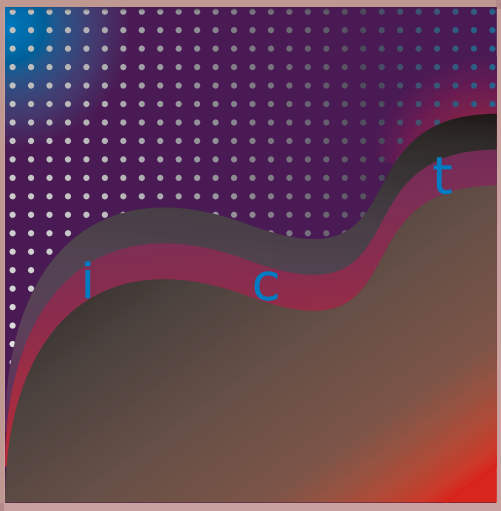
United Nations Conference on Trade and Development

E-COMMERCE AND DEVELOPMENT REPORT 2001

TRENDS AND EXECUTIVE SUMMARY



United Nations

UNITED NATIONS CONFERENCE ON TRADE AND DEVELOPMENT

E-COMMERCE AND DEVELOPMENT REPORT 2001

TRENDS AND EXECUTIVE SUMMARY

UNITED NATIONS
New York and Geneva, 2001

Note

Symbols of United Nations documents are composed of capital letters with figures. Mention of such a symbol indicates a reference to a United Nations document.

The designations employed and the presentation of the material in this publication do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area, or of its authorities, or concerning the delimitation of its frontiers or boundaries.

The Trends and Executive Summary contained herein is also issued as part of The *Electronic Commerce and Development Report 2001* (UNCTAD/SDTE/ECB/1, sales no. E.01.II.D.30)

UNCTAD/SDTE/ECB/1/Overview

This Trends and Executive Summary can also be found on the Internet, in English, French and Spanish, at the following address:

http://www.unctad.org/ecommerce/

Foreword

The emergence of electronic commerce over the past decade has radically transformed the economic landscape. For developing countries, the digital revolution offers unprecedented opportunities for economic growth and development, as entrepreneurs from Bangalore to Guadalajara to Dakar will testify. On the other hand, countries that lag behind in technological innovations risk being bypassed by the competitive edge of those using the new technologies.

The *Electronic Commerce and Development Report 2001* reviews trends that developing countries need to be aware of as they try to position their economies to take advantage of ICT and the Internet. It provides basic facts and figures about electronic commerce and discusses the impact on sectors of particular relevance to developing countries. It also suggests, with concrete examples, ways in which developing countries can create the necessary enabling environment for e-commerce.

The ICT age has dawned, but not yet for all. This Report, which will serve as a useful reference for the United Nations Task Force on ICT, aims to help policy makers and practitioners in developing countries understand the nature of the network economy, and develop the infrastructure, capabilities, flexibility and openness with which they can reap its benefits. As a contribution to our collective efforts to unite the great promise of ICT with the needs of the poor, it merits the widest possible readership.

Kofi A. Annan
Secretary-General of the United Nations

Contents

A. TRENDS

It seems that the "new economic paradigm", according to which new information and communication technologies (ICT) would deliver ever higher rates of inflation-free growth, was among the first victims of the dotcom crash. The recent sluggish performance of the United States economy, the most visible exponent of the benefits of the widespread use of ICT and the Internet,[1] has not helped to keep it alive. As far as the most exaggerated versions of that paradigm are concerned (for instance, the assertion that the business cycle was dead or that the Internet had rendered competition policy irrelevant) this is a healthy development. However, it would be a dangerous mistake to discard offhand the great and lasting changes that the ICT revolution has made, and will continue to make, to the ability of enterprises to create value and to compete in increasingly globalized markets.

The ICT revolution should not be different from previous technological upheavals that have had profound consequences for the economy. The steam engine, railways, the internal combustion engine and the industrial application of electricity spelt the end of entire sectors of activity, generated new industries and services, and most importantly, allowed enterprises to work differently and more efficiently. These changes, and the ensuing improvements in living standards, were always the result of productivity gains that took a long time, even decades, to spread from the sectors first affected by technological change to the rest of the economy, first in those countries where these inventions were first applied and then gradually in the rest of the world.

The first important question is therefore what impact ICT and the Internet have had on producti-vity growth. With regard to the experience of the United States, where investment in ICT has been most intense, data from the Bureau of Labor Statistics show that between 1995 and 2000 output per hour in the non-farming sector grew at an annual rate of 2.5 per cent, significantly higher than the rate of the previous two decades and

closer to the growth rates of the "golden age" of 1959–1973. Economists are not unanimous in their assessment of these data, and it will be necessary to wait until the end of the current cycle before the debate about how much of this acceleration of the growth of productivity is structural rather than cyclical can be closed. However, the UNCTAD secretariat agrees with those[2] that think that there are reasons to believe that much of the acceleration of productivity growth in the United States is structural and attributable to changes induced by ICT and the Internet, through improvements in all aspects of corporate organization, production, finance, marketing and logistics.

Although the speed at which companies in several advanced countries invest in ICT has decreased in the past few months, in the medium term there are several reasons to expect that ICT will continue to support rapid productivity growth. First, the cost of computing power is predicted to keep falling at a steep rate for several years.[3] Secondly, most enterprises are still learning how to reorganize themselves in order to benefit fully from the Internet. Finally, even if productivity growth does not maintain its recent phenomenal pace in the United States, the rest of the world has a lot of catching up to do in the application of ICT to business. As firms in other developed economies and, most importantly, in developing countries engage in e-business, global productivity growth should accelerate.

If the comparison with other disruptive technologies of the past is accepted, there is nothing surprising in the Internet share bubble and its implosion or in the high mortality rate prevalent among early Internet start-ups. Hype, herd instincts and unrealistic business models also accompanied past technological revolutions. A short-term phenomenon in the stock market does not give us any significant message about the implications of the Internet for the economy, in the same way as the disappearance of all but a handful of the many car makers that existed when that industry came of age hardly means that the road transport industry they brought into existence is irrelevant in today's economy.[4]

In any case, from the point of view of new entrants to e-commerce and especially for developing countries, what matters now is not who is the winner of an academic argument about how new the new economy is. What they need to know is how they can avoid the mistakes of the pioneers.

We are still at a too early stage of the process to claim that we have a complete picture of the changes that economies will go through. A comparison with electricity may be illustrative. The rate of penetration of ICT in the most advanced economies (in terms of the number of personal computers (PCs) per hundred people) is close today to the share of electricity in the total power used by industry in the United States around 1920, i.e. 50 per cent.[5] It seems, therefore, that identifying some of the trends and patterns of change, and the lessons for practitioners that can be extracted from the events of the last few months, is a more realistic ambition for now. The next pages will attempt to answer three general questions:

- What lessons for the future of the digital economy can be learned from the Internet crash?
- What assumptions of the business models of failed dotcoms were wrong?
- To what extent will ICT and the Internet change the different sectors of the economy?

Venture capital and the digital economy

For reasons mentioned above, a detailed account of the collapse of the price of the dotcom shares is not directly relevant to this publication. Suffice it to say that UNCTAD participates in the almost general consensus that the cause of the crash was an excess of investment, generated by unrealistic expectations about the disappearance of the business cycle. The result was the weeding out of many dotcoms that had been launched without a viable business model (although companies with more solid projects have also suffered). However, a few comments about the role of venture capital in this process are justified because easy access

for entrepreneurs to venture capital finance is among the factors that explain the lead of the United States in the Internet economy.

Venture capitalism is mainly an American phenomenon: according to some estimates, the United States represents nearly 75 per cent of the global private equity and venture capital markets. Western Europe is a relative latecomer, with the United Kingdom having around 12 per cent and Germany and France about 3 per cent of the global market. In Asia, which has a very small share of the global venture capital market, two economies (Taiwan Province of China and Hong Kong, China) represent more that half of Asian venture funds while Japan lags far behind.[6]

A number of reasons are often given for the leadership of the United States in the venture capital industry: access to institutional financing and liquid stock markets; strong links between research centres and the private sector, and hence a clear focus on the applicability and commercialization of the outputs of research and development; flexible regulations; low capital-gain taxation; managerial ownership through widely used share option schemes; and the possibility for entrepreneurs to return to business after a bankruptcy. In the United States, as in its major competitors, there is a strong research and development capacity in the private sector, government agencies and universities, but it has also been possible to develop a vibrant venture capital sector with the initial support of the Government and close cooperation with academic centres. American venture capital funds have thus been investing in high-tech start-ups (by no means limited to the Internet sector) for years and have helped maintain the momentum of technological innovation and its rapid commercial application.

Venture capitalists operate on the assumption that although many (or most) of the companies they nurture (with funds, but often with managerial involvement too) will fail, some will be highly successful. Losses can thus be more than offset against the huge profits to be made through initial public offerings that introduce successful start-ups into the stock market. The expectations of spectacular growth rates in e-commerce businesses, where it was said that market dominance was ensured to the

first to arrive, provided a rational incentive for intense venture capital infusion into the dotcom sector. But in the rush to seize a share of the market, many venture capital funds were financing Internet business projects without first undertaking realistic risk assessments and due diligence procedures. The large amounts of funds that were thus available to start-up companies allowed them to grow at an accelerated rate — often much faster than what underlying infrastructure or demand for their products and services could support.

Since mainstream investors became nervous about the lack of profitability in the Internet sector and the stock market bubble was punctured, venture capitalists have had to face the risk of holding shares of newly formed private companies which, under the conditions prevailing in the stock markets, they no longer can leave through an initial public offering.

UNCTAD has approached a sample of venture capital funds, seeking information about any new strategies they might have adopted in the aftermath of the Internet crash. Have they become more selective? Do they apply more stringent due diligence procedures? Are they using new criteria to analyse the business plans and the managerial strengths of the companies they consider for investment? If so, what are the differences?

