Incidental Paper

International Trade and the Information Revolution

Joan Edelman Spero

Program on Information Resources Policy

Harvard University

Center for Information Policy Research

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Joan Edelman Spero
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Project Director: Oswald H. Ganley

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Joan Edelman Spero is Senior Vice President for International Corporate Affairs at the American Express Company.

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Explanatory Note

As part of the Program's continuing examination of the information revolution, Ms. Spero originally presented this analysis on November 19, 1984, at the Program's Monday afternoon seminar series. The talk outlines policy problems and possibilities for international trade as it faces rapidly changing and expanding information technologies.

Introduction

Many of you here have been on the front lines of the so-called information revolution for a long time. You have heard how that revolution is giving rise to profound changes in virtually every aspect of our economic, social and political life. Today I would like to discuss just one dimension of this revolution: its dramatic effect on international trade and economic relations between nations. In this connection I would like to show that international trade policy has been increasingly out of step with the changing international information environment. As companies and countries have come to rely more and more on international information flows, this policy void has left them increasingly vulnerable to government-imposed protectionism. And this new generation of protectionism threatens to undermine the overall trading system.

I would like to start out by giving some illustrations to show how rapidly the information revolution has taken hold in a few short decades, to a point where international information systems have now become the lifeblood of most major corporations and an extremely important factor in international trade.

Next I will show how governments, in the absence of any rules of the game for international trade in services and information, have regulated telecommunications and information flows as a mechanism to shield their domestic enterprises from external competition.

Finally I will make a few proposals for filling the gap in international trade policy in order to address this new generation of trade barriers before they do further harm to the international trading system.

And, so as not to appear totally negative, I would like to report on some recent events that may be the first step in the right direction.

Background: Changes

Let's first take a look at how much things have been changing. The rate of innovation in computer and communications technologies and their merger -- what Anthony Oettinger has labeled "compunications" -- has outpaced developments in virtually every other field in any other period in history. Costs have fallen and technical capacity has increased at exponential rates:

- In 1974, one megabit of memory cost $32,000. Today the cost is just pennies.
- The cost of international voice and telex traffic has gone from $3 per minute in 1970 to small change in the 1980s.
- In the early 1960s data communications links operated at 1200 bits per second. Computer-communications links now use 64 kilobits and our operations managers tell me that there is even talk of technology that would permit 1.5 megabits.
- Today individual companies are able to put together their own telecommunications networks that have more capacity than the total world telecommunications capacity in the early 1960s.

The vastly increased capacity and lower cost of telecommunications and computer technologies has made possible a wide variety of new applications and a huge increase in the use of information technologies. A 1983 survey of 380 companies in 85 countries found that 94% used or were planning to use computer-to-computer communications systems.

Of course, one of the widest applications of the new information and telecommunications technologies has been to various internal functions of international corporations:

- the coordination of production and marketing;
- for planning, accounting and financial management;
- for inventory control and sales coordination;
- for employee systems, including payroll, personnel and human resource planning;
- and for the communication of engineering and design computations.

These applications have become widespread in both the manufacturing and services sectors.

However, the intra-firm applications of the new information technologies are only part of the story. These new technologies have also had an enormous effect on the creation and distribution of services and, in so doing, have revolutionized international trade in services.

How has this happened? In the service sector the merger of telecommunications and information processing technologies has greatly increased the "tradeability" of services once largely confined to national boundaries by the barriers of time and distance. Whereas trade in services, almost by definition, once meant face-to-face contact between the service provider and the service user, the new technologies have built electronic highways that "disembody" services, allowing services producers to transport their products over long distances instantaneously.

In addition, the new technology has allowed for the development of new services products, such as data processing, that were unheard of just a few years ago.

The internationalization of services has also meant an enhancement in international trade overall, since services such as banking, management consulting, travel, transportation, and advertising are all an indispensible adjunct to virtually every traded product.

Another impact of the new information technologies has been a blurring of the distinction between that which is defined as "trade" and that which is defined as "investment." For example, is a securities broker working in the London office of an American firm providing a service directly in that country? Or is he merely an operating agent responsible for marketing and distributing a service produced by the parent company and transmitted via telecommunications? Using the first approach, the brokerage operation might be subject to one set of rules -- for foreign investment in the U.K.. But by the latter definition this is a matter for trade policy. I would argue that, given the fact that the overseas broker relies heavily on the home office's centralized research and database capabilities, there is a considerable element of trade in services here. This is more than just a question of semantics. As we shall see, the blurring of the lines between trade and investment is giving rise to a new set of policy issues, especially for the developing countries.

