

Introduction

The accumulated experience of IP Telephony development around the world (gathered, for instance, through case studies, see Table 1 below, and other sources of information) shows that the pace at which the service has been expanding in various markets depends heavily on a number of legal, institutional, technical, and economic factors. Depending upon how these different factors have played out in each individual marketplace, IP Telephony deployment has sometimes spread like wildfire (as in the case of China) or has sometimes stalled and contracted (as in the case of Colombia). The experiences gathered through the case studies also show that the rise of IP Telephony has, in turn, had a considerable impact on existing laws and regulations. The entry (legal or illegal) of IP Telephony service providers in domestic markets has, for example, accelerated the pace of market opening and, hence, the introduction of competition in the long-distance and international service markets.

The impact of the regulatory environment on IP Telephony

Today it is almost a premise in the telecommunications industry that new technologies bypass any attempt to regulate them and, for that reason, governments should just give up regulation and let technologies and markets determine the path and evolution of the industry.

Recent experiences with IP Telephony however, seem to defy this premise. The evidence gathered from a number of case studies indicates instead that pre-existing national legislation and regulation is a strong determinant of the evolution of IP Telephony in each country.

Going by the rules

In some countries, like China, the legislation that was in place at the time that the first IP Telephony services were launched provided a basis for the legal system to argue that the provision of such services was not breaching the law and, therefore, should be allowed to be provided in an unrestricted manner.

More specifically, when the Chen brothers were prosecuted because they were providing IP Telephony services from their computer shop, they argued in court that only one telecommunication legislation or regulation appeared to be directly related to their service. That was the 1993 "Provisional Arrangement for the Approval and Regulation of Decentralized Telecommunications Services" which listed the services considered to be telecommunications value-added services, for which a licence was required. Computer services, they reasoned, having not been listed, could not therefore be considered a telecommunication service, and as such fell outside the authority of the Ministry. While the Chen brothers lost their original hearing at the court of first instance, the Mawei District People's Court, they won on appeal at the Fuzhou Intermediate People's Court. The judge accepted their argument that the activity was not covered by criminal law, and was at most an administrative matter. Local court officials then agreed with the brothers that offering IP Telephony service was not explicitly prohibited under existing administrative rules and regulations. The decision of the courts unleashed the possibility for IP Telephony services to spread throughout the country, with various government agencies taking the lead in the building of a national IP Telephony marketplace.

In Colombia, by contrast, pre-existing legislation and regulation led to the punishment of those who defied the regulatory framework. The provision of IP Telephony by any company other than those with a licence (to provide international services) was not welcome.

The Colombian government is, in general, highly supportive of the development of the Internet in the country and has drafted a "Digital Connectivity Agenda" to wire the country and its institutions to the global Internet. Yet, despite this commitment to the Internet, the government found it very difficult to bypass existing regulatory and legal commitments to allow the provision of IP Telephony in the country.

It is important to recognize that all the services that can be offered over the Internet domestically in Colombia are liberalized. Voice over the Internet is not subject to any regulatory restriction of any kind if it is provided from, or to, a computer.¹ On the other hand, existing provisions establish regulatory barriers which restrict access to international long-distance voice services via the Internet when such service is offered to or from a cellular telephone by operators other than those authorized to provide international service² or when the communication originates and terminates at a telephone.³ This does not imply that authorized operators have any restriction on using IP technology, or any other technology of their choosing, in their services or networks.

The fact is that this regulatory framework and its premises pre-determined the outcome in the first case in which a cellular company—Comcel—attempted to provide IP Telephony services to its customers. The conflict erupted in December 1998 when Comcel advertised in a local newspaper that it was

offering its customers a new service based on IP Telephony. The Ministry of Communications opened a preliminary investigation on 22 December 1998. Its purpose was to determine whether there were grounds for Comcel being considered in breach of the telecommunication rules and regulations, and in particular in breach of the system for licensing the mobile cellular telephone service, by providing IP voice service for international communications. The Superintendencia de Industria y Comercio (Superintendent of Industry and Commerce) opened an investigation as well to determine whether Comcel had engaged in unfair competition or had obtained an illegal competitive advantage.

The arguments presented by the three operators—Comcel, Ocel and Rey Moreno—to defend their services were oriented towards demonstrating that the communications in question were neither basic switched international long-distance telephony nor cellular mobile telephony. After nine months of operation, the IP Telephony, service was suspended.

In February 2000, the Ministry of Communications and the Superintendent of Industry and Commerce wound up two of the three investigations. In the first of these cases, the penalty imposed on each of the two cellular operators and the value-added operator was a fine (1'000 times the monthly minimum wage, an amount equivalent to some US\$ 140'000). In the second, a fine was imposed while the long-distance operators were given 15 days to present a claim for the damages caused by the conduct of the IP Telephony service provider. The Superintendent of Industry and Commerce imposed a penalty, on Comcel only, in the form of a fine of 2'000 times the monthly minimum wage. Comcel has appealed against this decision.