Unsurprisingly, the majority of the answers received indicate that both before and after the crash venture capital funds were scrutinizing the business plans of dotcoms, assessing the quality of their management and undertaking all other necessary steps required by due diligence procedures. Apparently, no new investment criteria are considered necessary. It is as though the short-sightedness of mainstream investors and their herd psychology were the only culprits of the dotcom débâcle. This seems hardly credible. Perhaps the explanations are inherently systemic to the business environment. Like the last driver in a line of vehicles, who has to speed up or slow down in excess of the leading car in order to keep up, maintain a safe distance or avoid a crash, investors and entrepreneurs may drastically have to speed up or slow down investing or producing in order not to miss out on the boom or go down in the bust phases of the cycle. What appears to be mindless short-sightedness is an

objective and defining characteristic of the system. The following section will look at some of the myths that have been exposed by the crisis and will try to extract some lessons from them.

Some myths, lessons and trends

"Profits can wait (almost)for ever, only market share matters now"

When the high prices of the shares of e-retailers such as Amazon.com were questioned in the light of their inconsistency with traditional stock valuation yardsticks, the usual explanation was that the key to long-term success in e-commerce was achieving a large market share fast. If this required huge investments with implausibly long payback periods, so be it. Profits would come later, as e-commerce matured.

But the time horizons of many investors are not as distant as such business plans would have required. As financial markets grew nervous about the dotcom world and virtually cost-free capital stopped flowing in, many companies found that they lacked the resources to sustain the expansion that should, eventually, generate the profits investors want. A vicious circle was closing on them.

A few players (such as Amazon.com), who have built strong brands and generate sizeable revenue streams, have been able to escape it by establishing alliances with offline players, or radically reducing their expansion plans, or both. In all cases, the objective is to achieve positive financial results at a more clearly defined (and much closer) point in time.

The danger now is a move to the opposite extreme: unrealistic short-termism. No new business, in e-commerce or in traditional sectors, can be instantaneously profitable. Long-term success cannot be built on short-term financial strategies. Business plans must be precise about when profits will be achieved, and investors will not accept that any amount of investment is justified. But at the same time, an e-commerce project that is based on a rational market analysis and has a credible medium-term time horizon before profitability can be as valid a business proposition now as it was before the crash.

"The first mover has all the advantages"

Many Internet start-ups went into business far before their projects were mature enough, on the assumption that being the first to arrive in a fast-growing market would help them capture a large customer base at a lower cost than if they had to fight competitors. They would then be in an impregnable position.

In reality, many of the Internet pioneers have either closed (eToys) or been bought (Netscape) by relative latecomers. Especially in the retailing sector, many "first movers" underestimated the cost of making consumers change their habits, of building a new brand from scratch or of mastering the complexity of distribution logistics. In all these examples, latecomers, particularly those that already had a brand and physical assets (stores, warehouses, catalogues) they could leverage, have enjoyed animportant advantage. And, to some extent, they have been free riders since earlier entrants made a substantial effort to educate consumers and enterprises about e-commerce.

Speed does matter in e-commerce, because technological change makes competition a much faster game online than offline. Enterprises can hardly afford to stand still while their online competitors are learning by doing. Therefore, it may be necessary to launch an e-commerce project before everything is perfectly ready. But this does not mean that the basic rules of marketing do not apply to e-commerce.

E-commerce enterprises, like their traditional counterparts, cannot go into business without knowing clearly what their customers' needs are and what value the enterprise can offer to them. Products and distribution channels to provide that value at a profit need to be identified. Customers need to be made aware of the existence of the product or service in a cost-effective, consistent manner. And there must be clear targets so that progress can be measured and corrective action taken in time. Having a good idea for a product or service that can be sold over the Internet is just not enough.

"On the Internet it does not matter if you are big or small"

While it is true that in theory the Internet gives small and medium-sized enterprises (SMEs) new opportunities to compete, because it reduces transaction costs and barriers of entry, their e-commerce business models must be adapted to their competitive strengths and not just replicate the approaches of bigger players. If a small enterprise tries to compete with a large multinational simply by making a large investment in powerful equipment for its website, the chances are that its productive and/or distribution capacity will never allow it to recover the costs.

For SMEs and enterprises in developing countries, e-commerce may create new opportunities to participate in international trade. But although putting up a website opens a window to global markets, it is not a substitute for a full export strategy. Is the product range adapted to foreign demand? What regulations and standards apply to a firm's products in other markets? What impact will transport, insurance or tariffs have on product competitiveness? Are the staff able to deal with foreign customers? These and similar questions must be asked and answered at the same time as those related to the purely technological aspects of an e-business project. The good news is that the Internet makes it easier and cheaper to find answers to most of them.

In this context, the importance of brand management cannot be underestimated, both in international and in domestic markets. In the Internet one may be a click away from the competition, but customers are more likely to click on a web page that carries a brand they recognize. The Internet allows SMEs to implement new, cheaper strategies to build brand names and images in markets to which they had little access in the past (particularly for enterprises in niche markets). Sufficient resources – and thought – need to be given to them.

"On the Internet everything must be for free"

Even though there are well-known — and successful — examples of companies that have been charging consumers for their services from

the beginning (AOL), many business-to-consumer projects were based on the concept that the culture of the Internet was inherently incompatible with charges for content or services. Advertising was seen as the only viable source of revenue. Now it is clear that business models in most business-to-consumer sectors will have to rely on alternative income streams, mostly in the form of subscriptions and fees.

Internet advertising is not yet the income earner it was supposed to become. Although the Internet allows personalized, interactive advertising campaigns that cannot be conducted through any other means, it also has distinct disadvantages. While it is not always easy to distinguish the specific influence on consumer decisions of each of the various elements of a marketing campaign (television, radio and press advertising, sponsoring, price discounts, point-of-sale events etc.), click-through rates (the number of people who click on a advertising banner) are easy to measure and they have often been disappointing. There is also much to be discovered about how to use online advertising without putting off Internet users. In the meantime, advertising budgets have been reduced as a consequence of the economic slowdown. And it was online businesses, many of which are now struggling, that made up the bulk of Internet advertising.

Providers of generic information that is convenient online but is also available offline (for instance, newspapers) will not be able to charge for it until a cost-effective means to handle micropayments takes off. Search engines or websites that help consumers to carry out product comparison will also have to keep relying on advertising and, in the case of search engines, charges for listing a website in a prominent place. Apart from these businesses, most online services will have to turn to fees as their main source of income. This includes fees for Internet access (especially for premium, broadband service) and any value-added services such as translation, financial analysis, buying guides and, in general, information that is more than raw data.

Even those e-commerce companies that do charge for their products often make the mistake of assuming that because on the Internet price

comparisons are easy and cheap, price is the only factor in their customers' decision-making. As a result, prices are often fixed at too low a level and the possibilities for price segmentation and/or quick price adjustment in response to changing market conditions are not always used.

While it is true that in the business-to-business sector the enhanced transparency brought about by the Internet places buyers in a stronger position, this is not always the case in the retailing sector. In reality, most online consumers are not necessarily looking for the lowest possible prices. Issues such as the user-friendliness of a website, and the choice, security and reliability provided by the online merchant are often as important as prices. Also, more use should be made of techniques that allow companies to detect the reaction of customers to changes in prices — which is more difficult to do offline — and to charge different prices according to fluctuations in demand (as airlines, for instance, charge different prices for same-class tickets as seats in a given flight are sold).

"E-commerce needs PCs and web browsers"

Business models based on a PC-centric approach to the Internet ignore the fact that most of the potential (and the actual volume) of e-commerce does not involve a consumer sitting at home in front of a PC and surfing the World Wide Web through one of the two more widespread browsers. E-commerce today is very much a business-to-business affair. Enterprises in developing countries should not let themselves be fooled by the much higher visibility of the business-to-consumer dotcoms. Those enterprises in developing countries that make goods or deliver services that are necessary for the productive process of other enterprises are the ones that should first consider incorporating the Internet (which does not necessarily mean the web) as an instrument to enhance their opportunities to compete and grow.

There is another reason why the prevalent model of web-based e-commerce need not be the only course that enterprises in developing countries can follow. In spite of the spectacular decline in the price of computing power, PCs remain unaffordable for the vast majority of the popu-

lation of the world. On the other hand, mobile telephones and other Internet-enabled devices, although expensive, are already accessible to a sizeable number of people and enterprises in developing countries. While wireless web applications have fallen short of expectations, there is a vast potential for mobile commerce (m-commerce) if the approach of transplanting the web onto a mobile phone is abandoned. It seems that in the developed countries m-commerce will focus on consumer-oriented location-dependent services, but it is possible that in the market environment of developing countries more general applications (including in business-to-business) of m-commerce can be developed.

"The Internet kills monopolies"

Except in the few industries that are affected by increasing returns to scale, the Internet tends to reduce economies of scale, for it creates new opportunities for outsourcing and lowers fixed costs. Because it makes it much easier and cheaper to exchange information across borders, it also helps the emergence of truly global markets in some industries, notably in the financial sector. It would therefore seem that the Internet is bringing the economy closer to the theoretical model of perfect competition.

Paradoxically, the industry that has made the Internet possible is itself subject to monopolistic or at least oligopolistic pressures. One single company builds nearly 80 per cent of the routers (the computers that put order into the flow of bits on the Internet). Another one sells about 90 per cent of the browsers people use to navigate the World Wide Web. Beyond this, data seem to indicate that a strong concentration is also taking place in the domain of contents and services, at least in the business-to- consumer sector. According to a study published in June 2001 by Jupiter Media Metrix (an Internet analysis and measurement firm), between March 1999 and March 2001 the number of companies that control 50 per cent of the time Internet users in the United States spend online (at home and at work) went down from 11 to just four. The number of companies controlling 60 per cent of the time Americans spend online went down from 160 to 14, an 87 per cent fall. The first in the ranking, AOL Time Warner Network, accounted for 32 per cent of online time.[7]

There is no reason to believe that this trend will not be replicated in other Internet markets as they become mature. Smaller players should be alert. The Internet, or at least the business of providing access and content, is as open to the forces of economies of scale and market concentration as the rest of the economy. Indeed, in the digital goods sector (in which some developing countries have a chance to exploit profitable niches) increasing returns to scale may make monopolistic and/or oligopolistic market structures more frequent than in the past.

