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**ELECTRONIC COMMERCE, INTERNATIONAL TRADE AND EMPLOYMENT:**  
**REVIEW OF THE ISSUES**

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## **Introduction**

Electronic commerce is a relatively new phenomenon. Its rapid expansion since the mid-1990s has drawn attention to the impact it will have on promoting trade, economic growth and development. In addition to the many benefits associated with e-commerce, concern has been rising in regards to the widening technological gap, 'the digital divide' among countries and sectors within countries.

Electronic commerce and the Internet are posed to stimulate trade by lowering the cost of gathering and processing information from distant markets, by creating global access to specific goods and services and by making it possible to send over the Internet goods and services that traditionally required physical delivery.

Electronic commerce is expected to directly and indirectly create and destroy jobs. New jobs will be generated in the information and communication technologies sector, while the indirect creation of jobs will occur via increased demand and productivity. At the same time, some reallocation and destruction of jobs are expected as a consequence of changes in the way of doing business. The net effect on employment will be the resultant of a complex set of interactions and will by no means be uniform across countries, geographic areas, industries or skill groups.

This paper will review the issues relevant to the impact of e-commerce on international trade and employment. Any discussion on these issues is necessarily tentative since evidence of the impact of electronic commerce on economic and social processes is only beginning to accumulate. The paper is organized as follows:

Section I, provides an overview of electronic commerce and its economy-wide effects. Section II, includes some indicators that shed light on the growth e-commerce and the overall state of e-readiness in the region. Section III, highlights the relevant issues dealing with the impact of e-commerce on trade and employment. Section IV, presents concluding remarks.

## **I. Electronic Commerce: An overview**

As electronic-commerce (e-commerce) grows and further exploits the attributes of the Internet, it will likely have significant effects on national economies and industry structure. E-commerce has come to take on two important roles; first as a more effective and efficient conduit and aggregator of information, and second, as a potential mechanism for the replacement of many economic activities once performed within a business enterprise by those that can be done by outside suppliers that compete with each other to execute these activities. In response to this increased level of outsourcing opportunities, businesses will exploit the benefits of e-commerce by decoupling as many links of their production chain as possible in order to seek the most efficient and low cost supplier within the e-marketplace. Given as the Internet has a global reach, these new e-marketplaces have fast become a product of globalization, leading the Internet and e-commerce to further the process of global integration.

### **1.1 What is electronic commerce?**

In its most basic form, e-commerce is any transaction made over the Internet. Most often this involves the transfer of goods, services, or information. Common e-commerce models include:

- Business-to-business e-commerce, companies interacting with other companies, seeking supplier bids, fulfilling orders, receiving invoices and making payments using the Internet as a backbone;
- Business-to-consumer e-commerce, retail services between companies and customers;
- Consumer-to-consumer e-commerce, trade in goods, services and even information between two or more consumers. Beyond the sale of goods,

through auction sites like eBay or Yahoo!, this model includes such “human intelligence” services sites like Keen.com and Guru.com; and

- Information retrieval, from public sites such as government agencies, libraries or museums or proprietary sites such as those operated by online banking services or brokerages.

The Internet is only the latest stage in advances in information and communication technologies (ICTs) that have progressively made information more accessible, faster to gather, less expensive to consume, and easier to analyze effectively. Due to the generally low cost of the technology that makes access to the Internet possible, it is more universally affordable than other previous electronic means of communication or information technology.

While using electronic means to communicate and exchange goods and services (i.e. bulletin board systems, e-mail) is not new, today’s e-commerce model is more effective because it exploits the best qualities of the Internet. The Internet’s ubiquity, interactivity, ability to integrate data platforms and distribute intelligence allows e-commerce to discover new markets and consumers, foster economic specialization and increase productivity. In this regard then, e-commerce only accelerates the trend toward globalization, integration and specialization, that has been underway for many years.

The Internet is a powerful enabler of e-commerce. Its most salient characteristics are:

**Reach.** The Internet is becoming nearly ubiquitous. Its ease of access and low cost has aided its rapid diffusion. Any end user (with the appropriate equipment and software) with access to a communications network can gain access to the Internet, regardless of geographical location and time of day. The ubiquity of the Internet defines the potential size of the e-commerce market. The greater the reach of the Internet, the larger the potential market for e-commerce.

**Speed.** The Internet provides a rapid form of communications. Large quantities of data can be transmitted, retrieved and processed very fast, and getting faster with each new technological advance. The speed of transactions allows for efficiencies (lower search cost) on the demand side of the market and even greater ones (efficient management) on the supply side.

**Interaction.** Standard Internet protocols facilitate considerable interactivity between users. The ability of the Internet to allow individuals anywhere in the world to share information, ideas, data through a medium allows them to interact as much as possible and in as many ways as possible. From a business model perspective, exploiting this interactivity is key. Now goods and services can be tailored-made to the individual customer's preferences, including advertising, special offers, and recommendations.

**Media Integration.** Internet protocols allow for the integration of several data platforms, such as voice, video and text, onto one network. By allowing more efficient and effective utilization of all types of data from various platforms, the integration qualities of the Internet allow firms to better manage complex production processes, and can even achieve great savings with lower fixed and marginal costs. For consumers, the Internet's integration capabilities expand the way they can retrieve and provide data.

