OECD DEVELOPMENT CENTRE

Working Paper No. 164
(Formerly Technical Paper No. 164)

E-COMMERCE FOR DEVELOPMENT: PROSPECTS AND POLICY ISSUES

by

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Research programme on:
Globalising Technologies and Domestic Entrepreneurship



OECD OCDE

September 2000
CD/DOC(2000)8

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ACKNOWLEDGEMENTS

We would like to thank Jorge Braga de Macedo, Maurizio Bussolo, Colm Foy, Kiichiro Fukasaku, Ulrich Hiemenz, Irène Hors, Roberto Longo, Catherine Mann, Helmut Reisen, and seminar participants at the Japan Bank for International Co-operation and the Japan Institute for International Affairs for comments and suggestions on earlier drafts. We remain solely responsible for the content of this paper, whose findings and interpretations do not necessarily reflect the views of the OECD, the OECD Development Centre, or their Member countries.

PREFACE

The OECD has been a pioneer in addressing the challenges and opportunities of electronic commerce and the digital economy in the industrialised countries. It is natural then that the Development Centre should assess the scope for e-commerce in developing countries. But like the sailors in the strait of Messina, the research should avoid at once the *scylla* of technological pessimism — seeing an inevitably widening "digital divide" between industrialised and developing countries — and the *charybdis* of exaggerated claims about the Internet's potential to resolve a host of development problems that have heretofore proved intractable.

The novelty of the Internet means that there is little historical evidence on which to venture projections of future trends, even in the OECD countries. As industry watchers claim, a year is very long in Internet time. E-commerce is evolving rapidly, with the corporate landscape being continuously transformed by start-ups, acquisitions, and failures, and with new technologies coming to market almost daily.

An analysis of its potential in developing countries has to be guided by a realistic assessment of: *i)* the prospects and timeframe for improving Internet access and affordability in low-income countries (no Internet, no e-commerce); and *ii)* the major sources of current and likely future demand for e-commerce transactions and web-based services in developing countries.

The obstacles facing developing country entrepreneurs, whether in penetrating world markets or in expanding and diversifying sales in their domestic markets, include limited information about market opportunities, limited access to financing, and limited capacity to satisfy the quality, cost and logistical requirements of overseas customers. How can the Internet and e-commerce be used to lower if not remove these barriers?

One of the key barriers identified here is the limited trust potential customers may have in on-line developing country enterprises. The paper also points to some of the initiatives, private and public, aimed at strengthening trust. Above all, it demonstrates the need for sector-by-sector research on the scope for small entrepreneurs in poor countries to tap into this new reservoir of technologies for their own benefit and that of their communities.

This paper, on which the authors based their article in the *Financial Times* on the day of the Okinawa summit of the G-7, represents an early contribution to a major Development Centre research project on e-commerce for development, under the heading "Globalising Technologies and Domestic Entrepreneurship in Developing Countries".

Jorge Braga de Macedo
President
OECD Development Centre
September 2000

RÉSUMÉ

Ce Document technique analyse la possible contribution d'Internet et de ses utilisations commerciales au développement des pays pauvres. D'un point de vue historique, Internet s'est répandu à un rythme extraordinairement plus rapide que les précédentes technologies de communication : entre 1990 et le début de 2000, le nombre estimé d'utilisateurs d'Internet a été multiplié par plus de dix, atteignant près de 300 millions, et modifiant la manière dont les gens communiquent entre eux, trouvent de l'information, apprennent, font des affaires et interagissent sur le plan culturel. Nous étudions plus particulièrement les opportunités que le commerce électronique offre aux petits entrepreneurs des pays en développement et les défis qu'ils doivent relever pour tirer parti de ce potentiel.

Le risque de création d'un « fossé numérique » — qui renforcerait encore les inégalités de richesse et de revenu existantes — est bien réel. Pourtant, l'un des principaux avantages possibles de la globalisation est le fait qu'elle facilite les transferts de technologie au-delà des frontières, notamment pour les technologies de l'information et de la communication (TIC). En principe, les TIC devraient avoir un effet de nivellement, en donnant aux pays et aux populations pauvres un accès aux marchés, à l'information et à d'autres ressources qui, sans elles, resteraient inaccessibles.

On ne dispose encore que de preuves éparses et anecdotiques de l'existence de tels avantages, alors que les obstacles à un accès à coût modéré sont encore très élevés. Mais le commerce électronique offre de réelles opportunités aux entrepreneurs des pays en développement. Il convient de surmonter les goulets d'étranglement dans les infrastructures de transport, de télécommunication et de logistique, parallèlement aux problèmes de gouvernance propres à ce domaine, à savoir la protection des consommateurs, la sécurité des transactions, la confidentialité des transactions et la propriété intellectuelle. Si l'expansion des infrastructures de télécommunications et d'Internet doivent être laissées autant que possible aux mains des investisseurs privés, l'aide publique au développement pourrait aider à mobiliser de tels investissements. En ce qui concerne les aspects juridiques et réglementaires, l'APD peut aider au développement des capacités nécessaires à la participation des pays en développement dans les négociations et les discussions sur les règles et les protocoles qui encadreront le commerce électronique au niveau mondial. Enfin, en cette période d'innovations électroniques, il est indispensable pour l'APD comme pour les associations d'entreprises privées, de penser au-delà des données budgétaires. Des initiatives pourraient être spécifiquement orientées vers les petits entrepreneurs des pays pauvres, par exemple en soutenant leur participation individuelle ou collective à des systèmes de cotation en ligne ou en créant des portails subventionnés qui proposeraient leurs marchandises dans un environnement favorisant la confiance. A l'âge de l'information, les inégalités dans l'accès à celle-ci sont toujours de mise.

ABSTRACT

In this paper, we analyse the potential contribution of the Internet and its commercial application to the development process in poor countries. In historical perspective, the Internet has diffused at a far faster rate than earlier generations of communications technology: from 1990 to early 2000, the estimated number of Internet users grew more than tenfold to roughly 300 million, affecting the way in which people communicate with each other, acquire information, learn, do business, and interact culturally. Our particular focus is on the opportunities e-commerce offers to small-scale entrepreneurs in developing countries and the challenges they face in exploiting e-commerce's potential.

There is a risk that a "digital divide" will emerge, reinforcing existing income and wealth inequalities within and between countries. Yet, a major potential benefit of globalisation is the freer movement of technology, including information and communication technology (ICT), across borders. In principle, ICT can have a levelling effect, giving poor countries and poor people access to markets, information, and other resources that would otherwise have been inaccessible.

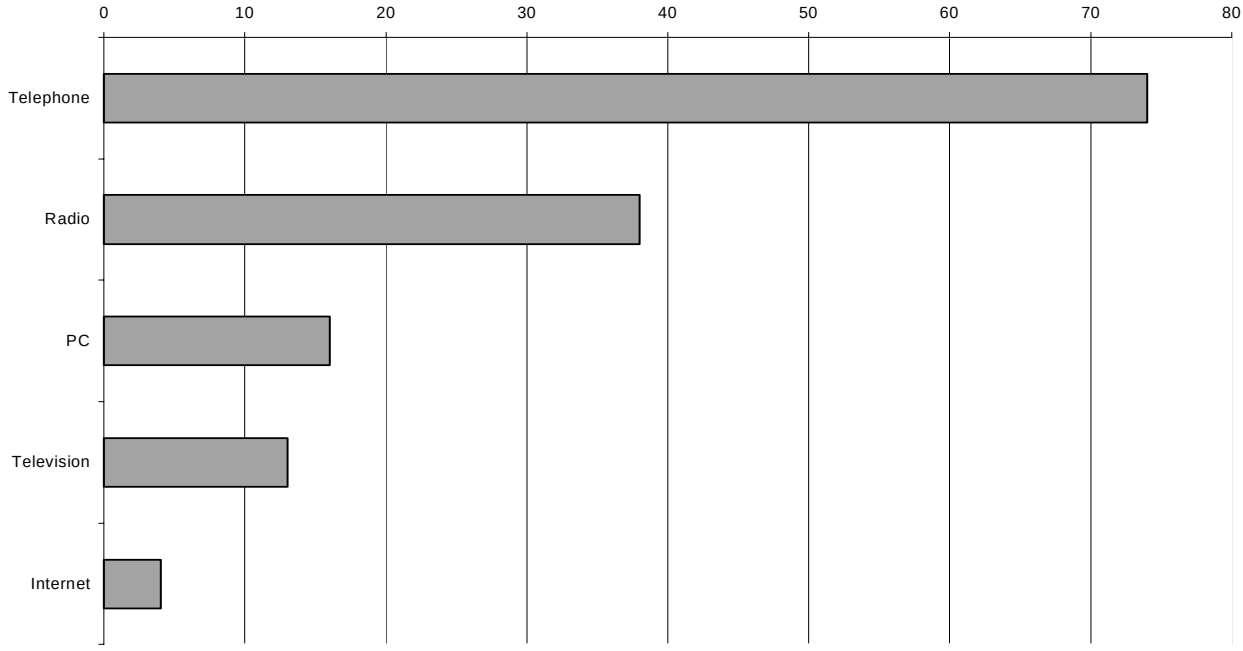
The evidence of real benefits is still scattered and anecdotal and the obstacles to affordable access remain formidable, but e-commerce does present real opportunities to small entrepreneurs in developing countries. The need to overcome infrastructural bottlenecks in telecommunications, transport, and logistics must be addressed in parallel with the governance aspects of e-commerce, including consumer protection, security of transactions, privacy of records, and intellectual property. While as far as possible the extension of the telecom and Internet infrastructure in developing countries can be left to private investors, official development assistance (ODA) may be able to leverage private investments. With respect to legal and regulatory issues, capacity building via ODA can assist the participation of developing countries in negotiations and discussions that are shaping global rules and protocols governing e-commerce. Finally, thinking "outside the envelope" is needed with ODA, just as it is with private ventures in this age of e-novation. There may, for example, be scope for initiatives targeted specifically at small e-ntrepreneurs in poor countries, as with support for their individual or collective participation in Web-based online rating schemes or with publicly-sponsored portals for small producers' wares to overcome barriers to trust. Information asymmetries persist in the information age.

