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E-COMMERCE, WTO AND DEVELOPING COUNTRIES

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ABSTRACT

In this paper, I discuss the policy issues e-commerce raises for the World Trade Organization (WTO) and developing countries. I advocate three policy prescriptions. First, it will be most appropriate to classify e-commerce as trade in services with GATS discipline applied to it. Developing countries should ensure that e-commerce is not classified as goods trade with a permanent zero custom duty pact. Such an outcome would liberalize all e-commerce by default, undermining their bargaining power.

Second, at present there is some disagreement about whether international Internet transactions should be classified as cross-border trade or consumption abroad. In making their commitments in the UR and post-UR negotiations in services, countries presumably viewed these transactions as cross-border trade. Therefore, Internet transactions would be best classified as cross-border trade.

Finally, developing countries such as India that have the capacity to export skilled services through Internet should aggressively negotiate market access with developed countries in the future WTO negotiations. This involves negotiations on two fronts. One, they should seek liberalization by developed countries in sectors in which they have a comparative advantage. And two, they should seek recognition of their education, qualifications, requirements met, or licenses or certificates granted in the markets of other countries.

Electronic commerce offers unprecedented opportunities to both developing and developed countries. In the short run, the gains are likely to be concentrated in developed countries but, in the long run, developing countries have more to benefit. This is because, in the short run, developing countries lack the infrastructure necessary to take full advantage of Internet. But in the long run, they can leap frog, skipping some of the stages in the development of information technology through which developed countries have had to pass.

Key Words: e-commerce, Internet, WTO, developing countries.

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CONTENTS

ABSTRACT	iii
I. INTRODUCTION	1
II. WHICH MULTILATERAL DISCIPLINE: GATT, GATS OR BOTH?	3
III. MODE 1 OR MODE 2?	8
IV. ACCESS TO E-COMMERCE	10
A. Access to internet services	10
1. Availability of infrastructure, hardware and software	10
2. Access to communications networks	10
B. Access to electronically traded services.....	12
V. INTELLECTUAL PROPERTY RIGHTS	14
VI. E-COMMERCE AND DEVELOPING COUNTRIES	15
A. The gains from internet to developing countries.....	15
B. Policies for the expansion of e-commerce	19
VII. CONCLUSIONS	23

I. INTRODUCTION

There are currently six different mediums of electronic commerce (e-commerce): telephone, fax, television, electronic payment and money transfer systems, Electronic Data Interchange (EDI) and Internet.¹ It is fair to say that even though phone, fax and television remain the most widely used electronic mediums to promote or conduct commerce, much of the current excitement, confusion and debate on e-commerce is the result of the rapid ascendancy of Internet. Internet has made international transmission of services possible in ways and on a scale via traditional modes such as fax, phone and television. It is being used today to buy abroad many back-office services such as electronic publishing, website design and management, customer call centres, medical records management, hotel reservations, credit card authorizations, remote secretarial services, mailing list management, technical on-line support, indexing and

abstracting services, research and technical writing, and technical transcription. Internet has also become a medium for electronic transmission of many products, traditionally traded in the form of goods. For instance, books, CDs, movies and computer programmes can now be transmitted internationally in digital form.

From the viewpoint of multilateral rules of international trade as well as national economic policy, this medium gives rise to issues somewhat different from those faced with respect to other mediums. For instance, WTO members must decide whether the GATT or GATS discipline should be applied to international trade via Internet. To the extent that some of the trade via this medium has a counterpart that is traded physically, as is true of books, computer programmes, music and movies, one may apply the GATT discipline. But to the extent that such counterparts do not exist, as is the case with the back office services mentioned above, it will make more sense to apply the GATS discipline. From the viewpoint of national economic policies, especially in developing countries, the potential for development, offered by this medium, increases the urgency to develop the telecommunications industry and create the financial infrastructure that facilitates electronic transactions (for example, credit cards).

¹ Created by the trucking industry in the United States in the early 1970s, EDI entails the exchange of documents and information between the computers of two businesses without human intervention. Stores such as WalMart use the technology to link their suppliers directly into their stock databases. Through the link, suppliers are automatically notified and authorized to send shipments when the shelves are bare. According to the *Economist* (May 10, 1997), 95 per cent of the *Fortune* 1,000 companies use EDI.

In the present paper, I discuss these and other aspects of e-commerce from the viewpoint of developing countries.² In Sections 2-5, I offer an analytic discussion of multilateral rules likely to be applicable to Internet commerce. Special attention is paid to issues of taxation and access to e-

commerce. In Section 6, I focus on the implications of e-commerce for developing countries and discuss possible policy measures the countries may wish to take in order to maximize the benefits from it. The paper is concluded in section 7.

² The reader may find it useful to acquire some background information on various electronic mediums from the more comprehensive study, *Electronic commerce and the role of the WTO*, Special Studies 2 (Geneva: World Trade Organization), 1998. Additionally, the *Economist* has published two detailed surveys on e-commerce in issues dated May 19, 1997 and June 26, 1999.

II. WHICH MULTILATERAL DISCIPLINE: GATT, GATS OR BOTH?³

The degree to which countries can regulate international trade via the Internet, what taxes they can impose on it, and in what way they can discriminate in favour of the domestic suppliers of similar items will depend on the WTO discipline the member countries decide to apply to it. The WTO report mentioned in footnote two [WTO (1998) henceforth] raises the possibility that, in principle, the “digits” traded on Internet could be viewed as goods, services or even something else. Which of these characterizations is chosen determines whether this trade is subject to the rules laid down in the General Agreement on Tariffs and Trade (GATT), General Agreement on Trade in Services (GATS), a combination of these two or an entirely new agreement.

It may be noted at the outset that there is no ambiguity at present regarding the status of the goods ordered and paid for on Internet but delivered physically in the conventional manner. Except for the order and payment themselves, these transactions are treated as goods trade and the GATT discipline applies to them. The ambiguity arises only when the goods are delivered on Internet.

On the face of it, any deliveries made by Internet would seem to re-

semble services. Nevertheless, as already noted in the introduction, there are products delivered by Internet that have counterparts in physical, merchandise trade. The obvious examples are books, videos, music CDs and computer software. When imported in physical form, these products are treated as goods with the GATT discipline applied to them. But can they be treated as services when delivered by Internet? Or, in conformity with their physical counterparts, should they be treated as goods?

