic rationale for competition, at least in computer-

based telecommunications services, is now much stronger and the argument for maintaining a monopoly structure for all services that might be loosely classified as telecom services is much weaker.

The rationale for competition in the provision of telecommunications services, as in the provision of other goods and services, is to spur suppliers to produce the services consumers want at the least cost. The results of a lack of competition in telecommunications have been all too visible: lack of consumer choice, high prices, limited innovation.

Two key reasons are usually given in support of a monopoly structure in telecommunications: First, the provision of telecommunications services is a natural monopoly; second, the provision of telecommunications services is a public good. Installing the cables, microwave transmitters, and switches that constitute the communications grid is a capital intensive activity that involves significant economics of scale. For most households and businesses, a single telephone cable provides all the telecommunications capacity that is needed, and so having more than one network to serve households and a majority of businesses seems wasteful. This is the natural monopoly argument that underlies the traditional communications monopoly.

General public availability of communication services results in advantages to a community over and above the advantages that individual households and businesses derive from having access to the telecommunications system. It leads to more frequent communications among citizens, and therefore assures a better informed and more harmonious citizenry. It enables many people to reach many employees, voters, and neighbors who might otherwise not have a phone. It also allows these individuals to notify authorities promptly of any natural disasters, accidents, and other emergencies that can affect the public. In short, the argument is that telecommunications is a public good that deserves to be subsidized.

The need for a subsidy does not in itself provide a rationale for a monopoly structure. The link to the monopoly is provided by the ability of a monopoly to subsidize universal access to local telephone service by charging households less than the cost of the production and distribution of local services and by charging them more for long-distance services, which are considered by many to have less compelling social value. In a similar sense, the monopoly can charge businesses the same rates as households, even though the higher volume of telecommunications traffic generated by business leads to higher capacity utilization rates and therefore lower costs for the same services to businesses.

These arguments were generally accepted until recently, and telecommunications was largely the province of national monopolies. This has changed, partly because a revolution in telecommunications and exponential growth in the telecommunications traffic generated by businesses has made it less of a natural monopoly. At the same time the disadvantages of a monopoly structure in relation to lost economic opportunities has become much more pronounced than in the past.

As I have stated already, the provision of computer-based telecommunications services does not require the same massive investments as the provision of transmission services, and the market is large enough in most countries to support many suppliers of these services. The new services therefore do not have the same characteristics of a natural monopoly as the transmission services.

Advances in microelectronics have also changed the economics with respect to satellite-based long-distance communications. Technological advances have reduced the capital cost of installing earth stations for satellite transmissions to the point where even individual companies can afford to establish their own satellite telecommunications networks, and indeed find it cheaper to do so than to pay the rates charged by the public companies. At the same time that it has become cheaper to build satellite networks, the volume of traffic has expanded to the point where the market can easily support competitive systems in heavily used segments of the market, thereby further undermining the natural monopoly argument. Technological change has thus even eroded the argument that the provision of transmission services is necessarily a natural monopoly.

The natural monopoly argument can still be made with respect to the local network that serves individual households and smaller businesses, and this leads to the key question whether the expansion and operation of the local network should be subsidized through the preservation of a monopoly structure for computer-based telecommunications services, for the long-distance network, and for the intracorporate and intercorporate network. Those who favor the continuation of a monopoly structure answer this question in the affirmative. Those who support competition either argue that no subsidies are necessary or that there are other ways of subsidizing the local network, such as direct government subsidies and access charges imposed on anyone who accesses the local network from a long-distance network or private network. Those who support competition also point to the growing costs of a monopoly structure in the form of lost economic opportunities.

The disadvantage of a monopoly structure is that it tends to reduce the variety of telecommunications services available to users and makes

it too expensive to introduce many new services. It also increases the production costs of national enterprises and reduces their competitive position in international markets. The technological explosion in electronics (computer chips), materials (fiber optic cables), and space transportation (communication satellites) has vastly increased the opportunities for innovation in telecommunications with respect to the provision of a much wider range of services and with respect to the installation of more efficient hardware and software. No matter how well run a monopoly is, it is bound to resist change.

Economic growth in the most advanced economies today is tied to innovation in telecommunications. This is because many of the productivity improvements in manufacturing and services today depend on the installation of new computer systems that tie together widely dispersed production and marketing facilities. Moreover, many of the most innovative new products in services involve the electronic distribution of information-based services through value-added networks. In both areas, progress depends on adapting the new technologies to fit the requirements of these systems and on reducing communication costs. It is impossible for any organization such as a telecommunications monopoly to develop all the necessary technology even if it had incentives to do so.

Technological advances, then, have led to the multiplication of potential channels for transmitting telecommunications signals (copper cable, fiber optic cable, satellite, microwave), for switching signals (electromechanical switches versus advanced computer switches), and for transforming a client's message into an electronic signal (phones, fax machines, modems). This has made it possible to offer varied services by linking together different facilities and equipment. The range of these services is so broad that a single organization no longer can be expected to meet all the specialized customer needs.