I. INTERNET AND THE DIGITAL ECONOMY

The past few years have seen an explosion of attention to the role played by information and communications technology (ICT) in shaping the global economic landscape (OECD, 2000*a*)[1]. On the supply side, contributing factors include the development and introduction of new and improved products through firm-level investments in R&D and innovation, the ready availability of venture capital funds for investments in ICT, the development and rapid growth of new products/services segments, and the general shift towards services. Stimulating demand are the rapidly declining costs and prices for ICT equipment and telecommunications services and the liberalisation of the trade and regulatory framework. While caution must be exercised concerning the existence and significance of a New Economy (OECD, 2000*b*), the spread and pervasiveness of ICT may indeed be boosting sustainable growth rates.

The Internet — a, or the, network of networks — is becoming a core feature of the contribution of ICTs to the economy, affecting the way in which people communicate with each other, acquire information, learn, do business, and interact culturally. The World Wide Web, a key component of the Internet, has provided the graphical interface and hypertext linking protocols to enable people to share text, sound, and images. In historical perspective, the Internet has diffused at a far faster rate than earlier generations of communications technology (see Figure 1). From 1990 to early 2000, the estimated number of users grew from around one million to around 300 million[2]. One particularly promising application of the Internet is in the area of e-commerce, i.e. trade that actually takes place over the Internet, usually through a buyer visiting the seller's website and making a transaction there, or through an online auction[3].

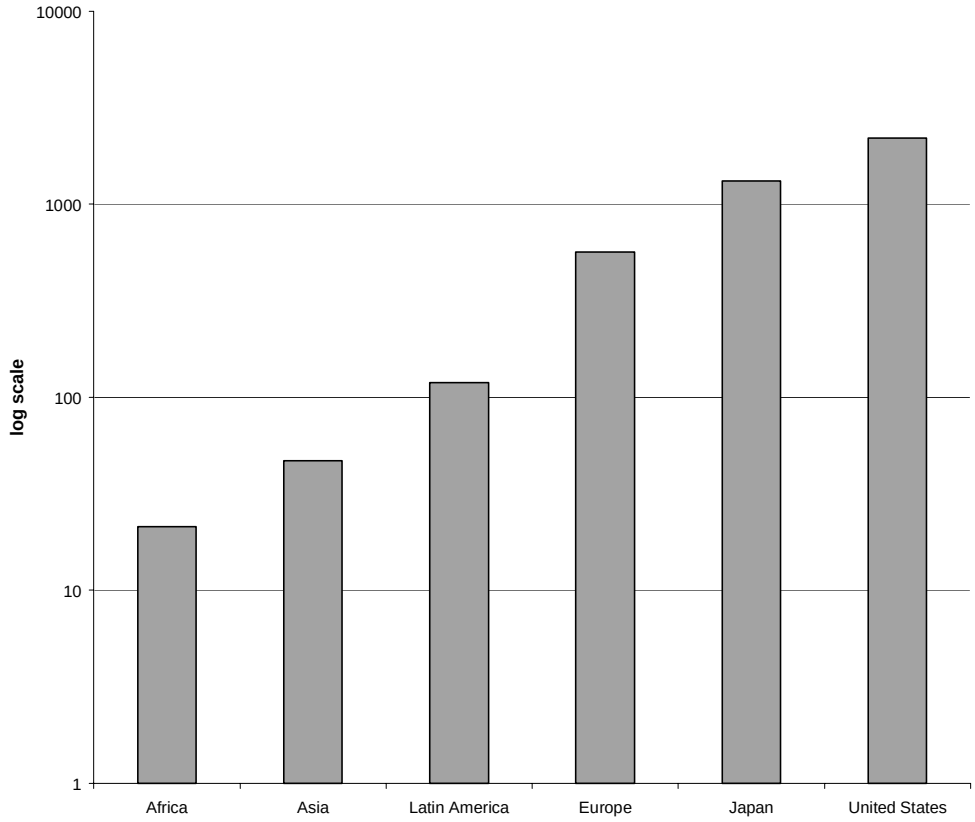
Figure 1. **Number of Years to Reach 50 mn. Users**



Source: ITU, *Challenges to the Network 1999: Internet for Development*, Geneva.

There is a risk that a “digital divide” will emerge, reinforcing existing income and wealth inequalities within and between countries. Figure 2 shows the currently uneven rate of diffusion of Internet use across the world. While ICT markets in some large non-OECD countries, Brazil and China in particular, have recorded faster growth than in the OECD (OECD, 2000*a*), corporate spending on ICT is considerably higher as a share of GDP in OECD than in non-OECD countries, and the proportion of households with Internet access is many times higher. Some analyses also reckon that the success of the United States in exploiting ICT partly reflects its flexible, competitive markets (e.g. Cohen *et al.*, 2000 and OECD, 2000*c*). The Internet may yield smaller benefits in more tightly regulated economies with rigid labour and product markets and inefficient capital markets, which prevent labour and capital shifting in response to new opportunities.

Figure 2. **Internet Users per 10 000 Inhabitants, 1998**



Note: ‘Asia’ excludes, besides Japan, also Hong Kong, Republic of Korea, Singapore and Chinese Taipei.

Source: International Telecommunications Union, 2000.

Yet, a major potential benefit of globalisation is the freer movement of technology — including ICT — across borders, from areas of abundance to those of scarcity. Potentially, then, ICT can have a levelling effect, giving poor countries and poor people access to markets, information, and other resources that would otherwise have been inaccessible. As the Internet reduces transaction costs, it also reduces the advantages of vertical integration and the optimal size of firms. Small firms can buy in services from outside more cheaply. Thus, in overall terms, barriers to entry should fall. If business-to-business (B2B) and business-to-consumer (B2C) e-commerce can ease poor countries’ access to

global markets and increase their trade, it makes it possible for them to reap benefits from specialisation and economies of scale and scope, thereby reinforcing the benefits of trade liberalisation. Moreover, the Internet, by increasing price transparency and competition, should directly attack the inefficiencies in those economies with high distribution margins, which are likely to see the biggest price reductions and efficiency gains[4]. By exposing firms to more intense global competition, the Internet should force governments and businesses to rethink their old, inefficient habits and seek new ways to get around or eliminate market rigidities[5]. For governments, the cost of muddling through and not acting to reform markets may therefore become higher.

This paper examines some of the possibilities that ICT, notably wireless telephony and the Internet, offer to low-income countries and poor people in those countries to benefit more fully from integration into the world economy. While recognising the broad range of applicability of the Internet — e.g. in health care, education, government administration, etc. — we limit our focus to those applications most closely related to the information and decision sets of small-scale entrepreneurs in developing countries. This does not represent a judgement about the relative importance of different applications, but rather a desire to understand the specific implications of this set of technologies for the income-generating activities of this large class of individuals (including in our definition farmers, livestock raisers, fishermen, artisans, and owners/managers of small- and medium-sized enterprises, or SMEs) who make up the backbone of many developing economies. How significant is the potential that ICT holds for entrepreneurs in poor countries and what do developing country governments need to do to encourage its realisation, keeping in mind the severe resource constraints under which they labour? What facilitating conditions — physical and financial infrastructure, legal and regulatory frameworks, skills, etc. — are required and how can they most expeditiously be put in place? What role is there for development assistance in this regard, again considering tradeoffs between competing demands for scarce resources? The remainder of the paper offers some reflections on these questions, in full recognition of the need for further research.