One extreme possibility is to characterize all transmissions on Internet as goods with GATT discipline applied to them. Such a characterization accompanied by a ban on custom duties on the transmissions, currently in place, would amount to the WTO members committing themselves to complete free trade in all transactions routed by Internet. This is because national treatment and MFN status are general obligations under GATT. By accepting the GATT discipline, under national treatment, the member countries would give up their right to discriminate against Internet imports as far as domestic taxes are concerned. In addition, the ban on customs duty would bind their tariffs on Internet imports at zero. However, at present, no one is considering such a proposal. The

³ In writing this section, I have benefited greatly by e-mail exchanges with Aaditya Mattoo and access to his ongoing research with Ludger Schuknecht for a forthcoming paper entitled “Trade Policies for Electronic Commerce.”

member countries made their commitments in the UR and post-UR negotiations on services based on the assumption that most of those transactions were services rather than goods.

At the opposite extreme, we could abandon both GATT and GATS and develop an entirely new discipline for Internet trade. Once again, virtually no one is advocating this position. For a search for a new discipline for e-commerce makes little sense. Internet services, which include Internet service providers and phone lines on which transmissions flow, are already subject to GATS and the Agreement on Basic Telecommunications. All electronic transmissions that flow on Internet, on the other hand, have counterparts in either goods trade or services trade. As such, the rules necessary to regulate that trade can be found in GATT or GATS.

Thus, the real choice is between applying GATS to all Internet trade, or GATT to that trade for which physical counterparts also exist, and GATS to all other e-trade. In my judgement, on balance, it makes more sense to define all electronic transmissions as services. At one level, it may be argued that at the time Internet transmissions cross the border between two countries, they do not have a physically traded counterpart. The eventual transformation of the transmission into a good such as a book or CD does not negate the fact that at the border the transmission did not have a physically traded counterpart. Indeed, in many cases, the transmission may not be turned into the physically traded counterpart at all. For example, the recipient may continue to store it in the digital form with books read on the screen and music played directly on the computer.

But this is not the primary reason why I lean in favour of treating all Internet trade as service trade. The key advantage of adopting the across-the-board definition is that it is clean and minimizes possible disputes that may arise from countries wishing to have certain transmissions classified as intangible goods and others as services. Under a mixed definition, in any trade dispute involving Internet trade, panels will have to first decide whether the object of dispute is a good or a service to determine whether the rules of GATT or GATS are to be applied in evaluating the dispute. The adoption of the across-the-board definition automatically resolves this issue.

The across-the-board definition, nevertheless, raises some efficiency issues that must be addressed. Thus, consider first the issue of tariffs, which are applicable to products imported in physical form but not when transmitted electronically. As long as the cost of electronic transmission is lower than that of physical delivery, the presence of tariffs on the latter poses no problem. Effectively, the electronic transmission offers the product to the country at a price lower than that available through physical delivery. This change is equivalent to an improvement in the country's terms of trade and, leaving aside some general-equilibrium considerations, improves welfare unambiguously.

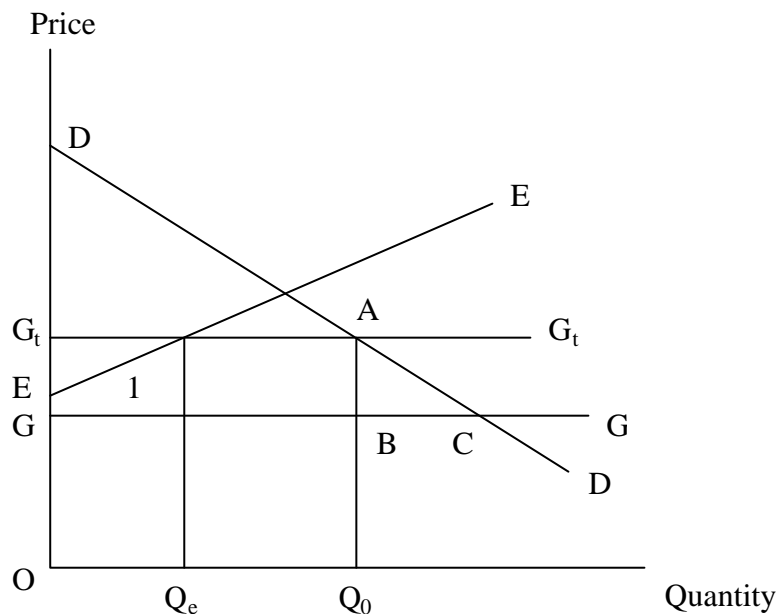
But for many countries, especially developing ones, this is an unlikely scenario. In these countries, most consumers do not have computers or Internet access. A likely scenario, therefore, is one in which a handful of independent entrepreneurs will receive the product by Internet, convert it into physical form such as CDs and sell the latter to consumers. But this activity

may itself be costly, using up real resources.

A possible outcome of the proposed regime in many developing countries can be represented stylistically, therefore, with the help of Figure 1. In the figure, DD gives the demand

for a specific compact disc (CD) and GG its supply when imported in physical form, as a good. It is assumed that the country is small so that the supply is perfectly elastic. In the absence of Internet transmission, the quantity purchased is given by Q_0 and tariff revenue by $ABGG_t$.

Figure 1



Suppose we next introduce Internet transmission. Assume, as is true currently, that if music is transmitted electronically, no tariff is paid. Competitive entrepreneurs import music electronically, convert it from digitized form into CDs and sell them to consumers. The marginal cost of conversion and distribution is positive and rising, leading to the supply curve EE . It is then immediate that quantity OQ_e will now be imported by the electronic medium with Q_eQ_0 continuing to come in physical form. The tariff revenue

collected previously on the quantity OQ_e disappears. Of the lost revenue, area marked 1 goes to cover the higher costs of supply by Internet and is a deadweight loss. The remainder of the lost revenue becomes a transfer to exporters.

