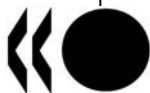


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**-- Session IV: Competition Issues in Telecommunications --**

**Contribution from Erika Lopez Ponton**

**9-10 September 2009, Santiago, Chile**

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**LATIN AMERICAN COMPETITION FORUM  
-- 9-10 September 2009, Santiago (Chile) --**

**Session IV: Competition Issues in Telecommunications**

**THE IMPACT OF TECHNOLOGICAL CONVERGENCE ON ANTITRUST ANALYSIS  
IN THE LATIN AMERICAN TELECOMMUNICATIONS SECTOR**

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## Executive summary

1. The telecommunications sector has changed significantly since the emergence of technological convergence.<sup>1</sup> The rules governing this industry must be adapted to reflect its new specificities. This is particularly pertinent for competition law and policy, given that antitrust principles have been affected by technological progress: entry barriers, network access, interconnection costs, substitutive services, as well as licenses, spectrum allocation, and universal services. Additionally, convergent services and technologies stimulate vertical and horizontal competition creating complex inter- and intra-firm relations, which encourages competition authorities and sectoral agencies to adapt their regulations to enhance competition whilst supporting technological progress.

2. In this evolving context, Latin American jurisdictions have progressively introduced the concept of technological convergence to their sectoral and competition laws and policies. In most countries, this regulatory reform strengthened and complemented the privatisation reforms undertaken in the early 1990s. According to the six country experiences examined (i.e. Argentina, Brazil, Chile, Colombia, Mexico and Peru), the main priority has been to reduce legal constraints and anti-competitive behaviours preventing new entrants from penetrating previously protected markets, with a focus on the simplification of licences and access procedures. Regulation asymmetries, as highlighted by substitutive and convergent services, have also been addressed by some jurisdictions, given their constraining effect on technology diffusion. Traditional interconnection issues are more complex, as networks become inter-related and service providers are more numerous. Network interconnection challenges require updated regulation in terms of access, rates, infrastructure sharing, and licences, amongst others. Last, but not least, convergence and universal access (a key policy concern for regulators in the region) have been combined in order to expand basic services significantly.

3. Despite the initiatives undertaken by all jurisdictions to adapt their regulations, progressively, to the emerging competition issues, regulatory provisions still lag behind, creating regulatory asymmetries and uncertainties. As a consequence, institutional divergences between competition and telecommunications regulators appear. These divergences are generated by different regulatory approaches and the difficulty of keeping pace with technological progress. Telecommunications regulators have an *ex-ante* approach, setting out the rules that frame telecommunications activities, while competition regulators have an *ex-post* approach, intervening only if market competition is negatively affected. Overlapping regulation problems also makes it more difficult to adapt regulation at the same pace as technological progress. These overlapping regulations may arise as a result of: convergent or new services involving several industries which fall under the remit of multiple regulators; unclear regulations within the same industry; and divergent views between competition authorities and sectoral regulators.

4. The regulatory problems and questions highlighted in this issues paper should be considered as challenges rather than weaknesses of the current regulation framing the Latin American telecommunications sector. Further discussion could assist competition authorities to exchange experiences about how to conciliate technological convergence and market competition, expand basic services as well as “value added” services, notably the internet, and promote the economic and social benefits generated by technological convergence.

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<sup>1</sup> Technological convergence is defined as the process by which telecommunications, information technology and media, sectors that originally operated independently of one another, are moving closer together (Stobbe and Just, 2006).

## 1. Introduction

5. The main result of the impressive progress made in information and communication technologies (ICT) is probably the convergence between different industries and services. Technological convergence could be defined as a process by which telecommunications, information technology and media, sectors that originally operated independently of one another, are moving closer together (Stobbe and Just, 2006). In economic terms, technological convergence connects two or more previously distinct markets.

6. In this context, antitrust and sectoral regulators are encountering major challenges in adapting their regulations to new services and networks features. Traditional telecommunications concerns, such as network coverage and spectrum capacity, have to be handled differently since the advent of digitisation and internet protocol. Furthermore, the expansion of technological convergence has changed the vertical and horizontal organisational structures favouring new competitive relationships within the telecommunications sector and hitherto unrelated sectors.

7. Latin American countries are already in the process of adapting their antitrust and sectoral regulations to maximise the benefits of technological convergence. Exchanges of national experiences through seminars, as the OECD-IDB Seventh Latin America Competition Forum (Chile, 9-10 September 2009) to which this paper contributes, and high-level discussions are taking place in the region, in order to address emerging competition and efficiency concerns. Many questions are still to be resolved, given the rapid pace at which one technology replaces another and the absence of a standard technology.

8. Without getting into technical details, the objective of this issues paper is to highlight the antitrust consequences of technological convergence in the telecommunications sector in Latin America. For this purpose, the paper focuses both on the impacts of technological convergence for antitrust analysis and on the institutional divergences between the competition authorities and the telecommunications regulators.

9. The paper opens with the major changes to the telecommunications sector generated by technological convergence. It goes on to describe how Argentina, Brazil, Chile, Colombia, Mexico and Peru are adapting their regulations to technological convergence challenges. These challenges are discussed further in section four: the new antitrust challenges related to regulatory asymmetries, licensing, spectrum allocation, network interconnections, regulator neutrality and universal services. This section tackles the institutional divergences between the competition authority and the sectoral regulator. The conclusion proposes issues for further discussion.

## 2. The effect of technological convergence on the telecommunications sector landscape<sup>2</sup>

10. The development of digitisation, computerisation, and internet protocol (IP) lead to technological convergence and creates new networks, services and products as well as new sectoral interactions. One remarkable example of technological convergence is “triple play”: operators using one network (either cable or copper lines-ADSL) and one technology (IP), to offer access to television, voice telephony and internet services.

11. Technological convergence has had three radical effects on the telecommunications sector (Bezzina and Terrab, 2005). First, the full digitisation of contents and networks makes it possible to supply different services over integrated networks to a much greater extent than previously. The emergence of IP led to new physical infrastructures using wireless and wired technologies like Wi-Fi and optical fibre.

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<sup>2</sup> Non-expert readers can consult the glossary at the end of paper.

12. Second, technological convergence opens up new markets for new functionalities, devices, and services resulting from new technologies. For instance, smart-phones are progressively replacing digital cameras and mobile phones, which had previously been available only separately. As far as services are concerned, interactive television (video on demand) mixes television and movies in a TV set or a computer through IP technology (OECD, 2007b).

13. Third, all of these innovations point towards “market convergence”. In converging markets, industry boundaries become blurred. Technological convergence enables different services belonging to separate networks to come together. A mobile phone that can receive television programmes and play videos could be a telephone, a TV set and a video player all in one. Stobbe and Just (2006) distinguish four generic types of convergence, depending on the convergence driver (technologies or products) and the relationship between the respective markets (substitutive or complementary):

- a. Technological substitution generated by rapid technological progress. For instance, in many countries GPRS technology has already been replaced by 3G which allows higher data transfer speed and develops mobile data communication.
- b. Technological integration refers to a better use of resources and knowledge. For instance, personal data assistance (PDA) is the combination of computer (hardware and software) and electronics (particularly pocket calculators).
- c. Complementary product convergence emerges from the combination of different technologies. For instance, mobile television links devices that could previously only be used separately (mobile phone and television) and represents an extra service for consumers.
- d. Substitutive product convergence, as illustrated by smart-phones that can basically replace the conventional mobile phone, the PDA, and portable music players, since they integrate conventional voice telephony, data exchange via e-mail and internet, and the basic database functions all in one product.