One of the traditional objectives of domestic regulations in telecommunications has been to assure businesses and households equitable access to services provided by the telecommunications monopoly. In many countries this objective has been encompassed by the term 'universal service.' Other regulations have dealt with such issues as the price the monopoly was allowed to charge for services and the monopoly's right to set standards and to control the equipment that could be attached to the network.

Countries that have moved to permit competition in some telecommunications services have found it desirable to introduce new regulations designed to assure fair competition between the monopoly

supplier of telecommunications services and non-monopoly suppliers of telecommunications services open to competition. These regulatory changes are reviewed here because they have relevant counterparts in the new trade rules that have to be written to govern competition between monopolies and foreign suppliers of telecommunications services open to competition.

Countries that have decided to allow competition in segments of the domestic network have found it desirable, and indeed necessary, to separate the regulation of telecommunications activities from the management and operation of the national telecommunications monopoly. In the United States the two functions have always been separated because AT&T was a private company. Even in the United States, however, AT&T established all the regulations concerning the operation of the network and controlled all the equipment that could be attached to the network. In most other countries, where the national telecommunications monopoly was part of a government ministry, the monopoly itself wrote all the regulations.

With the establishment of competition in some segments of the telecommunications system it no longer could be assumed that the managers of the monopoly could act as neutral and objective arbiters of regulations with respect to the provision of services subject to competition. It therefore became necessary to create new regulatory agencies that could establish evenhanded regulations. One of the priority objectives of regulatory authorities in these situations is to ensure that newly established enterprises that seek to compete with the telecom monopoly are not overwhelmed by the monopoly before they have a chance to establish themselves. There is, moreover, a continuing need to ensure that a monopoly supplier of transmission services does not cross-subsidize its competitive activities from profits generated by monopoly activities, and that it does not use its position as the exclusive supplier of certain transmission facilities to disadvantage competitors dependent on such facilities.

Another priority regulatory objective in a competitive environment is to ensure the coherent development and implementation of standards by independent suppliers of telecom services and equipment, thus ensuring the interconnectability of separately managed networks. So long as the monopoly had exclusive control over the whole telecommunications system, it could set the standards for all network and terminal equipment and services. In the context of a competitive environment, standard setting has to be open to all suppliers. Moreover, given the more differentiated needs of users as a result of the diversification of technology,

many regulatory authorities have recognized that standard setting should be open to all suppliers as well as users.

Another regulatory concern, in light of the rapid growth of private networks, has been the so-called bypass issue. The rapid growth of private data networks has reduced the potential revenue of the telecom monopoly. The reasons for this are twofold: The leasing of lines is less remunerative than the provision of tolled services and the unauthorized use of private data networks for long-distance telephone calls leads to a loss of telephone traffic, which in most countries remains the exclusive preserve of the telecom monopoly. These concerns about bypass have made many regulatory authorities reluctant to widen the authorized use of private networks, or to allow the interconnection of private networks with the public network. These restrictions on private networks have led to major trade disputes in recent years.

The argument between telecom authorities and enterprises over the use and interconnection of private networks appears to require a tradeoff between two competing, equally legitimate public policy objectives. One objective is the ability of the telecom monopoly to support universal phone service and the other is to promote economic growth through the innovative application of the new telecom technologies by business enterprises. To avoid making this tradeoff explicitly, many telecom authorities have adopted a case-by-case approach, making concessions to individual enterprises or user groups where the economic arguments or political pressures proved difficult to resist, but maintaining the restrictions for everyone else. This strategy discriminates against smaller enterprises or groups that do not have the clout to obtain special treatment, and it raises questions of equity and economic efficiency.

There is only one satisfactory way out of the dilemma created by the bypass issue, but it requires modifying two strongly held regulatory concepts in telecommunications: Cross-subsidization of local phone service to households and full control of the telecom monopoly over the switching of the public network. Traditional regulatory philosophy called for uniform pricing of telecom services, regardless of cost, as part of the concept of universal service. Thus, households have been required to pay less than the fully allocated cost for local telephone service, and large business enterprises have paid substantially more for telephone service than warranted by the large economies of scale involved in high density and long-distance traffic.

The large and growing gap between the charges imposed by the telecom monopoly for the use of the public network and the cost of

establishing a private network has made use of the public network unattractive to many businesses. As noted earlier, another major reason why businesses have established private networks is that it gives them greater control over the switching of traffic, and hence greater control over the quality of the circuits used to transmit vital business information.

The economic pressures generated by the bypass issue have convinced many regulatory authorities and telecom monopolies that it is in their interest to move to cost-based pricing and to give users more control over the switching of data packets and messages. Thus, alternative means of subsidizing the local network, such as local access charges, are being developed to make it possible for the telecom monopolies to lower their toll charges for public switched communications traffic. Efforts are also under way in Europe and the United States to give business users of the public switched network greater control over switching, thus reducing the need for private networks. In the United States more control over switching will be made possible by ONA (Open Network Architecture) and in Europe by ONP (Open Network Provision).