"The Internet changes every thing"

This assertion sums up most of the misconceptions presented above. It was on the assumption that business in the Internet would work outside the traditional laws of economics that sky-high share prices were justified and many new dotcom start-ups behaved as though they had a definitive competitive advantage over their bricks-and-mortar rivals.

In reality, the laws of economics have proved rather resilient. The business cycle is very much alive. Investors, after all, want to see profits. Sensible financial planning, marketing strategies, and such unglamorous business problems as logistics remain as important as before. Intermediaries, whom the Internet was supposed to render irrelevant, have flourished in the Internet — although in different shapes. In many sectors, customers (both retail and wholesale) are still adapting to the new business models, and enterprises need time to incorporate ICT and the Internet into their day-to-day operations.

Because of that, it will not be Internet pure-players but brick-and-mortar firms that integrate the Internet into operations who will profit most from e-commerce. Many established "old economy" companies have already succeeded in making e-commerce part of their strategies, using the Internet to cut procurement costs, to help employees work together more efficiently (which can improve quality or shorten product development cycles), to improve customer service, and, of course, to reach more customers and to enter new markets. For example, such an emblematic "old economy" company as General Electric already apparently does more

business through its own market place than all public e-markets together (although the precise volumes handled by public e-markets are difficult to estimate).[8]

"The Internet changes nothing"

Of course, this was not a "new economy" myth, although it is probably a more dangerous proposition than any of the ones listed above. A natural reaction to the dismal performance of many dotcom start-ups, especially for most companies in the developing countries that have been only marginally affected by the Internet boom and crash, would be to consider that e-commerce is a risk not worth taking. They would be wrong.

First of all, the dotcoms always represented a small part of e-commerce and Internet business. Many of them have disappeared, but e-commerce(and particularly business-to-business e-commerce) continues to grow, although not at the breathtaking speed that was predicted some time ago. And many other dotcoms have indeed succeeded in establishing themselves as global companies with solid brands and business models in which new entrants in e-commerce can find inspiration.

Secondly, it is a mistake to think that e-commerce does not change an enterprise's competitive environment just because its products or services do not lend themselves easily to being traded online. A business transaction consists of many successive processes (information gathering, comparison, negotiation), most of which can be carried out more efficiently over the Internet, even if the final step of the transaction is taken offline. For instance, very few cars are bought online. Yet in Europe and the United States there is evidence that many purchase decisions are strongly influenced by information collected on the Internet.

Thirdly, marketing and sales are only a part of the value-creation chain. As mentioned above, an enterprise can become more competitive by using the Internet to get cheaper finance, reorganize its procurement, improve customer service etc. A major obstacle to the participation of SMEs from developing countries in international trade is the lack of

adequate trade-supporting services — finance, insurance, transport, business information. The Internet makes it easier for them to access new, better-quality suppliers.

Finally, as many established companies in the developed countries, and in particular large multinational corporations, integrate the Internet into their operations, buyers and suppliers located in developing countries will increasingly come under pressure to adapt to the new business models. Enterprises in developing countries that are or plan to be involved in international trade need to start incorporating ICT and the Internet into their business models in order to stay competitive.

It is true, however, that the Internet will not transform all productive sectors equally. At the end of the day, Internet or no Internet, most garment makers must still make a profit by cutting, stitching, ironing and packaging clothes — or they will go out of business. For a banker, the possibility of using the Internet to cut the cost of handling an account by a few cents may be a decisive competitive edge. The following section will discuss how the impact of the Internet and ICT in general will vary across economic sectors.

The future spread of the effects of ICT and the Internet, and the prospects for developing countries

A look at the list of the fallen and the survivors of the dotcom crisis shows that the value of ICT for development lies not so much in the share of the global economy that this sector may come to represent (undoubtedly a sizeable one), but in the changes that ICT will introduce in the functioning of enterprises across the economies that assimilate them.

Technological revolutions have always affected different sectors in different ways. Railways helped create the first nation wide markets in Europe and the United States, but one cannot say that they had a dramatic effect on financial services — other than generating a huge stock market bubble. The industrial application of electricity radically changed manufacturing, but had little direct impact on farming or retailing. Infor-

mation technologies and the Internet will have more widespread effects because they can be applied in most aspects of production, distribution and consumption. For instance, unlike previous technological changes, they have the potential to improve productivity in services. However, and particularly while enterprises undergo the necessary learning process, the transformations brought about by the Internet will be more important in some sectors than in others. This will, of course, have implications for the speed at which changes will be felt in the economies of developing countries, which will be directly proportional to the weight in their economies of the sectors in which the impact of the Internet and ICT will be deeper and faster.

Information-intensive activities are being — or will soon be — radically transformed by the combination of powerful, cheap computing and connectivity. This includes financial services, education, the cultural industry, professional services (consulting, design, translation, accounting etc.) and government services. In some of them (such as back-office services) certain developing countries may find new opportunities for diversification, as illustrated by the examples discussed in the chapter of this report dealing with e-commerce in the least developed countries.

Although these sectors are the ones in which more far-reaching changes are to be expected, they are also among those where technological and/or regulatory problems can be more important. For instance, privacy can be a serious concern for the potential customers of some professional service providers; the commercial exploitation of digitized goods (books, music) requires effective protection of intellectual property rights; and the availability of broadband Internet access will be crucial for the prospects of online entertainment services.

In other, less information-intensive sectors of the economy, changes will be incremental and mostly due to reductions in transaction costs: manufacturing and retailing are examples of industries where deep, although slower, changes can be expected. The benefits of e-commerce and e-business that have been mentioned before (cheaper procurement, faster knowledge accumulation, dissemination and application, more

effective management of the relationship with the customer etc.) can translate into significant savings. These savings will not materialize without significant investment and organizational and cultural changes that will not happen overnight. It is therefore important that developing countries prioritize areas where results can be expected earlier, so as to minimize the financial effort and encourage people to embrace change.

Within each individual enterprise the effects of introducing ICT will be directly proportional to the organizational changes that accompany technological change. In considering investment strategies to equip themselves to participate in e-commerce, the Governments and enterprises of developing countries should keep in mind that neither computers nor the Internet, by themselves, can make a country or a company radically more productive. It is when its potential to allow more efficient business processes to operate is exploited that ICT makes a real difference.

This means that the potential of e-commerce to become an engine of development will not be realized if investment in infrastructure, equipment and human resource development does not go hand in hand with profound modifications in the organization and management of companies and (as far as they have an impact on the operation of businesses) government agencies. Fundamental changes need to be made, in particular in assigning authority and responsibility in public and private organizational structures. In the digital economy information flows more quickly and in more directions than in traditional organizations. Decision-making thus becomes a less centralized activity than in the past, and workers need to be able (and feel empowered) to perform a wider range of tasks. This represents a serious challenge for many developing countries and economies in transition, where traditional notions of authority and hierarchy may be more deeply entrenched. These notions will have to be redefined, for competitiveness in the digital economy requires a workforce that is equipped with the skills to master change rather than to undergo it.

Of course, the changes in business processes that are needed for benefit to be derived from the Internet are not limited to the internal organiza-

tion of the enterprises. Among other things, enterprises in developing countries will also need to rethink the way in which they interact with their customers and suppliers, ensure compatibility of technical standards and business models or learn to share information with other enterprises. The networking effects of the Internet will also create new opportunities for innovative inter-firm cooperative arrangements and strategic alliances. Many of these aspects are examined in detail in the chapters of this report dealing with specific sectors of interest to developing countries.

At a more general level, the impact of the Internet on many key productive sectors of the developing countries will depend not only on the depth of the organizational changes that enterprises and their customers are ready to accept, but also on the linkages they establish between the information and the physical components of their activity. In concrete terms, the efforts of developing countries to adopt e-commerce and e-business will be futile if supplies spend weeks in a warehouse waiting for customs clearance, or the goods are not up to quality standards — because the workforce is poorly trained — or they cannot be brought to the market — because they lack reasonably priced transport.

Developing countries' policy-makers and entrepreneurs also need to be aware that the process of adoption of the Internet and related technologies by businesses will depend on, and at the same time change, the competitive environment in which enterprises operate. In some markets, the move to e-commerce will be a defensive reaction as enterprises see online rivals gaining market share. The most likely winners in this case will be consumers, as the process will result in increased competitive pressures on producers. In other sectors or markets, individual enterprises may use e-commerce to create a more or less durable competitive advantage (not necessarily in sales and marketing) and will reap the ensuing financial rewards. In every case the key factor will be the ability of entrepreneurs to identify the way in which the Internet can help them improve quality, reduce costs and, in the end, create value. Selling online will only be part of the process — and not necessarily the most important one.

In the end it will be as the efficiency gains derived from these and other changes in the business processes seep into the productive tissue of the developing countries that ICT and the Internet will contribute most to global economic growth and improved living standards. Indeed, it is because the Internet revolution is relevant not just to the high-tech, information-intensive sectors but also to the whole organization of economic life that its positive effects are spilling over more quickly into most sectors of the economy and that developing countries stand a better chance of sharing in its benefits earlier than in previous technological revolutions.

B. Executive Summary

1. Measuring Electronic Commerce

A crisis of e-commerce data?

Imagine gross domestic product (GDP) growth rates for the coming year (of, let us say, the United States economy) based on estimates provided by five different private companies and varying by as much as a factor of 10. These figures would then serve as a basis for taking decisions on economic policy and private sector investments in a large number of countries. While one would assume that most rational people would refrain from using the figures, such a scenario reflects the current situation of e-commerce-related data. No other economic sector has been subject to similar far-fetched growth forecasts (which had to be sharply readjusted after the Nasdaq crisis of the past year) and sweeping statements about the future of the sector and its "revolutionary" impact on the global economy. Venture capitalists and financial sector analysts alike have blindly used particularly optimistic e-commerce forecasts to take decisions on investments in start-up companies and the stock market.