All of these changes brought on by the information revolution have been felt in a wide range of service sector industries. Banks, insurance companies, accounting firms, travel service organizations have all become heavily dependent on international information flows

for our day-to-day business and for the development of new products, as have engineering and construction, transportation, management consulting, accounting and many other services producers.

These technological advances are to a great extent responsible, therefore, for the dramatic upward trend in international trade in services over the past few decades.

- International trade in services grew from $85 billion in the early 1970s to approximately $620 billion in the 1980s.
- In recent years, international trade in services has grown twice as fast as trade in goods.

My own company presents a dramatic example of the use of these information technologies.

- By the end of the mid 1960s, American Express had one international telecommunications link with a capacity of just 100 words per minute. By 1980 we had grown to some 28 international telecommunications links with a total capacity of 70,000 bits per second. Today, we have 75 international links with a total capacity of more than 450,000 bits per second.
- Amex expenditures on telecommunications and data processing have increased more than 100 fold in the past 20 years. For American Express the cost of developing, operating and maintaining these information processing systems and communications networks ranges more than a half billion dollars annually.

Today American Express could not function without the capacity to move information across national borders with speed, accuracy, reliability and security. We rely on our international systems to

allow us to provide a wide range of services: authorization of credit card transactions, replacement of lost or stolen travelers' cheques, travel reservations and other travel services, banking transactions by our international bank, and trading in securities, bonds and a host of other financial instruments.

International communications also have made it possible for American Express to develop new services for our cardholders and for the establishments that accept the American Express card.

Our international "point-of-sale" network links establishments accepting the American Express card with our central data processing facilities enabling them to "swipe" the card through a terminal to authorize card transactions with minimal delay. This provides a measure of protection and convenience not otherwise possible for both the cardholder and the retail establishment, making our card an even more attractive product.

Another new product that is the direct result of information-age technology is the automatic teller machine, which enables our traveling cardholders to withdraw cash or travelers' cheques in a rapidly growing number of outlets around the world.

As these types of information-based services have become a more and more important element of economic activity, they have come to play an increasingly important role in economic growth, international competitiveness and job creation. Virtually all of the 20 highest growth occupations forecasted for the 1980s deal with handling information.

Moreover trade in information-related goods has become a major component of world trade and thus a large new source of jobs and

growth in its own right. World sales of telecommunications hardware amounted to $30.4 billion in 1977 and grew to $45.1 billion in 1982. These sales are projected to grow to $65 billion by 1987.

Trade Policy Lags

Now that we have seen the impact of these new technologies, let me move on to my second major point: While this international information revolution has taken place, developments in the trade policy arena have lagged behind.

Over the past two decades the major advances in international trade policy were achieved through two rounds of trade negotiations concluded under the auspices of the General Agreement on Tariffs and Trade, GATT, the post-war regime for the liberalization of international trade.

- During the 1960s, the so-called Kennedy Round made significant advances in reducing tariffs on a wide range of nonagricultural goods but completely ignored the question of information and trade in services, both of which, of course, were still relatively undeveloped.
- By the 1970s, as we have seen, the information revolution was already well underway and services had come to play an increasingly important role in growth, employment and international trade. Still, the Tokyo Round of trade negotiations which took place during that decade, while making an important contribution to the elimination of nontariff barriers to trade in goods, was virtually silent on services and on international information issues.

Since the Tokyo Round was concluded in 1979 there has been an overall deterioration of the international trading system for goods and still no new initiative at the international level on services or information.

Meanwhile, the information revolution continues at break-neck speed. It is estimated that the volume of information carried on the international communications system is now doubling every five years. If present trends continue it will double in the future in less than two years.

In the face of this rapidly changing international information environment, the lack of any multilateral trade effort to deal with protectionism in the information sectors is not just an academic concern. As these information and services activities have become more important economically, governments, trade unions and some business people have come to fear that, if there is no protection for their domestic information, high-tech and services industries, they will be left out of the much heralded "post-industrial revolution," and therefore will be relegated to second class international economic status for the rest of this century and the next.

The developing countries are particularly fearful of the expansion of information flows and trade in services. They point to the fact that multinationals from developed countries control the technology, the acquired knowledge and the international telecommunications networks that are necessary for the establishment of internationally competitive services industries. These countries fear that multinational services companies will be able to offer their products in host countries via telecommunications, that is, without

establishing subsidiaries that will help develop skills and increase productivity locally or otherwise contribute to the national development process. According to this scenario the developing countries would only serve as outlets for the multinational service providers, and the existing unfavorable international division of labor would thus be preserved.