The rationale for international competition in computer-based telecommunications services is the same as the rationale for domestic competition – to provide consumers with a wider range of services at a lower cost and thereby stimulate economic growth. As I mentioned in the beginning of this essay, innovation in telecommunications has become one of the principal engines of growth and the application of the new technology to international telecommunications has led to international specialization in the production of goods and services. A liberalization of international competition will stimulate a further expansion of trade and investment and increase global economic growth.

The rationale for trade rules for international competition in telecommunications is the same as the rationale for domestic regulations for domestic competition – to define the scope of competition and to establish equitable ground rules for competition. In particular, such rules must deal with potential competition between monopoly suppliers of transmission services and competitive suppliers of computer-based telecommunications services.

To date, most trade negotiations on telecommunications issues have been conducted on a bilateral basis. These bilateral trade agreements can provide insights to the scope and content of a future multilateral trade agreement. Negotiations currently under way in the GATT on an

international agreement on trade in services are expected to lead to the negotiation of a telecommunications annex. Such an annex would elaborate on the application of the agreement to telecommunications services.

In 1986 trade ministers launched multilateral trade negotiations called the Uruguay Round. These negotiations, scheduled to conclude at the end of 1990, cover fifteen broad areas, including trade in services. At the time they launched the Uruguay Round, ministers set forth key objectives for the negotiations in a document called the Uruguay Declaration. With respect to trade in services, ministers agreed that:

> negotiations in this area shall aim to establish a multilateral framework of principles and rules for trade in services, including elaboration of possible disciplines for individual sectors, with a view to expansion of such trade under conditions of transparency and progressive liberalization and as a means of promoting economic growth of all trading partners and the development of developing countries. Such a framework shall respect the policy objectives of national laws and regulations applying to services and shall take into account the work of relevant international organizations.

The Uruguay Declaration thus establishes three levels of objectives for the negotiations on trade in services. At the operational level, the Declaration states that the negotiations should seek to develop principles and rules for trade in services generally, and that this framework for trade in services should be supplemented by rules that would apply to specific sectors.

This conclusion resolved a major debate over the feasibility and desirability of negotiating trade issues in services as diverse as telecommunications, banking, insurance, professional services, data processing, and transportation, within a common framework. Some argued that each services sector raises unique issues that have nothing in common with other sectors, and that it made no sense to negotiate such issues under the common heading of 'trade in services.' Others argued that many of the principles and rules of the GATT could be applied to trade in services, and that a framework of principles and rules would be more likely to succeed in achieving a broad liberalization of trade in services than would a sector-by-sector approach.

The language in the Uruguay Declaration supports the traditional trade policy view that across-the-board rules are needed to advance the

liberalization of trade barriers. At the same time, the Uruguay Declaration recognizes that sectoral differences are more fundamental in services than in goods, and that effective negotiations ultimately have to get down to a sector-by-sector level.

A framework approach puts the emphasis on general economic principles that are difficult to oppose in the abstract. And, once agreed, they can provide a basis for challenging restrictive arrangements that serve narrow sectoral needs and interests. A purely sectoral approach, though, emphasizes what is different about each sector and the unique characteristics in each sector that justify the status quo. A purely sectoral focus would have made it much more difficult to bring out the broader economic reasons why a liberalization of policies would further the public interest. Thus the decision to negotiate a framework first was tied to the broader liberalization objective.

After setting out the operational objectives of the negotiations, the Declaration goes on to state that the purpose of negotiations is to achieve an 'expansion of such trade under conditions of transparency and progressive liberalization. . . .' With this language, the Declaration not only makes it clear that the primary focus of the negotiations should be the expansion of trade in services, but it also lays out a path for pursuing that objective: Establish transparency in policy measures that restrict trade in services and liberalize measures that restrict trade in services. This language resolved the dispute over whether it was appropriate to expand trade in services through liberalization.

Alternative objectives that could have been adopted include an equitable or fair distribution of market shares in world trade in services, the harmonization of national regulations affecting trade in services, and the resolution of regulatory conflicts whenever traded services are subject to overlapping jurisdiction of national regulators.

The statement on objectives also establishes the negotiations 'as a means of promoting economic growth of all trading partners and the development of developing countries.' This language reminds negotiators that the ultimate purpose of their efforts should be to promote economic growth and development. It should also be read as a statement by ministers that liberalization of trade in services and development of a framework of rules for trade in services can advance economic growth, including developing countries.

In the course of the debate over the inclusion of services, the fear was often expressed that a GATT framework agreement on trade in services could undermine national regulatory objectives. The Declaration

addresses these concerns by stating that 'such a framework shall respect the policy objectives of national laws and regulations applying to services.' This language spells out the obvious – that any trade arguments on services will have to leave countries enough flexibility to pursue domestic regulatory objectives.

By focusing on the objectives of national laws and regulations rather than the laws and regulations themselves, the language of the Declaration leaves open the possibility that the liberalization of trade might require changes in the way national laws and regulations implement policy objectives. This is a distinction that has become well established in the GATT with respect to the application of technical and regulatory standards to internationally traded goods. The Standards Code, negotiated in the Tokyo Round of Multilateral Trade Negotiations (1973–1979), gives countries the right to pursue national regulatory objectives but requires they pursue them in a manner that minimizes distortions of trade.