E-commerce data are largely provided by private sector companies, which regularly publish reports on the latest developments in e-commerce, including short- to medium-term growth estimates. Unfortunately, the numbers differ considerably among the data providers given their use of different methodologies, definitions and indicators. Furthermore, private data providers need to be distinct from their competitors and serve their main clientele (largely e-businesses and investment analysts).

E-commerce statistics: Comparable and predictable

While there is little doubt about the ever greater role of electronic commerce and the use of ICTs in the global economy, the lack of reliable and internationally comparable data has been lamented by policy makers, researchers and business people alike. Therefore, a number of national statistical offices have started to collect data on e-commerce and, more generally, the use of ICT and the Internet. They have the advantage of guaranteeing the confidentiality of the collected data, having a more neutral position when it comes to collecting and interpreting the data and being able to use their existing methodologies and infrastructure for data collection, processing and analysis. Some countries are already benefiting from the results: they are now in a position to benchmark their economies with competitors internationally; they are able to identify the number of qualified people needed to advance their country's information economy or to calculate the amount of investments needed to provide businesses with access to the Internet. The United States is planning to include the measurement of e-commerce transactions in its entire statistical programme, which will enable it to measure the impact of e-commerce on the overall performance of the economy. In short, both policymakers and business people are able to take well-informed decisions about the best public policy measures and private investments in e-commerce-related sectors.

Defining e-commerce before measuring it

There are a number of important steps involved in collecting e-commerce-related data. First, a country needs to decide what kind of data it wants to measure, reflecting the level of its e-commerce activity. Most developing countries would probably focus on collecting "readiness" indicators, such as the number of businesses with computers and access to the Internet, and "intensity" indicators, such as the number of businesses that receive orders over the Internet and the value of those orders.

But how does one define these indicators? The member States of the Organisation for Economic Co-operation and Development (OECD)

have agreed on a working definition of e-commerce that could be used in the measuring process. The definition includes the networks over which e-commerce activities are carried out (Internet or others), the specific business processes related to e-commerce and the different actors involved (businesses, households or Governments). On the basis of this definition, a set of priority indicators for e-commerce have been established by a number of international and national bodies. Some of them, in particular those suggested by the Asia-Pacific Economic Co-operation (APEC), could be a useful starting point for developing countries wishing to compile e-commerce statistics.

New e-commerce surveys or add-ons?

At the empirical level, the two most common methodologies adopted for measuring e-commerce are (i) adding questions to existing surveys, and (ii) developing new surveys. Adding questions is more cost-effective, an important criterion for poorer countries. On the other hand, it provides limited information as it is attached to an existing survey. A good example of a new e-commerce survey is the Nordic Model survey, which has been tested across the Nordic (and other) countries and currently represents best practice in this field. It could thus be a useful input into the questionnaire design stage, in particular for developing countries.

What are the prospects for developing countries?

Most developing countries are at an early stage in collecting their own e-commerce statistics. They can thus take advantage of the experiences of some of their counterparts in the developed countries. Given their resources and statistical infrastructure, national statistical agencies in the developed countries are in a better position to contribute to the development work and are encouraged to do so. They should, however, help their counterparts in developing countries to develop the statistical infrastructure needed for the compilation of electronic commerce indicators.

2. Electronic Commerce and Developing Countries: A Computable General Equilibrium Analysis

Does e-commerce accelerate productivity growth?

The impact of e-commerce on the business sector has been widely accepted: it reduces transaction costs, allocates resources better, increases economies of scale and improves the competitiveness of businesses in general. On the other hand, doubts have been raised about the impact of e-commerce on macroeconomic growth, and in particular on productivity growth. At the root of this debate is the observation that the United States, the leading country in information technology and e-commerce, has experienced impressive GDP growth since 1995. This output expansion has been characterized by an acceleration in productivity growth, very low unemployment rates, low inflation rates and a reduction of fiscal deficits. However, productivity statistics have not provided any evidence of the impact of ICT and the Internet on this accelerated growth, also known as the "productivity paradox".

Recent studies on measuring industrial productivity in the United States show that productivity growth could in fact be widespread and not concentrated specifically in a few sectors of the new economy. It was found that productivity growth occurred in both computer and non-computer sectors. Productivity growth in the non-computer sector therefore would be a result of technological progress and production system improvements outside the computer sector, such as those related to e-commerce or computer- and web-based learning. Hence e-commerce seems to have a positive impact on the productivity and growth of countries (at least in the United States). It is expected that European countries will catch up quickly with the United States, and developing countries, with a certain degree of preparedness, could also converge in productivity with the leading e-commerce countries.

The risk of staying behind

UNCTAD's quantitative analysis focuses on the impact of e-commerce on the global economy by looking at two scenarios: first, if developing economies fall behind technologically; and, second, if they catch up with developed countries. The analysis is centred on cost savings and assumes that e-commerce can reduce the costs of services, particularly in retail and wholesale trade, transport, financial and business services. Cost savings in services are simulated through a productivity growth scenario.

The results of the first scenario reveal that while developed countries will have welfare gains of US$ 117 billion (based on 1997 data), the developing world, except for Asia, will lose welfare of US$ 726 billion. The Asian region, on the other hand, will increase welfare by US$ 802 million, largely from gains in the transport services sector. In addition to welfare and GDP losses, developing countries will experience a reduction in wages and deteriorating terms of trade. E-commerce could constitute, therefore, an additional factor increasing the gap between developed and developing countries.

Catching up quickly

The results of the second scenario, however, show that convergence in productivity in the services sectors (i.e. catching up with developed countries) allows developing countries to increase their external competitiveness and increase output, wages and welfare. A 1 per cent productivity growth in the services sector in Asia, for example, would result in welfare gains of US$ 12 billion, GDP growth of 0.4 per cent, a wage increase of 0.4 per cent and a growth in services exports of between 2 and 3 per cent. By reducing costs, increasing efficiency, reducing time and distances, e-commerce could thus become an important tool for development.

3. Electronic Commerce and Tourism

E-tourism: A chance for developing countries?

Developing countries generated US$ 131 billion in 1999 (according to the World Tourism Organization) by selling tourism services to international visitors. In many developing countries the tourism industry's role as an employer and earner of foreign currency is important and policy should be oriented to maintaining and improving its competitive advantages over developed country destinations. An important tool for doing this is e-commerce. While computer penetration and Internet penetration, as well as credit card and online payment facilities, may be lacking in many developing countries that are popular tourism destinations, this is not necessarily an overwhelming disadvantage as consumers come mostly from developed countries with modern ICT and financial infrastructures.

An information-intensive industry

The tourism industry is among those sectors most quickly adopting the Internet as a business medium. Tourism is very information-intensive and substantial resources are used in advertising, market research and consumer profiling. Purchase and delivery are often remote occurrences and during the intermediary period the tourism product exists in the form of information (reservation number, ticket, voucher), which requires consumers to have confidence that it will materialize. Confidence is best gained through the quality of information provided by the seller or producer. Value added by international tourism intermediaries, who are often no more than information handlers and who rarely own or manage physical tourism facilities, can be as high as 30 per cent or more, thus controlling general terms and conditions throughout the whole value chain. Keeping this in mind, it is easy to see that tourism and e-commerce are natural partners.

The "set-up"

The traditional international tourism market was, and to a large extent still is, a linear value chain. At the starting end we find the producers of tourism services in developing country destinations. These commit or sell their capacity to international distributors or intermediaries, who take the form of inter-national tour operators such as Thomas Cook and JTB. Alternatively, they may commit capacity to computer reservation systems (CRSs), such as Sabre, Galileo or Amadeus, which are usually run by the largest international airlines. These distributors then retail this capacity in developed country markets through own or licensed agencies.

An often-heard complaint is that with each party taking a commission, little remains for the destination, where in fact the consumer or tourist will actually spend some pleasant or exciting time. It is the destination's socio-economic, cultural or geographical content that forms the fundamental tourism product. The common explanation for this perceived imbalance is that many developing country destinations are far away and there is not enough competition in air travel to bring down transport costs. Travel costs regularly account for more than half of the total price of a packaged product.

Another characteristic of this "set-up" is that tour operators typically provide a very comprehensive packaged product, including lodging, transport, recreation, some sight-seeing and popular cultural and historical tours with little or no flexibility for "tailoring". On the other hand, CRS operators provide full flexibility but little comprehensiveness. Besides lodging, air tickets and some car rentals from major international companies, little else is on offer.

What could change?

E-tourism may change all this and create a more dynamic and networked industry and disintermediate and deconstruct the value chain. Each and every participant in the tourism industry is trying to establish itself as the

entry point for the prospective tourist surfing the web for ideas and information about where to go or what to do. Some are trying to establish themselves as an Internet generalist, while the others may become niche "portals", depending on where they see their competitive advantage. By creating a business network through freely and voluntarily associating their diverse offers in a competitive environment, tourism producers, including those in developing countries, may provide, directly to the client, a flexible and tailored product, while avoiding commission costs imposed by international distributors and high-street retailers.

Even the large distributors are transforming themselves into Internet-based operations and are transferring their proprietary/legacy computer systems to the Internet. The Open Travel Alliance, an association of leading tourism and travel industry companies, is creating a working, public and open Internet-XML data interchange protocol that will enable businesses to exchange specific tourism capacity data using the Internet as the data conduit.

Creating consumer confidence

The fundamental question is: why would an Internaut buy a tourism product from one portal and not from another? The key issue is confidence. This is why the international distributors and agents still manage to capture a large part of the buying public's orders. Their legal presence in tourists' countries of origin and their physical presence in the high street serve as a guarantee that the actual purchased product will be delivered, often weeks or months after purchase. How can distant developing country tourism producers compete with this? Only by offering quality information, and products that are better tailored, more interesting and priced more competitively compared with what international distributors and agents can manage.

Establish the dot

The ultimate goal is to improve competitiveness through the use of the Internet and e-commerce tools. To do so, a developing country tourism

industry can adopt appropriate and often diverse technological solutions: the state of the art is not necessarily feasible for each and every business. It should consider very carefully the way e-tourism will interface with the traditional physical industry that needs to become the content provider. If it is disowned or technologically alienated from the content of its web, any advantages will be short-lived. It is necessary to build a business web to provide comprehensive and flexible tourism products: local businesses must cooperate and see their joint interests.