Table 1: Market statistics and regulatory structures*For selected case-study countries, 1999/2000*

Country	Teledensity at 1/1/2000	General market structure	Degree of State involvement in incumbent fixed-line PTO	Price of three minute peak-rate call to US, 1999, in US\$	Price of settlement rate per minute with US, 1999, in US\$
China	8.7	Some degree of competition between different State-owned firms.	100% State owned	\$5.44	\$0.505
Colombia	16.0	Three companies hold licences to provide international services.	100% State owned	\$1.65	\$0.325
Czech Republic	37.1	Incumbent held international services monopoly until 2000.	Partially privatized	\$1.71	\$0.185
Hungary	37.1	Incumbent holds international services monopoly until 2002.	Fully privatized	\$1.09	\$0.19
Nepal	1.1	Full monopoly by State-owned incumbent. A regulatory body has been established, but policy-making body not yet separated from incumbent.	100% State owned	n.a.	\$0.84
Peru	6.7	Partial competition in local services; monopoly in international services.	Partially privatized	\$2.35	\$0.33
Thailand	8.6	State-owned operators for domestic and international service have legal monopoly but share revenues with franchisees able to provide domestic services.	100% State owned	\$3.38	\$0.30

Source: ITU World Telecommunication Indicators Database and country case studies.

The experience of Colombia is not unique. A fairly large number of countries around the world either banned explicitly the provision of IP Telephony or had pre-existing legislation that restricts the provision of this type only to those with a licence to provide voice services—which in a large number of countries are only the incumbent carrier or carriers with exclusive licence or licences for such services. On the other hand, the countries that explicitly allow the provision of IP Telephony are relatively few.

Leveraging definitions and deficiencies

Some countries explicitly ban IP Telephony while others allow it, based on existing legislation. The majority of countries have no particular policy at all. But there are some nations that, in their effort to promote the Internet and to spread its benefits to the population, have used definitional tools or the argument of regulatory deficiency either explicitly to allow the service or to avoid prosecuting those that are providing the service.

In Hungary, for example, the incumbent operator MATÁV has exclusive rights until the end of 2001 to carry international public voice telephone traffic. The government, which is actively promoting the expansion of various Internet services across the country, established a definitional boundary between public voice telephony (which remains closely regulated) and non-public voice telephony (which is open to competition), based on the quality of the service, and, more precisely, on the transmission delay.

In China, the Chen brothers' case also posed the question of definitions and legality of the services, based on the market boundaries set by those definitions. To solve the matter the Appeals Court consulted with a number of legal and technical experts on telecommunications and the Internet and based its final decision for the case on the basis that Internet Telephony is technologically different from conventional telephony.

Similarly, Peru faced a similar dilemma at a certain point. The Peruvian legislation on telecommunications does not cover Internet services specifically, but the Ministry of Transport and Communications has regarded them as value-added services—based on the notion that they involve the addition of some feature or facility relative to basic services. The Peruvian legislation explicitly states that all value-added services are covered by a regime of free competition.

A peculiarity of the Peruvian law however is that it excludes real-time voice traffic from being classified as a value-added service. Apparently, at the time when this classification was made, it was already known that value-added companies might be able to carry voice traffic, to do so in real time would necessitate them holding a licence. As a result, discussions on the subject of VoIP have focused on whether or not VoIP transmission is performed in real time. Regrettably, the legislation does not give a satisfactory definition of what "real time" means, giving rise to a variety of opinions on the matter. With the opening of the domestic

market to competition many of these definitional problems have moved to the background of the telecommunication agenda.⁴

In Nepal, although VoIP is illegal, the national regulatory agency, the Nepal Telecommunications Authority (NTA), has taken a hands off position by arguing that IP Telephony is almost impossible to block.⁵ The policy-making body, the Ministry of Information and Communications (MoIC), has in response obliged the NTA to make clear to domestic ISPs that VoIP is illegal.⁶

Definitional boundaries lead to jurisdictional boundaries

Another important factor in the definitional dilemma is that, the way IP Telephony is defined and, therefore, regulatory regime under which it falls, determines also the kind of institutions that will deal with the legal and regulatory challenges posed by the new technology and the actions of those that provide the service. This is an important factor because, according to the particular historical, social and institutional ties, and the "ideology" of the institutions involved (whether they favour progressive and limited or unrestricted liberalization), one would expect different outcomes from the legal and regulatory conflicts posed by the rise of IP Telephony.