Another concern often voiced in the debate over services was that GATT negotiations could conflict with international agreements negotiated in sectoral organizations such as the International Telecommunications Union (ITU). In recognition of this concern the language of the Declaration provides that a framework agreement 'shall take into account the work of relevant international organizations.'

The negotiations will have to address the relation between a trade agreement in services and agreements in telecommunications. Here, too, GATT agreements negotiated in previous rounds of negotiations can serve as useful models. In the area of standards, for example, governments had to define complementary responsibilities for the GATT and the International Standards Organization (ISO). While the challenge to define a division of responsibilities may be greater in services than it was in goods, the language in the Uruguay Declaration is based on the proposition that such a division of responsibilities can and should be worked out.

For the first two years of the negotiations, the negotiating group on services (GNS) focused on the first part of their mandate, namely the development of a multilateral framework of principles and rules for trade in services. This led to a tentative agreement, at a meeting in Montreal in December 1989, on the key elements of a future multilateral framework for trade in services. The meeting brought together ministers for a Midterm Review. The text of the agreement on services does not have the legal precision of a binding agreement and does not contain all

the elements of the eventual framework agreement, but it covers most important principles and concepts likely to be incorporated in the framework agreement on trade in services.

The key principles adopted at Montreal include:

- Transparency – full publication of 'all laws, regulations and administrative guidelines relating to services trade.'
- Progressive liberalization – establishes the objective of a progressive reduction of 'the adverse effects of all laws, regulations and administrative guidelines' on trade in services in order 'to provide effective market access.'
- Market access – links achievement of market access to a choice of the preferred mode of delivery (e.g., cross-border delivery of information services through the telecom network, cross-border movements by either a supplier or consumer of services, establishment of production or distribution facilities in the importing country).
- National treatment – foreign services or service providers granted market access under the provisions of the framework agreement on trade in services would be accorded 'treatment no less favorable than that accorded domestic services or services providers . . . in respect to all laws, regulations and administrative practices.'
- Regulation – recognizes the right of countries to introduce regulations for the achievement of national policy objectives, provided such regulations are consistent with the liberalization commitments under the framework.
- Increasing participation of developing countries – addresses the developmental objective of developing countries, including the provision of effective market access for services that can be produced by developing countries.

Most of these principles are derived from general economic or political principles associated with good government. The transparency principle, for example, is based on the notion that one cannot expect producers of services to participate in productive economic activities if they do not know the rules of the game. The national treatment principle states that a commitment to grant foreign providers market access in a certain services activity needs to be buttressed by a commitment to treat domestic and foreign suppliers the same way when applying regulations aimed at domestic regulatory objectives. If the objective of a regulation is to protect a domestic industry from foreign competition rather than to

achieve a domestic regulatory objective, then the regulation should be treated as a protective trade measure rather than as a domestic regulatory measure.

Other principles such as right of establishment and labor mobility, which were only indirectly addressed in the Montreal text, deal with how foreign service providers can gain effective market access. Trade in services often requires the establishment of a business facility in the importing country, and the right of establishment would therefore provide a legal basis for securing an essential means for gaining market access. Trade in services in other cases requires travel by professional experts or managers to the importing country, and the right to labor mobility would provide the legal basis for achieving market access in these cases. Adoption of these principles would not prevent governments from creating rules for establishment or labor mobility, but it would explicitly make such rules a legitimate subject of negotiation.

One of the issues that remains unresolved concerns how much the adoption of a multilateral framework will lead to an initial set of binding commitments (i.e., the extent to which the agreed principles are to be applied to regulatory measures affecting international transactions in specific services). The United States has taken the position that the principles in the multilateral framework should bind signatories to all policy measures taken in covered sectors, except insofar as a country chooses to except or reserve a policy measure from the application of the discipline. All exceptions or reservations would subsequently become subject to negotiation as part of a mutual reduction of barriers to trade. Other countries have argued that the principles in the multilateral framework agreement should be treated as objectives, and that they should become binding only insofar as a country agrees to bind specific policy instruments in individual sectors in future negotiations. In either scenario, the creation of the multilateral framework would be followed by negotiations on policy measures.

The text adopted in Montreal also spelled out how the negotiations would proceed over the next two years. It was agreed that the negotiations would turn to a consideration of individual sectors. Since individual sectors in services have many unique characteristics, the general principles will have to be fine-tuned and supplemented for some sectors to make them operationally meaningful. Where such refinements or additions are found to be desirable or necessary, they are likely to be incorporated in sectoral annotations or annexes that would become an integral part of the multilateral framework agreement. Telecommunications is one of the most likely sectors to be covered by such an annex.

Policy measures that affect international transactions in telecommunications, data processing, electronic information services, and related activities will be central to the negotiations on trade in services. Most likely, the full range of services covered by these industries will be treated as a single sector for purposes of carrying out any sectoral reviews and the subsequent negotiation of sectoral annotations. Since the negotiators in Geneva have not gone beyond collecting factual data in individual sectors, it is not possible to be specific about the content of a sectoral annex on telecommunications. Since recent trade agreements on services have included provisions on telecommunications, however, a review of these agreements can shed some light.