14. As a consequence, the main core of the telecommunications sector (i.e. fixed and mobile telephony) is now closely related to the producers of information devices (e.g. PDAs, computers, etc) and to the producers of media contents (e.g. movies, broadcasting, etc). The expansion of technological convergence has favoured a new competitive relationship within the telecommunications industry and hitherto unrelated industries. In this sense, technological convergence together with privatisation reforms has changed the organisational structure of the telecommunications sector (Figure 1).

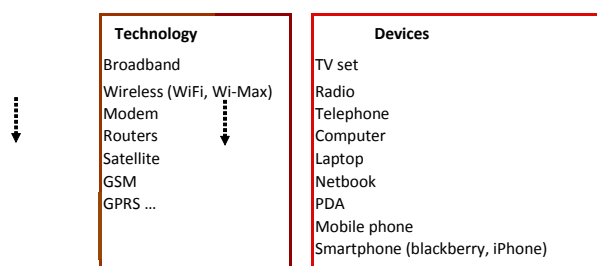
15. Traditionally, the telecommunications network was composed of vertically integrated layers and was operated by one operator<sup>3</sup>. Following privatisation reforms and the development of technological convergence, these layers have tended to disintegrate vertically, compete vertically and cooperate horizontally. Digitalisation contributes to the vertical disintegration between telecommunications infrastructures and services and, therefore, enhances market competition. By separating out their different operations, historical operators are giving room to new network providers who can outsource their transmission through switched interconnection to other networks and feed new horizontal and vertical services providers (e.g. eBay, Skype, etc).

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<sup>3</sup> The duct and mast level, the cable and antenna level, the transmission level, the network level and the application level.

**Figure 1. Technological convergence create new competitive relationship within the telecommunications industry and hitherto unrelated industries**

Operators	Network	Services (multi packages or individual)					
Classic telecoms operators	Switched Telephone (copper)	Fixed telephone	Internet (low speed)				
Cable operators	Cable (coaxial, optical fiber)	Fixed telephone	TV	Internet (medium or high speed)	Radio	Video on demand	
Internet operators	ADSL (IP)	Fixed telephone	TV	Internet (high speed)	Radio	Video on demand	
Satellite operators	Satellite		TV	Internet (high speed)	Radio	Video on demand	GPS
Mobile operators	GSM	Fixed telephone	TV	Internet (high speed)	Radio	Video on demand	GPS



**Technological convergence**

Sectoral convergence : telecommunications (voice) + information (data) + media (contents)

Source: Author

16. The emergence of several networks induces vertical competition, understood as competing firms providing the same kind of service but with different network technologies. For instance, television services can be transmitted by cable, ADSL or satellite. These operators compete, in terms of tariffs and additional services, to obtain a higher number of subscribers. Technological convergence mixed with vertical disintegration reduces infrastructure costs and eliminates one of the most important entry barriers in network industries. One of the major aspects of vertical disintegration is that services can be provided without local presence and outside the jurisdiction of the national competition authority. For instance, Vonage a company based in the United States provides international calls from Latin American through “voice over internet protocol” (VoIP).

17. Technological convergence also involves horizontal cooperation between two or more firms in different sectors. Infrastructure operators may cooperate with content providers and producers of devices to create a particular service and a new product. The intensity of horizontal cooperation goes from spot agreements and partnership to mergers, depending on regulation, the investment and the risk. For instance, in Mexico the fixed telephony and cable operators decided in 2007 to connect their networks to offer triple-play services and compete against incumbent operators. However, horizontal cooperation does not imply the unification of these different markets. The specificities of the Latin American telecommunications sector, in particular the low coverage of low and middle-income households and rural areas as well as the demographics and growth trends, indicate that the potential market acts as an incentive for competition, innovation and investment (Box 1).

18. All in all, technological convergence has a positive impact on the performance of the telecommunications sector (OECD, 2007a). Indeed, technological substitution and integration lead to better technologies that reduce transmission costs and improve network coverage. Likewise, substitutive

product convergence creates new competitive relations between companies that previously operated independently. Technological convergence also means that barriers to entry are lowered for new entrants, and that competition is intensified. For the incumbent firms, market convergence implies adjustments in their production and business model to keep their position, which enhance efficiency. For new entrants, sophisticated technologies open the way to new markets. As long as there is not a standard technology and product in the market, the technological convergence will force all firms to remain constantly competitive. Ultimately, technological convergence reduces price and increases choice and quality.

### **Box 1. Telecommunications sector in Latin America**

The Latin American telecommunications sector is characterised by its high market concentration, in particular in the fixed telephony segment. Market concentration and its potential corollary -- abuse of dominant position -- have been a great concern for competition authorities and sectoral regulators. In fact, regulators fear abuses that may result in entry barriers, tariff increases, and reduction in service quality. For instance, Mexico and Peru had a higher market concentration than Argentina, Brazil and Chile, and had the lowest fixed and mobile telephony penetration rate between 1990 and 2005 (OECD, 2007). Mexico has an income *per capita* higher than Chile and Argentina but has the lowest mobile phone use rate. Market competition needs to be promoted to reduce prices.

Two companies dominate the market: the Spanish firm Telefónica (i.e. Movistar and Vivo20) which moved into the region riding the wave of privatisations in the 1990s and the Mexican Carso Group, owners of Telmex and América Móvil (i.e. Telcel, Claro and CTI Móvil, among others) which moved, in little more than five years, from being a national monopoly to becoming a major regional player. Telefonica and the Carso Group have operations in 26 countries of the region and have 64% of the regional mobile market (Mariscal, 2007). The other operators include subsidiaries of Telecom Italia, France Telecom, Portugal Telecom and Millicom International Cellular.

### **3. New challenges facing the competition regulatory framework in Latin American countries**

19. In the context of technological convergence, network operators, service providers and consumers are pushing competition authorities and telecommunications agencies to rapidly adapt their policies and regulation, even though the sector is still evolving. New antitrust issues appear alongside the emergence of new services, complex relations between service providers and network operators, and several transmission networks. To deal with the emerging antitrust concerns, different policy strategies have been adopted.

20. This section provides a snapshot of experiences in Argentina, Brazil, Chile, Colombia, Mexico and Peru experiences with adapting their competition and sectoral regulations to technological convergence as a complement to the reforms implemented in the early 1990s to promote market competition. This section also considers the impact of technological convergence on antitrust law and policy: regulatory asymmetries, interconnection, network accessibility, spectrum allocation, licensing, regulator neutrality and universal service obligations.

#### ***Strengthening competition following the privatisation of public telecommunications monopolies***

21. From the 1950s to the late 1980s, the telecommunications sector in Latin American countries passed from foreign private companies to state monopolies, inspired by European trends and, to some extent, by the private monopoly in the United States. At the beginning, the nationalisation era brought investment and service improvements, but during this period the telecommunications sector was mainly marked by lower productivity, high capital and employment costs, and inefficiencies. This situation, exacerbated by the debt crisis of the 1980s and the international tendency to privatise monopoly industries, prompted the region to reform the sector.

22. The reforms of telecommunications sector are certainly part of the worldwide liberalisation and privatisation process but technological convergence has, without doubt, helped to launch such reforms and contributes to their success in terms of competition, quality, and price reduction. Indeed, as technological advances reduced networks cost, the potential entry of new firms became an unavoidable reality, at least in some markets. This was the case of the American company AT&T, whose reform in 1984 gave rise to seven regional telephone companies known as Baby Bells and open competition in long distance telephony, manufacturing and R&D (Barnett and Caroll, 1993).