In the case of China, for example, although China Telecom was quite successful in convincing the police that the Chen brothers had broken the law and having them detained, the matter was later submitted to the judicial system of the country (not the telecommunications regulator or the communications ministry or the competition regulator, as has been the case elsewhere). The judge accepted their argument that the activity was not covered by criminal law, and was at most an administrative matter. Local court officials then agreed with the brothers that offering IP Telephony service was not explicitly prohibited under existing administrative rules and regulations.

In Colombia, by contrast, the challenge posed by the cellular operator Comcel was considered in first instance as a matter to be dealt by government agencies—the problem was tackled by the Telecommunications Regulatory Commission (CRT), Ministry of Communications, and the Superintendent of Industry and Commerce. By early 2000 the Ministry of Communications and the Superintendent of Industry and Commerce wound up their administrative investigations. The Ministry imposed penalties on the three operators Comcel, Ocel and Rey Moreno. The decision was appealed by Comcel and confirmed by Resolution 984 of 8 May 2000.

Peru also offers an interesting case related to the role of definitions and jurisdictional boundaries. The Ordinary Collegiate Body (CCO) nominated by the OSIPTEL—the telecommunications regulatory body—and charged with settling the dispute resolved that, if RCP had been supplying long-distance service without a licence, then the competent body to resolve the dispute would be the Ministry of Transport and Communication. However, the key conclusion of the CCO was that use of APLIO, a phone-like IP Telephony device, did not constitute a long-distance public service because no payment had to be made for the communication service.⁷ According to the CCO, RCP did not require a licence for marketing the APLIO equipment since its authorization for offering Internet services was sufficient for the functions it was performing.⁸

The three cases offer a wide array of ways of dealing with the legal challenges posed by IP Telephony. In China the matter was resolved by the courts, in Peru it was resolved by an Ordinary Collegiate Body nominated by the telecommunications regulator, while in Colombia it was tackled by the government bodies as an administrative matter. It might be pure coincidence, but it is nevertheless interesting to see that in the case in which the courts were involved, the outcome of the case favoured IP Telephony providers; and in the case in which an Ordinary Collegiate Body

was appointed, the jury also granted judgement in favour of the party attempting to provide IP Telephony services—rather than supporting the position of the incumbent.⁹ However, in the case in which the Ministry of Communication and other government bodies were involved, the final decision benefited the traditional voice carriers (in which the State still has some ownership interests).

The incentives of asymmetric regulation

There are a number of other elements in the legal and regulatory framework of each country that can work in favour or against IP Telephony services. For IP Telephony service providers, the degree of asymmetry in obligations between traditional voice telephony carriers and value added operators could be an important factor in deciding whether or not to enter a particular telecommunications market.

The fact that regulatory asymmetry can work in favour or against the rise of IP Telephony services is clearly reflected in the Peruvian legislation. While carriers that provide traditional voice telephony over the PSTN are obliged to hold a licence (which generally takes 50 days, with a possible extension to 70 days) with a range of requirements; value-added service operators need only to obtain an authorization (which takes five days) to enter the market, and in most cases have to fulfil only very limited requirements.¹⁰

Some of these requirements in Peru are:

- Traditional voice carriers are required to present a technical/economic profile; a requirement from which value-added network service providers (VANs) are exempt.
- PSTN voice service operators are obliged to make a one-off payment of 0.25 per cent of forecast initial investment, while VANs have no obligation in this regard.

- Voice PSTN operators are obliged to contribute 1 per cent of gross annual revenue to the Fondo de Inverstiones en Telecomunicaciones (FITEL) a sort of universal service fund, while VANS have no obligation in this area.
- Traditional voice service providers are obliged to have, in two years from the time of licensing, their own infrastructure and at least one switching centre in at least five cities. VANS, by contrast, have no obligation to expand their services or to own the infrastructure the use to provide services.
- Traditional carriers may be subject to tariff regulation; a regulatory intervention from which VANS are exempt.
- Similarly, traditional carriers are obliged to meet quality parameters, which are not applicable to VANS.
- Traditional carriers are obliged to interconnect with other public service providers – interconnection requirements for VANS are at the discretion of the regulator.
- Finally, traditional PSTN voice service providers are obliged to contribute towards the cost of implementing the pre-selection system that is required in liberalized markets, while the no obligation is required of VANS.

One of the few regulatory requirements that is applicable to both PSTN voice service providers and VANS is related to the payment of a regulatory supervision fee: both type of carriers are required to contribute to the costs of inspection with 0.5 per cent of gross annual revenue.

Impact of public telecommunication operators on the evolution of IP Telephony

Aside from the impact of legal factors, such as the pre-existing regulatory environment in each market, there are a number of more dynamic factors that affect, in rather unpredictable ways, the evolution of IP Telephony in each market.