The US and Canadian agreement has provided a particularly useful precedent that is likely to influence the negotiation of any telecommunications and information services annex. In many respects it goes beyond what could be negotiated now multilaterally, but many of the principles incorporated in the US and Canadian agreement are likely to be incorporated in a telecommunications annex negotiated in the Uruguay Round.

The telecommunications provisions in the US and Canadian Trade Agreement call for three things. First is non-discriminatory access to, and use of, telecommunications transport services, including: The lease of local and long-distance telephone services; full period flat rate private line service; dedicated intercity voice channels; and public data services for the movement of information including intracorporate communications; the sharing and reselling of telecommunications services; and the purchase or lease of terminal equipment. Second is the maintenance of access for the provision of enhanced telecommunications services through the use of the network and computer services within and across borders of both parties. Third is the assurance that monopolies which also offer enhanced service on a competitive basis do not benefit from unreasonable cross-subsidization or other anti-competitive practices from their related monopoly service activities. Appropriate safeguards such as separate accounting records, sufficient structural separations, and disclosure will be put in place.

In constructing a telecommunications annex to the framework agreement, trade negotiators will need to take account of realities that will influence the telecommunications environment. Telecommunications will be subjected to revolutionary changes in technology and regulation for some time to come. Given the prospect for continuing change, trade negotiators will need to avoid formulating long-term trade agreements on the basis of regulatory terminology currently in fashion. Instead,

trade agreements will need to focus on basic principles. Trade agreements will also need to address the process that is followed in making regulatory decisions, with the aim of ensuring that all those with an interest are included in the process.

Another reality is that the pace of regulatory change will differ from country to country and cannot be squeezed into a uniform schedule. Some countries will move faster in opening up telecommunications activities to competition; others will move more slowly. The trade rules that are adopted should accommodate these differences, while at the same time recognizing that differences in regulation create differential rights and obligations. Moreover, for the foreseeable future some telecommunications activities will be reserved for monopolies in a majority of countries, while other telecommunications activities will be open to competition. This calls for generic rules to ensure that competitive or supplier-customer relations between the monopoly suppliers of telecom services and competitive suppliers of related services are fair and market oriented.

Another factor is that telecommunications is becoming an important component in the delivery of services. This has led many vendors to incorporate the telecommunications component in the sale of the services product. Telecom services are thus often part of the package when acquiring services such as electronic information, electronic banking, electronic shopping, and electronic insurance. The same development can be expected to surface with maintenance activities associated with the sale of manufactured products. Trade agreements will have to include principles to help ensure that regulatory decisions in telecommunications do not adversely affect the competitive position of suppliers of non-telecommunications goods and services, while at the same time avoiding a situation where regulators responsible for these non-telecommunications activities get wrapped up in the regulation of telecommunications activities.

Yet another reality is that issues related to standards will be an important area of overlap between regulatory concerns in telecommunications and commercial concerns about the impact of regulatory decisions on trade. Interconnectivity will be a major regulatory concern in the provision of many telecommunications related goods and services, yet the imposition of standards that are too closely tied to certain technologies can be a deterrent to economic innovation and growth. It may be useful to develop guidelines as to when voluntary standards will provide adequate means for ensuring interconnectivity, as against compulsory standards, and to develop an understanding of the

procedures followed in setting standards in order to ensure the broadest involvement of all parties with a stake in the development of those standards.

The major objective of a telecommunications annex to the framework agreement on trade in services will be to elaborate the principles and procedures in the framework with respect to telecommunications services. The annex would address the application of the framework principles to the trade interests of three groups: Foreign providers of telecom services that have been opened up to competition according to the progressive liberalization schedule; foreign enterprises that want to use the telecom network to distribute information services such as database or electronic banking; foreign enterprises that use the telecommunications network to transfer data to other facilities of the firm, to outside suppliers, and to customers. The principles of the annex would be binding on all countries that decide to adhere to the framework agreement, though each country could enter a reservation in its liberalization schedule with respect to the application of these principles to specific measures or services.

By drawing on the agreement reached at Montreal with respect to the key principles to be included in the framework agreement and by pulling together the major conclusions of the analysis provided throughout this essay, one could set out some elements of a telecommunications annex. One is *transparency*. The annex could amplify the transparency requirement by extending it to internal regulations and guidelines of telecom monopolies, including accounting procedures designed to separate monopoly business from competitive business, procurement rules, and cost accounting associated with services offered to the public.

Another element of a telecommunications annex is *progressive liberalization*. The annex could tie progressive liberalization of competition (by domestic and foreign enterprises, including liberalized rules for the use of private networks) to phased regulatory reform that could differ from country to country. Each country would be required to agree to a schedule for reforms, depending on its own requirements and legislative procedures. At the same time the agreed schedules would have to result in balanced rights and obligations. Provision could also be made for periodic review and renegotiation of the progressive liberalization schedule. In light of the rapid pace of change in telecommunications technology and regulations, there may have to be more frequent negotiations in telecommunications than in other sectors – for instance, an annual or semi-annual review and negotiating schedule.

