

New Trends in Mobile Communications in Latin America

Judith Mariscal & Eugenio Rivera*

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Centro de Investigación y Docencia Económicas
Telecommunications Research Program Telecom-CIDE

Carretera México-Toluca 3655
Col. Lomas de Santa Fe
01210
Mexico City
Telephone: (52 55) 5727 9825
Fax: (52 55) 5727 9873

judith.mariscal@cide.edu
eugenio.rivera@cide.edu

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Introduction

The mobile telephony sector has experienced a growth pattern that vastly surpassed all expectations. During the mid-eighties mobile telephony was expected to become a device used only by the richest segments of the population.¹ Today, mobile telephony provides the only source of access to some of the poorest segments of the population. The dramatic growth in mobile telephone is partially a result of technological change but is also due to regulatory, entrepreneurial and social aspects related to it. In Latin America the level of mobile penetration has grown with such magnitude in the past few years that it has left fixed telephony behind: today the penetration of mobile telephony is twice that of fixed telephony and the perspectives for growth seem to point towards a further increase in the gap between the two.

Along with the fact that mobile telephony has become the central mode of communications in the region another unexpected phenomena is that the mobile industry in Latin America is becoming a duopoly market. Today, the Spanish firm Telefónica and the Mexican firm Telmex, have operations in fifteen countries of the region and together service ninety percent of the regional market. This context poses a serious challenge to regulatory policies that promote competition.

This paper analyzes the particular form of expansion that the mobile sector has experienced in the Latin American region, it identifies the driving forces behind this growth and provides the market context in which it is occurring. The first section will present the transformation of Telefónica and Telmex into central actors in the regional market as a result of particular policies that were followed in their countries of origin and the strategies that were followed by these firms to secure this position. The following sections offer an overview of the development of the mobile market in Latin America and its role in providing access to the poorer socioeconomic groups.

¹ In 1984, AT&T estimated that by 1999 there would be 1 million mobile users,. That same year, the actual number of users in the United States was close to 90 million (Hausman, 2002)

I. How two carriers dominate the regional mobile market

After more than a decade of a pro-market reform, today, the Latin American market is dominated by two carriers. Instead of an open market with numerous players that compete for a share, the region today experiences the consolidation of the same two grand players that compete with one another in virtually every country. While the Spanish firm, Telefónica, consolidated a strong position after the acquisition of the mobile operations of Bellsouth in many countries of the region, the Mexican firm, Telmex and its sister firm, America Móvil have recently developed an aggressive acquisition policy in local telephony as well as in the mobile sector. These results are unexpected not only because the objective of the reforms was to generate an atomized market but it is surprising that the companies that today control the market were far from being the strongest in the world. Telmex and Telefónica were transformed into central actors in the international telecommunications sector.

The reforms undertaken in the telecommunication sector during the 90s in Spain and Mexico both favored the creation of two large companies with a strong position in all segments of this market. The strategy implemented in both cases was the result of policies that were directed towards the creation of National Champions and the success of these policies created the basis for their internationalisation.

In the case of Spain, on the eve of the creation of the European Common Market, the Spanish government supported Telefónica for it to face competition under more favourable conditions. At the time, Spanish telecommunications were the most backward of Europe, reason for which it could be expected that Telefónica would be absorbed by the major European operators or, in the best possible scenario, that it would play no more than a minor role within integrated European telecommunications. In order to avoid this alternative, the Spanish authorities decided to turn Telefónica into the National Champion.

The regulatory framework established a generous pricing policy together with a “cheap money” financing policy and the decision not to distribute dividends. During the first half of the 90s, the pricing policy was oriented towards financing the modernization of the company and to balancing tariffs. Telefónica benefited from the support of the Spanish

government through sold financing mechanisms.² Telefónica began acquiring companies holding market power and with exclusivity periods in Argentina, Chile, Peru and Brazil.

In the case of Mexico, as a cornerstone of the country's modernization process, Telmex was privatised and sold as a vertically integrated company in 1990. Achieving such a privatisation successfully meant overcoming a number of political and economic obstacles. A vertically integrated company served the purpose of satisfying the demands of the key actors in the system: The national private sector and the unions which were lobbying against the disintegration of the company and favored the creation of a National Champion.

Initially the Mexican group Telmex-América Móvil did not have a significant participation in the process of privatisation in Latin America. Its interest in the Latin American telecommunications sector began only during the second half of the 1990s and followed two different paths: 1) the acquisition of privatised fixed telephony companies in Guatemala, El Salvador and Nicaragua, and 2) the most important one, the expansion of its mobile telephony operations to several countries in South America in 2003.

In terms of technology, the Latin American experience shows that those companies that competed in the fixed telephone segment of the market acquired a significant advantage that allowed them to consolidate a very strong position in the competitive arena. The control of the incumbent position in Spain, Mexico, Argentina and Chile, for example, established important obstacles to the consolidation of competitors within those markets. The U.S.-based companies that entered the Latin American telecommunications market, in what appeared to be the dynamic sectors at the beginning of the last decade, such as mobile and long distance, were not able to secure their position and today have lost all significant shares of the Latin American market. Even pro-competitive regulatory policies were not enough to create a real level playing field that would counteract these initial strong positions.

² This policy was not exclusively for the telecommunications sector, but was developed also in other sectors, such as infrastructure and banking.