Policy-makers and regulators

According to the evidence provided in the case studies, high-level government officials and policy-makers have, in general, adopted a positive attitude toward the emergence of the Internet and related services. However, as with privatization, competition and other telecommunication market reforms, there are divergent positions within each national administration. The pace and direction of the evolution of IP Telephony in each market will depend heavily on the power play between different groups, such as advocates and the detractors of IP Telephony.

China offers a clear illustration of the important role played by the various interest groups that struggle in favour or against the rise of IP related services. In the particular case of IP Telephony, it is widely accepted that senior government officials in Beijing countered any overt pressure from the Ministry of Information Industry (MII) and made the court aware of the administrative battle surrounding the Internet. Premier Zhu Rongji's widely-known antipathy for carriers with market dominance had dovetailed with the government's administrative restructuring program and the leadership's desire to promote economic growth and market competition. Organizations such as the Ministry of Foreign Trade and Economic Cooperation (Moftec), began to argue that, unless the MII allowed Chinese companies to make

international calls at the cheapest rate, then domestic companies would be at a competitive disadvantage.

Experience in the Czech Republic was similar. Here the government endorsed the rise of IP Telephony services in the domestic market through a ruling issued in August 1999. The IP Telephony conflicts were triggered in 1998 when the incumbent operator, Cesky Telecom (formerly SPT Telecom), complained to the Czech Telecommunication Office (CTO) that mobile operator Radiomobil was offering international long-distance service in violation of the exclusive licence Cesky Telecom enjoyed for such services, until 1 January 2000. The CTO agreed and suspended the service in November 1998.¹¹ But the regulatory agency later changed its policy and from August 1999 onwards, allowed certain classes of operators to provide most forms of IP Telephony.

ISPs, mobile operators, and Cesky Telecom itself are now offering discount international calls using IP Telephony. The incumbent Cesky Telecom's "XCall" service enjoys special status, for the time being, as the only licensed Phone-to-Phone IP Telephony service accessible on the fixed-line network. Users dial a special access code, the destination country code, and the telephone number. Calls are billed afterwards on the fixed-line telephone bill.

The courts and administrative tribunals

The judicial and administrative tribunals of a country can play a crucial role in promoting (China) or undermining (Colombia) the development of IP Telephony services.

Prosecution of presumed illegal IP Telephony service operations can send a chilling message to the market and undermine the growth of the service. In Colombia, new telecommunication legislation, together with the complexities of micro-managing the liberalization of the market, has led to penalties being imposed, which include imprisonment for failure to abide by telecommunication rules and regulations.¹²

Rapid technological innovation and the convergence of technologies and services have posed significant challenges to the existing regulatory frameworks in most countries. Colombia has been no exception in that regard, and a number of value-added operators in the country became increasingly involved in the transmission of voice over data networks.

Several of these operators have been affected recently by the actions taken by the Fiscalía (Office of the Inspector General) at the end of 1999, which started investigations into at least 20 of them on the basis of accusations made by Telecom that they were transmitting voice over their networks.

Apparently, there was a considerable amount of traffic being routed in the form of data over IP networks, because the three long-distance operators—namely Telecom, ETB and Orbitel—saw their traffic increase considerably after Fiscalía started investigating the value-added operators. According to unconfirmed reports, traffic to and from the United States increased by as much as 50 per cent.¹³ Several of the CEOs of the value added companies were thrown into jail and, since then, most of the other VANs have become extremely circumspect about moving forward with the provision of IP Telephony services.

The incumbent operator(s)

In general, as would be expected, there is considerable reluctance on the side of incumbents to embrace or support the emergence of IP Telephony for fear that it would undercut their existing services. However, there is a tangible difference in the attitude of incumbents in open and closed markets.

In emerging markets, where competition in basic telephony services is either not allowed or is limited in scope, incumbents have been proactively blocking the rise of IP Telephony services. In Peru, for example, the incumbent, Telefonica del Peru (TdP), has been denounced

several times by other carriers for its anti-competitive practices and its strategy to undermine the provision of IP Telephony services.

The Net2Phone service had been very popular in Peru among Internet users. However, in the first half of 1999 there were many complaints that clients using TdP's Internet service were suddenly unable to access Net2Phone services. It was argued that the Net2Phone equipment was at fault, unable to cope with such high levels of demand. However, in a counter claim, Red Científica Peruana (RCP), one of the major ISPs in the country, published a complaint claiming that TdP had been blocking access to IP numbers that identified the Net2Phone servers, so that Internet users could not route calls via the Internet and were obliged to use TdP's own services. RCP argued that, according to its tests, access to Net2Phone was possible when the Internet was accessed other than through TdP.¹⁴

In some other countries, like Thailand and China, the rise of competition from IP Telephony and other least cost routing services has been fought on the same grounds, that is, by the PTO entering that segment of the market and taking the lead in the provision of the service.