II. INTERNET AND THE DEVELOPMENT PROCESS

The Internet and ICT more generally are new tools for information acquisition, processing, analysis, and transmission, but information is the underlying resource of value to entrepreneurs. Based on surveys of small- or medium-sized enterprises (SMEs) in developing countries[6], four types of information appear to be especially valuable:

— on customers and markets;

— on product design;

— on process technology — operation, maintenance and repair of existing equipment, as well as new technology developments; and

— on financing sources and terms.

ICTs may also benefit entrepreneurs by improving information available to their transaction partners, whether customers, financiers, or others. Besides reducing information search costs, the Internet or mobile telephony can improve the efficiency of the working of product and factor markets directly, e.g. by reducing time for payments clearance, credit processing, etc. (Leff, 1984 and Garbade and Silber, 1978).

Far and away the most important use of the Internet to date in developing countries has been for e-mail services. In Bangladesh, about 82 per cent of Internet traffic consists of e-mail, while in the United States the Web accounts for 70 per cent and e-mail only 5 per cent (ITU, 1999). This is a result of the rather high access costs in many developing countries compared, notably, with the United States. As a mode of information management, the Internet competes with, but also complements, other modes. Depending on access costs, it can be a cheap if imperfect substitute for telephone and fax services: cheap because of the higher transmission speed of a given information bundle or, viewed differently, the large quantities of information that can be transmitted per unit time; imperfect because, unlike telephone at least, *i)* it does not readily permit two-way communication in real time[7], and *ii)* it presumes basic literacy or the ability to hire a literate message transcriber. In any event, it makes use of the telecommunications infrastructure, whose inadequacy in many parts of the developing world (notably in rural areas, where most of the developing world's population, and a disproportionate share of its poor people, still lives[8]) precludes either telephone, fax, or Internet use. Wireless (or mobile) telephony has emerged as a potential solution to the rural telephone deficit and as a possible "bridging" technology from an unwired world to an Internet-accessible one[9]. While state-of-the-art mobile telephones already offer the potential of direct Internet access, even without this capability in many low-income countries mobile phones are diffusing rapidly, in some cases even in rural areas (e.g. the Grameen village phone network in Bangladesh).

As an instrument for acquiring timely information by otherwise isolated rural communities, there are certainly parallels between the current uses of wireless telephones and the potential uses of the Internet in developing countries. One difference is that the latter potentially makes available with a single call (or dial-up connection) a much larger set of databases and information sources. Moreover, the Internet makes possible the automatic packaging and distribution of information to targeted user groups on a repeated basis, and even the distribution of fully customised information packets for each individual

user. The question remains whether there is sufficient information on the Web of value to the average developing country entrepreneur to warrant the investment in Internet access. Most SMEs in developing countries serve local markets and rely mostly on locally generated information. In Botswana, for example, Duncombe and Heeks (1999) find that Internet use remains in its infancy and argue that its benefits to most SME users are unlikely to outweigh the costs until the amount and quality of local content is substantially increased. For low-income entrepreneurs in much of the developing world, this also means local-*language* content.

III. E-COMMERCE AND SMALL ENTREPRENEURS

The share of value added that potentially lends itself to electronic commerce represents around 30 per cent of GDP, most importantly distribution, finance, and business services (Pérez-Esteve and Schuknecht, 1999). E-commerce is also likely to boost international flows of many services significantly[10]. At present the biggest volume of electronic trade by far is business-to-business (B2B), mainly involving big firms setting up online exchanges to buy industrial inputs, such as steel, chemicals, or car components. A recent Goldman Sachs report estimates that firms' possible savings from purchasing over the Internet vary from 2 per cent in the coal industry to up to 40 per cent in electronic components[11]. Yet some of the biggest potential gains from B2B may lie in smaller firms' purchases of indirect inputs, such as telephone services, office equipment and furniture, and electricity, which together account for 30-60 per cent of firms' total non-labour costs. By pooling the buying power of small businesses, online intermediaries can negotiate discounts. And by making the procurement process more efficient, they can also cut processing costs[12]. The business-to-consumer (B2C) segment is the second-largest form of e-commerce, embracing normal retail activity on the Web, such as Amazon.com. A third type of market is consumer-to-consumer (C2C), which covers auction sites, while a fourth — consumer-to-business (C2B) — involves reverse auctions, taking advantage of the power the Internet gives to customers to drive transactions (e.g. with airlines competing to give travellers best offers on tickets). Finally, business-to-government (B2G) e-commerce refers to the use of the Internet to move public procurement, licensing procedures, etc., online.

There are at least four different channels through which e-commerce may impact on developing country entrepreneurs:

i) making it easier for artisans and SMEs to access B2C world markets;

ii) facilitating activity on the global market for agricultural and tropical products;

iii) allowing firms in poorer countries to tap into the B2B and B2G supply chains; and

iv) allowing service-providing enterprises in developing countries to operate more efficiently and to provide certain services directly to customers anywhere in the world.

B2C E-Commerce

To date, much discussion has focused on B2C applications for OECD entrepreneurs, but there is growing evidence of a significant potential for developing countries, notably artisans in traditionally low technology sectors[13]. Many if not most such artisans are women living in remote villages. Indeed, their very isolation may be one reason that their crafts have managed to survive if not flourish. Wealthy consumers in OECD countries have long prized their work, and as more OECD citizens have joined the ranks of the well-to-do, the market for traditional crafts has grown apace. Expatriates from developing countries constitute another target market, at the same time that they can provide entry points into the wider OECD markets. By virtue of the inaccessibility of many craft producers, transport and distribution has accounted for a large share of the costs of bringing their wares to international markets. With the advent of the Web, artisans have the possibility to advertise

and even to sell their products directly to customers in OECD markets, posting images of the products on sale, providing descriptions of the history of the craft and of the production process, taking custom orders[14], and negotiating prices. While they must still arrange for transport and delivery to customers, the Web allows them to exert greater control over the supply chain and, in principle, retain a larger share of the revenues from final sale. At the very least, the producers should be able to bargain away any price advantage enjoyed by middlemen by virtue of asymmetric information; they may also be able to eliminate one or more layers of middlemen (a process known as disintermediation).

A Guyanan weavers' co-operative offers one example of the potential for global marketing offered by the Web[15]. Using 19th century accounts and illustrations of the hammocks made by European travellers, an organisation formed by 300 women from the Wapishana and Macushi tribes revived the ancient art of hammock weaving, reintroducing the process from cultivating the cotton on small family plots to hand-weaving the large brown-and-white hammocks. They then took their wares online, hiring a young member to create a Web site. By the mid-1990s, the weavers, known as the Rupununi Weavers Society, had sold hammocks to Queen Elizabeth, Prince Phillip, the Smithsonian Institute, and the British Museum, which called it "one of the most perfect forms of indigenous art purchased this century". Since mid-1998, the society has sold 20 hammocks over the Internet to people around the world for as much as $1 000 apiece. There are many other such cases, including collective efforts such as the International Federation for Alternative Trade (IFAT), which is comprised of more than 100 organisations in 42 countries (including more than 70 organisations in developing countries). IFAT members collectively market from $200-400 million a year in handicrafts and agricultural goods from low income countries and provide support to craft producers in the area of logistics, quality control, packing and export[16].

Manufacturing production for the world market may take different forms, depending on relative bargaining power within the supply chain and where rents can be captured. Many chains are characterised by a dominant party (or sometimes parties) who becomes responsible for upgrading activities within individual links and co-ordinating interaction between the links. In order to contribute to value added in each of the full range of activities that are required to bring a product from conception to consumption, a firm would have to develop capabilities in design, distribution, marketing, and post-sale support. Whether SMEs that are bulk producing items like clothing, footwear and leather goods, furniture, etc., stand to reap the same price dividend as artisans from direct Internet selling is not clear. In the first place, they are likely to be less geographically isolated and therefore less handicapped by either limited price information or logistical problems moving their products to market. In this sense, for them the marginal benefits from accessing the world market via the Web may be lower. Second, they are unlikely to benefit to the same degree, if at all, from the "feel-good" factor that makes some OECD consumers willing to pay a premium to help a worthy cause like preserving traditional cultures or the environment. Third, they may not be able to command a significant price premium unless they can offer innovative designs, although the Internet can be a useful tool to tap remotely international design expertise. Indeed, this is already being done on behalf of artisans, partly on a *pro bono* basis and partly on a fee-for-service basis, helping them adapt designs to changing market fashions[17]. Similarly, clothing and footwear manufacturers in developing countries may be (and in some cases are) supplied electronically the patterns and specifications of the major designer labels that buy and market their "wears". In this case, though, the design

premium is captured by the fashion houses and not the developing country producers. It remains to be seen whether Web presence offers them greater opportunity to establish their own global brand recognition.