**Intelligence at the edges.** Finally, the Internet's most important feature is that its intelligence lies at the edges of the network, where the end users are. Intelligence at the edges means that the Internet has the ability, distributed throughout the Internet, to retrieve, store, analyze and process information. Intelligence at the edges of these networks, allows for innovation, creativity and ingenuity that could potentially come from any end user connected to the Internet. E-commerce will continue to evolve as quickly as innovators at the

edges of the Internet can design a business idea and code it into software compatible to Internet Protocols.

## **1.2 The effects of e-commerce on the economy**

Information and communications networks are playing a significant role in the reorganization of production and the conduct of business. In particular, the Internet and e-commerce are transforming the way firms operate by redefining how back-end operations – product design and development, procurement, production, inventory, distribution, after-sales service support, and even marketing – are conducted. In this process, the Internet and e-commerce alter the roles and relationships of various parties, fostering new supply networks, services and business models. The end results are efficiency improvements, better asset utilization, faster time to market, reduction in total order fulfillment times, and enhanced customer service. Consequently, information and communication technologies are associated with economy-wide productivity improvements and gains in welfare.

### **1.2.1 Electronic commerce and the firm**

Over the past two decades, a combination of technological and market forces have compelled companies to examine and reinvent their supply chain strategies. To stay competitive, firms have searched for greater coordination and collaboration among supply chain partners (supply chain management or supply chain integration) to wring out the inefficiencies that might exist within firm transactions. Many of the transactions that were done internally can now be done externally, via electronic markets. The Internet and its applications have thus served to enhance the process to increase efficiencies in supply chain management.

In addition, these technologies will allow companies to further push customization to new dimensions. Competition on the basis of customized orders requires the management of complicated processes and specialized information and communications capabilities. For example some firms, would compile information on the characteristics of the good a customer

requires, gather the appropriate components from a variety of producers and finally integrate all the components to meet customer specifications. These “integrators of components” will be heavily dependent on the capabilities of the Internet to process and execute the specific market demands that arise.

Moreover, ICTs allows firms to identify the market for the inputs they need in production and substantially reduces the cost of gathering and processing information about the prices and input characteristics of different goods and services. New economic agents, such as, specialized suppliers, will begin to participate in e-markets for business. E-commerce, and specifically e-markets, are expected to increase competition among these and other potential suppliers bidding to provide outsource goods and services.

In addition, information and communication technologies (better, cheaper and faster voice, data and video communications) make it easier to integrate and control remote operations without incurring prohibitive costs. Better ICTs enable optimized operations to be established in low cost domestic locations and/or countries where comparative advantage is present for the outsourced task. E-commerce thus facilitates the efforts of companies to separate and spin out every conceivable activity in the production process to entities outside the firm (i.e., encourages outsourcing to happen at a global scale.) Costs of transport of intermediate products and/or the need to maintain cost-effective managerial control over remote operations both within and across national boundaries are more manageable in the world of e-commerce.

### **1.2.2 E-commerce and productivity**

Evidence from countries where the use of information and communication technologies is widespread suggests substantial improvements in productivity. In an analysis of the contribution of information and communications technology to economic growth in nine OECD countries, Colecchia and Schreyer (2001) found that over the past two decades, ICTs contributed between 0.2 and 0.5% per year to economic growth. During the second half of the 1990s, this



contribution rose to 0.3 to 0.9% per year. Effects were the largest in the United States, followed by Australia, Finland and Canada.

Moreover, several studies conclude that information and communication technologies were an important factor in improving the overall efficiency of labor and capital, (multifactor productivity) in the United States (Oliner and Sichel (2000), and Jorgenson and Stiroh (2000)). Most importantly, productivity increased not only in the information and communication producing sectors but in sectors of the economy that do not produce information and communications technology (Council of Economic Advisors 2001; and Stiroh 2001). In other words, users of these technologies also benefited from increased productivity. In addition, the data seems to reveal that workers in the US may have also benefited from increased productivity induced by e-commerce and ICTs (Baily, 2001).

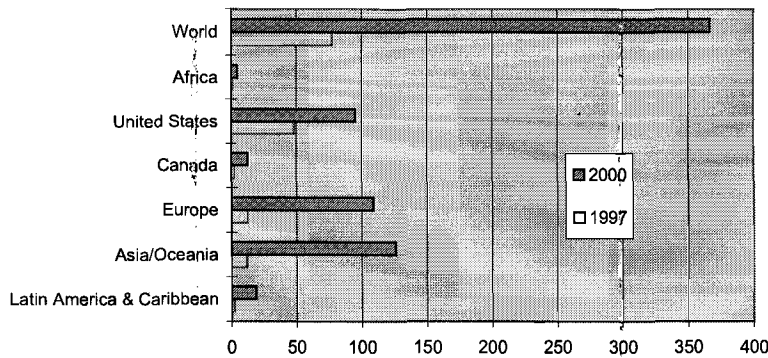
More importantly, there is no indication that the existence of a large ICT producing industry is either a necessary or a sufficient condition to successfully experience the growth effects of ICT. Rather, ICT diffusion, not the existence of an ICT producing sector, appears as the relevant element (Colecchia and Schreyer, 2001).