This is the standard story from the smuggling literature that arises when there are two sources of supply and the more expensive source is not subject to a tariff but the less expensive source is. It should, of course, be clear that if the

cost of Internet transmission were low such that the Internet supply curve crossed the demand curve below GG, this problem would not arise. Internet supplies will eliminate physical shipments and the price will be below GG, benefiting the consumers by more than the lost tariff revenue.

This analysis shows that subjecting like products, delivered by different means, to different disciplines can potentially result in harmful efficiency effects. This is not an inevitable outcome, however. There are at least two solutions to the problem. First, the country could choose to eliminate the tariffs on physical deliveries, thus eliminating the efficiency loss such as that represented by area 1 in Figure 1. Indeed, this will lead to a net efficiency gain of triangle ABC. Second, if the tariff on physical supplies cannot be eliminated because of fiscal considerations, the country could choose to impose a higher VAT or excise tax on music CDs supplied by Internet by an amount equal to the tariff on physical deliveries. As long as the country has not already committed itself to giving national treatment to imported music services, this option is available within GATS.⁴

It is useful at this point to return briefly to the temporary ban on customs duties on all electronic transmissions mentioned earlier. While this ban would be meaningful if all e-

⁴ The absence of trade taxes on services is an important and entirely neglected problem. If tariffs are imposed to raise revenue, efficiency dictates that services are brought into the tariff net as well. Yet, this issue has received no attention in the academic or policy literature presumably because academics still like to think of services as non-traded and policy analysts do not want to scare away foreign investors by taxing the services supplied by foreign sources at higher rates.

commerce were classified as goods trade, its continued existence and the current United States proposals to make it permanent are puzzling. At present, the only feasible method of charging a customs duty on electronically supplied foreign services is to subject them to a higher domestic tax relative to the identical, domestically supplied services.⁵ As long as a country has not committed itself to giving national treatment to the foreign service in question in its national schedule, it is free to impose a higher domestic tax on electronically supplied services from abroad. The existing ban on customs duty and the United States proposal to make the ban permanent, do not and cannot forbid countries from subjecting an imported service to a higher VAT or excise tax than an equivalent domestically supplied service. The discriminatory treatment is forbidden only if the Member commits to giving the imported service national status in its national schedule. But in that case, the current ban on customs duty and the United States proposal to make it permanent have no additional impact. In either case, the ban is meaningless and entirely vacuous.⁶

A second difference between GATT and GATS discipline from the viewpoint of efficiency, is that the former does not allow quotas while the

⁵ Even this option is available in the case of business-to-business transactions only. When a foreign business sells a product electronically directly to domestic consumers, it is not clear how the transaction can be subject to any domestic taxes.

⁶ One possible explanation is that in the Seattle Round negotiations, the United States may still be intending to get Internet trade classified as goods trade. And if by then the countries have already committed to a permanent ban on customs duty, Internet trade will automatically be freed of all border restrictions.

latter does. In the particular example I have discussed above, in principle, if WTO members decide to apply GATS discipline to services traded electronically, a country will have the option to limit the number of CDs that could be transmitted by Internet. It is not immediately clear how this restriction can be enforced. But assuming that it

could be done, trade will be diverted to shipments in physical form, which may be an inferior mode of delivery. At present, such a quota is not enforceable. If it does become enforceable, the outcome can be inferior to that obtainable under the GATT discipline. This will be a cost of the clean definition I have advocated.

III. MODE 1 OR MODE 2?

The General Agreement on Trade in Services classifies services according to the mode of delivery. It distinguishes four modes: cross-border supply (mode 1), consumption abroad (mode 2), commercial presence (mode 3), and the movement of natural persons (mode 4). Assuming the GATS discipline is applied to electronic trade, for transactions that do not take place either through commercial presence or the movement of natural persons, the member countries will still need to decide whether they are to be treated as cross-border trade (mode 1) or consumption abroad (mode 2).⁷ There are no clear-cut objective criteria that can be brought to bear on this classification. Therefore, it is likely to be negotiated as a part of the next round of negotiations. The choice of classification has two principal implications.

First, the classification will determine the liberalizing impact of the commitments made in the UR and post-UR GATS negotiations on services. In these negotiations, countries have already made commitments based on the modes of supply of services. Therefore, it matters whether electronic trade is treated as being supply by mode 1 or mode 2. For example, if a country gave full market access un-

der mode 2 for a particular financial service that is traded electronically, the commitment would have no liberalizing impact if electronic commerce is classified as supply under mode 1 rather than 2. Thus, the liberalizing impact of previous commitments will depend on the mode supply under which electronic commerce is classified. It is my impression that countries undertook more obligations for liberalization under mode 2 than under mode 1. Accordingly, the liberalizing impact of the commitments will be greater if electronic commerce is classified under mode 2. Developed countries, which are net exporters of electronic services, stand to gain greater market access if these services are classified as being supplied under mode 2.

Second, the classification determines the country of jurisdiction for purposes of regulation and dispute settlement. For supply under mode 1, the transaction is deemed to have taken place in the country where the buyer resides. Therefore, it is the regulatory regime of the importing country that applies to the transaction. In contrast, for supply under mode 2, the relevant regulatory regime is that of the country where the supplier resides. If countries feel that they want to protect their buyers' interests, they are likely to opt for mode 1. Thus, there is some tension in the choice of classification depending on the objective. The market access objective pulls towards mode 2 while the consumer protection objective pulls towards mode 1.

To the extent that in making their liberalization commitments in the UR and post-UR negotiations, countries

⁷ Though the discussions on e-commerce are often focused on cross-border method of delivery, it can and does take place through commercial presence (mode 3) as well as the movement of natural persons (mode 4). For example, when a foreign bank offers electronic banking services to the residents of a country, the transaction is classified under mode 3. Likewise, when computer programmers move to another country and offer their services electronically there, such e-commerce will be classified under mode 4.

viewed the electronic transactions between providers and recipients in different countries as cross-border transactions, it makes sense to treat them as

such. Otherwise, actual liberalization is likely to result in being at variance with what the countries intended.