While establishing an Internet storefront can be relatively low cost, marketing can still be quite costly. Because of the anonymity involved in e-commerce and the wide range of potential e-suppliers of certain products, reputation effects and brand recognition may matter even more in the virtual world than in the real one. If so, this could raise new barriers to entry that may partially negate the benefits of being able to afford a customised Web storefront. Moreover, establishing a website is not the same as having a known, oft-visited site. Besides ensuring that the website is informative and user-friendly, the webmaster must ensure that content is frequently updated, that search engines direct browsers with specific sorts of requests to that site on a priority basis, and that news of the site gets widely disseminated via the electronic grapevine. Only then can a website expect to generate significant advertising revenue. Also, the experience of OECD countries, where many new economy companies rank among the largest print and broadcast media advertisers, shows that even the best e-marketing strategy does not substitute for traditional media. Indeed, such advertising is normally viewed as an unavoidable sunk cost to establish brand name recognition, in the expectation that this will pay for itself in a large flow of future web advertising and other online revenue.

E-Commerce and Primary Commodity Markets

Most low-income developing countries continue to be primary commodity exporters (including oil, gas and other minerals, and agricultural products). Thus, short of wholesale diversification into manufactures and services, their immediate interest is in how e-commerce may affect competitiveness in their traditional export markets. Global commodity chains for tropical goods generally differ in market structure from those for manufactured goods. Historically, they have been characterised, in individual producer nations, by a high degree of market power exercised by government procurement agencies and by international price-stabilising agreements among producer nations. On the other side of the market, exporters have been faced by large multinationals wielding significant market on account of the control of brand names and distribution channels[18]. In principle, a monopoly seller on the exporter side was intended to counter the bargaining power of a monopsonist/oligopsonist on the buyer side. In general, however, even where this worked, the losers have been small-scale producers, who have not often shared in the higher revenues. Government commodity marketing boards have been winding down in many countries, and international price stabilisation bodies have been doing likewise, reflecting their lack of effectiveness.

Enter ICT, which is an important impetus to changes in the organisation and functioning of world markets for agricultural products. How are these changes likely to affect the financial prospects of developing country producers? As far as market governance is concerned, ICTs have made it possible to hold auctions at source as well as online. In the case of bulk tea, for instance, such auctions now take place in both Africa and Asia, leading to the closure of the London Terminal Auction in 1998. These trends can be found in other markets. The Cochin Oil Merchants Association of India has formed an alliance with the clearing arm of the International Pepper Exchange to offer future contracts in coconut oil and copra[19]. Trade will be screen-based rather than open outcry, with the

ultimate objective of moving over to Internet trading and creating a B2C portal. In the case of rubber — where three Asian producers (Indonesia, Malaysia, and Thailand) control about 80 per cent of global output — the six largest tyre groups plan to launch an Internet exchange by the end of 2000 in order to break the market power of this quasi-cartel[20].

In some markets, there is a tendency for wealthy consumers to demand higher-quality brands and organic methods. In December 1999, the first online coffee auction was held for 10 high-quality Brazilian coffees (pre-selected by tasters) coming from ten farms[21]. A single exporter represented the suppliers, while 23 bidders qualified. While Brazilian coffees are normally sold at prices below the New York benchmark price, the auctioned coffees commanded an average price 73 per cent higher than that benchmark. Shortly before the auction the farmers sold the coffee to the nominated exporter and a formula was agreed for splitting the premium. Among the lessons learned is that, Internet notwithstanding, suppliers continue to depend critically on a sound physical distribution system. Farmers and roasters are seldom equipped to handle intermediary export functions like transportation to port, letters of credit, payments, documentation, and shipping. Another is that size of shipment is crucial to making a profit, and that guaranteeing a minimum economic size (essentially filling a cargo container) can be difficult with speciality coffees.

In the case of gourmet tea, conventional whole-leaf is preferred to crush, tear, curl varieties, although the capacity for smallholder tea growers to meet the required quality standards is still weak. There is also a segment of the market (still small) that pays a premium for "fairly traded" produce. In the case of coffee, Equal Exchange is a specialised "fair trade" importer from growers' co-operatives in developing countries[22]. In Costa Rica, a small company, Café Britt, completes the entire cycle of growing, processing, exporting, importing, and selling via its website[23]. A number of websites have sprung up to provide market and technical information, agronomic advice and risk-management tools to coffee and tea farmers in developing countries[24]. On the one hand, the Internet may permit readier direct access of small producers and their co-operatives to overseas customers; on the other, the demand for coffee produced by organic methods or meeting other customer-dictated standards may favour a few large producers whose production methods can be easily monitored and verified.

Linking into B2B Supply Chains

For countries undergoing rapid structural transformation, the expansion of industrial employment still holds vast potential for raising living standards of the poor. To what extent can the Internet and e-commerce serve to raise productivity and competitiveness in the industrial sectors of developing countries? If entry barriers have been reduced in the B2C market, does the same hold for B2B marketplaces? There is reason to suppose it does, though perhaps not to the same degree. Companies primarily in the business of making products for sale to other companies generally do not require the same sort of advertising presence as those selling to consumers. In that sense, small producers of intermediate products in developing countries may not derive the same benefits as traditional artisans from being able to advertise their wares on the Web. On the other hand, such enterprises clearly need to make contact with potential business customers and to convince them of their capacity to supply products to specification, on time, to an acceptable standard of quality and at a competitive price. The Internet does almost certainly make this process easier. Indeed, in principle access to the large B2B portals being established by OECD-

based companies in sectors as diverse as auto parts, steel, and chemicals is open to any potential supplier on an equal basis, regardless of location. Naturally, though, online market access cannot on its own open opportunities to developing country suppliers lacking access to adequate transport and logistics infrastructure to ensure reliable delivery.

Not only is the SME with a Web presence more likely to be discovered than one without, but Internet savvy may itself be a signal to potential customers of a certain level of technical and commercial sophistication. A typical global supply chain involves multiple transactions: if at any point an electronic interface is not present, then the time and cost advantage of e-commerce is dissipated. Thus, international companies are unlikely to go to the expense of dealing with the non-Internet-capable supplier unless there are significant other cost advantages of doing so. In short, if some SMEs in developing countries cannot afford the costs of entry into the electronic marketplace, neither can they afford not to enter if they aspire to membership in international supply chains.

E-Commerce in the Service Sector

Certain segments of the service sector are especially amenable to the introduction of ICT, to the establishment of a Web presence, and to transacting business electronically. For instance, the international travel and tourism industry is increasingly moving online, and developing countries that either currently attract or aspire to attract a sizeable tourism business need to react accordingly. As the World Tourism Organisation writes, “niche players are no longer constrained by the cost of breaking through geographic barriers. The niche player can now tackle global markets. For just a few hundred dollars of ISP charges and with some careful planning and design, world markets can be captured by organisations which, a few years ago, could not have contemplated looking beyond their own borders. Global distribution is available to the smallest players” (WTO, 2000). As in OECD countries, there is presumably scope for small operators of tourism-related services (tour operators, B&B and mini-hotel businesses, restaurants, etc.) in developing countries to transact directly with overseas customers or at least to advertise their facilities. Tourism associations/boards can provide a useful intermediary function, aggregating lists of various categories of service providers on their websites.

The list of other services that are potentially cyber-deliverable is an open one, limited in a sense only by the imagination. Already, offshore data processing centres in developing countries — and even some low-wage developed countries — provide data transcription and “back-office” functions for insurance companies, airlines, credit card companies, banks and various other service enterprises in OECD countries. Telemarketing firms can afford to hire remotely located sales persons to pitch their products. Customer support call centres of dot.com and other ICT companies in OECD countries are among the fastest-growing segments of the offshore services sector[25]. India and the Philippines have developed into major locations for offshore data entry and computer programming, while India has also built up a fairly sophisticated software development capability (dependent on highly skilled personnel). Translation services, editing, proof reading and even e-publishing are other candidates for remote service provision, though ones that obviously require more than basic literacy in at least one language. Local ISPs and other entrepreneurs in developing countries may be able to compile information on Web use habits that has a potential market value to international companies. Also, music produced by developing country artists can be digitally recorded and distributed via the Web; already there are websites marketing recordings of African and other artists.

Small-scale entrepreneurs in developing countries can also benefit as users of remotely provided services via the Internet. In the case of their ICT systems, the Internet makes possible remote diagnostics and online technical support as well as delivery of software tools and applications[26]. In the case of other types of capital equipment, while the Internet may not be the only way to make technical inquiries, request repairs, or order replacement parts or new tooling, it may be the least cost, quickest, and most reliable means to do so, especially if secure payment can be made electronically as well.

Another attraction of the Internet is the possibility of joining a discussion group with other equipment users and entrepreneurs in the same business to share experiences, including on the solution to specific technical problems. While such information sharing may occur informally at the local level, the global community of users may offer additional valuable information; needless to say, this benefit is especially pertinent where an entrepreneur is geographically isolated from his/her peers or where the local user community is thin.