23. In Latin America, the privatisation of the telecommunications sector began in the early 1990s, apart from Chile which started earlier, in 1987. Interestingly, the process has followed different patterns (Table 1). While Bolivia, Peru and Venezuela privatised the sector and created the sectoral regulatory agency simultaneously, Brazil, El Salvador, Guatemala, Honduras, Nicaragua, Panama established the sectoral regulatory agency before privatisation, while Mexico and Argentina did so six years after privatisation. In turn, Colombia and Ecuador created a sectoral regulatory agency but some telecommunications companies remained partially or totally public. Costa Rica, Paraguay and Uruguay have a sectoral regulatory agency even though the telecommunications sector still has a monopolistic structure. Most countries in Latin America have independent telecommunications regulators (although not always exclusively dedicated to the industry). The exceptions are Chile and Uruguay.

**Table 1. Institutional framework in Latin American countries**

Country	Privatisation of the state operator	Creation of an independent regulatory agency
Argentina	1990	1996
Bolivia	1995	1995
Brazil	1998	1997
Chile	1987	-
Colombia	2002	1994
Costa Rica	1996	1996
Ecuador	2002	1995
El Salvador	1998	1996
Guatemala	1998	1996
Honduras	2003	1995
Mexico	1990	1996
Nicaragua	2001 / 2005	1997
Panama	1997	1996
Paraguay	1995	1995
Peru	1994	1994
Dominican Republic	1930	1998
Uruguay	2001	-
Venezuela	1991	1991

Source: ITU (2009)

24. Another difference in the privatisation processes is the period of exclusivity granted to the concession. Argentina, Mexico, Nicaragua, Panama, Peru, and Venezuela granted an exclusivity period in order to gradually open the market to private capital. Whereas, Brazil, Chile, El Salvador and Guatemala opted for full market competition. Generally speaking, the countries that mixed privatisation and concessions with an exclusivity period had more difficulties than others with creating a competitive market (Rivera, 2007).

25. Examining the outcomes of the liberalisation and privatisation reforms in Latin America is beyond the scope of this paper. However, it is worth noting that performance in the telecommunications sector improved in terms of investment, network access, and service quality (e.g. reliability, dial tone, price). Countries with independent regulators have on average received more FDI per capita in the sector, have progressed more in the last 15 years in terms of density, and have less unequal access to telephone service (OECD, 2007). That being said, it is not possible to attribute these positive impacts, at least in their totality, to the privatisation reform, since a similar growth is observed in Colombia, Costa Rica, Ecuador and Uruguay where the sector remains partially or totally public. Many authors explained these trends by the impressive technological progresses in the sector (OECD, 2007a).

### ***Introducing technological convergence to competition legislation***

26. Latin American regulators have been actively introducing technological convergence to the regulatory agenda<sup>4</sup>. For instance, Mexico, Peru, and Chile are considered the pioneer countries in technological convergence regulation, while Argentina, Brazil and Colombia have been progressively integrating competition laws to avoid anti competitive behaviours that limit the efficiency gains from technological convergence. In both cases, abolishing legal constraints which prevent new entrants from penetrating previously protected markets has been a priority. An example of this would be eliminating rules and practices preventing new operators from entering a particular market. Such a practice protected the incumbent operators and limited market competition at the expenses of efficiency.

#### *Argentina*

27. The Argentinean experience illustrates how the inadaptability of the regulatory framework can reduce economic and social gains from technological convergence. The main obstacle of the current regulatory framework is the imposed restriction on fixed and mobile telephone operators offering television services while TV cable operators may offer telephony services. Fixed and mobile telephone companies can only offer services based on digitally stored contents (i.e. video-on-demand) “selected” by subscribers. This restriction prevents the development of multiple packages and IP networks.

28. To some extent, this situation is due to macroeconomic factors. In fact, decree 764/2000 of 2000 promoted competition in the telecommunication sector and addressed essential issues such as network interconnections, licences, universal services, and spectrum allocation<sup>5</sup>. However, it was not fully applied due to the economic crisis immediately after its promulgation. Therefore, anticompetitive behaviours and regulatory asymmetries limited the performance that some segments of the telecommunications sector could achieve.

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<sup>4</sup> For an exhaustive examination of the impact of technological convergence on telecommunications regulation readers can consult the following authors. Chile: Peres and Hilbert (2009) and Wohlers (2008). Mexico: Mariscal J. (2007). Peru: Barrantes (2007). Argentina: Galperin and Cabello (2008).

<sup>5</sup> Available in the ICT Regulation Toolkit website:  
<http://www.ictregulationtoolkit.org/en/Publication.1576.html>

29. One notable tool of the Argentinean regulatory framework is the unified licence system for telecommunications operators, as is the case in Peru. Nonetheless, this tool is not sufficient to enhance competition and encourage operators and service providers to penetrate new markets. To overcome these regulatory weaknesses, the regulators are planning to implement an in depth reform targeted at stimulating convergence through the improvement of network interconnections and the sanctioning of discriminatory behaviours. The government's project does not, however, address television access restrictions. Even if consumers and mobile phone operators, as well as potential entrants support the broadcasting reform, the main TV cable operator (Cablevision – Clarin Group) strongly opposes change, which could suggest some degree of regulatory capture.

### *Brazil*

30. In 2006, the partial acquisition of the TV cable companies by telecommunications operators (TVA by Telephone and Way Brazil by Telemar) revealed regulatory gaps and asymmetries in the Brazilian regulation. These acquisitions have helped operators to circumvent legal restrictions prohibiting telecommunications companies from owning TV cable networks in the same region. Furthermore, through multiple technology service packages, telecommunications operators have expanded their networks without needing new licences. Discussions are currently taking place between the Administrative Council of Economic Defence (CADE) and the National Telecommunications Agency (ANATEL) --, the competition authority and the telecommunications regulator respectively -- to propose a reform of the concession obligations.

31. The regulatory asymmetries also refer to the application of different rules to television services provided by different technologies: cable, home satellite (DTH) and Multichannel Multipoint Distribution Service (MMDS). For instance, one main difference refers to the participation of foreign capital: no limit exists for DTH and MMDS, while for TV cable the participation cannot exceed 49%. Regulation changes regarding foreign capital and investment restrictions are expected in 2009.

32. Some regulatory changes have been implemented recently. For instance, after a public consultation, regulation concerning number portability (for fixed and mobile telephony), improving competition and reducing prices, was adopted in 2006. Furthermore, in the same year, the guidelines for the transition from analogical television system to digital system were adopted. The new system enables: the digital broadcast of high definition (HDTV) and standard definition (SDTV) television; the simultaneous digital broadcast for mobile and fixed reception; and interactivity (e.g. video-on-demand). Last but not least, from 2013 the Department of Communications will only authorise broadcasting through the digital technology. It is clear that Brazilian regulators are stimulating value-added services by gradually phasing out what were “basic services”, i.e. fixed telephony). This is the case for broadband, which will be the main supporting base for a broad range of content-related services, such as IPTV.

33. One particular aspect of Brazil's experience is the public hearings and consultations carried out by the telecommunications and competition authorities. In 2007, the regulators decided to examine the impacts of technological convergence, notably triple play, on market competition and consumers welfare. According to the hearings, the main concerns have to do with: i) treatment of network sharing without discouraging investment incentives; ii) equal treatment among all operators and service providers offering similar services, regardless of the technology employed, nationality of capital and network development stage; and iii) reduction of entry restrictions into the triple play market and pay-TV services. Last but not least, the public hearings brought consensus among regulators, operators and consumers, with support for future regulation reforms.

