

Internet and Telecommunications Outlook in Latin America

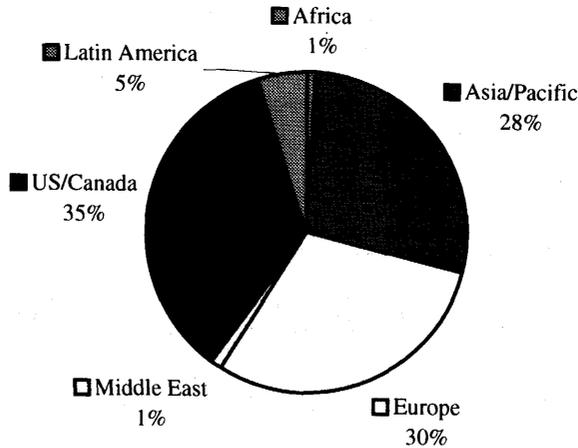
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1. INTRODUCTION

The telecommunications industry in Latin America entered a new age during the 1990s as most countries opened up their telecommunications markets, privatized government-owned monopolies, and liberalized regulatory policies relying more on market forces than decrees. Such reforms coincided with the introduction of the Internet and the World Wide Web, offering them an opportunity to participate in the new information age as a full-fledged member. Still, Latin America as a region lags far behind North America, Europe and Asia/Pacific in terms of Internet penetration. User estimate in 2001 shows that Latin American users account for only 5 percent of the world total (25 million out of 513 million users) (Figure 15.1). Nevertheless, by most accounts, Latin American Internet users are projected to grow steadily at a high rate (Figure 15.2).

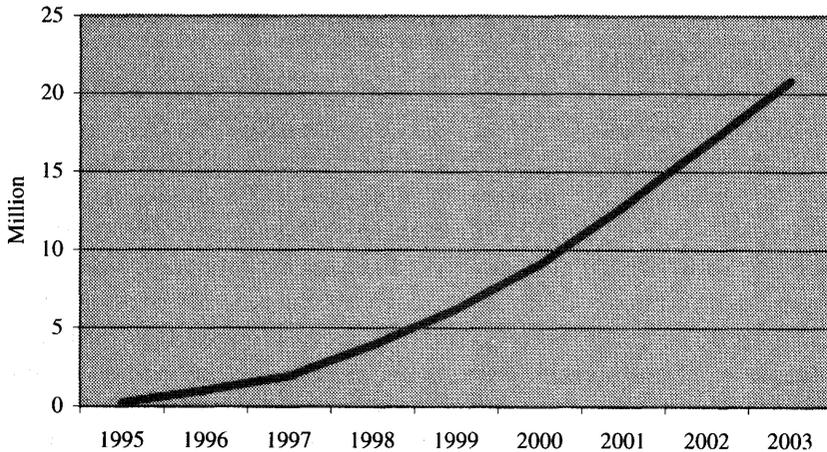
In this chapter, we focus on the current status of telecommunications markets, Internet access and e-business in Latin America, and investigate pricing, telecommunications policies and technological factors that affect current and future growth rates in Internet penetration. Throughout our discussion, economic situations (and unequal income distribution)

Figure 15.1: Online Internet Users, August 2001



Source: NUA, *How Many Online*.

Figure 15.2: Projected Growth in Internet Users in Latin America



Source: Pegasus Research, 1999.

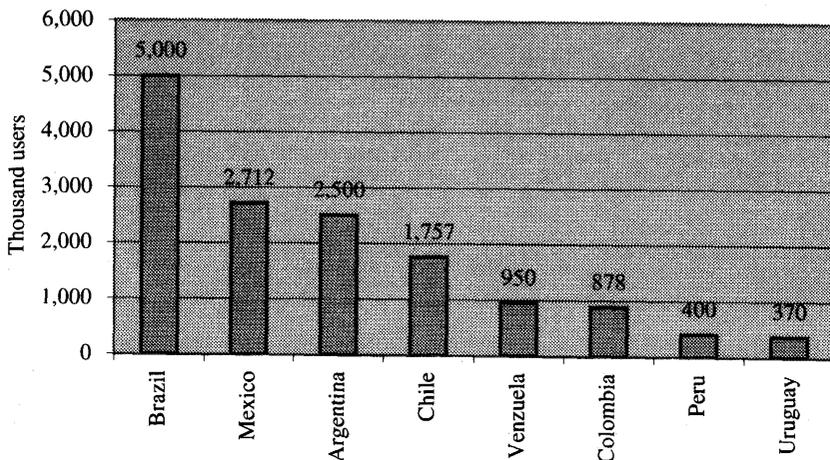
appear as an underlying reason that severely limit future potential in many countries. Nevertheless, policy initiatives and market reforms are beginning to take effect in a few cases. Outlook for future telecommunications markets will be summarized and, in the next chapter, we focus on two case studies Mexico and Argentina.

2. CURRENT STATUS OF INTERNET DEVELOPMENT

By far, the best developed country in terms of Internet access is Brazil, with 5 million users estimated in 2000 (Figure 15.3). Mexico, Argentina and Chile round out the top four leaders in Latin America. In terms of top-level Internet domain, significant growth is evident in these four countries, although some Internet sites may be operating under .com, .net and .org domain names (Figure 15.4). Brazil also is ahead in terms of Internet penetration: available data for 1999 showed that 32 percent of upper and middle income groups had access to the Internet in Brazil, compared to 14 percent for Mexico, 12 percent for Argentina and 11 percent for Chile (US DOC, ITA [2000]). Active Internet users who have online accounts also indicate that Brazil leads other nations. 40 percent of total online subscribers in Latin America are in Brazil, compared to 22 percent for Mexico, 9 percent for Argentina, and 6 percent for Chile.