IV. ACCESS TO E-COMMERCE

Access to e-commerce, which in the WTO parlance often means access to e-exports, has two components that must be distinguished sharply: access to Internet services and access to services that can be traded electronically. The former deals with access to Internet infrastructure while the latter relates to specific commitments in electronically tradable services (for example, commitments in financial services under modes 1 and 2). In goods trade, we can liken these components, respectively, to access to transportation networks (including ports, ships, roads, railways and air transport) and access to specific goods markets through a lowering of trade barriers such as tariffs and quotas. For lower trade barriers to result in more imports, access to transportation networks is necessary. Similarly, for specific commitments in various services sectors under modes 1 and 2 to result in increased flow of imports, access to Internet facilities is essential.

A. Access to internet services

The access to Internet infrastructure depends on two factors: (i) availability of communications networks, hardware and software and (ii) access to the existing communications networks. Let us consider briefly each of these factors.

1. Availability of infrastructure, hardware and software

At the basic level, access to Internet by the residents of a country de-

pends on the level of development of the telecommunications sector and the availability of hardware and software. In the remote villages of many developing countries, even the basic telecommunications services may not exist. To bring Internet and, hence, e-commerce to these villages, one will need first to bring telecommunications services there. But even when telecommunications services exist, additional hardware that links up the individual user to Internet must be put in place. Finally, one needs to ensure access to equipment such as computers, modems and software. Generally speaking, an open trade regime with respect to information technology equipment is likely to facilitate access to this equipment. This is perhaps the reason why some countries chose to sign the Information Technology Agreement (ITA), which requires the signatories to open up trade in a large number of information-technology products.

2. Access to communications networks

There are three principal WTO provisions that govern access to communications networks: GATS Article VIII on monopolies and exclusive service suppliers, GATS Annex on Telecommunications, and the Reference Paper on regulatory principles in the Agreement on Basic Telecommunications. In addition, specific commitments on national treatment and market access made by countries in the basic telecommunications sector have

implications for access to Internet.⁸ GATS Article VIII and the Annex apply to all WTO members uniformly. The Reference Paper applies to approximately 60 countries that incorporated it into their specific commitments in the agreement on basic telecommunications services. A total of 69 countries made specific commitments in the basic telecommunications sector. Of these, ten countries made specific commitments with respect to Internet access providers.

Article VIII, which applies to all services, is designed to deal with monopoly suppliers who can potentially frustrate a Member's MFN and specific market access commitments. For instance, suppose telephone lines in a Member country are owned by a single entity and the Member has made market access commitments to other countries in the provision of Internet services. Article VIII requires this entity not to limit access to phone lines to service suppliers from other Members or discriminate among them. It also requires this entity to ensure that the commitments made by the Member in other service sectors are not frustrated.

Article VIII is limited in its application to cases in which a monopolist supplies the service in question. GATS negotiators recognized, however, that basic telecommunications services are central to the smooth flow of trade in a large number of other services. Therefore they introduced further provisions in the Annex on Telecommunications to widen access rights in the use of public telecommu-

⁸ For completeness, mention may also be made of GATS Article IX on business practices, which provides for consultation and information exchange between affected Members when suppliers resort to anti-competitive practices.

nications transport networks and services (PTTNS).⁹

The Annex requires each Member government to ensure that suppliers of other Members are given reasonable and nondiscriminatory access to and use of PTTNS for the supply of a service included in the Member's schedule. The term "nondiscriminatory" is defined here to include both national treatment and MFN. The Annex, thus goes beyond Article VIII in two respects. First, for a service listed in the Member's schedule, it gives foreign suppliers nondiscriminatory access to PTTNS even though the Member has not committed to national treatment in that service.¹⁰ Second, the access provision applies to PTTNS irrespective of whether these services and networks are supplied by a monopolist or competitive firms.

The concern that telecommunications markets would be dominated by large operators, capable of frustrating market access commitments, remained central during basic telecommunications negotiations. This led the participants to lay down a set of regulatory principles in a Reference paper,

⁹ As defined in the Annex, a public telecommunications transport 'service' is any telecommunication transport service, offered to the public, involving the real-time transmission of customer-supplied information without any end-to-end change in its form or content. Public telecommunications transport 'network' refers to public telecommunications infrastructure permitting telecommunications between and among network termination points.

¹⁰ This means that if a country lists internet service supplies in its national schedules even without committing to national treatment, foreign suppliers are to be given nondiscriminatory access to PTTNS. Discrimination against foreign suppliers is still possible in other areas (for example, taxation) as long as the country has not committed to national treatment in internet.

aimed at reigning in the behavior of the major suppliers of telecommunications services. Some 60 participants incorporated this Reference Paper into their commitment schedules.

The regulatory principles in the Reference Paper oblige major suppliers to provide interconnection on nondiscriminatory terms. They are to provide also services in sufficiently unbundled form that those seeking interconnections do not have to pay for unnecessary components and facilities. The Reference Paper also lists rules governing anti-competitive cross-subsidization, the misuse of information, licensing criteria and transparency.

Finally, Internet access also depends on the degree of liberalization in basic telecommunications undertaken by Members. 69 countries signed the Agreement on Basic Telecommunications in February 1997. Counting the European Communities as one, this produced 55 schedules. Many of the negotiated undertakings represent a pre-commitment to liberalize in the future.

A key area of liberalization from the viewpoint of Internet access is that of Internet Service Providers (ISP). In many countries, telecommunications services are supplied by a public monopoly, which often also becomes the monopoly provider of Internet access. In countries, which have liberalized their communications regimes, competing ISPs exist and offer different bundles of Internet services. In future negotiations, it will be worthwhile to incorporate ISP as an explicit sector into national schedules of commitment. This may induce further liberalization in many countries in this key area. There is no compelling argument against permitting multiple ISPs or

foreign entry even in countries with monopoly provision of other telecommunication services.

B. Access to electronically traded services

In addition to the Internet access services just discussed, Internet offers the opportunity for trade in two additional areas. First, many services outside of the telecommunications sector, such as those in the banking, insurance and computer programming sectors can be delivered electronically. Second, Internet can be the vehicle for the provision of distribution services with goods and services purchased through Internet but delivered by other means. For transactions in the first category, GATS discipline applies fully. In contrast, transactions in the second category are similar to those by telephone or mail order. When delivered physically, goods are subject to the usual GATT discipline including customs duties.