In Thailand, the exclusivity of CAT in the international service market has been severely eroded in recent years by competition from international call-back services, and substitution of fax and phone calls by e-mail, instant messaging and other Internet-based services. Another important reason for the declining revenue is the decrease in the international settlement surplus that used to contribute a significant proportion of revenues to CAT's coffers. Due to these changes, CAT's revenue fell to Bt30.3 billion (US\$ 694m) in 1999 from Bt33 billion (US\$ 755 m) in 1998. During the same period, its profit also plunged by 39 per cent from Bt7.38 billion

(US\$ 169m) to Bt4.50 billion (US\$ 103m). It was in this context that the CAT decided to introduce its VoIP services.

In China, once it became clear that, given the courts decision on the Chen brothers' case and the media coverage of it, it would be almost impossible to sustain a ban of IP Telephony services, the Ministry quickly decided to push its national carriers to take the lead in the provision of IP Telephony. Soon after the results of the courts case, the four major national carriers were engaged in an IP Telephony trial promoted by the MII itself.

As the cases of China and Thailand show, public ownership of the incumbent carriers can make it easier for governments to introduce IP Telephony service, if they choose to do so. The initiative is framed as part of a national policy programme and the services can even be provided at a subsidized rate for promotional purposes or for universal service aims. In the case of Thailand, the VoIP service of the Telecom Organization of Thailand (TOT; operating under the name of Y-Tel 1234) is aimed at providing cheap domestic long-distance call service to distant regions of the country. The service is in line with the government's policy of low-cost services in the provinces.

Yet, on the other hand, public ownership of the incumbent(s) can work as a deterrent to IP Telephony. That is the case of Colombia where pre-existing legislation, a high licence fee (US\$ 150 million) paid by the three long-distance/international carriers, and the interest the State has in some of them led to a negative reaction to the rise of IP Telephony in the country.

New entrants and ISPs

New entrants and ISPs have been quite enthusiastic to engage in the provision of IP Telephony services. In most cases they have both the capability and the technical and financial conditions to implement

services. However, regulatory restrictions and/or market structure constrains the ability of these carriers to provide services, even if incumbents have no interest to promote it themselves.

Furthermore, in a large number of developing countries, incumbent carriers control both the main national backbones and the retail ISP market. In Latin America, for example, most incumbent PTOs control between 40 and 95 per cent of the domestic ISP market. In Asia also, incumbent operators influence, through their control of the PSTN, the business development plans of most ISPs in some of the major countries of the region.¹⁵ The concentration in ownership and control of the Internet market is true even in countries where the telecommunication sector has been opened to competition in all segments of the market.¹⁶

Given the current market structure in the IP services segment of most developing country markets, and the manifest reluctance of PTOs to engage in the provision of IP Telephony services, the short-term prospect for this new service is sometimes quite gloomy, in spite of the fact that most government officials support the development of low cost services such as those offered through IP Telephony.

The impact of IP Telephony on the regulatory environment

The relations between IP Telephony and the legal and institutional environment in each marketplace are, at this stage of the evolution of the technology, rather fluid. The rise of IP Telephony has affected the evolution of the regulatory environment as much as, if not more than, the regulatory environment has affected the evolution of IP Telephony. One of the most tangible effects, in those markets where IP Telephony has started to spread, is the acceleration of market liberalization (either *de facto* or through the reform of existing legislation). The other aspect of IP Telephony that

is affecting traditional telecommunication market arrangements is the relatively low prices offered through IP Telephony, which is having the effect of reducing overall market prices.

Increasing competition and market reform

In most cases the rise (legal or otherwise) of IP Telephony, tends to exert considerable market pressure to accelerate the liberalization process. In China, for example, the attempts to block the provision of IP Telephony services failed, and China Telecom realized that its position was untenable; it embarked upon a dramatic turnaround. Government officials at the MII created a new licensing framework for Internet Telephony operators, limited in the first instance to the government-affiliated telecom bodies—China Telecom, China Unicom and Jitong. They also focused the newly licensed carrier, China Netcom, on IP services and they galvanized China Telecom to undertake the largest roll-out of an IP Telephony platform anywhere in the world.

Almost overnight, the government had swung around from blocking IP Telephony (in much the same way that they had banned call-back operators) to rolling it out as a central plank of their emerging telephony, data and Internet agendas. China's IP Telephony market formally opened on 28 April 1999, with the MII issuing licences to China Telecom, China Unicom, and Jitong to begin six-month periods of operation in a total of 26 cities. The legalization of IP Telephony ended what was effectively a *de facto* long-distance and legal international monopoly held by China Telecom.