IV. RELIEVING INFRASTRUCTURE BOTTLENECKS, ENCOURAGING ISPs AND REDUCING ACCESS COSTS

A country's readiness for e-commerce depends fundamentally on network infrastructure, including narrow and broadband, and on costs of Internet access. The quality and range of services available depends on the emergence of innovative Internet service providers (ISPs). OECD experience strongly suggests that telecommunications reform has been a major determining factor in the emergence of the so-called "new economy" (OECD, 2000*b*). Faster and more reliable network infrastructure, associated with new ways of pricing, both for consumers and for the leased lines used in B2B transactions, have led to increased Internet connection in homes and businesses. Low access costs are an important factor driving uptake, while competition among infrastructure providers and among ISPs has led to innovative pricing structures.

In low-income developing countries, the first priority is rather obviously to attain greater telecommunication penetration: there are just 14 million copper phone lines, for example, serving Africa's population of 800 million, whereas the United States has 169 million lines. Approximately 80 per cent of the world's population (almost all living in developing countries) has no access to reliable telecommunications (Panos, 1998). Most of Africa's telecom coverage is concentrated in the regional and national capitals of the more developed countries — and even there don't count on getting a dial tone. Rural areas have especially low telephone density, which complicates the provision of low-cost Internet access, since it is difficult to provide node connections to rural Internet users for the price of a local phone call.

Historically, a major reason for the slow pace of basic telecommunications network expansion has been the unfavourable economics of connecting rural areas, especially remote ones, in low-income countries. By one estimate, assuming capital costs of $1 000 per line, a telecom operator would need to generate revenues of $330-400 per line to be profitable, above the average per capita income of quite a few poor countries (Ernberg, 1998).

Telecommunications deregulation has been gaining momentum in the developing world. More than 90 developing economies opened their telecommunications sector to competition between 1990 and 1998, transferring to the private sector the operating or construction risk, or both, of more than 500 projects, attracting investment commitments of $214 billion[27]. Telecommunications reform can be a positive-sum game in which customers, existing and new operators, employees, domestic and foreign investors, and government all gain. Some rules that will enhance those benefits include sorting out conflicting objectives early — especially the conflict between maximising revenue and delivering more, better, and cheaper services; using market mechanisms rather than individual negotiations to select partners for erstwhile the telecoms monopoly and determine the right sale price for operating licenses; and establishing and following clearly defined processes for sale of assets and regulation that are open to participation and review by all interested parties, including the general public. Nonetheless, it is a well-known lesson from almost two decades of regulatory reforms worldwide that, even while private participation takes place in increasingly competitive market structures, poor performance of regulatory agencies may limit the benefits of reform. Establishing a full-fledged regulatory

agency may not be technically and financially feasible, calling for more pragmatic solutions such as pre-packaging rules, locking in principles through international agreements, and contracting out functions and creating multi-sectoral or regional agencies.

One of the most severe constraints on wider Internet use in low-income developing countries is their limited access to international "bandwidth", the high-capacity connections needed to transmit the large quantities of digitised information required for full Internet services[28]. Until this bottleneck can be removed, e-mail is likely to remain the dominant use of the Internet in those countries. Developing regions can potentially leapfrog traditional copper- and fiber-based land lines, and go directly to leading-edge wireless technologies that blend voice and data over the same networks. Major recent wireless network projects have been concluded in Shanghai and Fujian in China, Peru, Indonesia, and Ethiopia. A small Ericsson partner, Ecuador-based Bismark, even founded a thriving business using wireless data networks to manage remote alarm systems[29]. As for India, by some estimates it has more cable television connections (about 30 million) than telephone lines (about 20 million)[30].

In terms of potential for early access in remote and poor communities, commonly provided facilities such as telecentres probably hold the most promise. In Africa, for example, about 10 per cent of the phone lines in Senegal are used by telecentres, pilot projects have been established in Mozambique and Namibia, and South Africa has set up a Universal Service Fund, so that all telecom operators are taxed to fund rural telecentres. In Latin America, Peru has had a scheme of telecentres since May 1996, each providing a dedicated line to the Internet[31]. In Suriname, two basic telecentres were established (in 1996 and 1997 respectively) to provide public phone, fax and computer services to remote communities in the interior[32]. The telecom technology used is an inexpensive fixed cellular communications system, linked to the national network by a digital microwave link built by the pilot project. Equipment is solar powered, with batteries and a back-up diesel generator that works during evenings and cloudy weather conditions. An October 1998 evaluation of those experiments is not especially encouraging, however, with users of the centres well below the target of 10 per cent of the population (Ernberg, 1998). The main use is telephony, with a low fax traffic and very little PC use. The facilities are not commercially viable, and funds could not be raised to extend the network of telecentres more widely. With fewer nodes, the network benefits to existing users are that much smaller.

Net cafes and Internet shops are rapidly expanding across the developing world, mostly in town and urban centres but, with the help of tourism, the phenomenon has reached even to remote areas. In the Tibetan capital of Lhasa, Tsering Tashi opened the only Tibetan-owned Internet bar as soon as Tibet established an ISP last year. Within 10 months, he recovered his original investment of almost $10 000. Still, nearly all of his customers are tourists and in the off-season, October to February, he converts most of his Internet cafe into a clothing store[33].

Beyond the physical infrastructure, providing wide Internet access requires the emergence of local Internet service providers (ISPs) and portals that can arrange a reliable, low-cost connection to the Web, develop sites with useful, local language content, and offer a range of other services demanded by local Internet users. Once telephone density is sufficiently high, it should be possible to offer access to most users at local call rates. This presumes that an ISP can lease a high-capacity line from a telecom service provider at a competitive rate. At present the cost of such leased lines varies widely across countries, but it is generally several times higher in developing countries than in the United States. In

the latter, the annual charge would be around $3 800, while in Argentina, for example, the ISP could expect to pay $180 000 to the monopoly operator (Panos, 1998). Just as in telecoms services, competition needs to be fostered in the ISP market. A potential risk is that a dominant position in the ISP market may be secured by a telecom operator or by one of the conglomerates that control a large share of economic wealth in many emerging and developing countries. In Turkey, for example, Superline, the biggest ISP with a 38 per cent share of the market, is owned by Yapi Kredi, the second-largest private sector commercial bank, and its parent, the Çukurova group, which also control Turkcell, Turkey's leading GSM provider[34].

V. INSTITUTIONAL AND POLICY REQUIREMENTS FOR E-COMMERCE DEVELOPMENT

Even assuming the physical infrastructure bottlenecks to Internet expansion are overcome and access prices become more affordable in developing countries, a number of other significant policy challenges must be met if governments are to create an environment conducive to e-commerce. E-commerce requires *legal norms and standards* (covering, for example, contract enforcement, consumer protection, liability assignment, privacy protection, intellectual property rights) and *process and technical standards* (e.g. regarding the way payments are accepted on the Internet and products are delivered to the final user, security, authentication, digital signatures, and connectivity protocols).

As regards Internet-related technologies, it seems virtually inevitable that many of the norms and standards defining the e-commerce environment will be forged in the more advanced countries. "Standing on the shoulders of giants" makes sense when network externalities and interoperable standards are key to maximising the benefits of e-commerce (Mann, 2000*b*). Besides an enabling policy environment, merchandise e-commerce also requires complementary physical infrastructure, notably a logistics system capable of timely, secure, and affordable small batch shipping to multiple destinations. The cost for delays can be high even in the United States. A recent BCG study revealed that 19 per cent of online customers said the delivery of their orders either took longer than they expected or never occurred. As a result, many stopped shopping online, while others refused to do more business with the offending e-tailer[35].

Weaving a Web of Trust: Consumer Protection and Competition Policy

Trust is needed at many levels, including hardware and software security, the regulatory regime, familiarity and users' perceptions. Factors affecting the level of trust required and provided include:

— where and how payment takes place (whether real or virtual — for virtual settlement, either electronic money or payment instructions must be transmitted over the Internet);

— when settlement takes place (prior to, at the time of, or after the transaction);

— who settles (established incumbents or new entrants);

— whether the transaction is B2B or B2C (with online settlement much less advanced in the former than the latter); and

— whether settlement can be traced[36].

Establishing trust in the eminently impersonal environment of the Internet is not straightforward. Traditional paper-based rules and regulations may leave room for uncertainty as to the validity and legal effect of electronic transactions. In many societies, especially in the developing world, trust is established and reinforced through family association, repeated personal contact and interaction. Modern societies have devised ways of extending the basis for trust through the impartial enforcement of the law and its adaptation to a new technological environment. This is the basis of the trust that underpins

e-commerce in the developed world. Where legal and juridical institutions are underdeveloped, as in much of the developing world, e-companies find themselves at a disadvantage because of insecurity, whether real or perceived. The reluctance to entrust sensitive personal information — like credit card numbers — to businesses operating on the Web remains strong. Surveys of e-commerce users in developing countries suggest a low willingness to provide sensitive financial information over the Web. In China, for example, banks only recently began issuing true credit cards, but they are rare, and while many people have debit cards that draw directly from their bank accounts, few trust using the cards online[37]. As a result, cash on delivery is the most common method of e-commerce payment. The auction house EachNet, with listings that span nine cities, links buyers and sellers in any one city. After the bidding is closed, they arrange to meet each other face to face[38]. Online payment is, however, becoming easier, with a new Shanghai-based company, Chinapay, offering the first city-wide online payment system[39] and a similar company (Cyber Beijing) operating in the capital (though without being able to process transactions in real time).