Because of these types of concerns, governments from both developed and developing countries are already introducing information and telecommunications policies to protect their domestic industries: industries producing computer and telecommunications hardware; the rapidly growing computer software industry; data-processing and database services; and telecommunications user industries, in both the manufacturing and services sectors.

In effect, governments are trying to set up "hot-house" environments where they nurture these information and high tech industries, shielding them from competition from the outside environment. This has been particularly evident in developing countries, such as Brazil, and in Europe, where there is considerable anxiety over the perception that the European countries are rapidly falling behind advances in innovation in the United States and Japan. The European Community has undertaken a major Community-wide effort called ESPRIT, which is intended to reverse this competitive gap through a program of heavy government investment and, we fear, protection from foreign competition.

Governments may also seek to erect protection in order to develop an exportable technology. The French government, for example, has been heavily subsidizing innovations in bank card technology -- the

so-called "smart card" with a computer chip memory capacity -- and the associated telecommunications and data processing infrastructure. Their hope is that this product will turn out to provide the basis for a range of new high-tech export products.

Let me now describe how this kind of protectionism works.

In the early 1970s, our major concern was that government policies ostensibly aimed at protection of personal privacy, national security or cultural sovereignty would be abused for protectionist purposes. While this is still of concern, a more effective and direct form of protectionism in the information and services sector has emerged through the use of telecommunications regulation, that is, control of the conduit for international information flows.

Telecommunications regulation has been a convenient protectionist mechanism for governments. Outside of the U.S., almost all national telecommunications systems are operated as government-owned or-controlled monopolies (the PTTs or Post, Telephone, and Telegraph Administrations.) Likewise, suppliers of telecommunications equipment and related products and services are often owned by, or at least highly dependent on, the telecommunications monopoly. While there are significant moves toward deregulation in the United Kingdom and Japan, in most countries the telecommunications monopolies are well entrenched, economically and politically. Therefore these government monopolies are readily able to implement policies that redirect or obstruct information flows without much opposition. Foreign firms facing these barriers therefore have little recourse, especially in the absence of internationally agreed principles or procedures to deal with this kind of protectionism. Moreover, because

these barriers are often arbitrary and outside of the existing trading regime, companies are faced with an uncertain and unpredictable policy environment in many countries that makes it difficult to make the necessary plans and major new investments needed to keep pace with the changing technology and the competitive environment.

Protectionist telecommunications barriers work:

- by imposing higher costs on telecommunications users;
- by limiting users' choice of equipment or services;
- by preventing users from "plugging in" to national telecommunications systems and specialized private networks (for example automatic teller machine or point-of-sale systems);
- and by imposing unreasonable, arbitrary or discriminatory technical requirements for access to the national telecommunications system.

Because foreign companies, especially services companies, must rely more heavily on telecommunications than their domestic counterparts, the increased cost imposed by such telecommunications barriers can significantly reduce foreign firms' commercial competitiveness. Examples of such barriers include:

- Restrictions on the use of leased lines: Companies rely heavily on the use of private telecommunications lines leased from the PTTs at a fixed price that does not vary with the volume of usage. Such privately leased lines are cost effective for heavy business users and enable such users to develop telecommunications systems that are suited to their particular business needs. PTTs can use their monopoly control

to restrict or eliminate use of private leased lines or to eliminate fixed rate pricing. As a result, foreign service companies and other foreign telecommunications users must incur higher costs for transmitting and processing data in their home country or elsewhere abroad. Elimination of leased lines can also reduce the user's flexibility in setting up a telecommunications system and can thus impose serious constraints on that user's business. For example, American Express experience in Germany indicates that the forced use of the less efficient public network would unacceptably delay point-of-sale transmissions.

Barriers to access to specialized networks: An extremely important new trade barrier in the telecommunications field has emerged in the form of limits on foreign companies' access to specialized telecommunications networks, for example point-of-sale or automatic teller machine networks set up by private groups or cartels, either alone or with government participation. If foreign service providers are not allowed to "plug in" to such networks, they are effectively barred from competing in those markets.

Domestic data processing requirements: Governments may explicitly prohibit companies from transmitting data abroad for storage or processing. Such requirements may be imposed for the expressed purpose of protecting the domestic data processing industry or for other reasons, such as banking regulation.