### *Chile*

34. In 2006, the *Voissnet vs. the Compañía de Telecomunicaciones de Chile (CTC)* case introduced technological convergence concerns into the Chilean competition regulation. CTC, the historical operator, was accused of unfair competition by preventing operators from the free utilisation of different internet applications and services, particularly VoIP. In this ruling, the competition court (Tribunal de Defensa de la Competencia) raised for the first time convergence concerns related to antitrust analysis. The competition authority ruled on: i) whether to define VoIP as a public utility; ii); numbering portability for the VoIP; iii) and numbering networks interconnection (broadband internet and telephone).

35. CTC argued that if telephone traffic was transferred from the traditional local network to VoIP telephony, it would not receive the monthly fixed charge paid by users which covered telephone network costs. Additionally, CTC accused Voissnet of offering public telephone services without having the relevant license and of not paying the fee for using telephone local networks needed to provide VoIP.

36. The competition court analysed the legal nature of VoIP telephony. The court decided that this service should be included in the public telecommunication services category but should not be considered as a telephone public service because it is not a fixed, mobile or long distance telephony service. The competition court considered that the service provided by Voissnet does not have quality and geographic coverage obligations while the telephone public services provided by CTC do.

37. Regarding network interconnection, the competition court ordered CTC to avoid any conduct in the future that would limit the use of the broadband capacity to provide VoIP telephony services. CTC had to pay a fine of US\$ 1.1 million for imposing artificial entrance barriers to VoIP telephony service providers. Number portability was also introduced, further enhancing market competition among telephony service providers.

38. This case sets an important precedent sanctioning the contractual limitations imposed by the historical operator on other services providers and raising good questions about the impact of technological convergence on market competition. The ruling favoured economies of scale and scope through network integration and improved consumers choices and reduced prices. This case reduced, to some extent, the antitrust uncertainty surrounding technological convergence in the mid-2000s and encouraged future operators of IP technology in Chile to enter the market.

### *Colombia*

39. In July 2009, Colombia approved the ICT law that allows operators to offer telecoms services under a single general concession. The law also simplified the regulatory framework which defines the objectives of the different regulatory bodies involved in the technological convergence processes<sup>6</sup>. This law reinforces the authority of the competition agency (Superintendencia de Industria y Comercio) with the aim to attracting private investments and exploiting the benefits generated by technological progress, in terms of coverage, quality, and prices. Indeed, Colombia used to have a restrictive environment with costly licenses and an investment level not significant enough to develop VoIP network.

40. This law will also simplify the complex regulatory environment, characterised by overlapping laws. For instance, the unified licence system, already implemented in Argentina and Peru, will reduce entry barriers and transactions costs related to different procedures, while keeping technological neutrality. This law will encourage competition in all segments and will promote scope and scale economies thus improving consumer welfare. One of the particularities of this law is the creation of the National spectrum

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<sup>6</sup> The law 1341 is available at: <http://edutecno.org/2009/08/colombia-ley-de-tic-2009/>

agency, which is in charge of the management, planning, monitoring and control of the spectrum. Under this law, network operators will rationalise the use of the infrastructure and, therefore, investments.

### *Mexico*

41. In Mexico, the Technological Convergence Agreement of 2006 resulted from the dissatisfaction of private operators with the regulatory gaps of the Telecommunications Law of 1995 in the face of technological progress<sup>7</sup>. The principal goal of the Technological Convergence Agreement of 2006 was to promote competition and cooperation among all service providers and network operators in order to enjoy the benefits of technological convergence. The expected outcome was the improvement of fixed local telephone, television, and audio public services through copper, wireless, and satellites infrastructures.

42. Additionally, the Agreement introduced convergent services and network interconnection definitions in order to eliminate artificial access barriers to previously restricted markets and promote technologies interoperability to achieve number portability. Therefore, this new regulatory framework aimed to increase the number of new entrants, reduce switching costs, and encourage scale and scope economies.

43. One of the first results of the Technological Convergence Agreement was the signature of interconnection arrangements by Telmex, the historical operator, and eight cable TV operators. These arrangements enabled the new operators to offer triple-play packages. Thus, they were allowed to provide telephony services directly over their respective networks, in addition to television and internet services.

44. Despite the fact that Telmex obtained a licence for the provision of services on a national level while cable TV operators could only operate in limited population coverage areas, the implementation of triple play rules had a direct impact on the Mexican telecommunications markets. Indeed, following the implementation, Mexico's cable industry announced its plans to invest some US\$300 million to enable deployment of telephony and broadband access services. The eight new entrants and their investments destabilised Telmex's dominant position, competition intensified and end-users had a wider range of choice.

45. However, the opening of converging services to competition did not resolve the wider issues between Telmex, new operators and providers, the telecommunications regulator (SCT) and the antitrust and investment authorities (CFC and COFEMER). For instance, Telmex asked that equal treatment be applied to all companies because of its obligation to pay for entering the pay-TV market.

### *Peru*

46. Peru's experience differs from other countries in the region in the sense that VoIP services have been allowed and offered since 1996. In 2000, 28 operators were competing for this market. Peru's approach to VoIP reduces regulatory uncertainty and encourages new entrants. It also raises the question of whether it may be too early to develop more VoIP policies, and whether regulators need time to observe the market before applying these policies. Despite the technological progress and constant innovations characterising the telecommunications sector worldwide, Peru has adopted two main laws that frame antitrust issues and define the national policy.

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<sup>7</sup> The Technological convergence Agreement of 2006 is available in the ICT Regulation Toolkit website: <http://www.ictregulationtoolkit.org/en/Publication.3720.html>

47. First, the Ley de Concesión Unica was adopted in 1993 but only came into force in 2006<sup>8</sup>. Its principal objective is to reduce access and entry barriers to any new service provider and network operator. In fact, this law confers to all operators the right to offer all public telecommunications services (long distance and local calls, national and international calls, mobile phone, fixed phone system, wireless phone system, TV cable), no matter the technology. For this purpose, the law simplifies the authorisation procedures by introducing a unified licence system, in which a single licence covers an extensive range of services. This administrative simplification reduces transactions costs as well as legal burdens and regulatory uncertainty. To some extent, under this law any firm willing to enter a new market is able to do so.

48. Second, the Supreme Decree 003-2007-MTC of 2007 defines the national guidelines regarding the development of technological convergence. The national policy defines a strategy that will: i) consolidate the progress of telecommunications services; ii) develop competition; and iii) promote new services derived from technological convergence. This decree defines the goals that the sector should reach in 2011 and sets the agenda to achieve number portability by 2010. The authorities expect to reduce market and legal access barriers, limit the dominance of incumbent operators, and create a contestable market<sup>9</sup>.

### *Adapting antitrust analysis to frame technological convergence*

49. The country experiences described below demonstrate the efforts that regulators are making to improve market competition while encouraging technological convergence. Despite national specificities, sectoral and competition regulators are dealing with common antitrust challenges. These include issues such as: should substitutive and convergent services be considered as public telecommunications services? Are incumbent telecommunications operators abusing their position if they charge internet providers that offer telephone services? How to define the limits of new entrants' activities and grant a licence when services and markets are converging? To better understand the impact of technological convergence for antitrust analysis, regulators are going back to basics to examine the adequacy of competition tools.