The acceleration of the liberalization process is also being experienced in Hungary and the Czech Republic where the rise of IP Telephony services offered their governments a tool to accelerate the introduction of competition in a market segment that was under the exclusive domain of the incumbent operators.¹⁷

Challenging the existing price structure

Data gathered in the case studies indicate that the new pricing scheme offered by emerging IP Telephony services is another important component affecting the current regulatory and pricing regime in most markets. As data from the different countries show, prices for IP Telephony have turned out, in most cases, to be between 30 to 50 per cent lower than for traditional voice telephony. Consequently, they are posing serious challenges to the conventional services of traditional PSTN carriers.

In the case of China, for example, the MII's initial pricing structure for the IP Telephony trial showed the potential consumer appeal of IP Telephony.¹⁸ During this stage, domestic long-distance charges were levied at Rmb 0.30 (US\$ 0.04) per minute, while international calls were charged at Rmb4.8 (US\$ 0.58) per minute. In comparison, non-IP long-distance telephony tariffs at that time stood at Rmb 0.90 to 1.10 per minute while international calls stood at Rmb 12 to 15 per minute. In December 1999, the Ministry of Information Industry reduced the prices of international telephony services. The price for peak period calls on 16 major routes was cut to RMB 4.8 per minute (the same price as an IP international call), and for off-peak calls the price was cut to Rmb 2.9 per minute (40 per cent cheaper than comparable IP calls). It is doubtful whether such cuts would have taken place in the absence of competition from IP Telephony.

Similarly, in Peru, a call to the United States placed through an IP Telephony service provider, like Net2-Phone, offers significant savings compared with the rates of the incumbent carrier, Telefonica del Peru. For a PC-to-telephone call from Peru to the United States, the tariff per minute is US\$ 0.15 via Net2-Phone, compared the US\$ 0.66 charged by Telefonica del Peru.¹⁹

In Thailand, IP Telephony rates of PhoneNeduring standard rate calling hours are between 29 per cent (to South and Central America) to 33 per cent (to Europe and East Asia) cheaper than the rates of traditional PSTN voice telephony offered by the Communications Authority of Thailand (CAT).

In addition to lower rates, the IP service provider claims that there are other benefits to users. Firstly, the service is not charged in blocks or units of time, as in the case of international call, but on the number of actual seconds used. Thus the prices of the service will effectively be lower than in the simple comparison. Secondly, with the calling cards, users can more easily control their expenditures. It is interesting to note that the prices of PhoneNet do not change with the time of the day. Thus it seems that the service will be most attractive for business users who have less flexibility over the time to make when calls are made.

Similarly, the IP Telephony rates for national long-distance calls are quite competitive. As of May 2000, during the peak hours (7:00-18:00 on working days) the VoIP service prices ranged from Bt 2 to Bt 8 per minute (4.5 to 18 US cents per minute). This is significantly lower than the current traditional long-distance voice telephony rates of Bt 3-18 (8-41 US cents) per minute, and is competitive with the relatively low prices of mobile phone services.²⁰

The attractive prices offered by IP Telephony services have gained wide popularity among telephone users. China offers interesting anecdotal evidence of such positive reactions of the population to the emergence of IP Telephony services.

Jitong, one of the Chinese companies licensed to provide IP Telephony services during the trial period reported that, at its sales offices in Shanghai, more than 2'000 people lined up to buy the IP Telephony cards when they went on sale on

19 May 1999—some of them having lined up at 2:00 a.m. Jitong employed a small army of people in 15 sales agencies to promote their cards and, in their first month of service, was able to sell some 50'000 in just five cities. From June to August 1999, the total revenue from sales of IP phone cards was estimated at US\$ 35 million, with an annual potential of US\$ 150-200 million (assuming that the service is expanded).

Unicom, one of the other carriers licensed to provide IP Telephony services during the trial period, argued that between June and November of 1999, the company had acquired nearly 700'000 customers through its 12-city trial and was already generating "several million minutes" in monthly traffic between China and the United States. Another important outcome of the trial is that Unicom's 12-city trial network reached full capacity in only 80 days instead of the 180 days predicted at the start of the operations.

China Telecom, the incumbent, was reluctant to promote the service and set up only one sales counter at the Beijing Long Distance Telephone Exchange Bureau, and issued only a very limited number of IP cards. Even so, the Beijing Telecom office had over 500 people per day sign up for telephone service during the first two days following the announcement. Previously, the office handled about 20 telephone subscriptions per day.