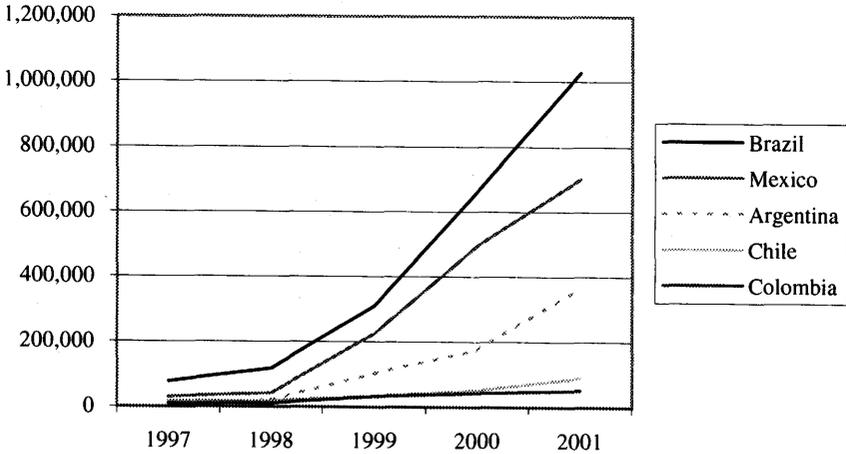
However, the correspondence between the number of existing Internet users and future growth potential is a tenuous one. Brazil's large shares are attributed to its large population (170 million, 2000) and a relatively sound participation by upper- and middle-income groups. Nevertheless, its basic telephone infrastructure is no better than other leading Latin American countries in terms of per capita basis (Figure 15.5). Furthermore, figures on IT spending per capita indicate that Argentina, Chile

Figure 15.3: Internet Users in Largest Latin American Markets, 2000



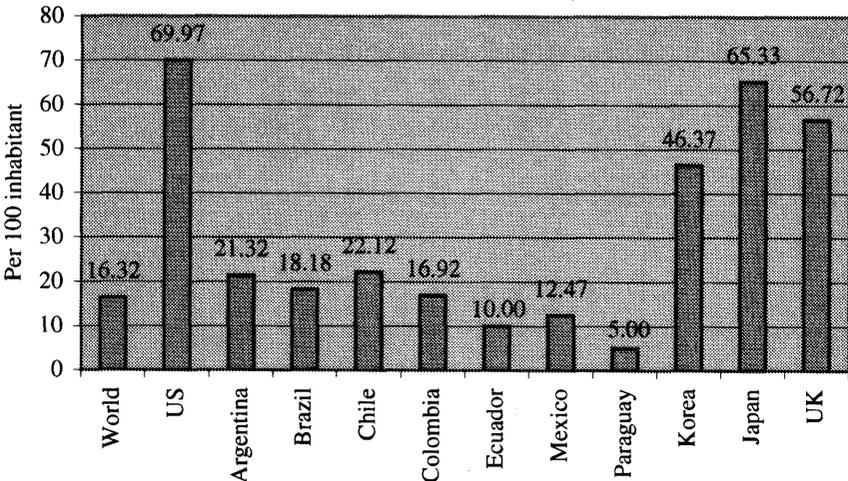
Source: International Telecommunication Union, 2001.

Figure 15.4: Top-level Internet Domain Growth, 1997-2001



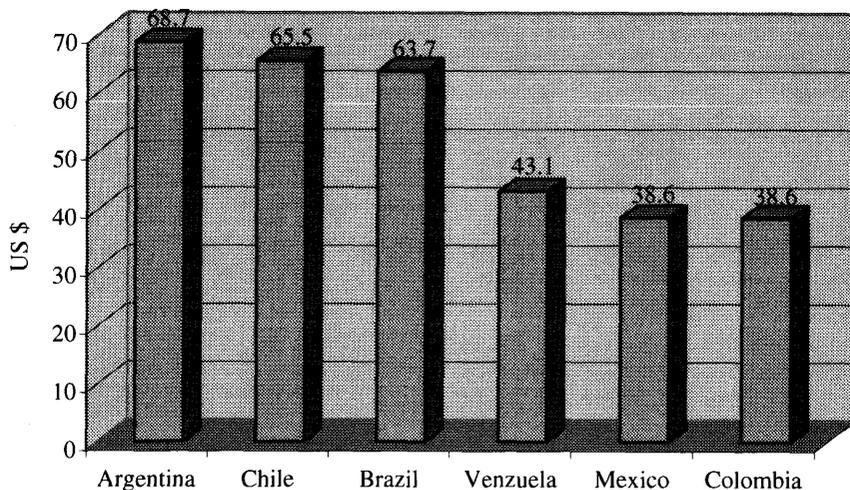
Source: International Telecommunication Union, 2001.

Figure 15.5: Main Telephone Lines per 100 Inhabitants, 2000



Source: International Telecommunication Union, 2001.

and Mexico are more successful in building up basic infrastructure (Figure 15.6), although this level is far below the US per capital spending of US\$1,198.

Figure 15.6: Per Capita IT Spending, 1997

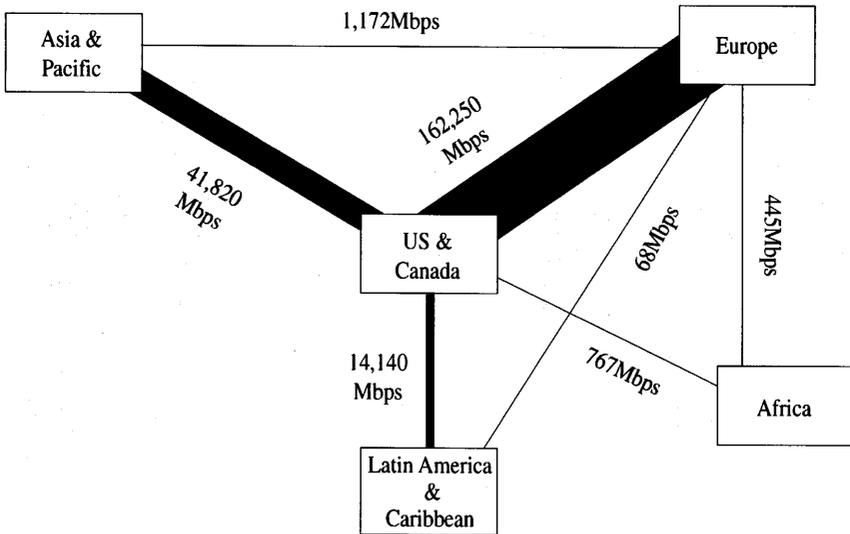
Source: IDC, US DOC ITA.