### *Regulatory asymmetries for new and substitutive services*

50. As a result of technological convergence, the traditional services classification does not fit with the new convergent services. This means that it is difficult to determine the rules that should frame them, if any. The antitrust effect is that two competing services may be subject to different regulatory obligations, there by penalising one of the providers. Certainly, it is not easy to classify and define the boundaries of new services since they are all closely related and simultaneously provided by several technologies and devices. This is particularly the case for substitute services, as telephony from?? data services.

51. This market competition distortion can be illustrated by fixed-wire telephony services and either mobile or VoIP services or Cable TV and ADSL broadband services. An often-mentioned situation is that of VoIP services that are not currently obliged to meet universal service obligations, unlike fixed line telephony. Regulators have not been quick to encourage new VoIP services, fearing the threat to existing universal service obligations. For example, VoIP telephony providers are not yet able to provide communication services between two normal telephones. This decision sacrifices competition in the name of universal services. The regulator should undertake an evaluation of the impact of VoIP services on its universal services targets to adapt the existing regulation before making a trade-off between policy goals. Indeed, regulators may consider reforming the universal service funds mechanisms by, for example,

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<sup>8</sup> Law available at: <http://www.osiptel.gob.pe/WebSiteAjax/WebFormGeneral/sector/VerLegislacionTeleco.aspx>

<sup>9</sup> Decree available at: <http://www.glin.gov/view.action?glinID=198108>

requiring a contribution from all operators holding telephone numbers, regardless of the technology used to provide services with those numbers.

52. The regulatory asymmetry may also generate free-riding behaviours, since consumers could switch to new services to avoid regulatory constraints. For example, the choice of unregulated VoIP services may allow consumers to avoid making a contribution to universal service funds. The internet may also allow consumers to avoid content restrictions or local-content requirements on domestic broadcasters.

53. Regulatory gaps and asymmetries distort market competition and are manipulated as entry barriers by incumbent operators. Incumbent telecommunications operators are well placed to restrict competition given that they control the interconnection and access to the existing network. Indeed, incumbent operators may ask for additional information to delay registrations and ultimately delay the entry of competitors. For example, in Brazil, at the end of 2004 there were rumours that some incumbent operators of the fixed telephony [had] been blocking access to the routers of Skype, a VoIP provider (OECD, 2005). In so far as a substitute service threatens the incumbent service, the incumbent may adopt anti-competitive actions requiring action from the competition authority, which calls for clear rules to reduce convergent and substitutive services regulatory ambiguity. One must recall that every intervention from the regulator increases its costs (e.g. investigation, experts, hearings...) and that an efficient regulatory environment is the one that defines clear rules and requires minimum regulatory intervention.

54. Last but not least, regulators may use this regulatory ambiguity to promote policy objectives that otherwise would be hard to achieve. In those situations where the existing regulations are not promoting overall economic welfare, competition from new services can enhance overall welfare. For instance, competition from unregulated new services can break down inefficient cross-subsidies, so that tariffs more closely reflect the underlying costs. Furthermore, the emergence of substitute services is an opportunity to review the existing regulatory obligations. The emergence of new services has increased the number of competitors for each different service, allowing a relaxation of regulatory controls.

55. Experiences in OECD countries show that the emergence of a substitute service generally enhances competition by promoting economic efficiency and, in general, should be encouraged (OECD, 2005). Therefore, where the public policy goals underlying those regulatory obligations remain legitimate, some changes in the regulatory regime may be necessary to eliminate any regulatory asymmetry. In a case-by-case approach, regulators have at least three possible policy responses to regulatory asymmetry: maintaining asymmetry, extending existing regulation to the unregulated service, and lifting regulation on both services.

### *Licensing*

56. Licensing is a major competition tool to certify operators' quality (financially and technically) as well as to define their responsibilities (service obligations, geographical coverage...). In turn, the operator strengthens its credibility in the eyes of consumers. Some regulators may also use licenses to limit the number of operators in a given market. In this sense, granting a license could be used only to correct market failures or to attain specific competition policy objectives.

57. Given the regulatory uncertainty regarding new services, licensing can become an entry barrier rather than a regulatory safeguard. Fees, charges and transaction costs to obtain a licence may be an obstacle for new entrants, specially small and medium enterprises. On the other hand, some licensing requirements become obsolete in the face of emerging services and the increasing use of IP. It becomes complex for regulators to control provisions of a particular service through licensing. The complex and overlapping requirements discourage investors, which ultimately harms market competition.

58. The implementation of a single license, already enacted in Argentina, Colombia and Peru, provides a substantial reduction of legal entry barriers to markets, contributing significantly to enhance market competition. In 2000, Argentina besides adopting the unified license system (for fixed, mobile, cable, wireless, national, and international services), also simplified the requirements and procedures. For instance, entrant operators do not need to own the infrastructure to obtain the license: they can outsource it (Galperin and Cabello, 2008). This way, network economies are favoured whilst enhancing competition since market shares will not depend on infrastructures ownership or “first come, first served” but on service quality and prices.

59. The unified license system appears to stimulate optimal use of technology options by operators and generate fair competition between different network infrastructures. Nevertheless, in areas where it is not yet implemented, such as broadcasting, regulators from different industries need to coordinate between themselves to avoid overlapping regulations and prevent providers from circumventing a given restriction.

### *Spectrum*

60. Paradoxically, technological convergence has a positive and negative effect on spectrum demand. Indeed, wireless technologies increase the demand for radio frequencies exacerbating scarcity problems, but technological advances allow for a better use of spectrum resources. Decisions regarding spectrum allocation will depend on the proliferation of mobile devices that need this scarce resource. Since the demand for wireless devices is expected to growth, the problem will be trying to prevent scarcity by providing greater flexibility to operators to redeploy their capacity to new applications and to introduce a more dynamic frequency planning. For these technical measures to be applied, flexible regulations need to be implemented.

61. Despite a free market approach in Latin America, the spectrum regulation is too rigid, thus limiting the potential gains generated by market competition and technological convergence. The Mexican experience illustrates this point. The sectoral regulator (Secretaría de Comunicaciones y Transportes) grants 20 year concessions for the operation of the radio spectrum, but the use of the spectrum is limited to a specific activity even when the operator can provide several services. This system does not encourage investment and efficiency since the operator knows it will not face any additional competition. It also reduces consumer welfare since consumer will not benefit from the latest technology available in the market. Experts estimate that this system increases the price of an already limited resource and creates artificial shortages as well as a speculative secondary market (Mariscal, 2007). In terms of technological progress, the current spectrum allocation systems may act as entry barriers. The days when only a few operators were allowed to use the spectrum has been replaced by a large number of potential entrants demanding fair treatment on equal terms.

62. Another important effect of technological convergence is the close relationship between spectrum management, broadcasting services and content regulations. These may lead to regulation asymmetries since in some jurisdictions broadcasting providers have public service obligations. This institutional problem as well as some technical complexities will remain on the agenda of telecommunication regulators for the time being.

63. The current spectrum management system which consists of allocating frequencies to be used for specific services and bands to use in various geographical areas is being progressively replaced by the use of a more flexible frequencies system, whereby mobile devices fit several frequencies and choose the free ones (e.g. smart antennas, intelligent radio terminals). With these devices, the segments of the spectrum that are allocated but not used, can be shared with other services.

64. Instantaneous auction systems have also been used in the United Kingdom, through which operators pay for the use of the spectrum in real time. This way the spectrum capacity can be rationalised reducing its management costs. An example of this is the special weekend and night rates offered by mobile operators. This way, mobile operators distribute the traffic, avoid congestion and increase the potential number of subscribers who can use the spectrum. Nevertheless, spectrum auctions do not entirely solve the capacity problem, as licenses are still connected to a specific application. Issuing licenses without application restrictions could overcome this barrier since it is up to the licensees to decide how to use their spectrum capacity.