In sum, evidence from the case studies suggests that, where IP Telephony has been allowed, the competition introduced has contributed to a substantial reduction in the prices for international and long-distance calls, which in turn has brought about considerable consumer benefits. It is likely that the effect of lowering prices has been to stimulate demand, which will partially offset any possible revenue loss. Further research is required in this area to show what happens.

Conclusion: Who benefits from restrictive policies?

The country case studies (summarized in Annex A) show that the rise of IP Telephony services varies considerably from one market to another. A closer look at the cases shows that the factors affecting the pace of evolution of IP Telephony are varied. There are, however, some commonalities among the cases that provide some basis to draw some preliminary "lessons" related to the interaction and interdependence between the national regulatory environment and the IP Telephony services. Some of these "lessons" can be summarized as follows.

- Defying the almost unchallenged notion that efforts to regulate new technologies and services are useless, the case studies show that pre-existing and newly crafted legal instruments and regulations do have a considerable effect on the pace and direction that new technologies and services such as IP Telephony take in the marketplace.
- The cases also show that the degree of government support for cutting prices, via IP Telephony, is as (if not more) important for the future of the service as the existence of restrictive or permissive legislation.
- Supportive governments can "interpret" restrictive legislation in ways that provide incentives for IP Telephony services to develop, in sheltered market niches. In this context, definitional tools that differentiate between IP Telephony and PSTN Telephony can help.
- On the other hand, the effective prosecution of "illegal" IP Telephony operations sends a chilling message to

the market and constrains growth.

- Incumbent operators are invariably less enthusiastic towards IP Telephony than new market entrants or ISPs.
- The approach adopted towards IP Telephony often hinges on the degree of State involvement in the incumbent operator and who takes the decision. Where decisions are taken by the national courts, or by a regulatory agency that is completely independent of the incumbent, the outcome is more likely to be favourable to IP Telephony service providers than if a decision is taken by a policy-making body which retains links with the incumbent operator.
- The rise of IP Telephony services has exerted considerable pressure on current market arrangements and has, in most cases, speeded up the liberalization process under way in most countries of the world.
- Use of IP Telephony can offer considerable price savings for consumers, particularly in markets where there is little other competition or where prices for international calls are kept high in order to generate revenues to cross-subsidize local calls and subscription charges.
- In some cases, it is shown that IP Telephony networks can be established relatively quickly, allowing for accelerated market entry.

The case studies and the data gathered elsewhere also indicate that many countries, particularly developing ones, do not specifically prohibit IP Telephony but most likely do not allow it because the incumbent still has (or will have for a period of time) exclusivity over the supply of voice telephony services.

Although it is difficult to obtain concrete evidence, it appears to be the case that a growing proportion of incoming international voice traffic to developing countries markets is coming over IP networks and then breaking out into the PSTN locally. Given that the lines rented by ISPs would normally show large volumes of traffic being directed to users, it is relatively easy to hide incoming voice traffic, worth around a hundred times more per minute than the IP data and fax traffic with which it is mixed.

In most developing countries, governments choose to block outgoing VoIP traffic while being unable to block incoming VoIP. With a restrictive policy like this, the country suffers on all fronts. On the one side, the incumbent (and most likely the State, given that in more than half of the countries of the world the State is either the only owner of the incumbent or still controls majority of shares) is being hurt by the fact that VoIP traffic bypasses the accounting rate system causing a significant decline in incoming net settlements. On the other hand, citizens of the country are also hurt by the high international tariffs levied by the incumbent and by the fact that they cannot benefit from cheaper IP Telephony services.

In view of the evidence presented here, it is appropriate to encourage policy-makers to review their positions vis-à-vis IP Telephony and to establish policies for IP networks in the broader context of national economic development, productivity and competitiveness.