While national treatment and market access commitments in national schedules do matter in that they restrain the importing country's ability to discriminate in its tax policies in favour of domestic suppliers or among various foreign suppliers, in the case of Internet trade, they play a less crucial role. To the extent that governments do not have effective control over what is traded on Internet, especially when transactions are from business to consumers, the value of these commitments is limited.

Instead, the bulk of the expansion of e-commerce will depend on countries granting recognition to the education or experience obtained, requirements met, or licenses or certificates granted in another country. Article VII

of GATS allows for such recognition even on a discriminatory basis, in the sense that it allows Members to extend such recognition on a selective basis. For instance, the United States may give recognition to accountancy degrees from Europe but not India. This could signal potential buyers that it is hazardous to buy accountancy services in India even though the latter may be capable of supplying them competi-

tively. In this regard, Article VII gives some flexibility to excluded countries, which developing countries should exploit as much as they can. In particular, if a Member gives recognition to the standards prevailing in another Member in a specific area, and a developing country's standards in the same area happen to be at par, under Article VII provisions, it should be granted similar recognition.

V. INTELLECTUAL PROPERTY RIGHTS

The Trade Related Intellectual Property Rights (TRIPs) Agreement applies as much to transmissions on Internet as through other mediums. Copyright, trademark and geographical indications must be respected in Internet transmissions the same way as in other mediums. In December 1996, two new treaties came into existence under the auspices of the World Intellectual Property Organization (WIPO), which deal specifically with Internet transmissions. These are WIPO Copyright Treaty and WIPO Performances and Phonograms Treaty. These treaties are to enter into force three months after 30 countries have deposited the instruments of ratification or accession with the Director General of WIPO.

The new WIPO treaties further strengthen the rights of authors, performers and phonogram producers. The treaties recognize the role that technological measures used by rights holders have in facilitating effective protection. A variety of technologies that help control access or limit copying of work transmitted via electronic means already exist and are being continuously developed. The signatories to the treaties must provide adequate legal protection and effective legal remedies against the circumvention of these effective technological measures used by authors, performers and producers of phonograms.

Technologies also exist for incorporating into digital copies of works

and other material, digital envelopes and watermarks that identify the work, its author and any other right holders, the terms and conditions of use of the work, and any other information. The treaties require signatories to provide adequate and effective remedies against any person, who alters or removes such information or distributes copies of protected material knowing that such information has been removed without authority.

At present, these WIPO treaties have not come into force. However they can be eventually expected to be brought into WTO and incorporated into TRIPs. This may pose a problem for developing countries given their capacity to enforce disputes. In many developing countries, courts have already been stretched well beyond their capacity and it is unlikely that they will be able to deliver developed-country standards in the area of enforcement. As may happen with the existing enforcement provisions in TRIPs, meeting the standards of developed countries will give foreign rights holders a favoured treatment relative to domestic rights holders who will likely be subject to the domestic pace of dispute resolution. Developing countries will need to take into account these considerations, and possible threats of the denial of Internet access by developed countries, in making their decisions regarding these treaties as and when proposals are made to incorporate them into WTO.

VI. E-COMMERCE AND DEVELOPING COUNTRIES

It is perhaps not an exaggeration to say that, from the viewpoint of commerce, Internet is the most important inventions of the last two decades. This medium of "transportation" has opened markets that were previously closed, speeded up transactions as no other medium has done in the past, and made the delivery of some products almost instantaneous.

In this section, I discuss the issues more directly relevant to developing countries. I begin with an analytic discussion of the ways in which Internet generates benefits for the countries and interacts with other modes of delivery of services, especially the movement of natural persons. I then consider policy actions that developing countries may consider taking to enhance the benefits from e-commerce.

A. The gains from internet to developing countries

While virtually all countries stand to gain from the opportunities offered by Internet, according to one view, developing countries stand to gain more from it than developed countries. The argument is that these countries are far behind developed countries in terms of information-technology infrastructure. Given the cost savings offered by Internet technology and the relative ease with which it can be provided, they can now skip several stages of technological development through which developed countries had to go. Stated differently, developing countries are much farther inside the current technological frontier and, therefore, have larger potential benefits from moving to it.

In the long run, this is a defensible statement. But it must be acknowledged that the benefits of e-commerce are distributed unevenly not only across countries--both between and among developing and developed countries--but also over time. Given that three fourths of the current e-commerce is concentrated within the United States, perhaps this single country has benefited most from it. In contrast, for many poor countries in Africa, the telecommunications infrastructure is so poorly developed that it will take a long time before they are able to benefit significantly from e-commerce.

The benefits from e-commerce to a particular developing country, both domestically and internationally, depend on the volume of demand for, and supply of, goods and services that can be potentially traded on Internet. Despite all the excitement surrounding Internet, it is likely that for many developing countries the demand and supply factors do not promise large gains, at least in the foreseeable future. Due to a lack of electronic means of payment such as credit cards, payments will still have to be made by conventional means. This factor alone is likely to limit considerably the scope of domestic electronic transactions. Moreover, the domestic demand for services that are electronically delivered is likely to be limited. Due to low costs of internal movement of natural persons, even businesses, which have heavy needs for customized software, are likely to rely on the physical presence of personnel. In these countries, even if Internet were widely available, e-commerce, as distinct from email

and other communications, will not be a big success immediately.

In assessing the potential benefits from international e-commerce to a country, analysts often focus only on the goods and services that it can export. This is an incorrect approach, however, since benefits can arise from a reduction in the cost of imports as much as from an increase in the price received for exports. Even if a country does not export any services, it can benefit from imports of services, paying for them in terms of goods. Cheaper availability of medical, engineering and architectural services, long-distance learning and reduced costs of transactions can confer benefits even if the country does not immediately export the services traded through Internet.

To the extent that Internet effectively opens markets that were previously closed, it is tempting to think of it as another form of trade liberalization. But, in fact, it is much more: it amounts to a technical improvement that lowers costs of transactions and, as such, generates far larger benefits than the triangular efficiency gains from trade liberalization. Indeed, the decline in costs increases potential benefits from trade liberalization in many services sectors.