OECD e-shoppers may be reluctant to entrust confidential financial details to businesses operating in developing countries that have a weak reputation for rule of law and prosecution of business fraud. The site of the above-mentioned Costa Rican coffee company, for example, is not currently secured, so that consumers have to call a toll-free number to place an order. One government effort to address security concerns is Singapore's acting Certification Authority (CA), Netrust, which will verify merchant and consumer identities, examine merchants' transaction and security procedures and issue digital certificates to those who comply with standard criteria. Private solutions may also be possible: for instance, websites like Hypermart host (and help build) storefronts for thousands of small- and medium-sized businesses, providing a common secure payments system for all (ITC, 2000).

A broader issue of confidence arises with respect to the accuracy of product descriptions and claims and the enforcement of contracts. This is a general consumer protection issue, but the newness and relative anonymity of e-commerce presents new challenges[40]. New entrants have generally not had time to build reputations for honesty and reliability, and low entry and exit costs also weaken incentives for honest dealing. For this reason, as noted above, brand recognition may matter even more in the world of e-commerce than in the real world[41]. To some extent, the problem of trust is being addressed through private sector innovation[42]. Some private service providers offer to design secure websites for small enterprises [43]. Also, an effort is underway to develop a system of collaborative ratings that small e-businesses could display on their websites to inform, and presumably reassure, consumers. For example, in the case of electronic exchanges, those transacting through the exchanges can rate suppliers on the basis of quality of service, speed of delivery and other measures. Even here, there is clearly scope for fraud. So, certain safeguards are built into the rating system: e.g. evidence of a purchase is required for one's rating to count, and ratings of regular customers are assigned a higher weight. Trends in ratings would be available to users, as well as comments by specific customers. Such initiatives do not, however, fully address consumer protection concerns.

Thus, regulators in OECD countries see it as incumbent upon themselves to offer e-consumers a level of protection on a par to that afforded other consumers, and the business community is currently thrashing out self-regulation guidelines to pre-empt more restrictive legal measures. Relevant issues in this context are full disclosure of the terms

of sale; the opportunity to review the transaction and all costs (including shipping); standards for cancellation, return, refund and warranty; and security for customers' personal records. The risk that information gathered on the Internet can be gained by private investigators, used by a thief, or passed on to an insurance company is at the core of the debate on privacy concerns in OECD countries. The US Federal Trade Commission published data showing that fewer than 1 in 10 Internet sites that collect personal identifying data display the industry's voluntary privacy seal. It suggested that Web sites should be required by law to tell users in clear language what information they collect (often surreptitiously, through "cookies" implanted in computers to track users' movements), and to/with whom they sell/trade personal data[44].

A first-best solution to make it possible for agents to conduct business online without need for face-to-face contact would be to put in place a legal and judiciary framework that meets certain minimum standards of transparency, impartiality and timeliness. In many countries, however, this remains a distant goal. In the medium term, self-regulated codes of conduct currently under discussion in many OECD countries may provide a model from which business in developing countries could take inspiration. Eventually, it may not be too far-fetched to imagine that non-OECD businesses could subscribe, either individually or as part of a group of like-minded e-ntrepreneurs (e.g. associations or co-operatives), to codes such as OECD (2000*d*). For this to work, however, there is apt to be need of independent compliance accreditation.

There are also concerns that in some cases electronic exchanges, instead of reducing market power, may have the reverse effect if they lead to collusion. To the extent that B2B electronic exchanges serve to aggregate demand, such exchanges can contribute to monopsony (or oligopsony) power in markets characterised by a few large buyers and many small sellers. Also, if the major trader on an exchange is its owner, this could give it privileged access to market information as well as to revenue from transaction fees paid by competitors using the exchange. Since for the foreseeable future, most of the major global electronic exchanges are likely to be incorporated in the OECD area, developing country regulators may have little power to shape their treatment by competition policy. Their best hope lies in a coincidence of interests between the prospective OECD suppliers to those exchanges and prospective developing country suppliers in ensuring against collusive or other anti-competitive practices by large OECD-based buyers.

The International Dimension of Internet Regulation: Taxes and Domain Names

The intersection of a global, multipurpose medium, the Internet, with systems designed for the physical, territorial world poses further policy questions. Compared to other social institutions, the Internet has developed in a spontaneous and decentralised manner and does not have a central point of authority and control. In the event of contested claims and possible litigation, the fundamental problem of jurisdiction remains unresolved. Its technical development has been guided by protocols established through participatory decision-making processes by bodies such as the Internet Engineering Task Force (IETF) and its subcommittees, and the Internet Assigned Numbers Authority (IANA). There has not been a central rule-making entity that has exercised comprehensive legislative authority over the Internet and there is unlikely to be one. The multi-jurisdictional and multi-functional nature of the Internet means that, inevitably, many different interests in many different parts of the world will be concerned with any endeavour to formulate specific policies.

Even in the European Union, the suggestion contained in the Commission's draft directive that e-commerce should be governed by the law of the country where the service provider is established has been questioned by consumer groups that want the local law where the website is accessed to be given priority[45].

One crucial area is the tax treatment of online transactions. At present the volume of e-commerce transactions remains relatively small and the fiscal implications modest. If projections of e-commerce revenue growth are to be believed, however, the questions of how government and which government is to tax such revenue could have an important bearing on the state of public finances. There are at least two basic issues: whether e-commerce transactions can and should be taxed and, if so, at what rate; and into what tax jurisdiction international e-commerce transactions fall (addressed above). Within the OECD area, views diverge on the first issue. In the United States, the dominant view is that government should not levy taxes on e-purchases[46], while in the European Union the tendency is towards imposing VAT on electronic services bought on the Internet (e.g. software, music, information) at the same rate as their tangible equivalents. Governments of poor countries may wish to take a liberal approach to taxing e-commerce on two grounds. One is the fact that some important items available on the Web (notably software) are essentially investment goods whose taxation would be counterproductive; the other is that any tax would raise the incentive to piracy. Moreover, goods bought on the Web are in general not likely to substitute for domestic purchases and thereby erode the tax base. Extending this reasoning to the context of WTO commitments would imply choosing to apply, within any given industry, the least distortionary set of rules. Mann (2000*a*) cites the example of insurance products, which could be sold over the Internet even if the physical presence of a foreign insurance firm was not scheduled for liberalisation under GATS. Rather than view this liberal bias with alarm, developing countries could see it as a means of both fostering the development of electronic commerce and encouraging deeper liberalisation and deregulation throughout the economy.

A further issue relates to Internet Domain Names (IDNs), the human-friendly form of Internet addresses. While designed to serve the function of enabling users to locate computers in an easy manner, IDNs have acquired a further significance as business identifiers and, as such, have come into conflict with the pre-existing system of business identifiers that are protected by intellectual property rights. The World Intellectual Property Organisation (WIPO) convened an international process to develop recommendations concerning the intellectual property issues associated with Internet domain names, including dispute resolution[47]. The recommendations resulting from the WIPO Internet Domain Name Process have been made available in spring 1999 to the new organisation formed to manage the Internet Domain Name System., the Internet Corporation for Assigned Names and Numbers (ICANN). ICANN offers protection of ".com" names through its Uniform Domain-Name Dispute-Resolution Policy, which provides for the resolution of disputes by agreement, court action, or arbitration. Trademark owners can file complaints with courts or submit complaints to an ICANN-approved dispute-resolution provider[48].

Special care needs to be exercised to ensure that any policy developed for one interest or function does not impact unduly on, or interfere unduly with, other interests or functions. Given the enormous economic opportunities at stake for companies across the world, developing countries should be involved as equal partners in the development of the growing body of Internet governance.

VI. NEW CHALLENGES FOR SOCIETIES AND DEVELOPMENT ASSISTANCE

The current ICT-centred technological revolution, of which the Internet is but one manifestation, is reshaping not only the sphere of economic organisation but also, and relatedly, the sphere of social relations. The impact is likely to be at least as great in developing countries as in OECD ones. As the introduction of the Internet empowers people who were previously discriminated against, beneficiaries of the status quo may quite rationally react to defend their interests. In the Guyanan experience mentioned above, the foray into electronic commerce created tension between the weavers and the traditional regional leadership: threatened by the women's success, regional leaders moved to take control of the weavers' organisation. The woman who created the Web site quit in protest, and the group has been struggling since then to get by. More positively, the Grameen Village Phone network in rural Bangladesh has apparently further added to the empowerment of women beyond the acknowledged achievements of the GrameenBank (Bayes, von Braun and Akhter, 1999). The operators of the village phones are all poor women (selected for their strong credit record), whom members of the male-dominated village elite now regularly visit to avail of mobile phone services. Also, these women entrepreneurs appear to exercise greater discretion over the expenditure of profits from their phone service than is the case with other household income.