The growth in Internet usage critically depends on providing basic telecommunications infrastructure. For example, Dial-up Internet subscribers in developed markets such as Chile and Argentina grew by 150 percent and 136 percent, respectively, during 2000-2001 period (Business News America [2001]). They are comparably better equipped with main telephone lines as shown in Figure 15.5. Others endowed with low fixed-line infrastructure experienced lower rates of growth: Paraguay (42 percent) and Ecuador (55 percent).

But Latin America in general needs better telecommunications infrastructure such as traditional telephone networks, advanced telecommunications networks, Internet backbone, interconnection points and access points. In most of these measures, the region is ill equipped to sustain future growth. As shown in Figure 15.7 and 8, the network capacity for international traffic is relatively low compared to cross-Atlantic and cross-Pacific lines. The major region-to-region interconnection backbone exist from São Paulo (and from Buenos Aires) to Miami (3.4Gbps) and from Mexico City to Dallas. But the total bandwidth of 14 Gbps pales in comparison with 42Gbps (Asia to US) and 162Gbps (Europe to US) (Telegeography [2001]).

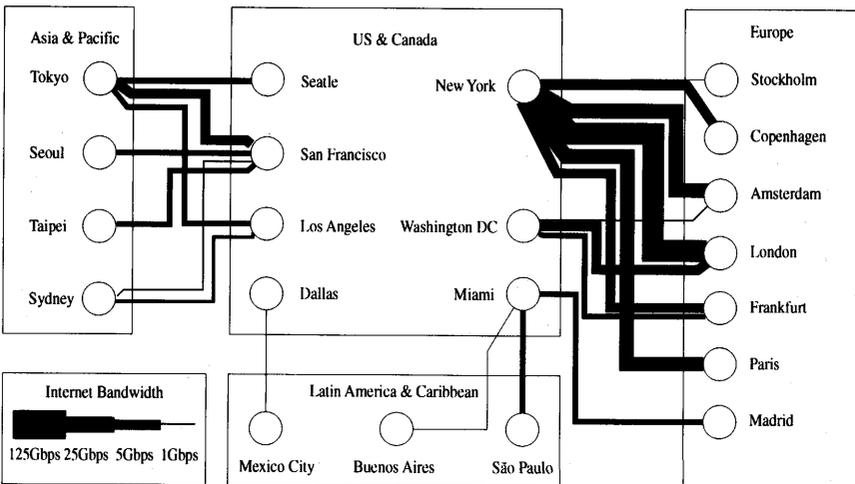
An encouraging sign is the fact that, during the worldwide slowdown in bandwidth growth in 2001, Latin America represented the most

Figure 15.7: Major International Internet Backbone, 2001

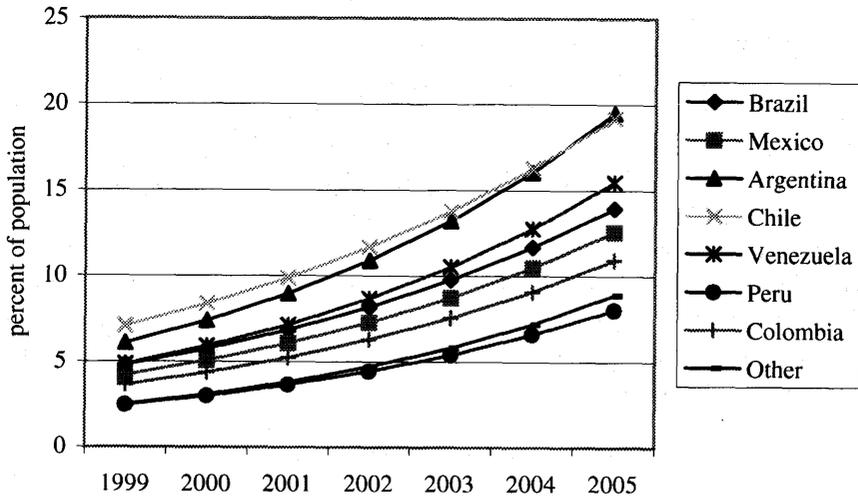


Source: Telegeography, 2001.

Figure 15.8: Major Internet Network Access Points, 2001



Source: Telegeography, 2001.

Figure 15.9: PC Penetration in Latin America, 1999-2005

Source: Jupier Communication, 2000.

growth in bandwidth, logging 480 percent growth in 2001 and 290 percent compound growth rates between 1990 and 2001. If sustained, this trend will improve Latin America's Internet connection capacity to the global network.