#### *Network interconnection*

65. Network interconnection has always been an important issue in the telecommunications sector. With the advent of technological convergence, network interconnection becomes even more complex and essential to promote competition in an evolving environment. Interconnection issues changed from access and charges matters to entry barriers and discrimination issues, the nature of the service provided, the increase in the number of services that can be offered and an explosion of the number of potential competitors, among others. Additionally, interconnection regulation becomes more diversified with the many different forms of vertical and horizontal interconnection agreements across the different levels of the telecommunications industry.

66. Another major challenge facing regulators is the transition from regulation based on networks to regulation based on services. The first approach, in which each operator should have its own network, would have a positive impact in terms of the network expansion. On the other hand, this approach will also have negative effects with regard to market entry and competition, the main constraint being infrastructure costs. The second approach, which consists on giving new entrants access to existing networks, promotes competition. Under this approach, several service providers will compete to increase their market share. Additionally, a structurally separated model where a company maintains the infrastructure and several service providers use it, is an option under the second approach. Whether competition is based on networks or services, depends on the technology used and the specificities of the market, including consumer income levels.

67. Changing network interconnection rules and practices has proved to be not that simple, in particular because the incentives between the historical operator and the new competitors are not aligned. Interconnection basically depends on standards and the incentives of operators to interconnect (including the regulatory obligations on operators). The incumbent knows that any new entrant is a competitor that will use its network. Therefore, given this conflict of interest, incumbents will support high interconnection and access charges while competitors seek lower costs. Competition authorities in Latin America have been very active in sanctioning the unbundling practices of incumbents.

68. Technological convergence makes interconnection regulation complex. For instance, as phone calls are one of a number of different types of communication services in an IP network, the core issue will be the interconnection between unbundled network elements and the exchange of data in an IP network, rather than the mediation of voice calls between different networks. Moreover, the current regulatory framework for interconnection focuses on interconnection of telecom networks, while instant broadcasting networks are either unregulated or subject to different types of regulation. The sectoral regulator should have a clear position on these new phenomena, in order to reduce uncertainty and regulation asymmetries, while the competition authority should only intervene if an anticompetitive behaviour is detected.

69. Another difficulty of undertaking interconnection regulation is the fact that industries are all inter-related through complex structures. Mergers and cooperation agreements between firms of all these segments lead to horizontal television studios, radio and software companies creating alliances with mobile

and fixed telephony. These emerging organisation structures call for clear rules to avoid opportunistic behaviours harming market competition

#### *Universal services*

70. In the telecommunications context, universal service obligations refer to the provision of voice telephony, as a "basic service". Ensuring access or universal service is a social objective to which regulators pay particular attention. However, as other technologies have been emerging, voice services have become more sophisticated and are available through several technologies (e.g. broadband, internet) and devices (e.g. computers, smartphones). Some OECD countries have examined whether broadband and internet access should be included as part of universal access requirements (OECD, 2007a). The current debate is revolving around whether voice services are still considered "basic".

71. Latin American regulators have shown great commitment to extending basic and internet services while enhancing competition. Countries with strong landline networks (e.g. Bolivia, Mexico and Panama) have imposed universal-access obligations to incumbent operators with varying degrees of success and severity. In Costa Rica and Uruguay, state or corporative objectives have achieved high levels of landline connectivity. Other countries, including El Salvador and Guatemala, created very liberal regulatory regimes that have increased coverage but have not reduced regional disparities. More balanced approaches, notably Brazil's combination of a liberal licensing regime and universal-service obligations, have proved very successful (OECD, 2007a).

72. One particular feature to balance efficiency and universal service is the creation of funds to finance universal-access projects. The objective is to provide financial incentives to the business sector in the deployment of communication networks to rural communities. The examination of universal funds undertaken by the OECD in 2007 concludes that, generally, the funds are managed by the telecommunications regulation authority, although in some countries they have not begun their action. For instance, the Argentine fund was legislated for in 2000 but was not yet in operation as of June 2007. The accumulation of funds by the Brazilian Fund has raised questions about their future use (Stern *et al.*, 2006). Chile, Colombia, the Dominican Republic, Guatemala and Peru's funds are particularly innovative because of their competitive bidding mechanisms (minimum-subsidy auctions). The success of Chile's fund is frequently mentioned because within five years of its establishment in 1995, the fund had extended access to basic service to the majority of Chile's rural population (Xavier, 2006). The majority of universal-access actions have provided public pay-phones and community telecentres offering a wider array of telecommunications services, although Peru's fund (FITEL) has also financed pilot projects that have extended individual access to the local network.

73. Some universal service funds are integrating technological progress to achieve their coverage and network access targets. Therefore, recent fund programs are providing access to voice telephony through both the fixed-line telephone and mobile networks. Mobile telephony is more cost effective in comparison to fixed telephony. Furthermore, many recent funds have supported programs promoting technological development services, especially internet access services. The expected outcome is the increase of competition in telecommunications markets since entry barriers and costs are less constraining through converging wireless technologies.

74. Nevertheless, Latin American countries still have to take into account that demand is implicitly limited by income levels. Accordingly, universal access funds have to be managed in the light of critical mass difficulties and possible public intervention beyond the boundaries of the competition authorities. The regulators' challenge would be to properly exploit the wide range of possibilities offered by technological convergence to bridge the digital gap.

#### 4. Overcoming institutional divergences between the competition authority and the telecommunications regulator

75. The previous sections highlighted the impact of technological convergence for the antitrust analysis as well as several country initiatives undertaken to adapt regulations to the emerging competition issues. With technologies and services that are evolving rapidly, and regulatory provisions that are lagging behind, this creates regulatory asymmetries and uncertainties. Such a situation, additionally, reveals institutional divergences between competition and telecommunications regulators. These divergences do not consist of different policy goals but are generated by their different regulatory approaches and the difficulty of adapting their regulation to the pace of technological progress. Successful regulation reforms take time to be properly designed and implemented. This means that competition and sectoral regulators need more discussions on the regulatory weaknesses harming market competition and preventing technological development.

76. The first source of divergence derives from the institutional domestic specificities of the telecommunications sector and the competition law and policy. This includes, the co-existence of a competition agency and a sectoral or multi-sectoral regulator, their independence vis-à-vis the executive power and the political environment and the enforcement of the competition law. All countries in Latin America have, at least, a competition authority and a telecommunications agency, except for Costa Rica with a multi-sector regulator. Independence problems of regulators are not exclusively related to technological convergence and are therefore outside of the scope of this paper.

77. Two institutional divergences generated by technological convergence can be distinguished: i) *Ex-ante* vs. *ex-post* policy approaches; and ii) overlapping regulations generating costs and constraining investments.

##### *Ex-ante vs. ex-post regulation approach*

78. Even if both the competition and sectoral regulators are market-oriented and have the same performance objectives, they have different regulatory approaches. The telecommunications regulator often has *ex-ante* regulation, as it imposes approval conditions and intervenes prior to certain actions (e.g. licenses, tariffs control, interconnection rates guidelines...). On the other hand, the competition authority tends to have an *ex-post* approach. Generally, competition authorities intervene after an anticompetitive practice has been observed or denounced. That being said, the competition authority may also usefully play an advocacy role earlier in the process, whether or not this is a function provided for in the legislation.