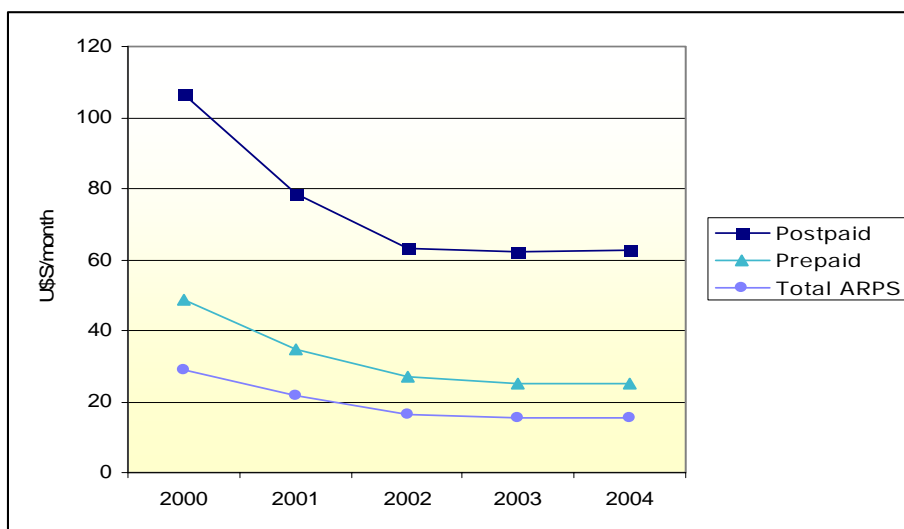
Until 1997, mobile telephony was a secondary business option for the incumbent companies. Fixed teledensity by far surpassed mobile penetration and the business in fixed telephony, being sheltered from competition and operating within a relatively weak regulatory environment, seemed to promise a major source of income. Mobile telephony firms, on the other hand, were subject to serious regulatory challenges, as described above, in addition to intense competition. Therefore, while the companies specialized in this sector were facing serious difficulties in generating positive EBITDAs, the firms in the fixed sector owning mobile sister companies saw this branch of the business as not very promising. The regulatory changes in the industry were to radically change this perception.

The impact of the changes in the two regulatory issues discussed above on mobile telephony were to dramatically change the access to voice communications. What initially appeared as a means of communications restricted to the highest income groups, has transformed into the principal means of access to telecommunications of the poorer sectors of the region.

After 1998, while fixed teledensity tends to stagnate in most countries, mobile telephony begins to grow at two digit ratios. The average annual growth of mobile telephony users during the 2000-2003 period was 33% in the region, while growth in the case of traditional telephony was only 7%.

Within the new scenario for the telecommunications industry a new process emerges: consolidation. Mobile telephony becomes the focus of attention for the region's two largest operators: América Móvil and Telefónica Móviles. The acquisition process of these two companies involved an aggressive campaign to attract customers and the depredation of local markets in the fight for regional positioning, which even involved a reduction in Average Income Per User (ARPU) (see Graph 1.1), both total as well as per service, during this time period as the number of users increased. This has generated a scenario of global survival as opposed to one of collusion among companies.

Graph 1.1 Mobile Market in Latin America: Average Revenue per Subscription (ARPS) (US\$/month)



Source: Pyramid.

The mobile business is no longer an appendix of fixed operations and the companies decide to separate both operations in order to maximize the operation of both. That is why Telefónica España restructures its operations by creating companies specializing in mobile communications, long distance, mobile telephony, data, WEB services and call centers. The companies lose their national personality and are integrated into regional companies and generalize the use of the Telefónica brand. The business strategy is no longer determined by the company in the fixed business but the different segments develop their own strategies close to autonomously and are coordinated at a higher level. Nevertheless, the companies take advantage of possible economies of scope to generate important advantages over specialized operators.

As mobile telephony becomes a business with a very favourable perspective, companies in the sector begin to fight for global operations. One of the central objectives is holding a central position in Brazil. That is why, both Telefónica España and TELMEX – América Móvil enter this country aggressively.

Telefónica España begins its mobile operations in Mexico in 2002 with the purchase of Pegaso, thereby strengthening its position as the second largest supplier of mobile services in the country. The biggest step undertaken by Telefónica to become the central

operator of the mobile segment in the region was the purchase of all Bellsouth operations in Latin America. As can be seen in the next Table, Telefónica holds mobile companies in 13 countries, with participations (excluding the case of Mexico) that fluctuate between 24% in El Salvador and 73% in Panama, with a special emphasis on the case of Brazil, where its participation is close to 50%.

In 2001, Grupo Carso follows a similar path and decides to separate TELMEX from TELCEL, the mobile company, which becomes the international conglomerate América Móvil. Through this company, the group expands its influence to all of the Latin American region and reaches the position described in the following table. As can be seen, it has operations in 10 countries, with participations that fluctuate (excluding the case of Uruguay) between 25% in Brazil and close to 76% in Mexico. América Móvil has entered the Chilean market through the acquisition of Smartcom, the thirds largest operator of the country.

By the year 2004, the operations of the Mexican group América Móvil and of the Spanish firm Telefónica Móviles covered 14 countries in Latin America with a joint participation within some countries surpassing 90% of the market, as is the case of Nicaragua, Colombia, Ecuador and Mexico (see Table 1.1). This clearly points towards a regional duopoly.

Table 1.1: Market participation by country and segment (2004)

Telefónica Móviles vs. América Móvil 2004				
Market share				
Country / Segment	AMX (%)	TEM (%)	AMX+TMX (%)	Mobile density in the country
Argentina	27.8	26.1	53.8	34
Brazil	25.6	49.8	75.5	37
Chile	- -	35.1	35.1	61
Colombia	57.5	32.6	90.1	23
Ecuador	63.9	30.8	94.7	28
El Salvador	32.2	23.9	56.1	23
Guatemala	45.6	26.2	71.8	23
Honduras	28.3	- -	28.3	10
Mexico	75.6	14.8	90.4	36

Nicaragua	58.1	40.4	98.4	13
Panama	- -	73.1	73.1	12
Peru	- -	51.9	52.0	15
Uruguay	1.0	35.6	36.7	16
Venezuela	- -	45.7	45.7	30

Note: Mobile density in the country is calculated as the number of subscribers per 100 inhabitants. Decimals were omitted.