## II. E-Commerce Indicators: What do they reveal?

The Internet, which has expanded explosively in the past few years, is now fuelling the growth of e-commerce. More and more users around the world are using the Internet to enter into commercial transactions. Although entry costs have decreased significantly, growth, however, has not been uniform. The geographic distribution of connections to the Internet is heavily concentrated in developed countries, and, among those, especially the United States. Developing countries, on the other hand, have been less intensive users of the Internet and e-commerce.

The worldwide trend into cyberspace was initiated in the late 1980's, with the evolution of the World Wide Web (WWW), allowing for the online transmissions of webpages, making the once research-oriented system more accessible for commercial and private use. By 1991, the number of users had reached about 4.5 million; by 1996, 60 million and by 2000 it had reached 367 million. Internet users are estimated to be near 600 million today, around 5% of the population and growth is expected to continue though at a slower rate.

**Internet User Population, by Region, 1997-2000  
(Millions)**

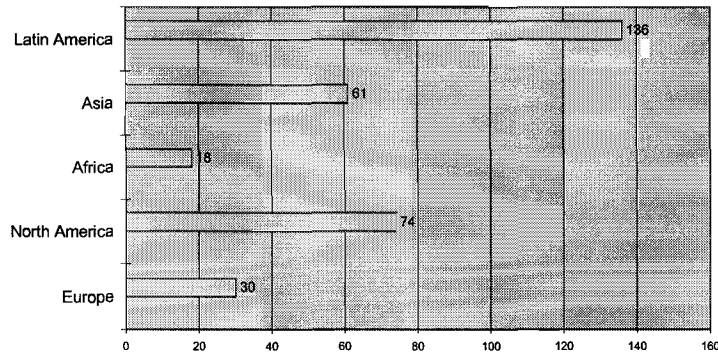


Source: ITU, Americas Telecommunication Indicators, 2000.

## 2.1 Internet Penetration

Internet hosts, which serve as the central nervous system of the Internet, routing traffic, exchanging e-mails and providing information for users, are largely concentrated in the United States. For the year 2000, the United States had 80.5 million Internet hosts, about 3 thousand per 10 thousand inhabitants and accounted for over 75% of total hosts worldwide. Furthermore, almost almost 100 million users were located in the United States in 2001.

**Growth of Internet Hosts, by Region, 1995-1999**  
(Percentage average annual growth)



Source: ITU, Americas Telecommunication Indicators, 2000.

### Latin America and the Caribbean: Selected Indicators

	Hosts per 10,000 people	Users per 10,000 people	PC's per 100 people
Uruguay	162.02	1,108.78	10.49
Argentina	72.98	675.09	5.13
Mexico	56.55	274.31	5.06
Panama	53.13	317.01	3.70
Brazil	51.53	293.92	4.41
Trinidad & Tobago	50.96	772.58	6.18
Chile	48.81	1,657.65	8.23
Antigua & Barbuda	40.95	652.03	...
Aruba	28.09	407.03	...
Dominica	24.24	261.44	7.13
Costa Rica	18.29	621.43	14.91
Guadeloupe	12.46	175.44	19.74
Belize	12.20	624.47	12.49
Colombia	11.06	207.46	3.54
Dominican Republic	9.24	64.30	...
Martinique	8.91	127.46	12.66
Venezuela	6.68	393.05	4.55
Jamaica	5.71	310.55	4.66
Neth. Antilles	5.11	93.14	...
Guatemala	4.92	70.27	1.14
Peru	4.17	974.20	4.09
Barbados	3.74	373.83	8.22
Nicaragua	2.76	98.54	.89
Paraguay	2.36	72.78	1.27
St. Lucia	2.18	195.18	14.10
Bolivia	1.59	144.07	1.68
St. Kitts & Nevis	1.04	516.10	18.17
El Salvador	.92	79.67	1.91
Bahamas	.79	431.58	...
Guyana	.69	46.46	2.56
Cuba	.59	53.58	1.07
Grenada	.32	435.56	12.71
Suriname	.23	269.79	...
Honduras	.20	61.68	1.08
Ecuador	.18	142.34	2.17
St. Vincent	.18	308.57	10.58
Haiti	...	7.42	...

Source: ITU, 2002.

Internet use in Latin America has been growing faster than in any other region of the world. In 2000, Internet hosts in LAC reached nearly 2 million after surpassing the 1 million mark in 1999. The number of users is estimated to be nearly 19 million in 2000, an impressive increase from just half a million in 1995. Brazil is the dominant Internet market in Latin America with over 5 million users in 2000 and nearly 900 thousand Internet hosts. However, on

a per capita basis, Uruguay is the leader with 162 internet hosts per 10,000 people, followed by Argentina, Mexico, Panama and Brazil, with 73, 57, 53 and 51 per 10,000 people respectively (ITU, Telecommunications Indicators, 2002).

## 2.2 E-Commerce

Continued growth of Internet-based e-commerce worldwide is projected for 2002, reaching \$1 trillion in sales. This represents an increase of 68% from 2001 and an even more pronounced increase from the 1996 Internet sales of \$2-3 billion, (IDC, 2002). The regional distribution of e-commerce is largely concentrated in the United States. About 70% of Internet web sites are located in the United States, another 8% is reported for Canada, 14% for Europe, 4% for Asia/Pacific and 2% for Africa and Latin America and the Caribbean. Only a small percentage of the population in the region used the Internet in 2000, about 2.7%, total spending only reached one fifth of e-commerce expenditures in the U.S.