Knowing the customer and speaking his or her language is vital. This often entails establishing cooperative and reciprocal relationships with similar businesses or organizations in other countries. Online payment possibilities are fundamental to closing sales and a lack of local financial infrastructure regularly forces e-businesses to establish offshore subsidiaries and accounts. Finally, all this is impossible without trained and educated IT and tourism professionals.

More room for the destination marketing organizations

The activities of national tourism offices, or destination management organizations, could be crucial for the success of e-tourism endeavours in many developing countries. Often, they may best understand the need for quality information and typically have a broad overview of the national tourism industry. They may be the industry's best representative in securing technical support and training, as well as negotiating terms and conditions with local financial institutions for securing online payment facilities. In many countries they may develop themselves into the national portal for prospective tourists, provided that they are able to respond to the information and online transaction needs of consumers in developed countries.

4. Business-to-Business Electronic Marketplaces: Their Nature, Impact and Prospects in Developing Countries

Are e-marketplaces the future of e-commerce?

B2B e-markets, also referred to as "net markets" or "exchanges", are expected to play a pivotal role in the future of e-commerce. The sheer total value of their transactions and the fact that they are created and supported by established bricks-and-mortar companies should ensure their long-term viability and growth. These market-places are forums that bring together many buyers and many sellers not only to exchange goods and services, but also to share a variety of value-added services. Furthermore, they involve contractual relationships that are more long-term than other e-commerce models such as B2C trading. Their future growth is expected to involve a variety of changes, the main ones being consolidation and the formation of strategic alliances, greater focus on the provision of differentiated and specialized products and services, and a shift towards the creation of industry-based or consortium-type and private e-markets as opposed to independent third-party markets. The lessons learned from the experiences of early dot. com companies may provide B2B e-markets with a vision for adopting sustainable business strategies.

The benefits of B2B e-markets to enterprises

B2B e-markets considerably enhance the various benefits that are generally attributed to e-commerce. They reduce transaction costs by minimizing search costs, as they bring a large number of buyers and sellers into one trading community. They also facilitate a more efficient processing of transactions by facilitating online auctions and online processing of invoices, purchase orders and payments. In addition, B2B e-markets provide a framework by means of which traders can optimize online transactions in other ways across the entire supplier chain, for example by

linking the processing of goods transactions directly to logistics functions.

B2B e-markets both eliminate intermediaries and create new ones. Independent, third-party e-marketplaces themselves are intermediaries by definition, as they are placed in between suppliers and customers in the supply chain. On the other hand, market-places established by bricks-and-mortar companies and private e-markets enable companies to link with established trading partners, thus eliminating the role of intermediaries.

B2B e-markets also have the benefit of increasing price transparency. By bringing together large numbers of sellers and buyers they reveal market prices and transaction processing to participants. As a result, price differences are reduced in the market-place and also buyers are allowed greater opportu-nities to compare prices and make better purchasing decisions. Finally, e-markets provide scope for economies of scale, largely because of substantial upfront expenses involved in setting up an e-market, such as programming costs. Also, by linking large numbers of buyers and sellers, e-markets provide demand-side economies of scale or network effects in that the addition of each incremental participant in a market creates value for all existing participants on the demand side.

The success and failure of an e-market

There is a wide range of capabilities or functionality that e-markets can offer to traders. These relate to the content or information they provide, support for collaboration between trading partners and the handling of online transactions, including payments, online exchange of documents and providing linkages to logistic services. The e-marketplace that offers the most functionality that traders require will have an advantage. Coupled with functionality is the attainment of a critical mass or liquidity that makes the e-marketplace viable and sustainable. In addition, technology is a critical input that enhances the functionality of an e-marketplace. This explains why many B2B e-markets have created strate-

gic alliances with technology companies or have outsourced the hosting of e-marketplaces to them.

Do B2B e-markets lead to competition or oligopolies?

A large number of B2B e-markets have been established in different industries, thus giving rise to intense competition. E-markets tend to have low barriers to entry, but the attainment of liquidity and critical mass determines which e-markets will survive the competition. Generally, first movers, but in certain cases newcomers, may have the advantage in attaining critical mass and thereby creating barriers to entry to other entrants. Also, because of the ability of B2B e-markets to engage in exclusionary behaviour and share information about prices and other commercial data, they have the potential for creating market dominance and anti-competitive behaviour. Competition authorities, however, have not so far established specific rules to address B2B e-markets.

It is an uphill task for developing countries to play a role in B2B e-markets

There are challenges and opportunities for developing countries to participate in B2B e-markets. So far they have accounted for a negligible share of transactions in such markets. For an enterprise to decide to participate in e-markets as a buyer or seller, it is essential to consider a number of strategic factors and to assess the expected return on investment.

Developing countries may find opportunities to participate in or create B2B e-markets in sectors where they have a significant presence, such as travel/tourism and primary commodity marketing. In tourism the Internet opens new channels through which developing country enterprises can participate in the supply and distribution of tourism products. To this end, a number of schemes, such as regional cooperation and affiliation with major players, are available to enterprises, including SMEs.

Primary commodities play a key role in the economies of many developing countries. Traditional marketing and export channels tend to be inefficient and dominated by multiple intermediaries. This situation can be improved by using the Internet for electronic trading. Online B2B exchanges have already been created in trades such as coffee, tea and cotton. Most of these have been created by developed country companies, but a few have been established by developing country enterprises. Developing countries, using existing local commodity exchanges and commodity export associations as a foundation, can use B2B online trading as a means of transforming existing commodity marketing systems to great advantage.

5. Towards Digital Government

Why should Governments go online?

The Internet, with its capacity to allow the sharing of information across organizations and to help people work together, creates new possibilities to reorganize and network government services so that they can become more user-centred, transparent and efficient. In UNCTAD's experience of the application of ICT to government services, the first pre-requisite for success in this process is political will and motivation. Government agencies will also have to overcome obstacles derived from their size and complexity, address concerns about inequality of access to the Internet and revise the way they are organized and operate. In developing countries they will also have to deal with the same problems of telecommunications infrastructure, poor computer and general literacy, lack of awareness of the potential of the Internet and regulatory inadequacy that also hinder other applications of the Internet there.

At the same time, there are many reasons to expect that the changes brought about by the Internet regarding the delivery and management of public services will be significant. As in the private sector, adopting e-government practices will allow Governments to achieve significant sav-

ings in areas ranging from procurement to personnel management. Not only can resources be saved, but also the quality of services provided to citizens can be dramatically improved. Furthermore, e-government will provide an example and an incentive for firms (especially SMEs) to adopt e-business practices, thus spreading the efficiency gains to the economy as a whole.

E-government is not about setting up a website

Even though the expectations about e-government are high, its reality today is uneven. Many government agencies around the world have set up websites that provide information about their services, include downloadable forms that can be submitted offline and let users interact with the staff of the agency through e-mail. These applications of the Internet, although useful, cannot be said to be true e-government tools, because they cannot support formal transactions.

The majority of government agencies that have started to provide some e-government services are concentrated in developed countries and a few advanced developing countries. Their sites support some formal online transactions that involve either payments or the creation or transfer of legal rights (for instance, filing a tax return, renewing a driving licence or claiming social security benefits); they may include tools to help users complete online transactions, but they normally need to be combined with more traditional support systems, such as a telephone "hot-line". These sites tend to replicate the procedures of the offline service, they rarely include the whole range of services and do not support transactions that involve more than one agency.

Finally, only very few operative government sites aim at providing services not on the basis of the organization of the agency entrusted with their delivery but according to the needs of the user. This means that they integrate a wide range of governmental services, normally under the same overall political responsibility. The objective is to build comprehensive government portals that people can use to find information or to carry out transactions without having to deal directly with the various

agencies that can be involved in a single "life event", such as setting up a small business or changing residence.

How to go about building e-government

To succeed in e-government, agencies will need to learn to see the citizen as their customer, which represents a radical cultural change for many organizations. Becoming a user-centred organization will require a change in resource allocation priorities and a thorough review of business processes. A user-centred agency will also need to give credible answers to concerns about the integrity and confidentiality of the sensitive data that government agencies often collect.

The move towards e-government will be incremental. The current phase can be considered an experimental one, with Governments concentrating on limited, relatively simple applications of the Internet. As demand for e-government grows, and agencies progress in their understanding of its benefits and the changes it requires, e-government will enter a second phase in which portals integrating a wider range of online transactions in a secure environment will be more widespread. The areas in which progress is likely to be faster coincide in part with those in which the private sector is getting more benefits from the Internet. They include procurement, applications to help agencies share information more efficiently and websites that provide convenience for citizens (renewing licences online, for instance) and reduce transaction costs for the agency.

The following are some other basic points that should be kept in mind by agencies considering how to use the Internet to enhance their operations:

- Technology for e-government does not need to be complicated, but it must be reliable and fast;
- As long as a large part of the population remains without easy access to the Internet, traditional channels such as counter service or the telephone will retain an important role. The requirements of people with special difficulties to use technology need to be taken into account too;

- Citizens and businesses need to be made aware of the availability and advantages of e-government services;
- E-government projects are an excellent opportunity for new partnerships with the private sector, which can contribute financial resources and its experience of e-business;
- E-government poses a complex challenge that calls for political commitment and a clear strategic vision at the highest possible level.