The annex could address, in some detail, what *market access* entails in telecommunications. In particular, the annex could address issues such as the right of establishment and the right of non-establishment. Under the right of establishment foreign providers of competitive services covered by the progressive liberalization schedule would have the right to establish local facilities required to produce or distribute the covered services. Under the right of non-establishment, foreign providers of covered services would be allowed to provide services across the border from a foreign location via the telecommunications network, without having to establish local facilities in the importing country.

The annex could spell out the application of the *national treatment* principle to telecom regulations, as they affect the commercial interests of both foreign users and foreign providers of telecommunications services. The annex would extend the national treatment obligations to the actions of regulatory authorities and telecom monopolies. Application of the national treatment principle to the telecom services offered by the monopoly would be linked to a so-called access to the network principle.

The annex could address *access to and use of public network services.* More specifically, the annex could: Guarantee access to services provided exclusively by the telecom monopoly (or monopolies) on reasonable terms and conditions, and to the extent possible, on a cost-justified basis; establish the right to acquire leased lines from the monopoly providers of transmission facilities for the purpose of establishing private, switched networks; permit the interconnection of private networks with other private networks or the public switched network; allow the switching of private networks by foreign firms or by any third parties chosen by the foreign user; allow the acquisition and attachment of equipment to the public network, provided it does not harm the network or users of the network; allow foreign enterprises to use proprietary protocols and communications software, in accordance with their needs and those of their customers; allow foreign firms to process, store, and transfer data across national borders so long as they abide by regulations designed to protect privacy, intellectual property, public safety, and national security.

The annex could establish the legitimacy of *regulation* aimed at the achievement of enumerated objectives, while affirming a commitment to avoid unnecessary distortions with respect to trade in telecommunications network services and the use of the network as a channel for intracorporate and intercorporate data flows.

With regard to *monopoly* considerations, the annex could establish an arm's length relation between the sale of monopoly services and the sale of competitive services by any telecom monopoly. Telecom monopolies would be specifically prohibited from cross-subsidizing competitive activities from the profits generated by the provision of monopoly services. Monopolies would also be required to offer all exclusive telecommunications services on a non-discriminatory basis to all potential customers, including foreign competitors, and to offer these services under the same terms, conditions, and rates available to themselves when they use these services in their competitive businesses.

The annex could provide for an open process of setting *standards* by giving foreign providers of competitive telecom services and foreign users of the telecom network an opportunity to participate in the process. The annex could also establish the principle that standards should be mandatory only to the extent that is necessary for the operation of a public network or for overriding public interest considerations.

The annex will need to deal with the concerns of *developing countries* such as their access to global networks and their need for additional time to meet the liberalization objective.

The annex would also need to spell out the application of *non-discrimination* in telecommunications. Generally, the agreement would guarantee all signatories non-discriminatory treatment with respect to services covered by the agreement. Monopolies would not have automatic rights in foreign markets to services for which they have exclusive rights in their own market, but each country would be allowed to establish ground rules for the participation of foreign monopolies in their market. Each country would also have the right to negotiate preferential agreements with other countries with respect to competition in telecommunications services not covered by the progressive liberalization schedule. Third countries would be given the right to join such agreements on the same terms and conditions.

It is worthwhile, in concluding this essay, to reflect on the impact that GATT's trade negotiations on telecommunications issues have had on the global information industry. First, and foremost, the discussions have constituted a global consciousness-raising effort regarding the trade dimension of information and telecommunications services, and the trade impact of regulatory actions in these areas. Trade officials, and more broadly officials with economic management responsibilities, have been drawn into domestic debates over the future course of regulations affecting these and other service industries. This has made regulatory officials more aware of the broader economic impact of

regulatory decisions, and the need to avoid the negative impact of excessively detailed or restrictive regulation on economic innovation and growth.

Many American businessmen deeply involved in these negotiations consider this first impact of the negotiations the most important result in the near term. The new technologies in themselves open up vast new areas for trade in services that are not currently regulated, and so long as the negotiations can slow down the introduction of new regulations that could restrict the introduction of new services, much will already have been accomplished. Beyond this, the involvement of trade officials has helped focus and accelerate the reform of telecom regulations in line with the new technologies.

The GATT negotiations have legitimized the deliberations on policy issues related to international transactions in information and telecommunications services, as well as other services, by trade officials. This represents a revolution in bureaucratic assumptions with regard to policymaking in services. It has moved key regulatory decisions in countries like Japan, Germany, and even the United States toward a pro-market position. While the involvement of US trade policymakers in foreign regulatory decisions in telecommunications is well known, less is known publicly about how US trade officials interact in domestic regulatory decisions.