### Growing Networks for Electronic Commerce Worldwide

(Millions Units)

Category	1991	1996	2000	2002
Telephone main lines	545.0	741.1	970	1115
Cellular subscribers	16.3	135.0	650	1000
Personal Computers	123.0	245.0	500	670
Internet host computers	0.7	16.1	107	NA
Personal computers with Internet access	4.5	60.0	385	600

Source: ITU, "Telecommunication Indicators Update", (2000).

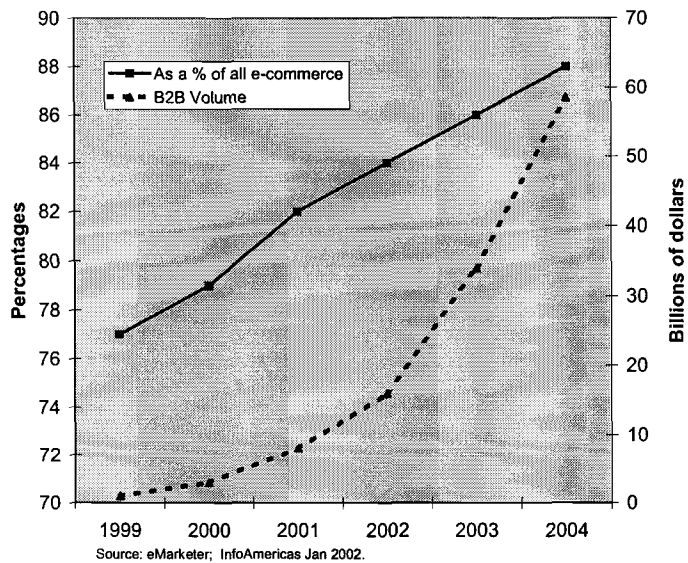
B2B, the main e-commerce activity in the region, accounts for 82% of all online transactions in 2001, and is expected to grow to 88%, with transactions totaling \$58.4 billion in 2004 (InfoAmericas). The B2B average order in Latin America and the Caribbean is about \$1,500. Costs of delivery are more than offset by lower product prices since the buyer deals directly with the manufacturer, rather than a complex multi-level distribution chain. However, international shipping costs in the region are about 20 to 60% higher than the prevailing rates in the U.S. and Europe.

However, most of the B2B e-commerce sites in the region, about 88%, are concentrated in Brazil. This is due in part to Brazil's leading online banking services, market size and a sophisticated bank wire system.

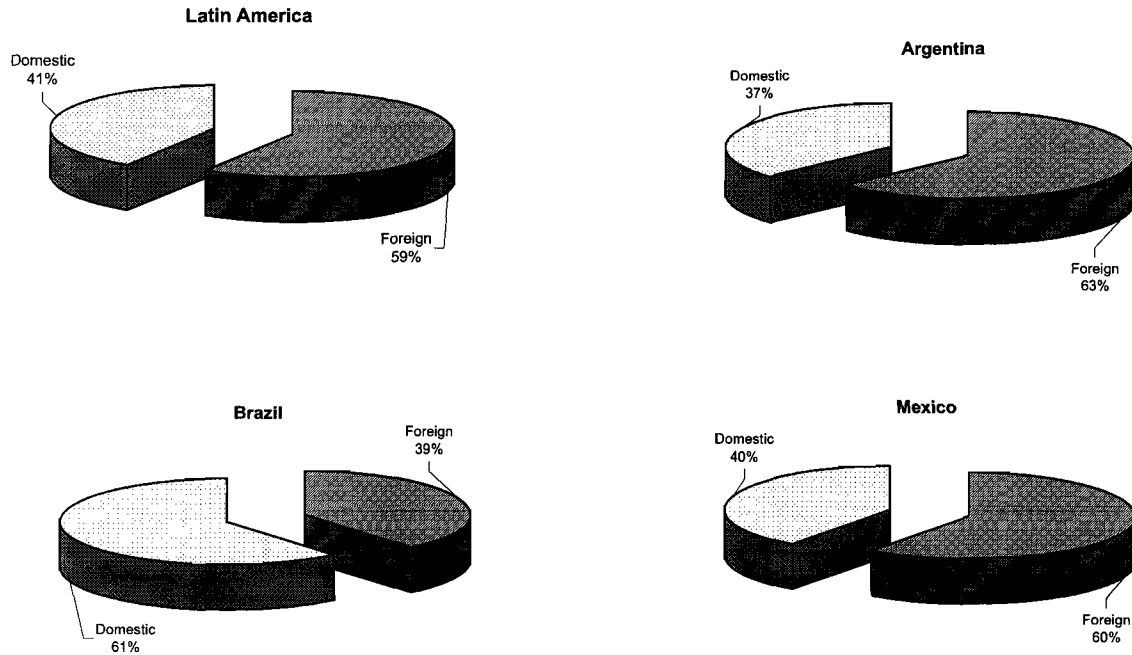
Most online purchases are conducted via sites outside of the region. For example, about 70% of B2B online purchases initiated in Mexico, are conducted through foreign websites, mainly in the U.S. (InfoAmericas).