Along with universities and research institutions, international development agencies and NGOs have been among the early introducers of the Internet to low-income developing countries. NGOs have played an especially important catalytic role, since they are often working in remote areas with isolated communities. They have to some degree primed the demand for wider Internet access. NGOs, for example, have been instrumental in dissemination of the technology to link rural artisans to the Web. A well-known example is that of Bangladesh's GrameenBank, which has made available its branch infrastructure to administer a village mobile phone network set up by its partially owned affiliate, GrameenTelecom[49]. An interesting possibility raised by this experiment is that the phones (and in time Internet connections) available to rural households would offer new income-generating activities, for which GrameenBank financing could in turn provide seed capital. In a best case, GrameenBank could become the incubator of a host of rural Bangladeshi dot-coms.

For such dot-coms to flourish, whether in Bangladesh or other developing countries, there is need to cultivate skills in the local population for certain e-commerce support services like web design. One interesting experiment in Kenya is training youth from Nairobi's slums in web design skills, with some seed capital from the Netherlands government[50]. The urgency of such training needs is recognised by rich countries' governments, as exemplified by the Japanese initiative for comprehensive ICT assistance to developing countries[51].

As Panos (1998) observes, "(i)f the market is ensuring that access is spreading (in terms of physical infrastructure), the donors and NGOs can shift their focus, ensuring that the benefits are maximised and that marginalisation is minimised". This seems to be the approach adopted by many official development assistance (ODA) agencies. According to the 1996 annual report of the World Bank-hosted InfoDev initiative to foster ICT diffusion

in developing countries, less than a third of the projects then under consideration were focused on infrastructure. Extending access to remote rural areas remains an issue, though the emphasis is shifting from purely public investment financed by development assistance to public-private partnerships. The ITU, for example, has established WorldTel, which is seeking to raise private capital to finance telecommunications links to rural communities and poorer communities in developing countries. Similar public-private endeavours may be warranted for making bandwidth available at low cost to rural parts of developing countries, with the multiple low earth orbiting satellite networks to be launched in coming years by private sector consortia offering the prospect of sizeable slack transmission capacity over low-income countries[52].

As for micro-level initiatives, the establishment of telecentres seems to be a favoured investment for the World Bank, various UN agencies, and regional development banks. UNDP, for example, has begun pilot projects aimed at the creation of electronic community centres as a platform for access and connectivity in rural areas, initially in Egypt and South Africa. They will also serve as centres for capacity building, skills enhancement, training, communications and content development. SMEs are encouraged to utilise these facilities and they will be assisted in the creation of websites, digital web management and the conduct of electronic commerce. A USAID project, Craftslink India, is building IT and e-commerce capacity into the operations of low-income women handicraft-producer groups, equipping and training them to use digital cameras and the Internet to market their wares while showcasing their cultural richness.

Building reputational capital and fostering trust in consumers remain major challenges for prospective developing country entrants into global e-commerce. The association of artisanal exporters with a brand name like IFAT or with a globally recognised and respected NGO has until now been an important means of building customer confidence. Eventually, if market entry barriers are to be lowered for a much wider group of SMEs, generic solutions are needed. It is of course too early to predict whether the open rating system mentioned above will become an e-commerce standard. Assuming it (or some variation thereof) does, then the question arises of whether the average SME in a developing country can independently afford the software and service costs of participation in such a scheme. It may be worth exploring options for negotiating favourable license terms and for cost sharing — e.g., through industry associations, perhaps with partial financing from ODA.

To foster an e-commerce friendly environment, international organisations are seeking to assist countries with the creation of suitable legal frameworks as well as support systems. As mentioned above, while many of the norms and standards for transacting e-commerce are being forged in OECD countries, developing countries have a stake in participating in fora where key decisions are made. This includes the WTO, with its role in defining the treatment of e-commerce in international trade. Given the limited capacity of many low-income countries to master the technicalities of even current trade issues, there is a clear need to strengthen capacity for effective participation in multilateral negotiations and standard-setting bodies. ODA can play a useful role here.

Finally, many traditional areas of development co-operation will increasingly incorporate ICT elements — e.g. education and health care[53]. Maintaining the ICT infrastructure of such projects may be facilitated by the technology's multipurpose nature, notably through leasing equipment and services to local e-ntrepreneurs.

VII. CONCLUSION

What have we learned about the potential that ICT and e-commerce hold for poor countries? While the danger of hyperbole looms large, e-commerce does present real opportunities to small entrepreneurs in developing countries. The paper has first sought to identify the main channels through which these can be realised. At present, the evidence of real benefits is scattered and anecdotal, and the obstacles to affordable access are still formidable. The past, however, is not an especially reliable guide to the future in this domain: as a matter of fact, even in OECD countries the profitable e-commerce businesses are still few and far between. The benefits of the Internet are subject to network externalities, but with a strong local bias. As the local user community grows, the incentive to develop local content and support services grows correspondingly, and this should in turn induce still greater local use. Thus, even if current usage rates in many developing countries are orders of magnitude lower than in OECD countries, the picture could change quite rapidly.

What facilitating conditions — physical infrastructure, legal and regulatory frameworks — are required to promote e-commerce and how easily can they be put in place? On the one hand stands the need to overcome infrastructural constraints, taking advantage of the latest technological advances and lessons of regulatory reform to extend low-cost reliable telecom and Internet access over the widest possible area. For this, public-private partnerships, possibly involving development assistance, may provide a means of leveraging assets, e.g. by making available spare bandwidth capacity to low-income countries. Also, telecommunications infrastructure complements not substitutes for transport and logistics infrastructure when physical merchandise needs to be shipped to complete an e-transaction. On the other hand stand the governance aspects of e-commerce, including consumer protection, security of transactions, privacy of records, and intellectual property. If the essential challenge is to create an environment of trust for conducting e-commerce, one possible solution would involve the adoption of self-regulated codes of conduct by groups of like-minded e-ntrepreneurs. Another would be to foster SME participation in internationally accredited Web-based online rating schemes.

What role is there for development assistance in promoting e-commerce? As noted above, as far as possible the extension of the telecom and Internet infrastructure in developing countries should be left to private investors, though international development institutions may be able to leverage private investments — e.g. by making available excess satellite capacity to extend service to remote rural areas of the developing world. Another sort of leverage comes from investments in small-scale demonstration projects — like telecentres — though this raises the question of whether the benefits of such investments are inherently limited by their stand-alone nature in places where network densities are still low. Also, realising benefits from e-commerce may depend crucially on complementary investments in other infrastructure — electricity, roads, ports — suggesting that ICT-related initiatives should not be viewed as an alternative to other ODA initiatives. This applies also to education and skills, where learning to walk precedes learning to run and so general education remains of paramount importance. At the same time, the Internet offers new opportunities for distance learning to poor, isolated communities, though radio and TV will continue to perform valuable educational functions.

With respect to legal and regulatory issues, approaches vary widely at present even within the OECD. There are few tested “best practices” to share, but it is important that developing countries have a voice from early on in negotiations and discussions that are shaping global rules and protocols governing e-commerce. Capacity building via ODA can be helpful in this regard, though it is perhaps best provided through regional or other groupings of countries with common interests to avoid excessive burdens on the small cadres of qualified personnel in poor countries. Also, co-ordination among development co-operation agencies is crucial to avoid costly duplication of effort, and ICT can itself facilitate that co-ordination[54]. Finally, thinking “outside the envelope” is needed with ODA, just as it is with private ventures in this age of e-novation. There may, for example, be scope for initiatives targeted specifically at small e-ntrepreneurs in poor countries, as with support for their individual or collective participation in Web-based online rating schemes or with publicly-sponsored portals for small producers’ wares to overcome barriers to trust.

NOTES

1. ICT can be defined as “electronic means of capturing, processing, storing and disseminating information”; in short, they are new tools for handling an existing resource (Duncombe and Heeks, 1999, p. 2).

2. See www.nua.ie/surveys.

3. Goods and services may be delivered offline or they may be “digitised” and delivered online.

4. However, a note of caution is warranted here, even with respect to OECD countries. A review of several studies comparing Internet and conventional markets in terms of price levels, menu costs, and price elasticity fails to support the hypothesis that the former are more efficient (see Smith *et al.*, 1999).

5. Since e-commerce integrates the domestic and global markets from its very inception, trade negotiations will demand self-inspection of key domestic policies, particularly in telecommunications, financial services, and distribution and delivery. Because these sectors are fundamental to the workings of a modern economy, liberalisation there will redound to greater economic well-being than comparable liberalisation in more narrowly focused sectors. Thus, the desire to be part of the e-commerce wave can be a powerful force to erode domestic vested interests that have slowed the liberalisation of these sectors (see Mann, 2000*a*).