Finally, the GATT discussions have made it legitimate to address issues related to international transactions on services in bilateral free trade agreements like those between the United States and Canada, the United States and Israel, Australia and New Zealand, and within the European Community. Negotiations on these agreements have paved important new ground with respect to the information and telecommunications industries. They have reinforced an emerging consensus that telecommunications services should be open to competition and subject to international trade rules. They have also reinforced the view that the impact of telecom regulations on the international delivery of information services is a legitimate subject of trade negotiations.

BIBLIOGRAPHY

Aronson, Jonathan D. (1984) 'Computer, Data Processing, and Communication Services,' in Robert M. Stern (ed.), *Trade and Investment in Service Industries: US–Canadian Bilateral and Multilateral Perspectives.* Toronto: University of Toronto Press, for the Ontario Economic Council.

Aronson, Jonathan D. and Peter F. Cowhey (1984) *Trade in Services: A Case for*

Open Markets. Washington, DC: American Enterprise Institute for Public Policy Research.

Aronson, Jonathan D. and Peter F. Cowhey (1988) *When Countries Talk: International Trade in Telecommunications Services.* Cambridge, MA: Ballinger, for the American Enterprise Institute, Washington, DC.

Bar, Francois and Michael Borrus (1987) 'From Public Access to Private Connections: Network Policy and National Advantage.' Paper presented at the Fifteenth Telecommunications Policy Research Conference, Airlie House, VA., Sept. 27–30, 1987.

Bressand, Albert (1988) 'Computer Reservation Systems: Networks Shaping Markets.' Unpublished paper, Promethe Institute, Paris.

Bruce, Robert R., Jeffrey P. Cunard, and Mark D. Director (1986) *From Telecommunications to Electronic Services.* London: Butterworth for International Institute of Communications.

Bruce, Robert R., Jeffrey P. Cunard, and Mark D. Director (1988) *The Telecom Mosaic.* London: Butterworth for the International Institute of Communications.

Bruce, Robert R. (1988) 'Telecommunications: The Need for a Policy Framework,' in *Keeping Pace: U.S. Policies and Global Economic Change,* edited by John Yochelson. Cambridge, MA: Ballinger, for the Center for Strategic and International Studies.

Business Week (1988) 'Enterprise Networking: Key to Your Company's Future.' Special Supplement, April 11, 1988.

Commission of the European Communities (1987) 'Green Paper on the Development of the Common Market for Telecommunications Services and Equipment.' Brussels.

Crawford, Morris H. (1988) 'EC 1992: The Making of a Common Market in Telecommunications.' Program on Information Resources Policy, Center for Information Policy Research, Harvard University, Cambridge, MA.

Dizard, Wilson P. and Lesley D. Turner (1987) 'Telecommunications and the U.S.–Canada Free Trade Talks.' Paper published by the International Communications Project of the Center for Strategic and International Studies, Washington, DC (mimeo).

Dunn, Donald A. and Octavio Sampaio (1988) 'Pricing Interchange Access,' Center for Economic Policy Research, Stanford University (mimeo).

The Economist (1985) 'The World on the Line,' Nov. 23, 1985.

Feketekuty, Geza and Jonathan Aronson (1984) 'Meeting the Challenges of the World Information Economy,' *The World Economy* 7, pp. 63–86.

Feketekuty, Geza (1987) 'Trade Policy Objectives in Telecommunications.' Paper published by the International Telecommunications Union in connection with the Legal Symposium of Telecom 87, a conference organized by the International Telecommunications Union in Geneva, Switzerland in October, 1987.

Feketekuty, Geza (1988) 'Telecommunications and Trade: Implications for GATT and ITU,' in *Transnational Data Report,* May.

Feketekuty, Geza (1988) *International Trade in Services: An Overview and Blueprint for Negotiations.* Cambridge, MA: Ballinger.

Feketekuty, Geza (1989) 'International Network Competition in Telecommuni-

cations,' in *Electronic Highways for World Trade; Issues in Telecommunications and Data Services.* (Edited by Peter Robinson, Karl Sauvant, and Vishwas P. Govitrikar as part of the Atwater Series on the World Information Economy.) Boulder, Colorado Westview Press for the Atwater Institute, Montreal, Canada.

Forester, Tom (ed.) (1985) *The Information Technology Revolution.* Cambridge, MA: MIT Press.

GATT (1989) 'Trade in Telecommunications Services.' Restricted Background Paper prepared by the Secretariat for the Group of Negotiations on Services.

Gilhooly, Dennis (1988) 'Commercial Common Carriers: Too Little, Too Late?'. Paper presented at the IIC Telecommunications Forum, held in Brussels, Belgium, July 14–15, 1988.

Gilhooly, Dennis (1988) 'Unlocking the Network: Can Open Network Provision Create Real Competition in Services?' *Communications Week International,* July 1988.

International Telecommunications Union (1988) 'ITU–GATT Consultations on Trade in Services and Telecommunications.' An unpublished paper prepared by ITU staff for consultations with the Group for Negotiations on Services, which is carrying out negotiation on trade in services within the umbrella of the Uruguay Round of Multilateral Trade Negotiations.

Jussawalla, Meheroo (1987) 'The Information Revolution and its Impact on the World Economy.' Paper prepared for the international seminar, Toward an International Service and Information Economy: A New Challenge for the Third World, sponsored by the Friedrich Ebert Foundation, mimeo, publication forthcoming.