79. One of the consequences of *ex-ante* and *ex-post* divergences is the reduction of regulators' credibility. Some regulators have been chastised by new operators for having a weak position on the anti-competitive practices of incumbent operators. In Nicaragua, BellSouth sued both the historical fixed telephony operator ENITEL, because of anti-competitive practices, which restricted and hindered network access to its clients, and the TELCOR for favouring the incumbent operator. Even though the Court of Justice confirmed TELCOR's authority, in 2001, this suit had a negative impact on the enforcement reputation of the regulator.

80. There is general consensus about removing or at least not creating additional, *ex-ante* conditions (OECD, 2005a). The argument behind this is that *ex-post* regulation is more flexible and is not as interventionist as *ex-ante* regulation because it relies on market forces. Under *ex-post* regulation, the regulator would not intervene unless abuses are committed. Nevertheless, given the rapid progress of technological convergence, adapting *ex-post* regulation may be too slow, thus generating uncertainty and exacerbating conflicts. For instance, VoIP services providers are experiencing entry barriers and facing higher costs since they enter the market and are not willing to wait for a doctrine reform.

81. Despite the increasingly important role that competition policy is playing in the telecommunications industry, the need for employing *ex-ante* regulation for some period of time is recognised as a necessary means to promote competition in markets where competition has not yet developed effectively, and in certain traditional service markets which may not be ready for an immediate removal of such *ex-ante* regulation (ICT, 2009).

82. The European Union and the United States experiences show how these two different approaches lead to divergent ways of developing technological convergence through market competition. In the European Union, the “1998 regulatory package” defined regulatory changes aiming at developing competition and technological convergence, as performance leverages. For instance, the i2010 programme calls for policy convergence to move to a consistent system of rules for the electronic, communication and media sectors and establishes a Single European Information Space to offer affordable and secure high-bandwidth communications, rich and diverse content and digital services<sup>10</sup>.

83. In concrete terms, the national regulatory authorities had one year to implement the Framework Directive adopted in 2002. The Directive aimed to simplify the existent regulatory framework (in particular licences procedures and network neutrality), promote market competition and protect consumer welfare. One of the main features of the new regulatory framework was the generic definition for all convergent services (fixed and mobile telephony, internet services) as “services and networks for electronic communications”. In this sense, the Framework Directive replaced much of the sector-specific and *ex-ante* regulations with technologically-neutral and general competition law rules.

84. This regulatory framework is adjusted according to a periodic analysis of relevant markets rather than in a sectoral and technological basis. The regulation approach is more closely aligned with the competition policy provisions than with sectoral issues. Nevertheless, determining relevant markets has proved to be very complex when it is about convergent services. For instance, the triple play is not yet considered as one market because the Commission wants to preserve consumer freedom of not subscribing to mixed services.

85. Interestingly, the United States is one of the ICT world leaders but does not have a sectoral policy framework like the one implemented by the European Union. The approach here has been to view it as premature to regulate convergent services given that the telecommunications sector is constantly evolving. For instance, there is no regulation of IP telephony services because it is feared that regulating a new technology could have a negative impact on its technological progress. There are still several convergent services and technologies that need time to become reliable and to be able to examine their impact on the performance of the telecommunications sector. In another example, the Federal Communications Commission (FCC) deregulated the broadband sector to promote competition and encourage convergent services and new technologies. In doing so, the American telecommunications regulator has preferred a business incentive approach to a regulatory one.

86. This approach does not completely eliminate uncertainty and regulation asymmetries. For instance, according to the Telecommunications Act of 1996 (section II), every service must be classified as either information or telecommunications services. The issue is that the information services are not regulated and that telecommunications services are submitted to strict rules about universal service funds, non-discriminatory safeguards, public interest telephones, among many others (FCC, 1996). Therefore, the FCC has to rule on its position, as it was the case with the broadband deregulation.

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<sup>10</sup> “2010 High Level Group: The Challenges of Convergence” available at:  
[http://ec.europa.eu/information\\_society/europe/i2010/single\\_infor\\_space/index\\_en.htm](http://ec.europa.eu/information_society/europe/i2010/single_infor_space/index_en.htm)

***Overlapping regulations generate costs and constrain investments***

87. Problems of overlapping regulation come from a variety of sources: convergent or new services involving several industries which are under the remit of multiple regulators; unclear regulations within the same industry; and divergence of views between the competition agency and the sectoral regulators.

88. In the context of technological convergence, the relations established with other industries are too complex to determine which regulation should be applied and the boundaries of each regulator. In the past, there was an explicit separation between the activities of telecommunications, information technology and media industries. To some extent, the rules of each regulator had no impact on the other sectors. Now days, the television service provided jointly by a telephone operator and a television studio will probably be regulated by three agencies: the competition agency, the telecommunications regulator and the broadcasting regulator. As a consequence, the probability of having contradictory and overlapping laws is high.

89. In Argentina, the overlapping telecommunications and broadcasting regulations generate market uncertainty and diminishes the positive impact of technological convergence on economic performance. Historically, separated regulators and regulations have framed these two sectors but, with the advent of convergence, both legal frameworks are obsolete. The former is based on laws passed more than three decades ago and the latter two decades ago (i.e. Law 19.798 of 1972 and Law 22.285 of 1980, respectively). The government introduced updates through *ad hoc* decisions and decrees but they have had little impact to the eyes of operators.

90. In Mexico, the faculties granted by the amendment of the Federal Law of Telecommunications in 2006 to the telecommunications regulator (COFETEL), abolished "double window" problems and reduced transaction costs related to the spectrum allocation. The spectrum allocation was the responsibility of both the telecommunications and broadcasting agencies; the former controlled the licence while the later controlled the content of the service provided. Integrating technological convergence and creating "one window" simplified administrative burdens and promoted competition. However, COFETEL is still a somewhat weak regulator since it depends on the Secretaría de Comunicaciones y Transportes. Secretaría and COFETEL have overlapping responsibilities. Indeed, from the 72 procedures handled by the Secretaría in April 2007, 46 concerned COFETEL.

91. In Nicaragua, the conflict between the telecommunications (TELCOR) and the competition regulator (SISEP) is based on divergences of views, and to some extent, on their political affiliations. TELCOR is in favour of a pricing structure allowing cross subsidies, while SISEP advocates for investment incentives to increase network coverage. Both institutions are implementing contradictory policies that increase uncertainty and reduce consumers welfare in the medium and long-term (Ansorena, 2008).

92. Last but not least, technology-neutrality is considered to be a fairly good regulatory principle in a converged environment (ICT, 2009). Neutrality reduces public intervention and ensures a fair and predictable regulatory regime, flexible enough to embrace technological changes and market development. However, regulators need to promote broad access and network interoperability. On a case-by-case basis, regulators can encourage industry cooperation (e.g. setting up cross-industry *fora* on particular standards) or adapting their competition goals to national realities. For instance, regulators should reconsider whether it is realistic to ensure choice between wired and wireless providers to internet subscribers in rural and remote areas, as it is the case in urban areas (OECD, 2008). Therefore, the challenge for regulators is to maintain technological neutrality by requiring certain characteristics of the access connection, rather than a regulator dictating a certain technology (OECD, 2009). The overall goal is to set criteria in a way that promotes winners over weak or obsolete operators.

## Conclusions

93. Technological convergence has changed the telecommunications sector landscape. It has made possible the supply of different services over integrated networks to a far greater extent than before. It has opened up new markets for new functionalities, devices, and services. It has generated “market convergence” depending on the convergence driver (technologies or products) and the relationship between the respective markets (substitutive or complementary).