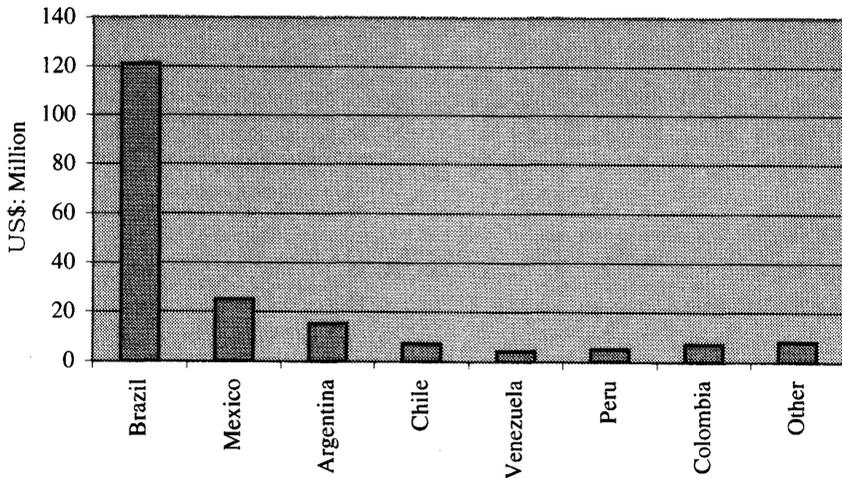
Another limitation in Latin America is the lack of interconnection between major network access points within the region. Most international traffic is routed to and from US NAPs, adding considerable costs to the users. A more concerted investment effort for interconnection is a significant issue if it is to stimulate e-commerce initiatives in the evolving regional economy.

Finally, Latin America's PC ownership, although growing steadily, was well below 10 percent of population in 2000, compared to 55 percent in the US. Projections indicate that Chile and Argentina will approach the 20 percent level by 2005 (Figure 15.9). But others will struggle to reach the 15 percent level. PC ownership is greatly influenced by the national income level, and without significant growth in GNP, Latin American countries must focus on providing Internet access through schools, work places and other public access sites.

3. E-COMMERCE IN LATIN AMERICA

Most estimates and projections for e-commerce in Latin America focus on the Brazilian market, which accounted for over 80 percent of all e-commerce spending in the region in 1999. Business-to-consumer (B2C) online sales in Brazil were estimated at US\$121 million in 1999, 62 percent of the total US\$194 million (Figure 15.10). Although projections can vary, Jupiter Communications considers this trend will continue. Brazil will account for more than 50 percent of total US\$8.3 billion B2C sales in 2005. Most of these figures are based on Brazil's dominant position in Internet users and online sites. However, growing Internet users in Mexico, Argentina and Chile will present new e-commerce growth areas in the next few years.

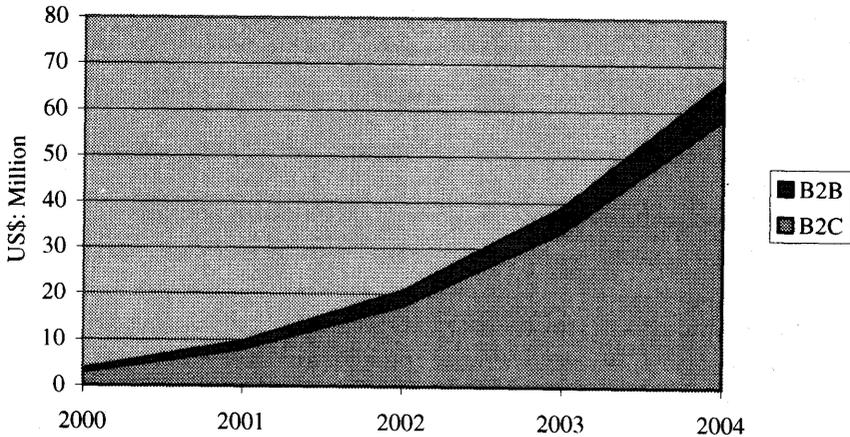
Figure 15.10: B2C Revenues, 1999



Source: Jupiter Communications.

Like other countries, Latin American e-commerce is dominated by business-to-business (B2B) transactions. Pyramid Research estimated that B2C accounted for only 2 percent of US\$1.14 billion e-commerce revenues in 2001. Both B2B and B2C e-commerce are expected to grow larger but the B2B sector will continue to dominate (Figure 15.11). The lack of consumer buying in Latin America stems from several reasons. A survey by TGI.net Latina revealed that Latin American consumers have

Figure 15.11: B2C and B2B E-Commerce Revenues in Latin America 2000-2004



Source: eMarketer, 2001.

similar concerns about buying online (Zona Latina [2001]). The number one reason why people do not buy on the Internet was that they liked to examine products before buying (47 percent). But a large number of people also indicated that they were unfamiliar with e-commerce (44 percent) and they feared for unsafe payment methods (42 percent).

Other peculiarly Latin American factors also hinder rapid growth in e-commerce. First, Latin America's mail delivery service is relatively unreliable. Catalog shopping is not as common as in the US. Second, some studies indicate that 74 percent of Latin America's B2C purchases are done in companies outside of the region, primarily in the US. Customs and taxes add costs and delay delivery to users. But even with added costs, many Internet shoppers use e-commerce to buy American products without leaving their countries. Third, the low level of credit card usage in Latin America presents another roadblock to increased e-commerce sales. In addition, real and perceived security issues are still discouraging many online shoppers. Finally, the low-income level of Latin American consumers is a significant deterrence to future e-commerce growth.

In contrast, B2B e-commerce is driven by large international corporations that have operations in Latin America such as Volkswagen and IBM and are expanding the use of Internet to communicate with their suppliers in the region and with branches in the US and Europe. Some

analysts predict that B2B commerce will grow to US\$108 billion by 2005, from US\$1 billion in 2001 (Pyramid Research [2001]).

4. TELECOMMUNICATIONS DEREGULATION AND POLICY ISSUES

Any market potential in e-commerce and the region's participation in the global digital economy will depend on improving telecommunications infrastructure and expanding Internet access to more people in diverse geographical and income groups. Toward these goals, most Latin American countries have been at the forefront of telecommunications reforms, market liberalization and privatization efforts during the 1990s. We now need to evaluate their effects on Internet access and the growth potential in advanced telecommunications services.