- Hardware/software procurement: PTTs may require that business users purchase domestically made telecommunications or data processing equipment or software or may impose discriminatory or unnecessary standards and approval procedures for such equipment. This protection keeps the cost of such materials high, keeps the business user from choosing systems that best meet that user's particular business requirements, and prevents international companies from harmonizing their global information systems. Brazil, France, Japan and the Federal Republic of Germany, among others, use such restrictions.

During the past few years a growing number of companies in both the services and the manufacturing sector have come to recognize the trade implications of these kinds of policies. And we have come to see the need for a whole new body of trade policy at both the national and international levels to deal with these problems.

The perception of information policy issues as being inextricably linked to trade policy issues is also taking hold in some governments and in some intergovernmental policymaking circles. The best evidence of this are the GATT national studies that have been prepared in the past few years as the first step toward a possible GATT regime for services. In the studies prepared by the United States, the United Kingdom, and Canada, there is considerable attention to the trade implications of information-related policies.

International Trade Policy Framework

With this growing understanding of the information/trade link, we can now begin to look ahead to the establishment of a trade policy

framework to deal with these issues. What forms would such a framework take? First of all, we have been arguing for more effective mechanisms for services and information trade problems at the national level. And we have been asking that the U.S. government recognize the increasing economic importance of the services sector and begin to address services-trade problems to the same extent that it deals with merchandise trade issues.

I am very pleased to report that in early October 1984, Congress finally passed some legislation that will help do just that. That legislation is the Trade in Services Bill. In this legislation "commerce" is defined to include "transfers of information" associated with international trade. This bill for the first time provides for important new measures to combat the proliferation of nontariff barriers to trade in services. Among these are included "restrictions on the user of data processing facilities" and "direct or indirect restrictions on the transfer of information." In effect, the bill will extend existing trade remedies to services, thus giving the President the authority to take action to respond to any foreign government policy that is unjustifiable, unreasonable, or discriminatory and that burdens or restricts U.S. commerce.

The Trade in Services Bill makes another important contribution. It establishes the elimination of domestic data processing requirements and other barriers to international information flows as a United States negotiating objective in any new multilateral trade discussions.

In the long run that is our key goal: A new round of GATT trade negotiations to pick up where the Kennedy and Tokyo rounds left off.

Specifically we should work to establish a set of international norms, a framework for multilateral negotiations, and international mechanisms to resolve disputes, akin to that, albeit imperfect, system which now exists for merchandise trade.

A new international trade regime should also extend and expand GATT principles to cover services, including telecommunications and information services; principles such as:

- National treatment,
- Nondiscrimination,
- Right to sell,
- Application of least restrictive regulations,
- And most-favored-nation treatment.

Clearly, these principles have not worked perfectly, especially in the current international economic environment, to preclude protectionism against merchandise trade. However, they could serve as a useful framework on which to build an even better regime for services.

There is a lot of resistance to dealing with information and services in this way. There are skeptics who would have us believe that services as a category of trade is too vast and complex to interpret and negotiate, and that the goal of an international regime for services is too ambitious a goal at a time of so many other pressing trade issues. And there are governments and industries that are outright opponents of any new major trade liberalization. While these opponents would never admit to supporting anything so crude as protectionism, they do greatly fear being left out of the international economic

revolution now underway if they do not make some effort now to cushion themselves from international competition.

And, as I have mentioned, this has also become a disputed issue in North-South relations between the developed and the developing countries. The developing countries -- or at least from their spokesmen in GATT and in the United Nations Conference on Trade and Development (UNCTAD) -- are beginning to argue that liberalization of services trade is only a "back door" to investment. Taking this view, the developing countries have opposed bringing services under a liberal trade regime. Rather, many are arguing, services and international information issues ought to be dealt with as matters of domestic investment policy, with more host government controls and restrictions.

In spite of all of this opposition, we run a considerable risk if we do not act decisively in the right direction soon. As services and information-related business rapidly become a more and more important aspect of economic activity and international trade, the failure to develop a regime to deal with the protectionism that is beginning to plague services and information will inevitably lead to further erosion of the world trading system. Countries will be less likely to dismantle protectionism in the traditional sectors if they are not allowed to compete fairly in the new information and services sectors at the international level.

But, as we have seen, trade policy is already far behind technological developments and policymakers are likely to have to commit soon to a full-scale effort to fill the large and growing policy gap.