Jussawalla, Meheroo and Chee-Wah Cheah (1987) *The Calculus of International Communications.* Littleton, CO: Libraries Unlimited.

Komatsuzaki, Seisuke (1988) 'A Summary of Questionnaire Survey on Deregulation/Regulation Situations in Telecommunications Services Area in 33 Countries.' Unpublished paper prepared by a research group at the Research Institute of Telecom Policies and Economics, Tokyo, Japan.

Mestmaecker, E.-J. (1987) 'Toward a New Regime for International Telecommunications.' Paper presented to the Legal Symposium, Part III, 5th World Telecommunications Forum, Geneva, Switzerland, October 21–3 , 1987.

Noam, Eli M. (1987) 'The Public Telecommunications Network: A Concept in Transition.' *Journal of Communication* 37, 1, Winter 1987.

Organization for Economic Cooperation and Development (1979) 'The Usage of International Data Networks in Europe.' Study prepared by Logica Limited, London for the Information, Computer, Communications Policy Committee, Paris.

Organization for Economic Cooperation and Development (1980) Policy Implications of Data Network Developments in the OECD Area. Papers presented at a working session of the Information, Computer, Communications Policy Committee, Paris.

Organization for Economic Cooperation and Development (1983) 'Transborder Data Flows in International Enterprises' (DSTI/ICCP/82.23). A report issued by the Information, Computer, Communications Policy Subcommittee of the Industry, Science and Technology Committee.

Organization for Economic Cooperation and Development (1983) *Telecommunications: Pressures and Policies for Change*. Paris.

Organization for Economic Cooperation and Development (1985) 'Trade in ICC Services: The Impact of Changing Market Structures in Telecommunications Services on Equipment Trade.' ICCP (85) 14. Paris.

Organization for Economic Cooperation and Development (1987) *Elements of a Conceptual Framework for Trade in Services*. Paris.

Organization for Economic Cooperation and Development (1988) 'Telecommunications Network-Based Services: Implications for Telecommunications Policy' (ICCP/87.5). Paper prepared by the Secretariat for the Committee for Information, Computer and Communications Policy.

Organization for Economic Cooperation and Development (1988) 'Trade in Telecommunications Network-Based Services' DSTI/ICCP/TISP/88.2. Paris.

Pipe, Russ (1987) 'The Ultimate Bypass.' August 1, 1987 issue of *Datamation*.

Pipe, Russ (1988) 'ITU-GATT Relations: How Tradeable are Telecom Services?' November, 1988 issue of *Transnational Data Report* XI, 9.

Pipe, Russ (1989) 'Telecommunications Services: Considerations for Developing Countries in Uruguay Round Negotiations.' Study prepared for the UN Conference on Trade and Development, Geneva (Project INT/88/020-1104).

Quinn, James Brian (1988) 'Services Technology and Manufacturing: Cornerstones of the U.S. Economy,' in *Managing Innovation: Cases from the Services Industries*, edited by Bruce R. Guile and James Brian Quinn, Washington, DC: National Academy Press.

Raavendran, Laina 'What is Trade in Telecommunications Services?: Are We Asking the Right Questions?'. Unpublished Paper by author who is associated with the ITU in Geneva.

Rada, Juan F. (1987) 'Information Technology and Services,' in Orlo Giarini (ed.) *The Emerging Service Economy*. Oxford: Pergamon Press for the Services World Forum, Geneva.

Rein, Bert W., Danny E. Adams, Carl Frank, Bruce McDonald, and Robert E. Nielson (1985) 'Implementation of a U.S. "Free Entry" Initiative for Transatlantic Satellite Facilities: Problems, Pitfalls, and Possibilities.' *The Georgetown Journal of International Law and Economics* 18, 3, 1985.

Robinson, Peter (1987) 'An International Policy Framework for Trade in Services and Data Services: The Current Debate in International Organizations.' Paper prepared for an International Seminar, Toward an International Service and Information Economy: A New Challenge for the Third World, sponsored by the Friedrich Ebert Foundation.

Roseman, Daniel (1988) 'Towards a New International Framework for Telecommunications and Information Services: Issues and Prospects.' Unpublished paper prepared for the Institute for Research on Public Policy, Ottawa, Canada.

Rubin, Michael Rosers (1986) 'US Information Economy Matures.' *Transnational Data and Communication Report*. June 1986 issue.

Sauvant, Karl P. (1986) *International Transactions in Services: The Politics of Transborder Data Flows*. The Atwater Series on The World Information Economy No. 1, Boulder: The Westview Press for the Atwater Institute.

Services Policy Advisory Committee to the U.S. Trade Representative (1987) *Telecommunications and Information Services in the Trade in Services Negotiations: An Industry View*. Washington, DC: Office of the US Trade Representative.

Snow, Marcellus S. and Meheroo Jussawalla (1986) *Telecommunications Economics and International Regulatory Policy: Annotated Bibliography*. New York: Greenwood Press.