6. See, for example, Duncombe (1999) and Duncombe and Heeks (1999) for a survey conducted in Botswana.

7. Although with the growth of Web-based telephony, the distinction between the two is increasingly blurred.

8. More than two-thirds of China’s 1.2 billion population, for example, is rural, and a large proportion of that rural population is poor. Forty-five per cent of Internet users live in Shanghai, Beijing or in the affluent province of Guangdong, which account for just 8 per cent of the country’s total population. Eighty per cent of users live in large cities; almost 80 per cent are men and 85 per cent are aged 18 to 35, according to a government-sponsored survey by the China Internet Network Information Center.

9. Though one which requires at a minimum a local electricity source for recharging cellphone batteries.

10. Despite the growing importance of e-commerce for economic activity and trade, tariff revenue loss is likely to be minimal. Trade in potentially digitisable media goods (such as music, software or books) which currently faces a tariff in some countries represents less than one per cent of total world trade and the revenue collected on these products amounts to less than one per cent of total tariff revenue in most countries. See Pérez-Esteve and Schuknecht (1999).

11. “A thinkers’ guide”, *The Economist*, 1 April 2000.

12. A recent study in the United Kingdom concludes that bulk buying by an online intermediary might lop 10-20 per cent off the cost of indirect inputs. But the study also reckons that this accounts for less than one-third of the total cost savings that small firms could reap. As much as 70 per cent of total savings come about because placing and processing orders online is much quicker and cheaper. Whereas the first kind of saving is mainly due to a shift in income from suppliers to buyers, this second form of saving represents a permanent gain in productivity. See “Could B2B B4U?”, *The Economist*, 26 May 2000.

13. The handicrafts market is not insignificant. In 1998/99, for example, India earned $1.23 billion in export revenue from handicrafts (excluding carpets), and another $490 million from carpets [Office of the Development Commissioner (Handicrafts), Government of India].

14. In principle, it should be possible for the customer and producer to exchange product design specifications and modifications thereto, and even for the latter to post a prototype image before batch production commences.

15. "Weavers Go Dot-Com, and Elders Move In", *The New York Times*, 28 March 2000.

16. One member, PEOPLink, has announced plans to arrange "global direct" selling of wares by its developing country trading partners, undertaking promotion in importing countries and securing wholesale prices for those goods, sharing gross profits 50:50 with the producers. With shipping and customs adding about 60 per cent to the FOB price, then if that price were $1 and the wholesale price $3, gross profits would amount to $1.40 ($3 - $1.60), and $0.70 of that would go to the trading partners, in addition to the FOB price. If $0.40 of the profit were in turn passed on to the artisans themselves, this would represent at a minimum a 50 per cent increase on the price to which they are accustomed. Information gleaned from the PEOPLink website (www.peoplink.org).

17. One such venture planning to offer customers access to an international network of design expertise is www.world2market.com.

18. See Gordon (1979) and Talbot (1997).

19. "Future for coconuts in India", *Financial Times*, 5 April 2000.

20. "Groups to launch internet venture", *Financial Times*, 19 April 2000.

21. M. Scholer, "The World's First Internet Coffee Auction A Success — And Some Lessons Learned", paper presented at *Executive Forum on National Export Strategies*, organised by the International Trade Centre, Geneva.

22. As an indication of just how small this market is at present, *Equal Exchange* reports turnover of only $3 million in a global market of over $3 billion.

23. "Internet Injects Traditional Marketing", *Tea and Coffee Trade Journal*, April 2000.

24. Bootcoffee.com, for example, offers to assist in developing export markets, connecting growers and importers directly, as well as provide advice on techniques used by roasting companies to evaluate a grower's product.

25. In the United States, IT support centres are being dotted around rural areas; Sykes Enterprises of Florida, for example, specialises in building and staffing such centres, including in the Appalachian mountains; "Wiring Appalachia", *Red Herring*, July 2000.

26. In the event that hardware repair (e.g. chip replacement) is required, ICT users in developing countries without a good transport infrastructure and logistics system to ensure timely delivery could still be at a disadvantage.

27. See Izaguirre (1999).

28. Even in the United States, the low quality of telephone service in many rural areas slows transmission on the Web. ["I'm out here on six miles of copper lines, so there's a lot of noise in there", said Mr. Lake, referring to the frequent losses of computer connections. "And when you hit the keys for a search, you might as well go get a cup of coffee while it searches, because it's going to take a while" in "A Promising Farm Tool, for Some", *The New York Times*, 7 June 2000)].

29. "Your Wireless Future", *Business 2.0*, August 1999.

30. "The Wiring of India", *The Economist*, 26 May 2000.

31. A similar initiative in Brazil is a joint venture between a maker of household cleaning products and the country's leading free e-mail company to set up computer kiosks in supermarkets offering web access to those who lack PCs of their own ("Online invaders from a neighbour to the north", *Financial Times*, 17 November 1999).

32. Also, in Tanzania, a U.S.-based company attempted to utilise a technology developed for rapid installation of low-cost communications networks by remote multinational operations to extend basic telephone access in rural areas by linking subscribers to a voice mailbox via a pocket pager; "The Final Frontier", *Red Herring*, 18 May 2000. For a variety of reasons, including government red tape, cultural unfamiliarity with the technology, and internal management divisions, the venture has recently folded; see "Many crossed wires in Tanzania", *Financial Times*, 1 June 2000.

33. "Tracking the Web Across China", *The New York Times*, 29 March 2000.

34. "Banks in control of Turkey's internet explosion", *Financial Times*, 11 March 2000.

35. "Creating Ways to Cut the Delivery Time From Mouse to House", *The New York Times*, 7 June 2000.

36. These factors affect the choice of the technology used to establish trust (e.g. encryption using a smart card), and how trust is perceived by users (e.g. consumers may trust the services of incumbent financial service providers more readily than those of a start-up IT firm). See OECD (2000).

37. See "Three Roads in China: B2B, B2C and C2C", *The New York Times*, 7 June 2000.

38. "Pedicarts Link Shanghai's Streets to the Internet", *The New York Times*, 29 March 2000.

39. "Linking Up", *Far Eastern Economic Review*, 24 August 2000.

40. One California-based company that was marketing "organic" produce from developing countries found few reliable, low-cost ways of guaranteeing the veracity of the "organic" claims made by suppliers (Panos, 1998).

41. See "An MIT Professor Who Could Level The Cyber Playing Field", *BusinessWeek Online*, 15 March 2000.

42. In the words of Patty Maes, the MIT professor behind this ratings initiative: "I'm an Internet idealist. I still believe in the vision that the Internet is the great equaliser, that little stores can compete with [established brands]. But for that to happen, smaller companies must somehow gain the trust of their customers" (*ibid.*).

43. One such is located at http://www.internet-trust-services.com/customers/small-business.html.

44. "Stalking The Internet", *The New York Times*, 29 May 2000.

45. Freshfields (1999), *International IT and new media update*, April.

46. In 1998, Congress passed the Internet Tax Freedom Act, which prohibited multiple and discriminatory taxes on the Internet and effectively prohibited sales taxes on e-commerce that crosses state lines until 2001. In May 2000, the House extended the moratorium for five years, to 2006. The issue remains contentious, with some influential industry representatives advocating sales tax.

47. There was a surprisingly even balance in the number of OECD and non-OECD countries submitting formal comments to the WIPO process, 15 vs. 14 (including three from sub-Saharan Africa — Burkina, Mauritius, and Senegal). See WIPO (1999), Annex II.

48. See "E-commerce: The Taming of the Internet in China", *The China Business Review*, July-August 2000, for a discussion of domain-name registration and dispute resolution procedures in that country.

49. GrameenPhone Limited, the largest cellular phone operator in Bangladesh, is building a nationwide cellular telecommunications network to install community telephones in half of the country's 60 000 villages. The project includes installation of village pay phones, where local women operate one pay phone service for the whole village. They receive micro-loans from Grameen Bank to finance the cost of handsets. Bangladesh has one of the lowest telephone penetration rates in the world, with only three lines per 1 000 people.

50. See www.nairobits.org. A similar initiative in Rio de Janeiro is described in "Stepping stones to a life beyond poverty", *Financial Times*, 5/6 February 2000.

51. See Address by Prime Minister Yoshiro Mori at the Discussion Group on the Kyushu-Okinawa Summit, Ministry of Foreign Affairs, Tokyo, Japan, 5 June 2000.

52. Existing satellites in geo-stationary orbit can already provide high-speed Internet access to remote areas at a relatively low cost (circa $10 000); see Dasgupta *et al.*, 2000.

53. See ITU (1999), chapters 4 and 5 for Internet uses in health care and education, respectively.

54. Bellanet is an international initiative with a mission to increase the impact of development activities through greater collaboration, enhanced by more effective use of information and communication technologies (ICTs). See www.bellanet.org.

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