The B2C e-commerce in Latin America and the Caribbean still remains in its early stages with most customers coming from the upper income and higher education levels. Consumers favor sites in the U.S. and other developed countries since product selection seems more important than local language and support. In the region almost 60% of online purchases are done at foreign sites, and the average purchase price is \$70, but logistics costs such as brokerage and customs fees and small package handling can double the customer's costs. The leading courier firms have been targeting the B2B market rather than the B2C market, one of the main reasons is that delivery is far simpler to businesses than to private consumers (Couriers take 2 visits on average to households to complete a B2C delivery order, while B2B deliveries average about 1.2 visits).

**Latin American B2B Market 1999-2004**



## Online Purchases in Latin America

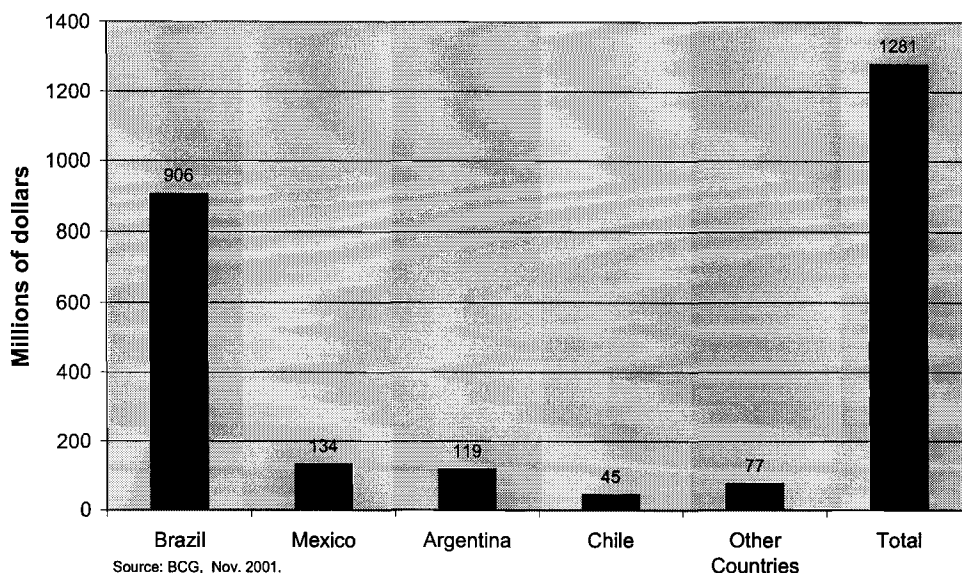


Source: InfoAmericas, 2000.

In Brazil, import tariffs and customs fees have maintained foreign sites to a 39% market share. Brazil represents more than two thirds of the B2C market in Latin America, with \$906 million in revenues for 2001. Mexico and Argentina follow with \$134 and \$119 million respectively and Chile accounted for \$45 million of online revenues in 2001. The rest of the region had revenues of \$77 million.

Any number of factors has influenced the slow growth of B2C e-commerce in the region. Sites seem to have difficulty building customer loyalty; only about 6.7% of those that purchase on-line become regular customers, as compared to about one third of U.S. online shoppers. Often customers abandon web purchases prior to completing the sale, most often complaining about, slow dial up connections. Furthermore, 35% of transactions are completed inaccurately and orders are sent to wrong addresses, double billed or never delivered.

## Latin American B2C Market 2001



Online merchants in the region generally lack some of the core capabilities needed for safe and efficient purchases, such as, automated purchase software, secure web environments and integrated inventory and shipping solutions (InfoAmericas, 2000). One of the key factors restricting the growth of B2C e-commerce in the region is the limited protection offered to consumers in regard to the use of credit cards and on-line payment systems to reduce the risk of purchasing via the Internet. Two-thirds of credit card holders are hesitant to use them for online purchases from Latin American sites.

### 2.3 Digital Divide

The Digital Divide refers to the gap in access to information and communication technology. The gap between countries and/or populations that are information rich or those that are information poor can be measured by various indicators, including the access to telephone lines, personal computers, mobile phones and Internet connections.



The availability of fixed telephone lines is one of the most important measures of ICT access, since it allows voice communications and connectivity to the Internet. However, in some countries mobile phones are substituting for fixed lines, due to lower start-up costs. As this trend for mobile phones continues, the number of countries with more mobile than fixed telephone subscribers is increasing. By 2001, there were seven countries in the region where this transition had taken place. Furthermore, it is estimated that by 2003, there will be more mobile than fixed telephone subscribers in the region.

Personal computer penetration has grown in the last few years to reach 4.44 per 100 people. The Internet penetration rate in the region is about 3.4 users per 100 people on average. In North America it's about 10 times higher.