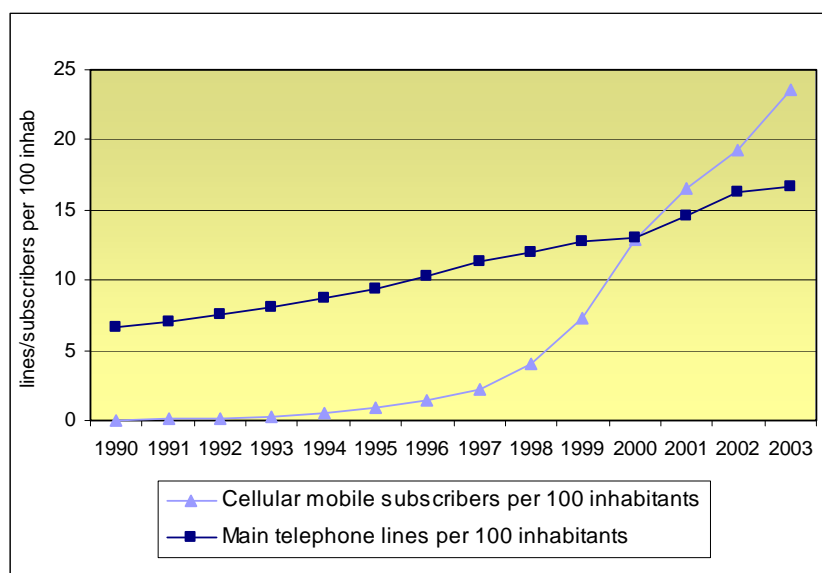
AMX: América Móvil, TEM: Telefónica Móviles.

Source: Telecom-CIDE based on the companies' annual report and regulator's web pages..

II. How mobile has surpassed fixed telephony

In several Latin American countries, the growth in mobile telephony by far surpasses that of fixed telephony as a result of the technological changes experienced in the sector, increased competition, the reductions in the cost of the network and the equipment in addition to the structure of tariffs adopted by the country. Graph 2.1 describes the evolution in the penetration of fixed and mobile telephony in Mexico and for an average of other Latin American countries.

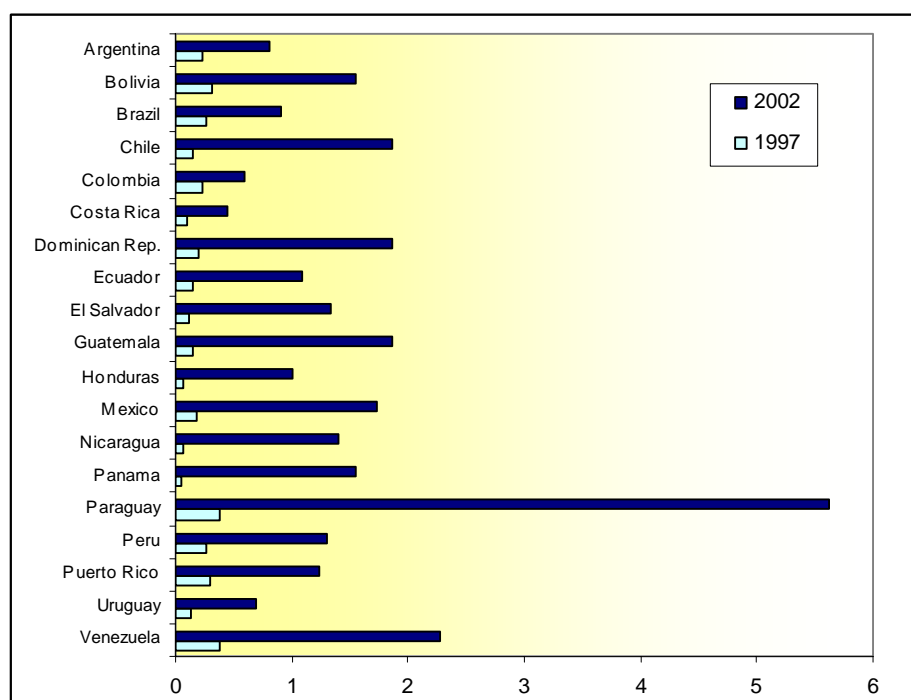
Graph 2.1 Fixed versus Mobile in Latin America



Source: Telecom Data based on ITU and operators.

Moreover, as can be seen in Graph 2.2, the number of cellular subscribers per fixed lines has grown significantly when comparing the year 1997 to 2002. Paraguay constitutes an exceptional case in the sample, followed by Venezuela. While in 1997 none of the countries surpassed the proportion of subscribers to fixed lines, in 2002 only five out of the twenty were in the same situation.

Graph 2.2 Mobiles per fixed lines in Selected Latin American countries - 1997 & 2002



Source: Telecom Data based on ITU and operators.

It is important to note, however, that in Graph 2.2 that in some countries the low denominator represented by fixed teledensity (e.g. Nicaragua, Peru and Honduras) could produce a bias. Nevertheless, although there may be an effect in this direction, an additional interpretation can be related to the balance that can be observed between both types of access (fixed and mobile). In that case, it is clear that mobiles play a major role in providing connectivity. This can partially be explained by the inability of fixed telephony to increase access and partially by the technological characteristics and lower costs mentioned above for mobile telephony.

Drivers of Growth

Although mobile telephony has been known for decades, before the invention of the cellular telephone, mobile telephony could only use a specific frequency, thereby severely limiting the number of potential users. With cellular telephony, the frequency can be reutilised by using a hexagonal network of interconnected cells, allowing for an uninterrupted frequency. Technologically, this opened the field to a much broader number of users.

The sector of mobile telephony has also developed in a more competitive environment than fixed telephony, thereby allowing for freedom in the determination of the pricing structure. Only few countries have assigned exclusive concessions in this field. Within this environment, prices of mobile telephony have become more competitive in most countries than those of fixed telephony, attracting an increasing number of users also within the lower income groups.

Nevertheless, the development of this market has also depended on regulatory decisions along two main branches: spectrum assignment and interconnection charges and access to the fixed carrier.