6. Overview of Selected Legal and Regulatory Issues in Electronic Commerce

Finding global solutions to address global transactions

Ensuring users and consumers effective redress for disputes arising from transactions in the online environment is a key element in building trust. There is a widespread awareness of the potential legal barriers arising from recourse to courts in disputes resulting from cross-border online interactions. Which law applies? Which authority has jurisdiction in the dispute? Which forum is competent to hear the dispute? Is the decision enforceable? These are some of the questions that all too often arise and for which there is not yet a clear answer. Electronic commerce has increased the need to rely on party autonomy, the choice-of-court clauses becoming central to any discussion of court jurisdiction. Thus, it is essential that national legal systems clearly provide for rules on which parties can rely in order to ensure that their choice-of-court clauses will be deemed valid. Uncertainty in this respect is detrimental to the trust which private operators will have in the judicial and legal systems of a particular country. To assist States in their efforts to accommodate e-commerce, this chapter analyses a number of options for countries wishing to develop a set of choice-of-court rules. A difference is made in this regard within business-to-business (B2B) and business-to-consumer (B2C) con-

tracts, as well as between (i) contracts concluded online and performed offline, and (ii) contracts concluded and performed online.

Disputes in cyberspace: Online solutions needed for online problems

It is well known that public law-making is too rigid, too slow in responding to the need for immediate adjudication, and too slow adapting to changes to the social, technological and commercial customs of cyberspace. In contrast, private law-making and private adjudication are more flexible and readily adapt to the diverse evolving technological and social nature of cyberspace and its changing commercial practices. Given that traditional dispute settlement mechanisms may not provide effective redress in electronic commerce transactions for a large number of the small claims and low-value transactions arising from B2C online interactions, this chapter analyses the various alternative dispute resolution (ADR) mechanisms that would provide speedy, low-cost redress. When ADR takes place using computer-mediated communications in the online environment, it is often referred to as online dispute resolution (ODR). Both e-disputes and bricks-and-mortar disputes can be resolved using ODR. The system could be used in a variety of contexts, including within a particular online market place (e.g. mediation in online auction sites, arbitration in the domain name system and in the automated negotiation process for insurance disputes), as part of a trustmark or seal programme, or on an independent basis. These ODR mechanisms range from those which are fully automated — in that a computer program without human intervention generates outcomes — to most other ODR providers that offer dispute settlement with human intervention. Parties may contract for a range of ODR services from mediation, which aims at encouraging the parties to reach an amicable settlement of their disagreement, to binding arbitration, which imposes on the parties a legally enforceable arbitral award. As of December 2000, more than 40 ODR providers had been identified.

Jurisdiction: Is your enterprise website regarded as a branch?

Concerning jurisdiction, two main questions are addressed: (i) can an Internet site be regarded as a branch or establishment for any legal purpose? and (ii) is the level of interactivity relevant? As regards the first question, it seems that the tendency is to consider that a website does not qualify as a branch or permanent establishment. Thus, the place of establishment of a company providing services via an Internet website is not the place at which the technology supporting its website is located or the place at which its website is accessible, but the place where it pursues its economic activity. The answer to the second question for a large number of countries is also clear: whatever the level of interactivity of the website, it will not change the answer to the first question. However, if a site is an interactive one, it may lead some countries, which apply a doing-business concept for court jurisdiction to assert jurisdiction as long as the interactivity can be seen as a clear link with the State whose courts assert jurisdiction.

Applicable law: A new concept of consumer protection

As regards applicable law, an important difference has to be made between B2B and B2C contracts. Concerning B2B contracts, there is a renewed interest in codes of conduct. Thus, States are confronted with an ever-increasing duty to define carefully the limits of their public policy rules, since operators over the Internet often develop their own codes of conduct. Whether or not operators can include a choice-of-law clause in their contracts will be determined by the public policy of each State. In the case of B2C contracts, and for a large majority of countries where consumers are protected, the law applicable would be the one which is more favourable to the consumer. Therefore, if the law of the location of the consumer is more favourable, it will apply; but if, on the contrary, it is not, the law of the professional who supplied the service or the goods will apply. This is the main reason why Internet operators have been so keen to block all adoption of rules of the same nature for the

Internet. This is one of the areas that would greatly benefit from an international agreement on common rules of protection for consumers. Concerning torts, most decisions which have been taken by national courts around the world apply the law of the place where the effect is felt, and not that of the country where the tort was committed. This rule needs to be reassessed against Internet specificity.

Data protection: Convenience at the cost of privacy?

The question of privacy and data protection over the net is another important issue. It is well known that the value of many Internet corporations depends on the amount of data they are able to gather. Thus, personal data about consumer habits, tastes and the like are of great value to any corporation wishing to operate over the net. A consumer may want to limit the availability and use of each of these types of information and may make decisions about entering into a transaction based on the extent to which the information will be protected. The problem is not new, what is new is its scale. It is this dilemma — keeping our personal information private, while allowing use of that information to make our lives easier — that is the crux of the current data protection debate. The more legal protection and control individuals are provided with as regards their personal information, the more costly it becomes for companies to comply with those protections, and for Governments to investigate and prosecute violations of those rights. Removing legal barriers to the free flow of information, while allowing for more innovation, development, and more personalized service, will lessen legal protection of personal information. Although the unification of substantive law remains the best solution for international protection of privacy and personal data, in practice it is not always possible to unify all aspects of the law. Therefore, the question of applicable law (e.g. the law of the location of the person whose data are collected) is still pertinent in this context. However, when the conflict rule clashes with the economic needs of Internet operators, it must remain a default rule to be applied only if substantive unification is not possible.

Legal recognition of electronic signatures: The options

As regards encryption and electronic signatures, there seems to be a consensus that a mechanism for secure authentication of electronic communication is critical to the development of electronic commerce. Such a mechanism must provide for confidentiality, authentication (enabling each party in a transaction to ascertain with certainty the identity of the other party) and non-repudiation (ensuring that the parties to a transaction cannot subsequently deny their participation). This chapter provides a review of the basic approaches to electronic signature legislation together with some recent samples of regional legislation that might guide States wishing to prepare legislation on electronic signatures.

Cybertaxation: No escape

So far, businesses have enjoyed a largely tax-free e-commerce environment. In other words, goods and services transmitted electronically have not been subject to taxation. However, fears of revenue losses from uncollected taxes and duties on Internet transactions have prompted many Governments to work towards internationally agreeable solutions with regard to changing existing tax legislation to take account of e-commerce.

Who pays the VAT: Buyer or seller?

At the centre of the e-commerce taxation debate are two issues: consumption and income taxation. As far as consumption taxes are concerned, the question arises whether the tax should be collected in the jurisdiction of the supplier or the consumer. Under current legislation foreign suppliers are often exempted from VAT. This provides incentives for suppliers to locate abroad and gives an unfair competitive advantage to foreign suppliers. Therefore, there seems to be a growing tendency towards applying taxation in the place of consumption. Given the disappearance of intermediaries who previously collected the VAT, it is not clear yet who should collect the taxes now. The EU has proposed that the foreign supplier should register in a EU country for VAT purposes. The United States, being the largest exporter and a net exporter

of e-commerce, tends towards an origin-based consumption tax. Furthermore, it has little interest in collecting VAT for European tax authorities on their e-commerce goods and services exports to the EU. Developing countries, which will be largely e-commerce importers in the short to medium run, would have an interest in not eroding their tax base by switching to an origin-based tax system.

Is my website a taxable business?

As far as income taxation is concerned, much of the debate has focused on the issue of the "permanent establishment" (PE) of a business. This will determine to what extent an Internet-based business will be subject to taxation. The definition of PE is important for countries that apply source-based income taxation (the majority of countries). Agreement has been reached at the OECD on the following issues: (i) a website by itself cannot constitute a PE; (ii) a web server hosted by an Internet service provider (ISP) cannot constitute a fixed place of business if the ISP does not carry on business through the server; (iii) a web server can constitute a fixed place of business and thus a PE if it is owned by a business that carries on business through the server; and (iv) ISPs cannot be PEs of the businesses whose websites they host. Developing countries, even if they are not part of an OECD agreement on Internet taxation, should use the agreed-upon rules as a basis for adjusting their own legislation. Since they are net importers of e-commerce, they will run a greater risk of losing revenues if traditional imports are replaced by online delivery, and should thus start to develop efficient tax collection systems for e-commerce.

No customs duties on digital goods: A fiscal concern?

In accordance with a WTO moratorium, no customs duties should be imposed on electronic transmissions. While a large number of (mainly developed) countries prefer to extend the moratorium, some developing countries have expressed concern about potential revenue losses resulting from uncollected border tariffs. The question of how to define digitital goods (books, CDs, software, music etc.) — as goods or as services —

has held up progress on e-commerce in the WTO. While border tariffs are normally collected on goods, they are not collected on services. Developing countries have therefore raised the question of potential fiscal implications if digital products are imported duty-free. UNCTAD calculations show a potential fiscal loss of approximately US$ 1 billion on border tariffs and US$ 8 billion if other import duties (including VAT) are taken into consideration. While these amounts are small relative to total government revenue, absolute losses from forgone tariff revenues are much higher in the developing countries, owing to their higher tariffs applied to digital products.

7. Managing Payments and Credit Risks Online

Online payments: A pre-requisite for e-commerce?

The issue of online payments has been identified at several UNCTAD meetings as one of the main obstacles to the growth of e-commerce in the developing countries. In particular, the lack of know-how, the high initial costs of introducing online payments mechanisms and difficulties in ensuring secure digital transfers via the Internet are often listed among the major impediments. Although e-commerce transactions in developing countries still rely mainly on "online conclusion and offline payment", as the volume of e-commerce expands the development of online payments will become a pressing issue.

Moving from traditional to online payment

The dramatic difference in cost and speed between traditional and Internet-mediated financial services and related information delivery has led to rapid growth of online payments, e-financing and online credit risk management, thus bringing about profound changes in the whole system of financial services and intermediation. Online versions of nearly

all existing payment methods are appearing rapidly. Moreover, new instruments and modes of financial intermediation such as smart cards and Internet banking are becoming the dominant features of the emerging, Internet-based international financial system.

Conventional financial instruments with online analogues include cash, money orders, giro transfers, cheques, drafts, notes and bills of exchange. The existing modes of third-party protection against the risks of non-payment and non-performance, including documentary credit, credit insurance, bonding, factoring and forfeiting, are also rapidly developing their online equivalents. The same applies to wholesale payment systems, including so-called automated clearing house (ACH) networks, "wire transfers" for large-volume payments and interbank payments networks.