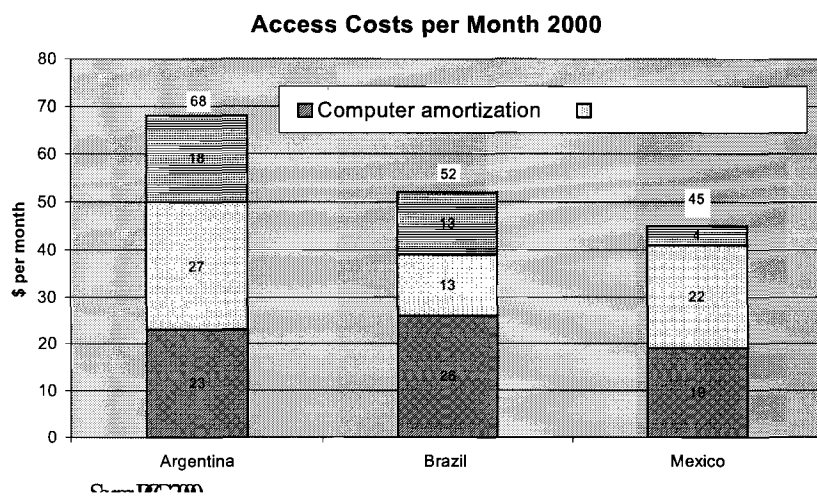
#### Telecom Access in Latin American and the Caribbean

Countries	Telephone lines per 100 people	Celular mobile lines per 100 people
Antigua & Barbuda	46.80	2.06
Guadeloupe	44.69	19.59
Martinique	43.82	26.00
St. Kitts & Nevis	43.82	1.13
Barbados	42.18	4.48
Bahamas	36.90	5.28
Aruba	36.69	5.72
Neth. Antilles	36.59	7.52
Grenada	29.78	1.53
Uruguay	27.07	9.54
St. Lucia	26.57	1.25
Dominica	25.23	.86
Trinidad & Tobago	20.58	2.05
Costa Rica	20.41	3.64
Argentina	20.11	7.0
St. Vincent	18.79	.67
Jamaica	18.68	3.11
Chile	18.57	6.5
Suriname	17.05	4.21
Panama	16.45	8.61
Colombia	16.04	7.54
Brazil	14.87	8.95
Belize	13.75	1.49
Mexico	11.22	7.83
Venezuela	10.91	14.34
Dominican Republic	9.28	3.11
Ecuador	9.10	3.09
El Salvador	7.61	6.22
Guyana	7.49	.17
Peru	6.69	3.92
Bolivia	5.80	4.93
Paraguay	5.54	8.13
Guatemala	5.46	3.17
Honduras	4.42	1.24
Cuba	3.89	.05
Nicaragua	2.98	1.40
Haiti	.8	...

Source: ITU, 2000

While investment in telecommunications during the last decade has been significant, so has the gap between industrialized and developing countries in terms of accessibility to services. Average fixed line teledensity (the number of fixed telephone lines per 100 inhabitants) was

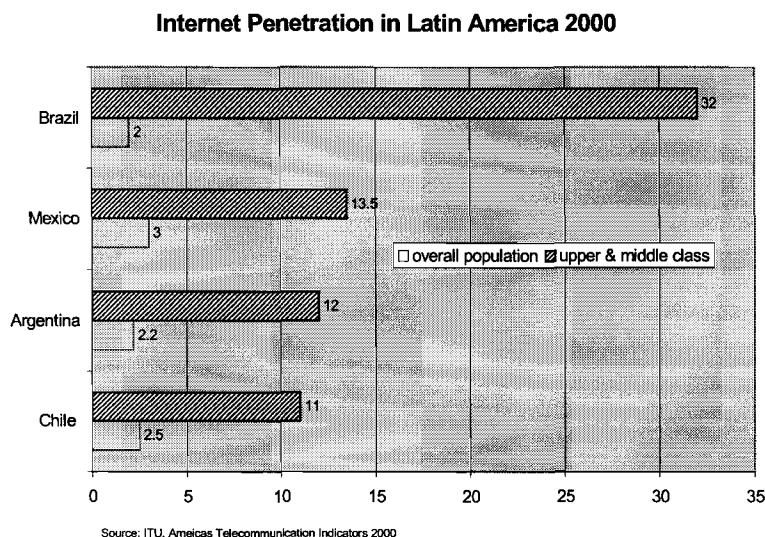
estimated by the ITU, to be about 15%, reaching about 80 million telephone lines in Latin America.



In addition, computers and Internet access costs are falling, as well as the introduction of flexible pricing plans and the reduction of local

telephone call charges for Internet usage in some countries. Internet Service Provider (ISP) rates, computer costs plus telephone charges have fallen 23%, 20% and 8% in Argentina, Brazil and Mexico respectively from 1999 to 2000 (BCG, Oct. 2000). Many countries have also initiated Internet terminals in public locations, as well as cybercafés.

Finally, as indicated by the chart below, penetration rate differentials between the upper and middle class and the overall population is significant.



### **III. Electronic Commerce, International Trade and Employment**

E-commerce, through the Internet, will increasingly permeate human activity altering relations and transactions in the economy, stimulating trade and bringing about fundamental yet uncertain changes in the labor market.

#### **3.1 International Trade**

Advancements in information and communication technologies have the potential to reduce considerably the costs associated with gathering and processing information. By making information more readily available to all economic agents, information and communications technologies reduce the costs associated with trade and will likely stimulate it, both locally and internationally.