With regard to the first issue, there are basically two ways for spectrum assignment: through the so-called “beauty contest” and by auction. In the first case, the concession is assigned to the company offering the project appearing to be most adequate in terms of government policy, coverage, prices and network deployment. The Latin American experience has been divided among these alternatives.

In the case of Chile, the licenses have been assigned using the “beauty contest” mechanisms. Even though the government thereby forsakes a considerable amount of resources, the growth in the number of subscribers was such that, by 2004, the country had a 61% penetration in mobile telephony, the highest in the region.

In the case of Brazil, the authorities decided to divide the country into nine areas for concession and each one of them applied the auction method to the assignment of the

spectrum. Mexico used a similar mechanism. Both countries have made great progress in the sector, reaching a 37 and 36% penetration respectively.

In 1988, Argentina assigned bands of the radiophonic spectrum to Movicom, company in which Bellsouth participated. In 1993 it included the incumbent firms in fixed local telephony Telefónica and France Telecom, which was associated with Telecom Italy. In 1996 the latter concessions were broadened to allow for both firms to operate on a national level. In 1999, the PCS telephony concessions were assigned using the auction method.

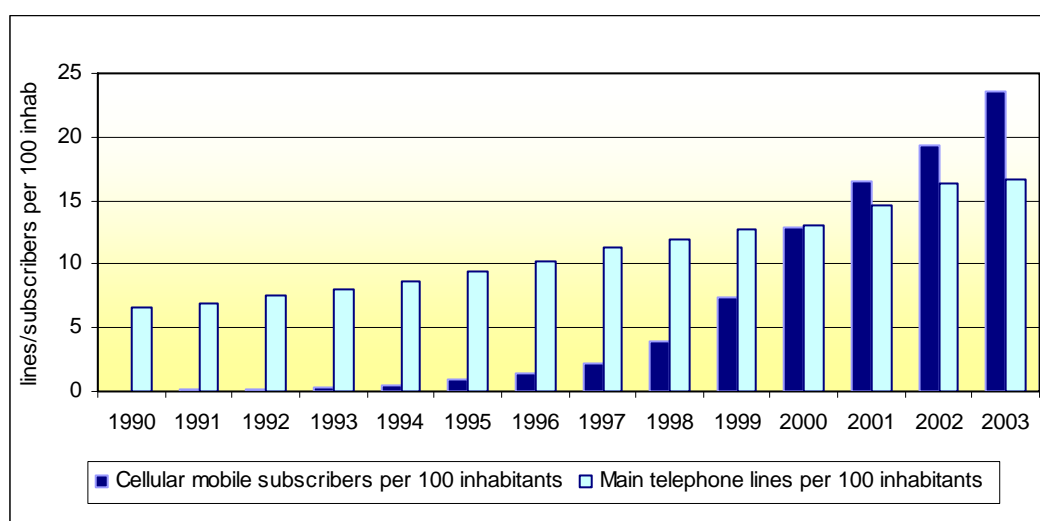
The second regulatory issue, interconnectivity with the fixed users of the incumbent company, has also had vast repercussions on the development of mobile telecommunications in Latin America. The main issue here was defining the criteria for access charges. Normally, the fixed telephony operators operating within the same concession zones, determine symmetrical access charges. The most common modality has been the “sender keeps all” one, whereby the company originating the call retains the full payment of the user. The second modality is to establish a formula to share the income, usually distributing 50% to each of the operators involved in a successful communication. In the case of mobile telephony, due to the differences in convergence, coverage and maturity between fixed and mobile technologies, symmetrical access charges did not allow for mobile operators to generate enough income to finance their companies. Therefore, initially the most common solution was for the user of mobile telephony to pay for both, outgoing and incoming calls. The high costs for the user of this solution greatly limited the number of subscribers.

A number of changes in the regulatory environment as well as in the business strategy of several mobile telephony companies, created the conditions to change this limitation to the growth of the sector. In 1997, Chile changed its regulations to introduce the “calling party pays” modality, which transferred the payment for mobile calls to the originating party. Additionally, the country’s regulatory agencies, the Ministry of Economy and the Subsecretariat of Telecommunications, determined access charges for mobile companies by applying the same methodology to them as to operators in non competitive conditions, thereby having the fixed operators pay the charges for the call.

By the end of 1999, Mexico introduced a similar reform, while Brazil adopted the “calling party pays” modality from the beginning. ANATEL has established maximum access charges, which were applied by the different mobile companies.

As can be observed in the following graph 2.3, before 1997, the number of mobile subscribers in Latin America was very few. Low per capita incomes in the region, together with the high costs involved in the construction of new networks, contributed to the slow growth of the sector. The regulatory issues analysed above, together with the commercial strategies adopted by the mobile companies in the region, first contributed to limiting the industry's growth and later created the conditions for the explosive increase in mobile subscribers.