4.1. Telecommunications Reform

The telecommunications industry in Latin America experienced a full swing from privatization to nationalized monopoly back to private markets during the latter half of the 20th century. Most telecommunications services were provided by the private sector prior to being nationalized (Jamison [2000]). Private companies, under heavy pressure by governments to maintain low prices, invested little to improve basic network infrastructure and telephone services in Latin America were in general extremely poor. Nationalization and other forms of government intervention, however, did not produce improved networks and services. Low prices and general economic maladies prevented them from investing in the infrastructure. Beginning in 1978, when Chile began allowing competition in the telecommunications sector, improved service was again associated with liberalizing or privatizing the sector.

Between 1984 and 1997, the majority (14 out of 24) of Latin American countries privatized their state-owned telephone companies, representing an estimated value of US\$27 billion (Gutierrez and Berg [2000]), in the hope of improving telephone infrastructure. In addition, the biggest telephone market player, Brazil, privatized its Telebras system in 2000. Gutierrez and Berg compared market performance in terms of main telephone line deployment and found significant benefits from privatization efforts (Table 15.1).

Table 15.1 compares 11 countries that privatized state-owned tele-

phone companies with 12 that did not (including Brazil), using simple average annual growth rates. For non-privatized countries, the decades of the 1980s and 1990s were used as a dividing line. The growth rates are in the number of main telephone lines per 100 inhabitants. While non-privatized countries also generated higher growth in the liberalizing 1990s, privatization seemed to have accelerated that growth in privatized countries to much higher rates. Individually, Bolivia (privatized in 1995), Guyana (privatized in 1991) and Peru (privatized in 1994) experienced the highest growth at 29 percent, 24.1 percent and 23.7 percent, respectively. Among non-reformed countries, El Salvador (12 percent), Guatemala (11.3 percent) and Nicaragua (11.1 percent) registered the highest growth rates.

Table 15.1: Effects of Privatization on Main Line Deployment

	annual growth (%)	annual growth (%)
	prior to privatization	after privatization
Privatized countries	5.7	13.5
	1981-1989	1990-1997
Non-privatized	5.1	8.7

Source: ITU data, calculated by Gutierrez and Berg, 2000.

4.2. Effects of Reforms

While Table 15.1 shows a generally positive effect of privatization on improving telecommunications infrastructure, various studies on the interrelationship between reforms and results are not conclusive (Gutierrez and Berg [2000]). For example, some researchers found that market competition helped increase telephone penetration but not the privatization efforts. Others show contradictory results that privatization increased network expansion while competition did not. Privatization sometimes had positive effects on telephone deployment but only in those countries with relatively high income (above per capita GNP of US\$1,500).

Therefore, improving telecommunications and Internet access is a matter of combined efforts in regulatory reforms, privatization as well as other positive developments in national income and political and economic environment. In their study of 19 Latin American studies, Gutierrez

and Berg presented a ranking of explanatory variables in the order of their effects on improving telephone service (Table 15.2). Variables with the largest impact were population density, GDP per capita and cellular subscription rates, in that order. Telephone expansion was more likely when an area is more densely populated, has higher disposable income and is affected by competition such as cellular communications. These are geographic and economic variables. Regulatory frameworks and market liberalization variables have also significant effects, but to a lesser degree than the former. In any case, Latin American countries are experiencing substantial improvements in access to basic telecommunication networks whether due to market reforms or improving economic conditions.

Table 15.2: Statistical Explanatory Power on Teledensity

	Standard deviation	Increase in teledensity
Population density	2.89	13.10
GDP	1.45	6.57
Cellular subscript	1.36	6.13
Government type	0.78	3.53
Regulatory framework	0.95	4.30
Economic freedom	0.21	0.93

Source: Gutierrez and Berg, 2000.

Other measurements of effective reforms are seen in the level of competition in telecommunications service markets and in growing broadband services. For example, consumers in Argentina by 2000 had four competitors for domestic and international long-distance service from only one in 1995 (Yomal [2000]). In addition to two privatized companies (Telecom Argentina and Telefónica Argentina), new entrants such as AT&T, Bell South-Movicom, and CTI-GTE are offering new services in pager, cellular and Internet markets. Fierce competition in the long-distance service market is evident in the flat or diminishing levels of revenues during the period of 1996-2000, at just over US\$10 billion (Pyramid Research [2001]). Mexico, Argentina, and Peru each had more than 20 operators in the long-distance market in 2000.

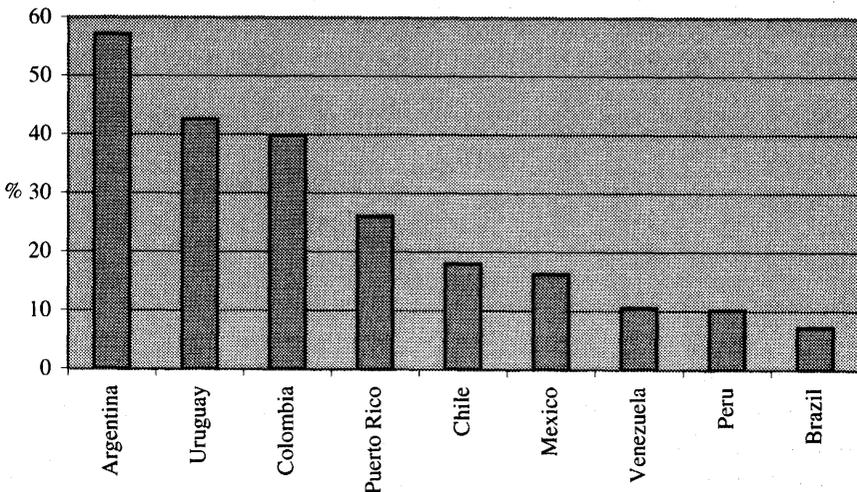
4.3. Broadband Internet Access

For dial-up and broadband Internet access, both improvements in basic infrastructure (such as telephone lines, DSL networks and cable penetra-

tion) and market competition must occur simultaneously. Most Latin American countries are pushing toward market liberalization in the hope that competitive players will invest in basic infrastructure. However, most users are from upper to middle income groups who are located mostly in urban areas. Infrastructure investment is geographically limited and heavy competition is focused on a small group of affluent users who already have Internet connection.