Collecting information is a costly activity, particularly so when it involves acquiring information across national borders. In fact, these costs can be so high that they can be considered a substantial barrier to trade. Finding the right supplier, specifying the product's requirements and quality, negotiating the price, arranging deliveries and marketing products is also very costly. With the Internet and e-commerce applications, a whole range of these activities can occur without having buyer and seller in close physical proximity. The use of electronic means and the Internet can make the process of initiating and doing trade a lot easier, faster, and less expensive. In this respect, the Internet will likely promote trade much in the same way as lifting other trade barriers would. Thus, it is expected that, the volume of international trade will likely increase.

The Internet, especially when organized via electronic markets through e-commerce applications, reduces information costs and allows consumers and sellers to be matched and interact electronically, reducing the significance of geographic proximity and traditional business networks. Freund and Weinhold (1999) found ample evidence that, development of global markets via the Internet makes historical linkages less important and suggest that countries with the fewest past trade links – most likely developing countries – have the most to gain from the Internet.

However, whether e-commerce promote international trade will depend on the nature of the good. On the one hand, a number of products that traditionally have required physical delivery, can be delivered to a customer via a network in digital form. Examples of these include media products, such as text, film and computer software. On the other hand, most of the goods traded internationally are not deliverable in digital form and therefore transportation costs will continue to play a significant role.

In this regard, world trade in digitizable media products amounted to about US\$44 billion in 1996, less than 1 per cent of total world trade. For most countries, trade in digitizable media products was less than 2% of total trade. The rate of growth of trade in digitizable media products is high and above the average rate growth of total trade: the growth in trade for digitizable media products on average was about 10% between 1990-96, 1.5 times faster than total world merchandise trade. (Mattoo and Schuknecht, 2000).

E-commerce will have a significant impact on trade in services. In fact, it has been estimated that electronic services could be worth over half a trillion US dollars globally by 2008, making this sector the fastest growing portion of international trade.

The most relevant change in trade in services is e-commerce's and information technology's ability to make non-tradable services into tradables. Activities that were previously non-tradable (i.e. research and development (R&D), computing, inventory management, quality control, accounting, personnel management, secretarial support, marketing, advertising, distribution, and legal services) will now be traded through the use of e-commerce. All that is required is that the quality, speed and cost of communication between buyer and seller be adequate. International cross-border trade in a wide range of services, financial, legal, telecommunications, customized software, etc, will increasingly be carried out by electronic means.

As communications costs continue to fall, and as information and communication networks expand to reach greater numbers of peoples and places, the potential for international

outsourcing grows. As a result, outsourcing management and production activities will become more important.

Obviously, some sectors and activities throughout the world are more prone than others to be affected by developments in e-commerce. In this respect, there have been attempts to identify industries or sectors that may be more predisposed to the effects of developments in e-commerce and technology. For example, Mann (2001), based on criteria that weighed the effect of cost savings, increases in productivity, industry readiness and product fitness to e-commerce, has elaborated an index of Internet intensiveness. Preliminary findings based on data from the United States and Europe suggests that the most Internet intensive sectors are electronic components, food, pharmaceuticals and forest/paper products. It is likely to expect that in other regions, these same sectors and industries will be affected by e-commerce via outsourcing. At the same time, recent evidence suggests that transnational corporations (TNCs) are likely to be the most intensive users of electronic commerce (Kuwayama, 2001).

### **3.2 Employment and Equity**

Since e-commerce is still a new phenomenon and quantitatively not large, its overall effect on employment is yet very small and the statistical evidence thus scant (OECD, 1999a). Thus, presently, any discussion of its effects is necessarily tentative.

As mentioned earlier, e-commerce is changing the way of doing business and fostering changes in the organization of work, including the facilitation of outsourcing. The state of technology, now allows companies to obtain work independently of location. With greater ease, firms can take advantage of external labor

#### **India Benefits from E-Commerce:**

Telemarketing, helpdesk support, medical transcription, back-office accounting, payroll management, maintaining legal databases, insurance claim and credit card processing, animation and higher-end engineering design — are among the new services delivered via telephones, computers and the Internet. The National Association of Software and Services Companies (NASSCOM) forecasts India's revenues from information technology-enabled services to multiply by 20 by 2008, to \$16.94 billion. NASSCOM estimates that the Indian IT-enabled services industry employs about 68,000 people, but forecasts this could rise to 1.1 million by 2008.

markets for inputs of short-term duration. Therefore locations, both domestically and internationally, that have the adequate mix of infrastructure and skills in their labor markets can benefit by participation in new global value chains, and in product markets such as software development or data processing.

As e-commerce continues expanding, its impact on employment and wages will be the result of a complex set of interactive forces. Electronic commerce is expected to directly and indirectly create new jobs as well as cause job losses. New jobs will be gained in information-related goods and services, entertainment, software and digital products, for instance. Indirect creation of jobs will occur via increased demand and productivity. Jobs will be lost when e-commerce substitutes for the traditional way of doing business. The jobs most likely affected, as preliminary evidence suggests, are those in the retail sector, postal offices and travel agencies. However, the effects will not be uniform across countries, geographic areas, industries or skill groups.

Evidence for the United States and the European Union reveals that employment in ICT-related industries and in the finance, business and commerce-related sectors account for almost one-third and one-fourth of total employment, respectively. More importantly, they accounted for 28% and 35% of job creation in 1993-96 (OECD, 1999). The data also reveals that jobs in travel agencies, retail and post offices were lost, however.