94. As a consequence, new competitive relationships within the telecommunications sector and hitherto unrelated sectors have emerged. Such relationships have a direct impact on antitrust analysis since several established rules become obsolete with the advent of new services transmitted through one network but using several technologies. Regulation based on the approach “one operator, one service” is not well-suited to address new antitrust problems related to fundamental changes to network access, infrastructure costs, spectrum capacity, universal services, and substitutive services.

95. Latin American countries are progressively introducing technological convergence specificities in their regulation framework. Special attention has been giving to legal constraints and anti-competitive behaviours preventing potential entrants from penetrating previously protected markets. Concretely, licences and procedures have been simplified and definitions or classifications of convergent services have been introduced. For instance, the unified licence system adopted in Argentina, Colombia and Peru and the definition of VoIP services as public telecommunications service, but not public telephony service, in Chile. The competition authorities, following an *ex-post* approach, have been intervening where competition is harmed. They have also launched consultations and examinations of the main obstacles to market competition and technological convergence, in particular regulation asymmetries, network interconnection, licences and universal services.

96. These regulatory challenges have revealed divergences between the competition authorities and sectoral regulators generated: i) by different regulatory approaches (*ex-post* vs. *ex-ante*); and ii) by the difficulty of adapting their regulations to the pace of evolving technology, which leads to overlapping regulations and regulation gaps. There is an increasing interest in many jurisdictions in *ex-post* rather than *ex-ante* regulation in order to avoid the risk of inefficient public intervention in this evolving sector. Under this approach, the market ejects costly technologies and inefficient operators. However, clear *ex-ante* regulation is still needed to reduce regulatory uncertainty that inhibits investment and technological development and reduces market competition.

97. The regulatory problems and issues highlighted in this paper should be considered as challenges rather than weaknesses of the current regulation framing the Latin American telecommunications sector. Further discussion could help competition authorities to exchange experiences about the way to conciliate technological convergence and market competition. In particular how to expand the basic service as well as “value added” services, notably the internet, and maximise the economic and social benefits generated by technological convergence. It is suggested that the discussions to be held in the 2009 LACF, competition authorities could share views about, amongst other issues:

- Overlapping regulations due to convergent or new services involving several industries and under the scope of multiple regulators;
- Unclear regulations within the same industry, for instance regulation of VoIP services. Indeed, some jurisdictions define this service as “value-added” and others as a “basic service” (voice service). Some jurisdictions prohibit or discourage VoIP, others require licensing, and others either deregulated or do not regulate it;

- Regulation gaps creating uncertainty and reducing private investments. For instance, whether the impressive development of fibre optic, should be regulated as traditional copper telephone lines calls for debate.
- Co-operation between telecommunications and other sectoral agencies. The broadcasting regulators focus on content requirements, the telecoms authority will look at telephone services and network issues. Who will look at prices?

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## GLOSSARY

**Asymmetric digital subscriber line (ADSL):** Is a data communications technology that enables faster data transmission over copper telephone lines than a conventional voice-band modem can provide.

**Broadband:** In telecommunications, it refers to a signalling method that includes or handles a relatively wide range (or band) of frequencies, which may be divided into channels or frequency bins. The wider the bandwidth, the greater the information-carrying capacity. Broadband is always a relative term, understood according to its context. In data communications, it can refer to broadband networks or broadband Internet. An analogue modem will transmit a bandwidth over a telephone line, ADSL or fibre optic circuit.

**Digitising or digitisation:** Is representing an object, image, sound, document or a signal by a discrete set of its points or samples. The result is called "digital representation" or, more specifically, a "digital image", for the object, and "digital form", for the signal. Strictly speaking, digitising means simply capturing an analogue signal in digital form, but digitising texts is also used to mean converting the image to text, via optical character recognition.

**GSM:** Is the most popular standard for mobile phones in the world. Its promoter, the GSM Association, estimates that 80% of the global mobile market uses the standard. Its ubiquity makes international roaming very common between mobile phone operators, enabling subscribers to use their phones in many parts of the world. GSM uses a variation of time division multiple access and is the most widely used of the three digital wireless telephony technologies (High-Speed Circuit-Switched Data -HSCSD, General Packet Radio System GPRS, Enhanced Data GSM Environment -EDGE, and Universal Mobile Telecommunications Service -UMTS). GSM digitises and compresses data, then sends it down a channel with two other streams of user data, each in its own time slot. GSM also pioneered a low-cost (to the network carrier) alternative to voice calls, the short message service (SMS, also called "text messaging"), which is now supported on other mobile standards as well.

**Internet Protocol (IP):** Is the method or protocol by which data is sent from one computer to another on the internet. Each computer (known as a host) on the Internet has at least one IP address that uniquely identifies it from all other computers on the Internet.

**Internet:** Is a worldwide system of computer networks in which users at any one computer can, if they have permission, get information from any other computer. The internet is a public, cooperative, and self-sustaining facility accessible to hundreds of millions of people worldwide. Physically, the internet uses a portion of the total resources of the currently existing public telecommunication networks.

**Multichannel Multipoint Distribution Service (MMDS):** Is a wireless telecommunications technology, used for general-purpose broadband networking or, more commonly, as an alternative method of cable television programming reception. It is most commonly used in sparsely populated rural areas, where laying cables is not economically viable, although some companies may also offer MMDS services in urban areas.

**Optical fibre:** It can be used as a medium for telecommunication and networking because it is flexible and can be bundled as cables. It is especially advantageous for long-distance communications, because light propagates through the fibre with little attenuation compared to electrical cables. This allows long

distances to be spanned with few repeaters. Over short distances, such as networking within a building, fibre saves space in cable ducts because a single fibre can carry much more data than a single electrical cable.

**Packet switched technologies:** Refers to protocols in which messages are divided into packets before they are sent. Each packet is then transmitted individually and can even follow different routes to its destination. Once all the packets forming a message arrive at the destination, they are recompiled into the original message. Most modern Wide Area Network (WAN) protocols are based on packet-switching technologies. In contrast, normal telephone service is based on a circuit-switching technology, in which a dedicated line is allocated for transmission between two parties.

**Protocol:** An agreed-upon format for transmitting data between two devices. The protocol determines the type of error checking to be used, the data compression method, how the sending device will indicate that it has finished sending a message, and how the receiving device will indicate that it has received a message

**3G (3rd Generation):** Is a family of standards for wireless communications defined by the International Telecommunication Union, which allows, in a mobile environment, services such as wide-area wireless voice telephone, video calls, and wireless data. Compared to 2G, 3G allows simultaneous use of speech and data services and higher data rates.

**Triple play:** A triple-play network is one in which voice, video, and data are all provided in a single access subscription. The most common applications are telephony, community antenna television (CATV) and high-speed Internet service. The transmission medium may be fiber optic, conventional cable ("copper") or satellite. Also called: Triple-play Services, Triple Play Bundled Services, Telecommunications Bundling, Bundled Telecommunications Services, Triple-play Bundled Services, and Bundled Services.

**Video on Demand (VOD):** VOD systems either stream content through a set-top box, allowing viewing in real time, or download it to a device such as a computer, digital video recorder, personal video recorder or portable media player for viewing at any time. The majority of cable- and telco-based television providers offer both VOD streaming, such as pay-per-view.

**Voice over Internet Protocol (VoIP):** Is a general term for a family of transmission technologies for delivery of voice communications over IP networks such as the Internet or other packet-switched networks. Other terms frequently encountered and synonymous with VoIP are IP telephony, Internet telephony, voice over broadband (VoBB), broadband telephony, and broadband phone.

**Wi-Fi:** This certification (trademark) warrants interoperability between different wireless devices.