Graph 2.3 Average penetration Fixed vs Mobile in Latin America



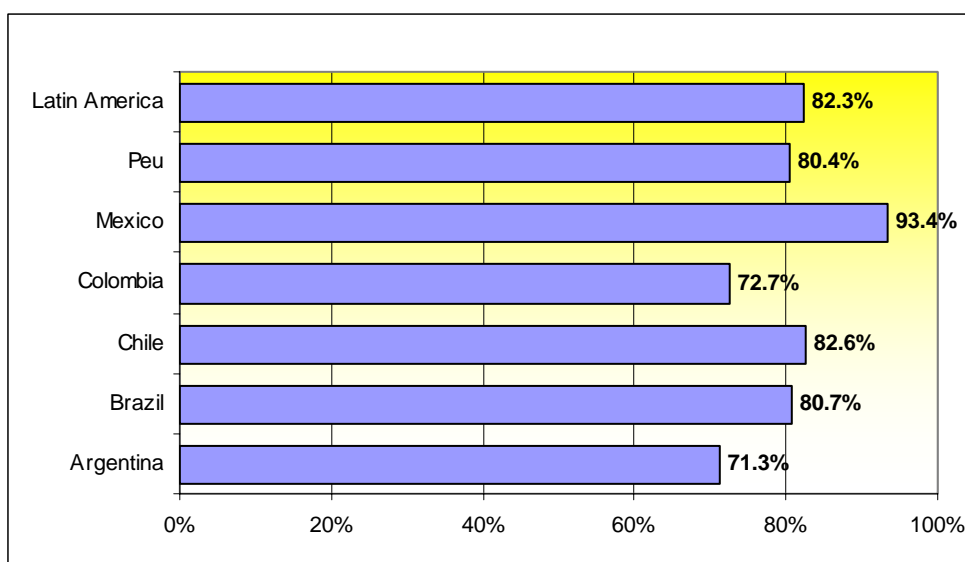
Source: Telecom-DATA based on ITU and data obtained from regulators.

The first factor determining the growth in the number of mobile subscribers was the overall adoption of the “calling party pays” modality discussed above. Not having to finance incoming calls translated into a major increase in demand and contributed to a major growth on coverage.

The second factor was the introduction of prepayment in mobile telephony. Before this, with the post-payment modality, the possibility of fraud constituted a major limitation to the sector. Mobile users could contract the services of other mobile operators despite leaving

a trail of unpaid bills. As lower income subscribers began using mobile services, the risks involved in this modality were expected to increase. As can be seen in the following graph 2.4, Latin America is a prepaid region.

Graph 2.4 Prepaid subscribers as % of Total Subscribers - Year 2004



Source: Pyramid.

The prepayment system created new options both for the operators as well as for the users. For the companies, the advantage is reducing the risks of fraud, eliminating the need for monthly expense statements and reducing collection costs. Although the ARPU is lower in the case of prepayment, the company generates income through its subscribers originating calls and through access charges payable by subscribers of other companies. Additionally, the sale of calling cards is undertaken with low labor costs.

Consumers, on the other hand, have the advantage of controlling their telephone expenses, eliminating the risk of escalating debts. The user has no fixed monthly charges but can determine its level of expense and usage. Even if the telephone no longer has credit, the user can continue receiving calls, allowing for a constant connection.

III. How mobile has widened access to previously un-served groups but still a mobile divide exists within countries. Technology pro-poor? Contribution to development/growth³

Several studies have been undertaken to show the advantages of mobile telephony over fixed telephony and other traditional accesses to telecommunications for users of low consumption (Dymond y Oestman 2004, NECG 2004, Stephens et al 2005, Oestman 2003, Telecom CIDE 2005).

One of the main advantages is the lower cost to the user of mobile services, including line activation, SIM card and equipment, compared to fixed services. The growth in mobile users and the prepayment modality have allowed for a significant reduction in unit cost of services. As can be observed in the following table 3.1, the growth in the number of subscribers coupled with the close to marginal cost of incorporating a new subscriber has translated into a reduction in prices of mobile telephony. Therefore the prices of the latter have fallen below those of fixed telephony, accounting for a stronger growth in subscribers for this sector. At present, in all countries, mobile telephony has surpassed fixed teledensity by far.

The following table 3.1 compares initial as well as monthly costs for low density users in some Latin American countries.

Table 3.1: Cost comparisons between fixed and mobile telephony for low consumption users⁴

Country	Start-Up Costs		Monthly Costs/calls	
	Fixed	Prepaid Mobile	Fixed	Prepaid Mobile
Argentina	\$150	\$50,0	\$13.65	\$7.95
Brazil	\$27	\$40,0	\$7.90	\$4.50

³ This section is based on Telecom CIDE (2005).

⁴ In the case of fixed telephony, initial costs include total connection costs, while in the case of mobile telephony, they refer to equipment and SIM card activation costs (in the corresponding cases). The monthly usage costs include the monthly rent and a package of 15 minutes of local calls in the case of fixed telephony. and in the case of mobile the monthly usage costs were calculated on the basis of a minimum payment for the activation of the prepayment system plus 15 minutes of mobile to mobile calls (Oestman 2003, 1).

Chile	\$43	\$67,1	\$11,40	\$8,10
Colombia	\$168	\$49,25	\$3,70	\$4,20
Mexico	\$119	\$46,2	\$16,25	\$6,90
Peru	\$131	\$60,4	\$13,95	\$4,50
Venezuela	\$102	\$54,0	\$11,6	\$6,15
Average	\$105,71	\$52,42	\$11,21	\$6,04

Note: Values in US dollars. Source: Oestman, 2003.

Within this framework it is interesting to study the growing use of cellular telephones by low income groups. We will specifically analyse the case of Mexico and, in order to do so, will be using the concept of “socio-economic levels” defined by the Mexican Association of Market Research and Public Opinion Agencies (AMAI). The series of socio-economic levels (SEL) constitute the standard for the industry, which, through a specific rule, assigns the corresponding socio-economic level to a given home. The levels are divided into five groups: A/B, C+, C, D y E, where the A/B group includes the highest income population of the country while the E group includes persons with the lowest income level and quality of life. The following table 3.2 summarizes the characteristics of the population and its distribution.

Table 3.2: Socioeconomic Level (SEL) in Mexico

A/B Level	Level C+	Level C	Level D+	Level D	Level E
10.8 %		9.1 %	23.8 %	56.3 %	
Level that includes the population with the highest level of life and income of the country	This segment includes people with life and income levels that are slightly above average	This segment includes people with medium life and income levels	This segment corresponds to people with life and income levels that are slightly below average, that is, the low income level with better life conditions.	Level D includes people with an austere level of life and low income	Level E is composed of the population with the lowest levels of income and life within the country's urban areas.

Source: Telecom CIDE (2005).