Credit and debit cards, which were already the most widely accepted mode of electronic payments, especially in B2B relations, have become the principal payments instrument in B2C e-commerce. The move from cards with magnetic strips to "smart cards" with multifunctional chips that include security features is the next Internet-centred stage in the development of the payments cards industry.

In parallel, Internet technologies to provide security in online payments have been evolving. The first, and still the most widely accepted standard, is the Secure Socket Layer (SSL), a set of built-in browser protocols designed initially by Netscape to protect card-based financial transactions on the Internet. A more secure and complex bank-centred Secure Electronic Transactions (SET) software is currently being used more and more by online payments providers.

Another increasingly popular method for carrying out large B2B payments is Internet banking. Moving online transfers such as ACH debits or credits, as well as domestic and international wire transfers, became possible with systems such as the Bank Internet Payment System (BIPS), which work as an Internet 'front-end' to the existing ACH. The latter can now be initiated directly by companies. The Society for Worldwide Inter-Bank Financial Telecommunications (SWIFT) — the largest international

interbank payment network — also started this year its move to the open Internet platform. Initiatives to introduce new regional and global systems for online real-time gross settlements and clearing operations all reflect the expectation of exponential growth in online payments.

New ways to secure financial transactions and financial stability?

For a successful online transaction to take place, the contracting parties should be able to find at low cost information on the corporate and financial health and performance of each other or be adequately protected by third parties. As in the case of conventional transaction protection by third parties, the Internet needs modern risk management tools. The leaders of the industry, including credit insurance, credit information, factoring and other companies or their alliances, are moving online to follow their clients and to protect them from political and commercial risks inherent in trade and investment.

The emergence of e-finance may pose new regulatory challenges related to the emergence of non-bank organizations operating electronic cash or online accounts holding substantial amounts of deposits. Monetary authorities may in the future have to take into account the effects of e-cash and other money substitutes on monetary aggregates and monetary policy instruments, although for the time being the volumes involved are too small for this issue to be more than a theoretical matter. At the same time, the blurring borders between instruments and service providers, the emergence of new entrants and the global character of e-finance make financial regulation an even more complex task and increase the importance of effective international coordination among the financial regulators.

E- finance for developing countries

Banks and financial services companies in the developing countries will need to adopt online payment systems and practices that will meet their clients' new needs arising from a shift to e-commerce. They will need to

adopt systems that address the key issues of concern to users, namely security, confidentiality, identification of sellers and buyers, verification of buyers' solvency and guarantee of delivery. Similarly, regulatory authorities will need to provide the necessary supportive measures to ensure that acceptable system standards are established and maintained.

To obtain e-trade finance and equity investment, companies from developing countries need to be registered in local, regional and global Internet-based commercial risk databases. For that, company registries, public courts, accountancy and audit, and other business-related services should undergo substantial enhancements. Non-bank financial services such as credit information, credit insurance, factoring and leasing should develop. Local banks should adapt to e-banking and move online their customer credit risk databases, and their individual and corporate customer payment services and financing, including trade finance instruments. Overcoming the digital divide in finance also implies closer cooperation between local and international financial service providers, including active co-financing by development banks, as well as concerted technical assistance, including training, from specialized international organizations.

8. E-Logistics: Delivering the Goods in E-Commerce

Why logistics services are critical to the success of e-commerce

Logistics services for e-commerce (e-logistics) have proved to be an area that requires major improvements if e-commerce is to achieve its full potential. The failure of many e-tailers, for example in the United States, to fulfil orders during peak demand periods and the reluctance of some sellers to engage in international e-commerce because of the complex logistics requirements clearly demonstrate the critical role of e-logistics.

The existing e-logistics problems arise largely from the fact that e-commerce and the demand for related logistics services have grown at a much faster rate than that at which suitable logistics services and solutions have been developed.

Solutions being used to improve logistics for e-commerce

Traders have responded to the increased demand for logistics services that arises from e-commerce by adopting a variety of methods. These include handling of order fulfilment by companies themselves using in-house logistics services, outsourcing fulfilment to third-party logistics service providers (3PLs), drop-shipping and various combinations of these methods. Concurrently, considerable efforts have been made to develop software applications in order to automate logistics functions such as order management, cargo and equipment tracking, transportation management and planning, customer service management and returns management. It is estimated for that by 2000 worldwide sales of software, hardware and services used in electronic logistics had reached US$ 277 billion, and they are expected to reach US$ 1 trillion by 2005.[9] While these figures appear to be on the high side, they nevertheless provide a useful indication of the importance being given to the issue of logistics in e-commerce.

Difficulties faced

Technology plays a critical role in providing systems that can enhance the ability of logistics service providers to satisfy customer demands. The main weakness of the efforts to develop applications for improving logistics is the general lack of integration between the various applications used for different logistics functions. Many of the applications are designed to handle different types of logistics functions, and this tends to lead to the existence of incompatible systems being applied to related logistics functions.

Another factor that impedes the effectiveness of e-logistics services is the existence of a multitude of constraints brought about by inefficient trade facilitation. The major problems in this area include:

- The existence of a considerable number of disparate documentation requirements, which include government documents, commercial documents and those relating to transportation;
- The lack of harmonization of customs procedures and tariff classification systems;
- The existence of custom valuation of exports and imports in many countries that is characterized by such problems as double invoicing and undervaluation, thus making assessment of the true value difficult;
- The existence of outdated trade procedures such as exchange controls, long retention of goods in customs custody and regulations that require paper documents;
- Lack of transparency in many regulations, leading to the inability to predict costs and delivery times;
- Customs administrations that are poorly equipped, as regards physical infrastructure and human resources and also lack of cooperation between customs administration of different countries. Many customs administrations are also prone to corruption, which leads to delays, high costs and a distortion in trade information;
- Limited use of automation and information technology in trade facilitation functions, leading to delays, high costs and inefficiencies.

The way forward

To achieve more efficient e-logistics and e-fulfilment, it is desirable to have a trading environment in which there is sufficient information about goods as regards their description and origins, and destinations. Sellers and buyers should be able to monitor and track goods at every point along the way from the supplier to consumer. All stakeholders should be able to check on the Internet the availability and status of orders. All this can be achieved if trade information is simplified, automated and fully harmonized in all countries and when all restrictive government export/import regulations and practices have been eliminated. It also

requires sophisticated supply chain management systems for compiling and enabling global end-to-end monitoring of trade information.

To accomplish these broad objectives and also to take into account the special problems of developing countries, it is recommended that Governments, the international community and the private sector cooperate in promoting the following specific measures:

- To take advantage of the great potential provided by the Internet technology in order to capture, transfer and monitor trade information over global networks of supply chains in an open fashion;
- To enhance and improve the harmonization of the classification of commodity tariffs and facilitate the identification of individual consignments;
- To automate trade processing and particularly customs declaration systems in order to develop customs-to-customs information exchange and thereby provide a basis for the elimination of unnecessary export/import requirements, which can instead be replaced by fully integrated international transactions. In this context, the International Trade Prototype (ITP) project created by the United Kingdom and the United States customs administrations to develop a system that could enable information provided for export declaration to be used to fulfil the data requirements for import entry in the country of destination could provide a model to be developed at the international level. This system, however, could only be implemented if all government customs requirements could be simplified and harmonized and the transmission of trade information based on internationally agreed standards. A preliminary evaluation has shown widespread support for further development of the project, and the international community should lend its support to the project as well;
- To harmonize and simplify trade facilitation regulations and procedures, and in particular to encourage greater harmonization of customs procedures through wide adoption and implementation of the revised Kyoto Convention on the Simplification and Harmonization of Customs Procedures;

- To encourage greater transparency in trade processing activities and take measures to reduce corruption and other forms of malpractice in customs administration;
- To promote greater integration of software applications for logistics functions, including the use of such systems as XML (eXtensible Markup Language);
- To promote partnerships between logistics service providers of developing countries and those of developed countries that are applying e-logistics systems;
- To provide technical cooperation programmes to developing countries in promoting services that support e-logistics, for example in customs, transportation services, cargo terminals and related services and also in the automation of trade information.

9. Electronic Commerce in the Least Developed Countries

A survey of the status of electronic commerce in 10 of the least developed countries (LDCs) was conducted by UNCTAD in 2001. The countries visited were Bangladesh, Cambodia, Ethiopia, Madagascar, Mozambique, Myanmar, Nepal, Togo, Uganda and the United Republic of Tanzania. The objective of the survey was to identify enterprises engaged in e-commerce in the LDCs, and sectors in which e-commerce may create new opportunities for these countries. The cases of 16 enterprises were selected for presentation in the *Electronic Commerce and Development Report 2001* among those identified through the survey. The criteria used to select them were potential market size, the sustainability of their competitive advantage, the qualifications of the management and the replicability of their business models.

Is e-commerce part of an LDC development strategy?

A prerequisite for international trade to make a positive contribution to the development of the LDCs is the generation of productive capacities there. The various policies implemented by the international community and national Governments over the past two decades have had little success. Adopting e-commerce may now place the LDCs in a better position to use international trade as a tool for development for two reasons. First, an important factor explaining the failure of export promotion policies in the LDCs is the impact of transport costs and inefficient trade procedures in the competitiveness of LDC enterprises (transport can amount to up to 40 of the total cost of the exportation of a product). LDCs enterprises in a number of sectors may find that e-commerce enables them to overcome some of these obstacles and thus become more competitive in international markets. Second, e-commerce may give some LDCs an opportunity for economic diversification by entering into new sectors, particularly in the field of teleservicing, where they can enjoy advantages derived mainly, but not exclusively, from their low labour costs.

It is well known that entrepreneurs in the developing world who wish to engage in e-commerce face serious difficulties, including a lack of infrastructure, IT skills, legislation, payment methods and financial resources. The participation of LDC enterprises in the digital economy is also limited by the relative lack of government interest in e-commerce issues. Very few LDCs have an e-commerce policy in place. Of those surveyed by UNCTAD, only Bangladesh is at an advanced stage in developing an information technology policy. Others are in the early phases of their e-commerce strategies and IT policy development.