In addition to the net employment gains and losses, e-commerce will have an impact on the demand for certain skills. The evidence suggests that ICTs and e-commerce demand a whole set of new skills where responsibilities and decision-making becomes more information based. This “skilled-bias technical change” generates demand for individuals with skills and talents to manage not only the information technology but also to exploit the large quantities of information about customer demands and production processes. In fact, preliminary findings in Brenashan *et al* (1999) note that new technologies will increase the demand for high-skilled workers to run them, but also of new managers that have to make decision in more information-intensive organizations.

This increased demand for high-skill workers, with augmented managerial and executive responsibilities and a greater need for specialized expertise, who will command higher wages is viewed by some researchers as a cause of worsening of income distribution. Evidence for the U.S. seems to suggest that demand has shifted from low and middle-wage occupations and skills toward highly rewarded jobs and tasks requiring specific talent, training or management ability. Much of the labor demand shift is being explained by skill-biased technical change (Brenashan, 1999). Overall, low wage, low-skill production, did not enjoy the wage increases that IT-intensive, high productivity growth industries experienced. Thus, real wages grew in IT-intensive industries, were wages were already relatively high and did not change in IT-poor industries that faced workforce reductions and were already employing low-wage workers.

The overall relationship between income distribution and the widespread adoption of e-commerce and information technologies is under scrutiny. On the one hand, in the United States and United Kingdom, countries with widespread use of these technologies, the period in which information technologies were taking off seems to have coincided with the time

**Costa Rica: Job creation in the ICT sector**

Recognizing the value of its well educated labor force, its solid institutions and infrastructure, Costa Rica sought to bring in foreign direct investment that would encourage highly competitive multinational firms in the ICT sector. In attracting the INTEL Corporation, some 4500 new jobs were created in the ICT sector and another 9000 in the ICT using sector. Overall, the ICT sector now employs about 1.4% of all the occupied population in Costa Rica.

income distribution became more skewed. In addition to the impact of the shift in labor demand on income distribution, consumption baskets of upper income households contained relatively more of the goods and services that benefit the most of increased productivity from information technology industries. In comparison, lower income household baskets are represented by higher proportions of non-tradables such as housing and transportation and therefore do not benefit from the real income increases that come from falling prices in goods and services produced and distributed with heavy IT processes.

However, income distribution effects described above are likely to be temporary as information and communication technologies become more diffuse in sectors where lower income workers are employed and in firms and industries that service these workers as well.

It is premature to speculate on the employment effects of e-commerce on developing countries in general and the region in particular. As in the case of countries where e-commerce is more pervasive, it is expected that new jobs will be created, especially in the service sectors. Demand would be expected to increase for workers in labor-intensive high-skilled services and information-intensive sectors. Essential ICT skills, software development, etc., will be in ever-increasing demand.



#### **IV. Concluding Remarks**

Electronic commerce, though growing at very fast rates, is still a small fraction of the world trade in goods and services. However, as electronic commerce continues spreading and more goods and services become suitable for electronic delivery, its impact on trade and employment will become more dominant.

In the region, electronic commerce has been spreading rapidly, though wide differences exist across and within countries. Though the development of e-commerce may be in its early stages, the risk of being left out of the electronic global market demands consideration. While much has been accomplished throughout the region, the realization of the full potential of e-commerce will require addressing further challenges. Among them:

**Information Infrastructure.** Building and expanding the information infrastructure on which the e-commerce economy depends is the first step in realizing the e-commerce opportunity. This infrastructure necessitates the availability of high-speed interactive communication infrastructures that facilitate access, low network delay and reasonable access and usage prices to both customers and service providers.

**Regulatory Frameworks.** Proper regulatory frameworks need to be devised with the capability of fostering competition, ensuring an efficient allocation of resources, and protecting the interests of consumers.

**Legal Security.** Security and privacy are fundamental to support the expansion of electronic commerce and promote user and consumer trust in information systems and electronic transactions. The protection of availability, confidentiality and integrity of information systems and the data that is stored and transmitted is the most pressing security concern. Protecting the integrity of transaction related information is paramount for the development of e-commerce. In an electronic environment, logos, brand names and trademarks are easy to replicate, and it can

be easy for buyers and sellers to misrepresent their financial and legal status, or even their physical locations.

**Payment and delivery.** The lack of online payment facilities and scattered use of credit cards among the general population, determines that consumers use the Internet at present for information collection purposes but conduct their business offline. If e-commerce is to be widespread in the region, reliable and secure payment systems need to be developed. Improvements in the postal service infrastructure for distributing goods and services are also needed.

**Skills.** Expansion of Internet use and electronic commerce will depend upon the development of human resources. The transition to a knowledge-based economy requires significant investments in human capital so that the knowledge that transmitted via computer and communications networks can be adapted to fit the new production needs.

**Digital Divide.** Special measures must be taken to ensure that the potential benefits of e-commerce are distributed efficiently and equitable among the population. In this regard, ECLAC (2000) has suggested various elements that might be included in a Latin American and Caribbean public policy agenda to ensure a more equitable transition to an information-based society.

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