Argentina is best poised for broadband expansion. With 5.2 million cable households, Argentina is the only Latin American country with more than a 50 percent cable penetration rate (Figure 15.12). The Strategis Group (<http://www.strategisgroup.com>) survey indicated that more than half of Latin American revenues from cable modems come from Argentina. Colombia (39.8 percent), Mexico (16.2 percent) and Brazil (7.2 percent) have low penetration rates but represent substantial markets in numbers, 3.3 million, 2.8 million and 2.8 million households, respectively. Combined with expanding DSL offers by international entrants, consumers can expect growing opportunities for broadband Internet access. Nevertheless, sustained investment to upgrade networks and offer such services are necessary beforehand, for which great improvements are not expected. Deteriorating economic conditions also

Figure 15.12: Cable Penetration Rates, 2000



Source: Deutsche Bank, 2000.

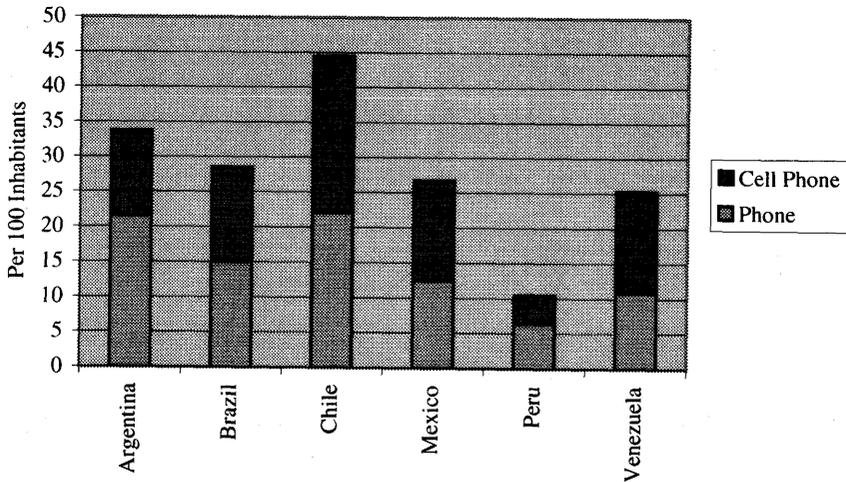
mean that the prospect of full deployment of 2.5G wireless is in doubt and the 3G licensing timetable is being postponed (Mobile Communications International [2001]).

The DSL revolution being experienced in Asia, especially in Korea, is influenced by market reforms as well as a fierce competition among multiple service providers. Simply liberalizing and opening up the telecommunications market will not guarantee improvements in Internet access and the availability of advanced telecommunications services to the general population. The most serious problem in the Latin American telecommunications market is the cannibalization of the existing market by new entrants without significantly enlarging the number of people who are connected and can afford to subscribe to new service offerings. Although recent reform efforts have stimulated better than average improvement in Internet access, market liberalization alone will not be enough to sustain such growth or to extend Internet access to the universal service level envisioned by policy makers.

5. EXPANDING INTERNET ACCESS IN LATIN AMERICA

Many developing nations, and especially disadvantaged groups in those countries, are still struggling to access traditional telephone services. Telephone lines in many low-income countries are less than 2 per 100 inhabitants, compared to 70 for US and an average of 39 for European countries, according to ITU data for 2000. While the Telecommunications Act of 1996 represented a shift in universal service policy from telephone service to advanced telecommunications services, many Latin American countries face the daunting task of improving basic telecommunications infrastructure while at the same time attempting to expand the level of access to the Internet. Universal service objectives in developed countries are concerned with 'not leaving someone behind' in the digital revolution. In contrast, many Latin American countries find themselves tackling the age-old problem of extending basic telecommunications services to the majority of their population.

Some of the new technologies indeed help late-comers. For example, with satellite and cellular networks, countries are no longer dependent on fixed-line networks that can be very expensive to connect to sparsely populated areas. Distance is now a lesser barrier to universal service than before. Declining costs also enable them to accelerate infrastructure deployment in urban as well as rural areas. These and other socio-eco-

Figure 15.13: Telephone Availability, 2000

Source: International Telecommunication Union.

conomic conditions such as market liberalization and global competition painted a very positive scenario under which Internet, wireless, satellite and associated telecommunications technologies will enable developing countries to catch up with developed nations faster than they thought they ever could. For example, Internet access centers and telecenters can be established in any remote area with a satellite uplink, providing voice as well as data services for a large number of inhabitants.

Nevertheless, most Internet access modes require fixed lines such as plain old telephone networks, or coaxial cables. Thus, an insufficient development in basic telecommunications infrastructure continues to be a critical obstacle in expanding Internet access in those countries. Wireless communications, despite lofty expectations, are stumbling to come into the market. High investment costs associated with expensive spectrum licensing also tend to preclude any possibility that wireless providers will offer affordable services to low-income populations. Under these circumstances, universal service objectives in the Internet age have not changed significantly from those for conventional telephone access.

Policies to expand access to telephone service and the Internet can be evaluated in three broad measures: availability, accessibility and affordability. Availability refers to the network's penetration into households.

Accessibility initiatives focus on providing access points such as public telephones and community Internet access sites. Affordability is measured in terms of price or cost of connection weighted by the level of income. There are policies and programs designed to improve each measure, and we investigate these in turn below.