The data generated by the survey undertaken by Marketing Group, allow us to have a preliminary understanding of the use of mobile telephony by the low income groups of the population. Table 3.3 provides interesting statistics for the year 2003 on this issue.

Table 3.3: Mexico: Mobile penetration by Socioeconomic Level - 2003

Year 2003						
	Level A/B	Level C+	Level C	Level D+	Level D	Level E
Distribution of Population	10.8 %		32.9%		56.3%	
Postpaid subscribers	19%		8%		6%	
Prepaid subscribers	81%		92%		92%	
Mobile Penetration (per group)	85%		43%		9%	

Source: Telecom CIDE (2005).

As can be observed in Table 3.3, in 2003 the use of mobile telephones dominates the higher income sectors of the population, where 85% of the individuals falling within the highest income bracket are users of mobile telephony. On the other hand, in 2003, the lowest income group also included users of mobile telephony since one in every 11 had a mobile telephone.

Nevertheless, penetration in the past two years tells a different story. According to recent (and preliminary) data provided by PRM International, by 2005 the mobile telephone has become a common tool among the lower income sectors. While in 2003 only 9% of the individuals classified within the D and E socioeconomic levels were users of mobile telephony, by 2005 the number had tripled and now reaches 27% of the population within those income brackets.

In the higher income sectors, on the other hand, the number has not changed significantly. This could be expected since the percentage of the population using mobile telephones in that income bracket was already high. It is also interesting to note that the middle class associated with SEL C and D+ have also shown a growing use of mobile telephones as evidenced by an increase from 43% in 2003 to 51%⁵ in 2005

⁵ The 51% number is a result of combining SEL C and D+ according to the PRM data.

Table 3.4: Mexico: Mobile penetration by Socioeconomic Level - 2005

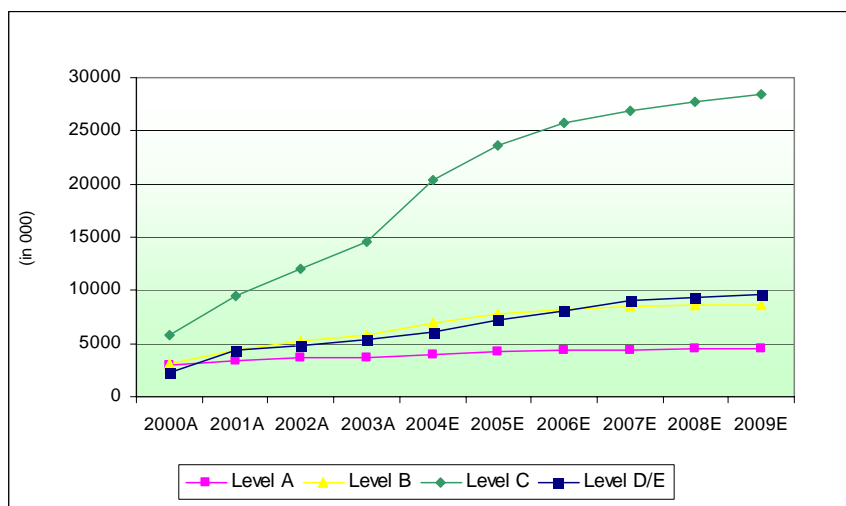
	Level A/B	Level C+	Level C	Level D+	Level D	Level E
Distribution of Population	10.8 %		9.1 %	23.8 %	56.3 %	
Postpaid subscribers	28%	12%	6%	6%	4%	
Prepaid subscribers	72%	88%	94%	94%	96%	
Mobile Penetration (per group)	89%	75%	67%	42%	27%	

Source: Telecom CIDE (2005).

The increasing use of mobile telephones by the lowest income groups is mostly due to the low access and usage costs provided by the prepayment system and the “calling party pays” modality. When analyzing the segment of prepayment specifically, using Tables 3.3 and 3.4 above, both in 2003 and 2005, the groups most intensively using this modality are those falling within the D and E SEL. This provides them with increased autonomy from other alternatives such as community centers, where there are often restrictions to receiving calls. Another aspect to be taken into consideration is the importance of having a means to be located in order to open up employment possibilities, since among the lower income groups temporary employment tends to predominate. Based on the study undertaken by Marketing Group, the reasons mentioned by the mobile users of socioeconomic level D for purchasing a cellular telephone include the need to be located, making personal calls and making job-related calls.

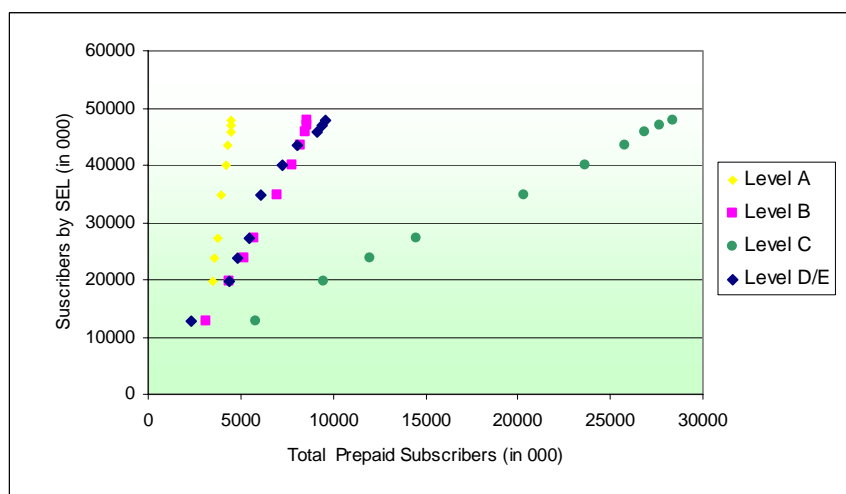
In order to analyze the specific case of prepayment plans, the following graphs 3.1 and 3.2 help us illustrate their contribution to providing telephone services the middle and low income brackets of the Mexican population.