However, all these problems should not obscure the fact that ICT and the Internet have a significant potential to generate new business opportunities for LDC enterprises seeking to participate in international trade. In particular, the LDC physical infrastructure for e-commerce is limiting but not prohibitive and new technologies (web enabling, cellular applications) offer exciting new opportunities to leapfrog development of a

local e-commerce infrastructure. The availability and the quality of telecommunications have indeed improved dramatically in LDCs, although most of the countries surveyed still reported relatively high local telecommunications costs.

Electronic commerce niches

The survey revealed the existence of potential niches for e-commerce projects in the LDCs and identified examples of successful business-to-business, business-to-consumer and other concrete actions taking place mainly at the initiative of enterprises, and to a lesser extent, of Governments.

An important point illustrated by these examples is that the most serious problem for LDC enterprises as they embark on e-commerce is not technology but the need to change their business culture and practices. The success stories identified in the survey are the achievements of dynamic entrepreneurs that found ingenious solutions to bypass traditional obstacles to international trade. That is the case, for instance, of SMEs using the capacities of developed country-based banks or Internet service providers (ISPs) to develop their web platforms and payment facilities, or using network agents such as restaurants as their distributors around the world. Success has come to those LDC enterprises that have been able to progressively generate consumer trust by creating a loyal subscriber base, by offering information about home or by developing an agent network in the target market.

"Offline teleservicing" (B2B) is recognized as a very viable opportunity for the LDCs. This includes transcription services, data input, software development, remote access server maintenance, web development, creation of databases, digitization of old documents (i.e. architectural drawings), translations and editing. There are indeed a few case studies indicating that opportunities abound in this industry, even if the LDCs already face stiff competition from other developing countries (India, Philippines, etc.) that are also able to offer a lower labour cost environment. In addition to attractive low labour costs, e-commerce creates opportu-

nities to exploit advantages derived from the loss of economic significance of distances and the geographical location of LDCs in various time zones.

There are also business-to-consumer opportunities, though limited, that involve servicing the diaspora market, and developments in international business-to-business exchanges will eventually provide opportunities to commodity suppliers and manufacturers.

Perspectives for the development of an e-commerce strategy

E-commerce policy and laws are important, but the lack thereof should not deter enterprises from implementing e-commerce strategies. E-commerce has flourished in the United States for many years without the existence of specific e-commerce legislation. This having been said, for the LDCs to make headway in the digital economy Governments should take a more active role, in particular in addressing the lack of an e-commerce business culture and the human resource needs of their countries.

Most of the countries surveyed had a sufficient infrastructure from which enterprises could implement some form of e-commerce strategy. This is partly due to the fact that ISPs are available in most cities, and partly due to the nature of the Internet itself, which enables companies to be serviced by ISPs based in developed countries (i.e. hosting, payments, web design etc.). Some of the cities visited have excellent connectivity for businesses, some of the ISPs offering wireless options on fixed monthly subscriptions albeit expensive, and a greatly improved telecommunications infrastructure in certain cities (i.e. fibre-optic cabling in Kampala). However, restrictive regulations such as exchange controls, protection of telecommunication monopolies, restrictive trade practices and prohibitions (i.e. encryption, Internet telephony, own gateway access etc.) are highest on the list of concerns indicated by LDC enterprises wanting to engage in e-commerce.

10. China's ICT Strategy and E-Commerce

A government-driven strategy

China adopted its ICT development strategy in the early 1980s in the context of constructing the information highway as a path to modernization and economic development. It eventually led to the launching of the Golden Projects, which include the Golden Bridge, an electronic information network linking provincial regional nodes with a central hub in Beijing; the Golden Card, an electronic money project designed to accelerate the development of electronic banking and a credit card system; and the Golden Gate, a foreign trade information network designed to promote information exchange concerning foreign trade and foreign investment, paving the way for eventual transition toward paperless trade. It is a top-down strategy with government backing and under government control. Some outside observers have criticized the Golden Projects as an attempt to strengthen government control which may prevent businesses and individuals from fully exploiting the potential of the Internet.

The substantial public investment in the telecommunication infrastructure has brought about considerable growth in the ICT industry. According to official statistics for 2000, the national telephone penetration rate by home rose to 20.1 per cent with a higher urban area rate of 39 per cent. Telephone network capacity in absolute terms has advanced its global ranking to second from 17th in the 1980s. The total length of fibre-optic cables was 1.25 million kilometres. The personal computer penetration rate is less than 3 per cent with only 30 million computers in the country. But the ICT industry has a PC production capacity of 8.6 million. A high growth of computer penetration rate can reasonably be expected in the next few years.

Internet users double every six months

Despite this impressive growth in the basic telecommunications infrastructure, e-commerce is still in its infancy. However, there are signs of increasing interest in e-commerce. The number of Internet users doubles every six months, faster than in India, Malaysia or Thailand. As of January 2001, the number of users stood at 22.5 million, with 8.92 million PCs connected to the Internet. According to the Ministry of Information Industry, by March 2000 China had 800 online shopping sites, 100 auction sites, 180 remote education sites and 20 remote medical sites. It also had 300 Internet service providers and 1,000 portals. However, a substantial increase in the number of actual business transactions conducted online has yet to materialize. In 2000, B2B transactions amounted to US$ 9.29 billion. B2C transactions have been insignificant — only US$ 47.17 million. E-commerce transactions represent only 0.87 per cent of GDP. Chinese enterprises and consumers are not e-ready for a number of reasons, including high Internet access cost, restrictions on Internet services, lack of a nationwide credit card system, slow and uncertain delivery, network insecurity, lack of awareness of the benefits of electronic commerce and lack of knowledge of e-commerce technology. Major efforts have to be made to remove these impediments in order to allow significant growth of e-commerce.

China's commitments in the WTO will spur e-commerce

The initial commitments which China made to progressively liberalize its telecommunication services upon accession to the WTO may create a competitive environment that will substantially reduce access cost and spur the growth of electronic commerce. In value-added and paging services, foreign service suppliers may hold 30 per cent of equity shares upon China's accession to the WTO. This may increase to 49 per cent one year later and 50 per cent after two years. In mobile voice and data services, foreign service suppliers will be permitted to provide analogue and digital cellular services and personal communication services. The committed liberalization of financial services will also have a major impact on electronic commerce.

A promising future

The major foreign ICT companies, and banking and financial corporations (including insurance companies), are queuing up for the green light to invest in the huge potential market. Telecommunication and financial services are the key sectors in the development of e-commerce. However, a significant growth of e-commerce would require major efforts in liberalizing telecommunication services, enhancing the Internet and PC penetration rate, establishing a comprehensive, uniform legal framework providing adequate protection of security, privacy and intellectual property rights, creating an efficient electronic payment system, creating a competitive environment to improve services and reduce access cost, and accelerating human resource capacity-building including language skills.

Despite the technological and economic obstacles, the number of the Internet users is expected to keep on increasing. As Chinese businesses increasingly incorporate the Internet into their operations, and users become more sophisticated, demand for higher-quality Internet access services will grow. In order to respond to this demand, the role of the private sector in the development of e-commerce in China will have to become more important than in the past. This, coupled with government initiatives and anticipated foreign investment in the ICT sector, will allow China to become a key player in e-commerce, matching its success in international trade.

Notes

1 Although ICT includes the Internet, a distinction is made between them because while ICT has been widely in use in businesses at least for the last two decades, it was with the development of the Internet, which enables people and enterprises to share information and to work together faster and at a lower cost, that the full potential of ICT to enhance productivity was unleashed.

2 See, for example, Jorgenson (2001), Oliner and Sichel (2000), Brynjolfsson and Hitt (2000) or Haynes and Thompson (2000). For a dissenting view, according to which most of the surge in productivity growth outside the ICT goods sector is cyclical rather than structural, see Gordon (2000).

3 Recent advancements in chip design and manufacturing should ensure that Moore's law (which states that the processing power of a silicon chip doubles approximately every 18 months) holds for another decade.

4 Indeed, there are signs that the Nasdaq crash has not made companies in the United States stop equipping themselves for e-commerce. For instance, recent data from Netcraft, a company that surveys the usage of web server software, indicate that the number of Secure Socket Layer servers (mostly used in e-commerce websites to perform encrypted transactions) in the United States increased by 50 per cent between July 2000 and July 2001. See www.netcraft.com/survey.

5 See David and Wright (1999).

6 PricewaterhouseCoopers and 3i Group (2000).

7 Press release available at http://www.jmm.com/xp/jmm/press/2001/pr_060401.xml.

8 The Economist (2001).

9 See Coleman, M. "Software gets its hands dirty" Investors' Business Daily, 5 January 2000.

References

Brynjolfsson, E. and Hitt, L.M. (2000). "Beyond computation: Information technology, organisational transformation and business performance", *Journal of Economic Perspectives*, vol. 14, no. 4, pp. 23–48.

David, P. and Wright, G. (1999). "Early twentieth century productivity growth dynamics: An inquiry into the economic history of 'Our Ignorance'", University of Oxford Discussion Papers in Economic and Social History, No. 33, October, p. 23.

Gordon, R.J. (2000). "Does the new economy measure up to the great inventions of the past?", *Journal of Economic Perspectives*, vol. 14, no. 4, pp. 49–74.

Haynes, M. and Thompson, S. (2000). "The productivity impact of IT deployment: An empirical evaluation of ATM introduction, *Oxford Bulletin of Economics and Statistics*, vol. 62, no. 5, December, pp. 607–619.

Jorgenson, D.W. (2001). "Information technology and the US economy", *American Economic Review,* vol. 91, March, pp. 1–31.

Oliner, S. and Sichel, D. (2000). "The resurgence of growth in the late 1990s: Is information technology the story?", *Journal of Economic Perspectives,* vol. 14, no. 4, pp. 3–22 .

PricewaterhouseCoopers and 3i Group (2000). Global Private Equity 2000. A Survey of the Global Private Equity and Venture Capital Markets. Report available at http://wwwpwcmoneytree.com and http://www.3i.com.

The Economist (2001). E-strategy brief: General Electric, 17 May.