Among developing countries, the countries best situated to benefit from e-commerce through export expansion are those with a substantial pool of skilled labour, capable of working on or near the frontier of computer technology. The case of India, which is already benefiting from e-exports in a big way, best illustrates this point.

I had long held the view that India had greatly over-invested in higher education. At one extreme, the most talented individuals left the country in

search of better opportunities abroad and, at the other extreme, the country had with a large pool of educated workers whom the economy could not absorb. Even today, the lowest-level clerical jobs attract large number of applications from graduates and post-graduates.

The advent of computer technology in general and Internet in particular threatens to prove my view to be incorrect, however. The migration of some of the country's most talented individuals to developed countries notwithstanding, the country has the world's second largest pool of English speaking scientific manpower. Each year, Indian universities graduate as many as 115,000 engineers. This pool, Internet and the opening to direct foreign investment by India have combined to yield annual exports of as much as US\$ 4 billion.¹¹

Because the international movement of natural persons is subject to severe restraints, the value of marginal product of skilled labour in developed countries is far higher than in developing countries. Though numerical estimates are not available, the potential gains from the increased mobility of natural persons are astronomical. Developing countries in general, and India in particular, have long sought a relaxation of restrictions in developed countries on the movement of natural persons. But they have not achieved a notable success in this effort.

By making the sales of skilled labour abroad, possible without actually

¹¹ This information was provided by Dewang Mehta in his presentation at the WTO conference "Potential for Electronic Commerce for Businesses in Developing Countries" on February 19, 1999 and summarized in the WTO document WT/COMTD/18.

moving natural persons physically, Internet has at last brought developed-country demand for skilled labour to developing countries. This has resulted in a large capital gain on the investment India has made in higher education during the last four decades. Thus, what had seemed to be a poor allocation of resources for decades, *ex post*, promises to turn into an excellent investment.¹²

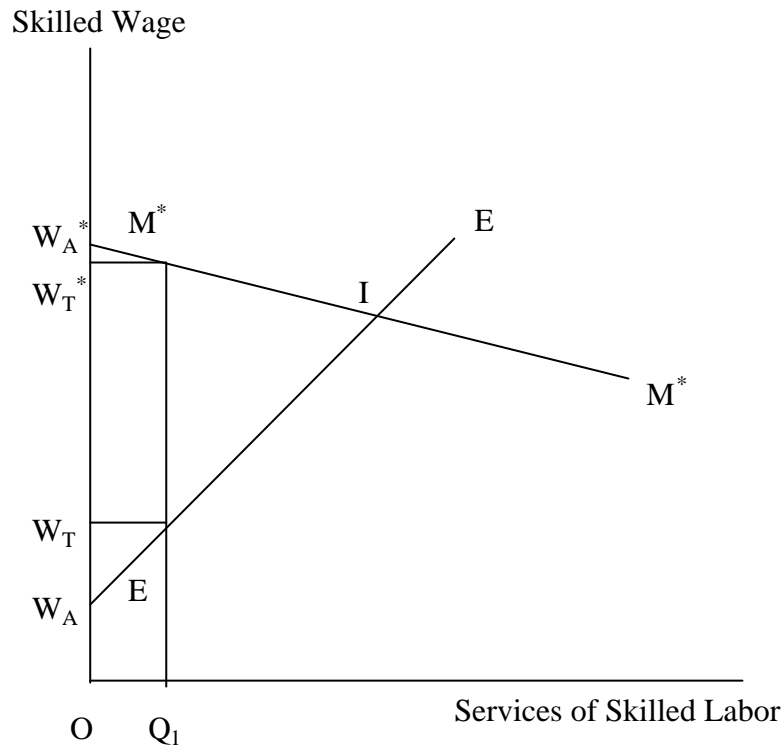
Figure 2 gives an analytic representation of the benefits from the opening of the market for skilled labour through Internet. For simplicity, divide the world into two countries and call them the United States and India. Use an asterisk to distinguish the variables of the United States from those of India. Let M^*M^* represent the potential excess demand for skilled labour in the United States and EE the excess supply of it in India. In view of

the fact that the United States is very large in economic terms, M^*M^* is shown to be relatively elastic.

In the absence of Internet and the movement of natural persons, skilled wages in the United States and India settle at W_A^* and W_A , respectively. The introduction of Internet allows "trade" in skilled labour between the United States and India provided the United States has opened up its imports of some services through modes 1 and 2. To the extent that Internet is an imperfect substitute for the movement of natural persons, and trade in services under modes 1 and 2 is not entirely free, we will not expect the equilibrium to move to the fully integrated equilibrium, I . Instead, trade is likely to be limited up to, say, Q_1 , generating gains from trade equal to the area between M^*M^* and EE over quantity OQ_1 .

¹² The simultaneous liberalization of direct foreign investment has also helped this process. The presence of foreign firms in India has played an important role in linking the demand for various services in their source countries with the supply in the host country (i.e. India).

Figure 2



The important question is how these gains are going to be divided between the United States and India. The answer to this question depends on where the wage settles. When natural persons are allowed to move, the answer is clear. The wage is determined on the demand curve, M^*M^* . This is because the American firms must compete for the limited number of workers who have been granted entry visas. It is also the case because United States laws do not permit local firms to hire foreign workers at a wage lower than that paid to United States citizens to ensure that firms do not opt for the former because they can employ them cheaper.

The outcome is likely to be different when Internet is the medium of exports of skilled labour. Now the wage will be closer to the export-supply

curve, EE . This is because the wage must be determined within the Indian market based on how much can be exported. The more liberalization in services the United States undertakes under modes 1 and 2, the greater the demand for Indian skilled labour and the higher the wage. Thus, benefits to India depend directly on the extent of liberalization undertaken by the United States in services that can be potentially exported by India on Internet.

This analysis is, of course, highly stylized. Cross-border trade will not substitute for the movement of natural persons in all cases. Often confidentiality or security considerations require consultants to move to the site where the service has to be provided. The most striking recent example relates to the Y2K contracts. In other circumstances, the movement of natural per-

sons may even be complementary to exports via Internet. For instance, installation and maintenance of software may require the physical presence of the supplier. Finally, natural persons may also be employed in sectors that remain largely non-traded. This is clearly true, for instance, in the case of medical and health services.