Graph 3.1: Users of mobile telephony under prepayment plans by socioeconomic level (SEL)



Source: Telecom CIDE with data from Pyramid

Graph 3.2: Users of mobile telephony under prepayment plans by socioeconomic level (SEL)



Source: Telecom CIDE with data from Pyramid

In all cases, the middle class, that falls within the socioeconomic level C, will be the one experiencing the fastest growing number of users as a percentage of total users of prepayment plans. At the same time, the temporary projection shows that, after group C,

the lowest income sectors of the population will be the ones most increasing the usage of these types of plans.

If we take into consideration the market trends previously mentioned regarding the use of prepayment plans for mobile telephony (graph 3.2), it can be seen that the increase in the number of users of mobile telephony will mostly be the result of the middle and low income groups adopting this service. This allows us to conclude that mobile telephony has and will continue to provide social benefits, since it is becoming the favored means of communication for the more needy segments of the population.

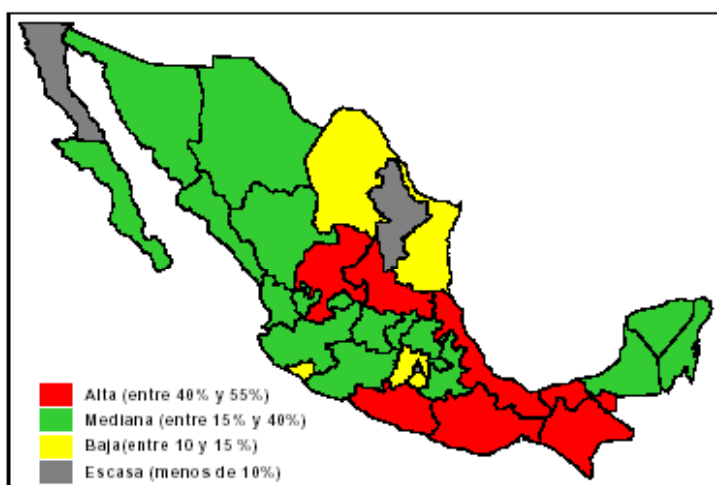
The growing use of mobile telephony in Mexico's rural sector

As was mentioned above, technological change, shifting cost structures and new payment mechanisms, have brought about a reduction in prices of mobile telephony. Therefore this technology is today a very viable model to cover the demand for telecommunications in rural and isolated areas. As was mentioned by Navas-Sabater *et al* (2002), wireless networks have clear cost advantages over fixed telephony, in particular to provide services to isolated communities, and even small villages.⁶

In Mexico as in many other Latin American countries, the rural population constitutes a large proportion of total population. In Mexico, 25 million inhabitants live in rural communities, most of them located in the States of Oaxaca (55.3%), Chiapas (54.5%) and Hidalgo (50.4%) (see graph 3.3).

⁶ The authors mention that the specific characteristics of mobile networks (speed and ease of equipment deployment and not having to install extensive cable networks) make these a more efficient solution than fixed telephony when reaching isolated communities or those difficult to access (Navas-Savater *et al* 2002).

Graph 3.3: Concentration of Rural Population in Mexico – Percentage by State

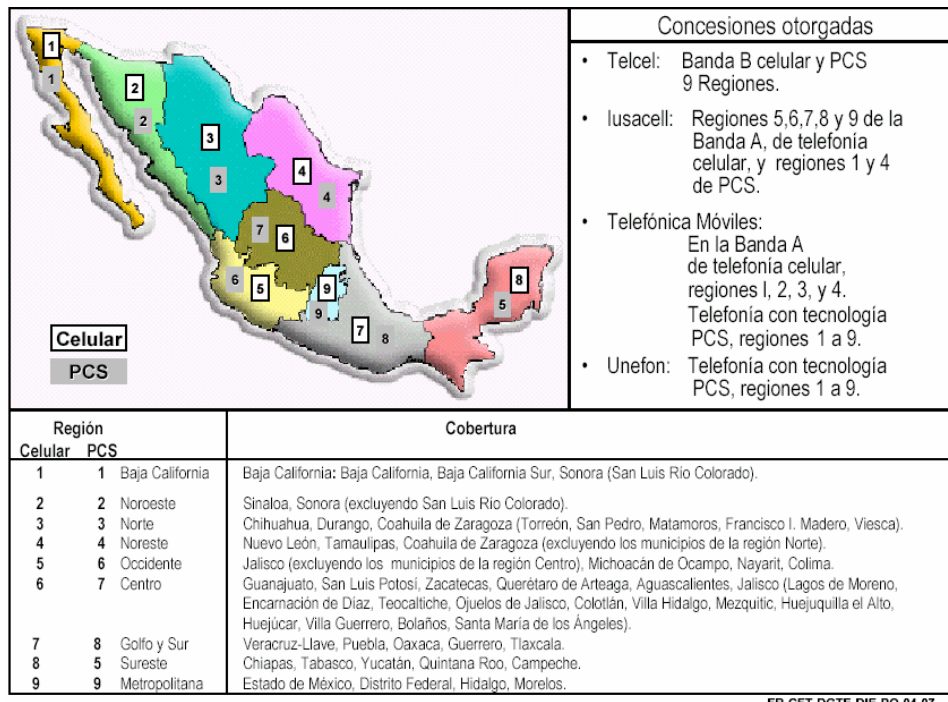


Source: SAGARPA with data from INEGI (2001)

In addition to the social benefits previously mentioned for mobile telephony in general, in the case of rural areas there are specific additional benefits. The first one relates to communications. Many of the rural Mexican families have members who have migrated to larger cities within Mexico or abroad, looking for better salaries, employment and educational opportunities, as well as a better level of life. For them and their families, being able to communicate, constitutes a crucial need. This fact also creates commercial opportunities. As is documented by Oestman and Dymond (2004), the revenues of rural operators are mostly the result of charges on incoming calls. In Chile, for example, these revenues amount to 60% of total revenues (Oestman y Dymond 2004, 53).