5.1. Availability through Privatization or Competition

The impact of new technologies such as cellular phones on network accessibility is apparent from Figure 15.13 that shows the number of telephone lines per 100 inhabitants in selected countries. In Chile, for example, there were 22.4 cell phone lines per 100 inhabitants in addition to 22.1 fixed telephone lines. Inclusion of cell phone lines improve telephone availability in Latin America significantly, compared with Figure 15.10 that considered only fixed-line telephones.

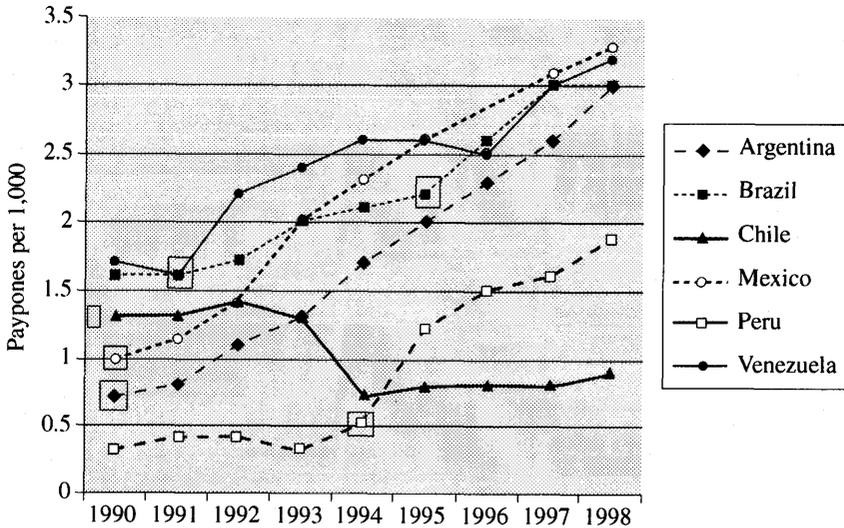
Nevertheless, Fuentes-Bautista [2001] pointed out that the best performers, Chile and Argentina, have no flexible universal service objectives within their national telecommunications reform agenda. Both Chile and Argentina began market liberalization early, in 1988 and 1990 respectively, and competition is significant in the telecommunications sector. In other countries, the privatization process was aided by grants of monopoly privileges to private companies in order to make the sales more palatable. But even with explicit universal access clauses, these countries are finding it difficult to inject any incentives to improve availability. Privatization does not necessarily amount to market competition.

5.2. Expanding Accessibility

Accessibility measures usually consider whether there are geographically usable access points for any given population. Public telephones and community technology centers for Internet access are designed to increase accessibility. Figure 15.14 shows that Brazil, Peru, Mexico and Venezuela, who were relatively low in availability measures, successfully expanded public phone lines following telecommunications reforms. Reforms are characterized by the privatization, partially or completely, of state-owned telecommunications companies or the introduction of competition in local or long-distance services.

In Figure 15.14, the year of reform or liberalization is marked with a rectangular box (Argentina 1990, Brazil 1995, Chile 1988, Mexico 1990,

Figure 15.14: Telephone Accessibility, 1990-1998



Source: International Telecommunication Union.

Peru 1994, Venezuela 1991). In most cases except Chile, reforms appeared to expand public accessibility. Chile has by far the best availability (Figure 15.13) due to a competitive market environment. Chile's inability to increase accessibility highlights the difficulty in balancing private initiatives with universal service policy goals.

Like public phones, public access to the Internet is also augmented by community technology centers and public Internet access sites. Mostly funded by governments, community technology centers are designed as a community support facility, such as Peru's Red Científica Peruana, Chile's Centro Comunitario Internet El Encuentro, Colombia's Neighborhood Information Units, and Brazil's Telecenters. Compared to the US where community access sites are primarily used by low-income population, Latin America's public access sites are used by middle-income as well as low-income groups (Fuentes and Straubhaar [2001]). Users' age and education levels also differ significantly. In Peru, for example, most telecenter users are under 30, while US users are more evenly distributed by age groups. High school and college graduates dominated in Peru, while the largest group of users in the US are those who did not finish high school. Clearly, community centers in Latin

America are meeting the unfulfilled demands of its population, while US sites serve primarily its universal service objectives.

A different kind of public Internet access sites are commercial Internet cafés and cybercafés. In Mexico, there were 286 registered cybercafés in 1998. These public sites can offer a very inexpensive opportunity to access the Internet. For example, 'PC-bang' Korea's cybercafés and game rooms, charge between US\$1 and US\$2 an hour and they are open 24 hours a day. There were over 21,000 PC-bangs in Korea at the end of 2000, greatly expanding Internet access to beyond home PC users. The majority of Korean PC-bang franchises are connected to the Internet at 512Kbps or T1. Although PC-bang users are young adults who primarily play interactive games, such Internet access sites offer ready and easy access to the Internet on virtually every city streets, villages, near train and bus stations and in resort areas. Operating mainly as a for-profit business, PC-bangs have greatly increased Internet access in a relatively short time.

5.3. Costs and Affordability

During the previous decade, market reforms and privatization efforts in Latin American countries greatly improved public access to telecommunication networks. Nevertheless, they lag far behind the US, European and some Asian countries, affording less than 50 percent of the population with a basic telephone service. At the same time, some telephone operators claim that there is not enough demand for such service. According to World Bank estimate [1995], 91.1 percent of telephone demand was met in Mexico. This measure is based on the average waiting time for a new telephone line (1 month for Mexico).