We may also ask whether trade on Internet might substitute for direct foreign investment. Sometimes it is suggested that if delivery by modes 1 and 2 becomes a substitute for delivery by mode 3, Internet will become a substitute for direct foreign investment. Although examples of modes 1 and 2 deliveries substituting for mode 3 deliveries are not pervasive, this does not rule out the possibility that Internet may have an adverse impact on direct foreign investment. Substitution between modes impacts only the sectoral composition of direct foreign investment, not its aggregate level. Instead, the aggregate level will depend on whether Internet raises the return on capital more in the source countries or the host countries. If the former, as is likely to be the case, at least in the short run, more capital will choose to stay in the source countries. This is clearly an empirically testable hypothesis and is worth studying further. Internet has expanded sufficiently already in developed countries for its impact on investment abroad to be detectable in the data.

B. Policies for the expansion of e-commerce

Development of e-commerce should not be treated as a goal in itself. Some countries are better positioned than others to achieve a rapid expansion of e-commerce for the same amount of resource invested. Since

resources have alternative uses, one must compare the rate of return in e-commerce to those in other activities before committing resources to this sector. This consideration remains valid even if investment decisions are made by private agents, but the policies chosen by the government have significant effects on those decisions. For instance, policies facilitating the development of e-exports are likely to yield higher returns in a country like India, which has a significant pool of skills to export, than in a country lacking such skills.

For developing countries that find the expansion of e-commerce a desirable instrument for achieving its social and development goals, action must be taken at three levels. First, the hardware and software necessary to develop electronically sellable services should be available at reasonable prices. Second, the basic infrastructure necessary for the smooth functioning of Internet must be in place. Here “infrastructure” is defined broadly and includes facilities to conduct financial transactions on the Internet. Finally and most importantly, developing countries must negotiate access to developed country markets in sectors to which they can export services by electronic medium. Let me take each of these areas in turn.

Countries can ensure the access to hardware and software by liberalizing the imports of the relevant products. This, in turn, can be accomplished by either signing the Information Technology Agreement or liberalizing the imports of the relevant products selectively, outside of that agreement. Note that this recommendation is made taking as given, the desirability of the expansion of e-commerce in the first place. We must bear in mind that when there are high trade barriers on

other products, as is likely in many developing countries, this liberalization itself may misallocate resources and consumer expenditure. In such circumstances, the benefits from the expansion of e-commerce must outweigh the costs of the misallocation.

It is presumably in the area of infrastructure development that developing countries need to do most to assist in the development of e-commerce. Without adequate telecommunications systems and the availability of inexpensive telephone services, Internet and e-commerce cannot flourish. At present, the telecommunications network in many developing countries is rather poorly developed. A large majority of individuals do not have access to telephones,¹³ and those who do must pay very high rates for telephone calls. Unlike in the United States, local telephone calls are metered and charged at fairly high rates so that even if the Internet access is cheap, the expense of local telephone calls, necessary to connect to the internet access provider, can raise the overall cost of Internet use.

There is also the issue of power supply. In India, for instance, publicly supplied power has been so unreliable that many software firms in Banaglore had to resort to their own generators to ensure a continuous flow of power. Frequent and long interruptions in power flows can have a devastating effect on the transmission of data.

¹³ In China and India, there are 2.3 and 1.1 telephones per one hundred inhabitants. This compares with 59.5 telephones per hundred inhabitants in the United States. Among developing countries, only Hong Kong and Singapore have telephone availability that is comparable to that in developed countries. See Table 2, p. 7, WTO (1998), *op. cit.*

At present, in the large majority of developing countries, Internet access is also expensive and unreliable. Often telecommunications services are supplied by a public monopoly, which also becomes the monopoly provider of Internet access. Unable to expand service sufficiently, under public pressure, it makes many more connections than the capacity of the system. The result is a failure of many customers to access the service for which they have paid.

The solution to this problem is to simply allow private Internet service providers into the market. As long as these access providers can be obliged to give inter-connections to one another through proper regulation, there are no benefits to having a monopoly supplier of the access service. This is clearly an area in which the private market can function efficiently.

The prevalence of a legal framework, centred on paper-based contracts and handwritten signatures can also impede the growth of e-commerce. The United Nations Commission on International Trade Law (UNCITRAL) had drawn attention to this issue as early as 1985 and called upon governments to consider the possibility of permitting, where appropriate, the use of electronic means of authentication. Subsequently, UNCITRAL developed a Model law on Electronic Commerce, which was approved by the United Nations General Assembly in December 1996. The Model law lays out what constitutes the equivalent of a written document, signature and original in the electronic environment. It also sets forth rules governing the admissibility and evidential weight of electronic messages, the retention of data messages, the formation and validity of contracts, and attribution. Many countries have either adopted the

Model law or introduced legislation related to electronic facilitation issues. The countries that have not yet introduced legislation along these lines are likely to need to do so.¹⁴

Finally, assuming the provision of reliable Internet service at reasonable rates domestically can be ensured, additional policy measures are required to facilitate e-commerce. In many developing countries, electronic means of payment, including credit cards, are virtually non-existent. This means that even when products can be ordered or services delivered by Internet, payment must be made by conventional means. This slows down the completion of transactions considerably, reducing potential benefits.

In the case of foreign purchases, this problem becomes even more acute. Many developing countries do not have current-account convertibility so that ordering goods on Internet from abroad is not a practical option except perhaps in the case of large firms, which may have ready access to foreign exchange. Even in countries such as India, which have current-account convertibility but not capital-account convertibility, individuals do not have ready access to foreign exchange. Thus, as far as imports of goods and services are concerned, the Internet option is likely to remain limited to larger firms. The solution is not entirely clear since the issue of giving access to foreign exchange to individuals has serious implications for the ability to control capital outflows, especially in times of crisis. Even if access is provided for current-account transactions only, it becomes easy to disguise capital-account transactions as

current-account transactions. This may be even easier when the purchase is that of services rather than goods.