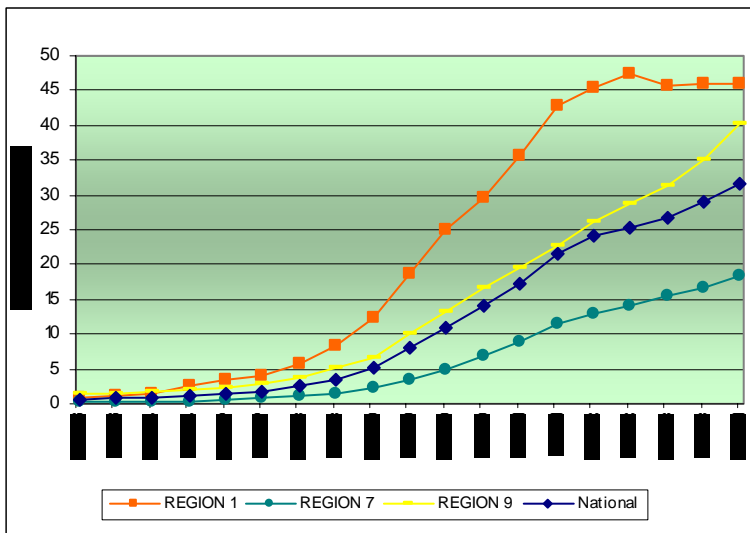
In Mexico it is evident that mobile telephony is covering certain rural zones which were previously unable to access any telecommunications services. Given that 25% of the Mexican territory corresponds to rural areas and since mobile telephony covers approximately 90% of the country, it is possible to state a priori that mobile telephony is covering at least some non urban zones. On the other hand, when analyzing the country's mobile regions, it can be concluded that the largest number of mobiles is concentrated in regions 1 (Baja California) and 9 (Mexico City), which include some of the most urbanized areas of the country (see Graph 3.4 and 3.5).

Graph 3.4: Regions of Mobile Telephony



Source: COFETEL.

Graph 3.5: Mobile Penetration by Region



Source: Telecom CIDE based on data by COFETEL.

Conversely, based on Table 3.5, it is interesting to note however, that in the States of Oaxaca and Hidalgo, the most rural ones together with Chiapas, mobile surpasses fixed penetration, although it is significantly lower than the national average.

Table 3.5: Penetration of Fixed and Mobile Telephony by State - 2002

	Fixed (%)	Mobile (%)
BAJA CALIFORNIA	20,8	45
CAMPECHE	7,8	9
CHIAPAS	4,2	4
DISTRITO FEDERAL	37,6	36
HIDALGO	7,6	12
NUEVO LEON	24,0	51
OAXACA	5,2	8
TABASCO	6,6	8

Source: Telecom CIDE based on data by COFETEL and Select.

Besides mobile telephony, another interesting solution for supplying low-income and rural customers is the use of mobile payphones. Several countries have used this modality to provide universal access. In Mexico, the regulating body COFETEL allows for public mobile telephony but there are no obligations related neither to it nor to universal access programs in general. The result has been a still incipient use of mobile payphones to provide telephony services in rural areas, although this technology is increasingly being used in tourism zones where it has been identified as a good business opportunity.

To summarize, although mobile telephony provides important advantages over fixed telephony to provide access to telecommunications in isolated or rural communities, in Mexico there is still mucho to do. There is a clear challenge, in terms of regulations, business and pricing strategies, as well as socially to develop instruments capable of promoting universal access to rural sectors.

IV. Conclusions

As the Latin American experience shows mobile telephony is a story of success in the adoption and rapid expansion of a new technology. One of the key drivers of this success is the reduction in costs that offered the poorest segments of the population in Latin America the possibility of acquiring a form of telecommunications access. The expansion

of mobile telephony became a very powerful tool of universal access in the region, for example, mobile service has had a significant impact on un-served rural areas.

The reduction in costs is not solely a function of technology; it has been supported by a more competitive framework and by innovative pricing strategies. Prepaid mobile services and calling party pays made access to these services more affordable. The strategies followed by private firms offer a lesson to be captured by regulators when designing universal access policies. There are market opportunities to be seized by firms in offering low cost services and regulators need not always offer subsidies to provide un-served areas. Instead, offering incentives that generate innovative strategies may be a more efficient policy.

Fostering competition has always proved to be a good rule of thumb in promoting the expansion of the network. However, the challenge facing Latin American regulators today is that the telecommunications industry is becoming increasingly concentrated. The region today appears to be a battlefield where Telefónica and Telmex are struggling for a privileged position in the regional market. However, it would be reasonable to assume that at some point they will coordinate their strategies and perhaps collude. Regional authorities would be well advised to coordinate policies that regulate the same two grand players in the region.

References

- Dymond, Andrew y Oestman, Sonja (2004), "The role of sector reform in achieving universal access", in *Trends in Telecommunication Reform 2003*, chapter 3, ITU, Ginebra.
- Navas–Savater, J., A. Dymond and N. Juntunen (2002), "Telecommunications and Information Services for the Poor: Toward a Strategy for Universal Access", The World Bank Group. World Bank Discussion Paper No. 432, Washington, D.C.
- Network Economics Consulting Group NECG (2004), "The Diffusion of Mobile Telephony in Latin America, Successes and Regulatory Challenges", Canberra.
- Oestman, Sonja (2003), "Mobile Operators: their contribution to universal service and public access", Intelecon Research.
- Stephens, Robert, Boyd, Jeremy y Galarza, Juan (2005), "Telefonía celular – nuevo instrumento para el acceso universal en Latinoamérica", in *Latin.tel*, Regulatel, Year 1 No. 1, March.
- Telecom CIDE (2005), "Contribuciones Sociales y Económicas de la Telefonía Móvil En México según un análisis de las fases de Maduración del Mercado", elaborated for Telefónica Movistar México, México, DF.