- ¹ It is worth stressing, however, that the regime governing both basic service and value-added service is one of open competition, and that while basic long-distance telephone service has to meet certain conditions, there is no express limitation on the number of operators that may be authorized to provide it.
- ² See Resolution 70 of January 2000.
- ³ CRT opinion, "Concepto sobre criterios diferenciales de los servicios de valor agregado" ["Opinion regarding differential criteria for value-added services"], 19 January 2000.
- ⁴ At the IP Telephony Workshop held by the ITU in Geneva in June 2000, there was broad agreement that "different definitions might be required for different market environments. Rapid technological change means that it may not be advisable to attempt precise definitions."
- ⁵ "NTA Bans VoIP," The National NewsMagazine, 28 January - 3 February 2000 and ITU Country Case Study of Internet diffusion in Nepal, available at: <<http://www.itu.int/ti/casestudies/nepal/nepal.htm>>.
- ⁶ In January 2000, NTA sent a notice to all ISPs instructing them specifically to block the DialPad.com IP Telephony service, which offers free calls to the United States and other destinations. The ISPs duly contacted their user base to inform them of NTA's notice. However, given that Fax-over-IP ("FoIP") is liberalized (requires a licence), and that it is virtually impossible for ISPs to distinguish between incoming voice and fax traffic, it would be surprising if the ISPs were able to comply with this ruling. Indeed, some cyber cafés still openly advertise VoIP on their websites.
- ⁷ National legislation states that public communication services, unlike private ones, are those that are supplied in exchange for payment ("economic compensation").
- ⁸ For the final first instance ruling and further material, see <<http://ekeko.rcp.net.pe/rcp/controversia/EXP-9902/index.shtm>>.
- ⁹ It would be useful to carry out further research in this matter to see if this is a pure coincidence or if there is a close correlation between the type of institutions charged with settling the disputes and their final decision on the cases.
- ¹⁰ For more details see the IP Telephony Peru Case Study at <<http://www.itu.int/osg/sec/spu/ni/iptel>>.
- ¹¹ For more detail, see <<http://www.itu.int/osg/sec/spu/ni/iptel/countries/czechrep/index.html>>.
- ¹² Law 422 of 1998 states in Article 6: "Anyone who accesses or uses the cellular mobile telephone service or any other telecommunication service by means of the unauthorized copying or reproduction of signals which identify terminal equipment for such services, or taps, or use of unauthorized lines of the local switched basic public telephone service, extended local service, or long-distance service, or who provides or engages in unauthorized telecommunication services or activities for profit shall be subject to imprisonment for a period of from four to 10 years and a fine of from 500 times to 1'000 times the monthly minimum wage established by law."
- ¹³ One problem for the regulatory authorities is the lack of reliable information, particularly in regard to long-distance traffic. Initially Telecom considered this information confidential, and this has made it difficult to obtain historical series that would provide accurate and reliable data, and hence valid studies. Responsibility in this area has subsequently been scattered among a number of bodies, particularly the Ministry of Communications, the CRT and the Office of the Superintendent of Public Utilities. These bodies have had no structure in place to handle or process the data, or produce timely reports. The most recent reforms have brought some institutional clarity to the issue, giving the CRT responsibility for preparing a corpus of data on the sector, with the Ministry of Communications and the SSP as participants in this effort. The CRT is now setting about this important task, which will be of great benefit to the entire sector.
- ¹⁴ Net2Phone was not the only case where allegations arose of apparent blockages by Telefonica to prevent long-distance communications using IP Telephony. Users of the Internet telephony hardware device, APLIO, experienced a similar situation. For more details see the Peru case study in Annex A.
- ¹⁵ In China, because China Telecom owns the vast majority of telecommunications infrastructure in China, this in effect means it is the monopoly supplier. All 150 or so of China's ISPs are small and local, and China Telecom has shown little compunction in squeezing as much money from these businesses as possible, with the result that whereas in the United States, line rental accounts for only about five per cent of an ISP's costs, in China the average is nearly 80 per cent. Even more restrictive is a China Telecom practice of linking line rental to the amount of revenue per line. Consequently, instead of rental declining with volume, it rises; making an ISP less profitable the more it increases its user base or traffic volume. Given a playing field tilted so steeply against them, most independent ISPs have found it impossible to stay in business without receiving some degree of assistance or lenience from China Telecom. As a result, although China saw a small blossoming of ISPs in 1997 and 1998 (many being small bulletin board service operations which decided to go commercial), many of the companies granted ISP licences have subsequently stopped offering ISP services, or have been incorporated into the ChinaNet framework.
- ¹⁶ In Peru, for example, the number of ISPs has been falling since July 1998 owing to a consolidation of the industry in the hands of Telefonica del Peru.
- ¹⁷ Poland was, during 2000, following a similar path by endorsing the provision of IP Telephony services by a cellular operator.
- ¹⁸ The price pressure from IP Telephony on traditional phone services had already been made clear when, on February 28, the MII announced major price reductions in existing phone service and installation fees.
- ¹⁹ It should be emphasized that the settlement rate (which is the equivalent of half the international accounting rate) that TdP has to pay to the United States carriers is currently USD 0.31 per minute. This indicates that

the settlement rate that Net2Phone Peru pays to Net2Phone USA must be much less than the rate paid by TdP, probably somewhat less than the peak tariff.

²⁰ In the Asia-Pacific region other companies are providing IP Telephony services at very competitive prices. In Singapore, for example, SingTel's VoIP service provider eVoiz offers calls from Singapore to New York at 5 US cents a minute. See "SingTel offers overseas calls via Internet", Bangkok Post, Business Section, 7 March 2000, page 2.