Ready access to foreign exchange is not a problem, however, in so far as exports are concerned. Normally, exports require receipt of foreign exchange for which restrictions on electronic transmission are likely to be less of a problem. Moreover, exports are likely to be undertaken almost exclusively by commercial entities which are generally equipped to deal in foreign exchange rather than individuals. Even if they need to import certain products, they are likely to be able to make payments electronically in countries with current-account convertibility.

The final step in ensuring access to international e-commerce is to have access to communication networks and markets for electronically tradable goods in foreign countries. Access to communication networks is essentially guaranteed under GATS and the Agreement on Basic Telecommunications as discussed in Section 5.1 of this paper. At present, there is sufficient excess capacity in the networks in developed countries. Therefore, access is unlikely to be a problem. It is possible however, that as the use of Internet grows worldwide, the expansion of capacity may fail to keep up with demand. Normally, one would expect the price mechanism to manage the demand for access, but there may be phases when networks begin to congest heavily. Under such circumstances, developing countries will need to ensure that their access rights are not violated. While, personally, I do not expect this to become a serious problem, some caution in this regard may prove valuable.

¹⁴ For further details, see UNCTAD, *Legal Dimensions of Electronic Commerce*, May 4, 1999, TD/B/Com.3/EM.8/2.

The more important access issue relates to liberalization commitments by developed countries in the services that developing countries can export electronically. To-date, liberalization commitments by both developed and developing countries have been concentrated in services traded by mode 3. Developing countries are largely importers of these services. Commitments in electronically traded services, which developing countries can potentially export have been limited.

For some developing countries, the potential for exports of services through electronic means is very substantial. For instance, the market for customized software alone is growing at more than 20 per cent annually and is projected to reach US\$ 250 billion by the year 2000.¹⁵ Back office services offer another area in which developing countries can and have been supplying services to developed countries. Starting with simple data entry services in the 1980s, the supply of back office services from developing countries has grown to include electronic publishing, website design and management, customer call centres, medical records management, hotel reservations, credit card authorizations, remote secretarial services, mailing list management, technical on-line support, indexing and abstracting services, research and technical writing, and technical transcription.

As reported to UNCTAD (1998), and based on OECD (1997) estimates, the global market for back office services (including Y2K code conversion) that can be potentially supplied by de-

veloping countries amounted to as much as US\$ 438 billion in 1998.¹⁶ This figure is at least 20 per cent of the total 1996 exports of developing countries. United States corporations alone spend US\$ 50 billion a year on information processing, of which at least 20 per cent can be provided in a back office environment.

Developing countries should also identify sectors that have not been liberalized so far by developed countries and to which they could export services electronically. One such area would seem to be accountancy services. Negotiations in this area could potentially be extremely beneficial to some of the developing countries since this is a very large market.

Internet also offers developing countries the opportunity to become exporters of products purchased by foreign governments. In the past, it would have been difficult for potential developing country suppliers to find information on these purchases. However, many developed country governments are now beginning to post tenders for procurement of goods and services on Internet. This gives suppliers from developing countries better access to yet another sector in developed countries. Though the establishment of credibility may take some time for the small and medium firms, large firms in developing countries can certainly bid and compete successfully for these contracts.

¹⁵ The information in this and the following paragraph is taken from UNCTAD, July 27, 1998, *Scope for Expanding Exports of Developing Countries in Specific Service Sectors*, TD/B/com.1/21.

¹⁶ OECD, 1997, *The World in 2020: Towards a New Global Age*.

VII. CONCLUSIONS

In this paper, I have discussed the main economic issues relating to e-commerce from the viewpoint of developing countries. The first set of issues discussed in the paper concerns the WTO discipline on this trade. Several points can be made in this context. First, all things considered, it will be most appropriate to classify e-commerce as trade in services with GATS discipline applied to it. Since this matter is still under negotiation, developing countries should be sure that e-commerce is not classified as goods trade with a zero customs duty pact made permanent. Such an outcome would liberalize all e-commerce by default, undermining their bargaining power.

Second, at present there is some disagreement about whether the Internet transactions in which the provider and recipient of a service are located in different countries should be classified as cross-border trade or consumption abroad. In making their commitments in the UR and post-UR negotiations in services, countries presumably viewed these transactions as cross-border trade. For if they are defined as consumption abroad, the category described as cross-border trade in services will be virtually vacuous. In view of this fact, it can be argued that the transactions under consideration be classified as cross-border trade.

Third, in the area of intellectual property protection, developing countries must eventually confront the possibility of two WIPO treaties, concluded in December 1996 but yet to come into force, being brought into the WTO. These treaties have strong enforcement commitments that develop-

ing countries will need to study carefully. Many of the countries may lack the ability to enforce and deliver the settlement of disputes in this area.

Developing countries such as India that have the capacity to export skilled services through Internet should aggressively negotiate market access with developed countries in the forthcoming round. This involves negotiations on two fronts. One, they should seek liberalization by developed countries in sectors in which they have a comparative advantage. Secondly, they should seek recognition of their education, qualifications, requirements met, or licences or certificates granted in the markets of other countries.

Policy issues confronting developing countries in e-commerce are not limited to negotiating issues, however. Indeed, for most developing countries, the binding constraints on the development of e-commerce are internal. These countries lack adequate telecommunications facilities with the density of telephone lines being less than three per one hundred people. E-commerce can, of course, grow rapidly even when this density is low as the Indian experience testifies. But such growth is likely to be confined to an enclave and will fail to achieve its full potential. It can be argued that with superior telecommunications infrastructure and regular power supply, even Indian software exports could have grown at a much faster pace than they did. Efficiency considerations dictate that, assuming e-commerce lowers the costs of transactions, its expansion should not be confined to external trade but also extended to domestic trade. That, in turn, requires an

expansion of telecommunications facilities. Also critical to the expansion of both internal and external e-commerce are financial sector reforms. In particular, unless electronic means of payment such as credit cards are developed, the expansion of e-commerce will be slow.

Electronic commerce offers unprecedented opportunities to both developing and developed countries.

In the short run, the gains are likely to be concentrated in developed countries but, in the long run, developing countries have more to gain. This is because, in the short run, developing countries lack the infrastructure necessary to take full advantage of Internet. But in the long run, they can leap-frog, skipping some of the stages in the development of information technology through which developed countries have had to pass.

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