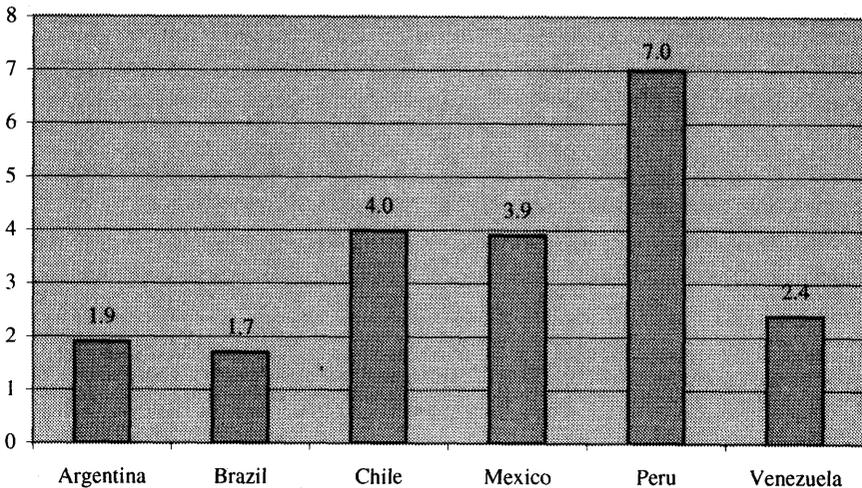
This peculiar aspect is explained by 'depressed demand' by Fuentes-Bautista [2001]. In other words, those who are in the high income group already have access to telephone or have cellular phones, while those in the low income bracket have no demand due to high costs. Lack of competition will increase prices beyond the reach of many. The emphasis on privatization instead of market competition has resulted in high costs, low quality and discouraging levels of service. The giant Telmex, for example, has improved Mexican telecommunications infrastructure somewhat, but it fails to offer reliable, quality services at reasonable prices.

The cost of monthly telephone subscription in Latin America far out-

strips the per capita income level. In Peru, for example, monthly residential subscription rate was seven times greater than monthly per capital income in 1998 (Figure 15.15). One third of annual income was spent for telephone fees in Chile and Mexico. Rates for cellular phone subscription are at least twice that of a fixed-line telephone. At such high prices, only a limited portion of their population can afford any telecommunications service.

In order to access the Internet, consumers must pay for telephone connection as well as subscription fees for ISPs. Therefore, any effort to expand Internet access must include both rate restructuring in local telephone services and similar policies targeted at Internet subscription and interconnection fees. With metered billing for local connection and ISP connection charges that often levy long-distance fees, many Internet users must pay an enormous amount in fees for a minimum level of Internet access.

Figure 15.15: Telephone Affordability, 1998



Figures: monthly residential phone subscription/monthly per capital income.
Source: International Telecommunication Union.

Some innovative schemes have been used to introduce different pricing regimes for traditional voice traffic and Internet data traffic. Argentina, in particular, experimented with a special long-distance area

code for dial-up users to encourage Internet access. Its effect will be discussed in more detail in the next chapter. The important aspect of this experiment was the realization that simple privatization did not consider fundamental differences between conventional phone networks and Internet access. Even though they might be transferred through the same physical networks, usage patterns differ widely and rates and tariffs must be altered accordingly in order to stimulate Internet usage. When income levels are comparatively low, small variations in access modes and charges may provide additional incentives for those who are denied Internet service despite their willingness to participate.

6. OUTLOOK FOR FUTURE INTERNET GROWTH

The basic premise that pushed for privatization and market competition in the telecommunications industry was that these measures would improve investment in basic telecommunications infrastructure and access to telecommunications services, including the Internet, for the masses. The vigor toward privatization and competition was one constant policy variable in most Latin American countries during the past ten years. Nevertheless, the result is mixed. While there certainly appear to be some positive developments in telephone and Internet access measures, the growth trend or current momentum does not seem to be sufficient to bring such services to the majority of their population. Are privatization and competition the answer to gaining universal access?

The fundamental roadblock seems to be the level of income that is unable to support a wider diffusion of telecommunication technologies. Privatization initiatives, while removing government controls, leave pricing to private companies at a level that the majority of the population cannot afford basic service. While they were designed to promote competition, which was expected to lower prices, the reality is that market forces seldom satisfy such objectives as universal service. Companies are eager to offer services to those who can afford them while market conditions often discourage them from investing in remote, underserved areas.

More importantly, deregulation may not be the answer in promoting wider telephone and Internet access. While others investigated the difference between privatization and competition, Guillen and Suarez [2001], based on their study of 141 countries, argued that they both had little impact on increasing the number of Internet hosts and users.

Rather, an index of predictable policymaking — as an indicator that a

business environment is unlikely to change without warning — is found to be most significant, after such usual variables as income levels and telephone lines, in explaining the growth in Internet hosts and users. A predictable and stable policymaking environment is a necessary condition to encourage investment and entrepreneurship. Although Argentina is one of the leading Internet hotbeds in Latin America, its current status pales in comparison with Ireland and Singapore.

For example, Argentina has a relatively liberal telecommunications policy but somewhat unfavorable environment for entrepreneurship conditions. The Argentine government intervened to bring down leased-line prices in 1997 — the creation of special area code (0610) for Internet usage. But small Internet startups were gobbled up by large, vertically integrated players who control the telecommunications market and are heavily financed by foreign interests such as Stet/France Telecom and Telefónica of Spain. Singapore's telecommunications policies are relatively interventionist in that service operators and ISPs are tightly controlled by the government. But regardless of policy framework, both Ireland and Singapore are far ahead of Argentina because of their favorable business environment.

This result signals a very difficult problem for most Latin American countries in their drive to expand Internet access. The hurdles they need to overcome are not simply those of privatization or opening up their markets to competition. The overall income level, economic policies, and political stability all contribute to success in the Internet age. Market initiatives, which are often made ineffective by monopolized private companies, may not bring about substantial gains that enable the majority of their population to participate in the digital revolution.

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