

## ***Market power, affordability and access: the case of Universal Telecommunications Services in Mexico (1990-2010)***

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### **I. Introduction**

Telecommunications service infrastructure is an important factor in attaining greater equality and social inclusion, when services are available and affordable to all citizens regardless of income and geographic location, and a crucial factor for achieving a global network economy. The aim of the present research is to analyse the design and implementation of telecommunications regulations and policies targeting the poorest regions of Mexico (1990-2010), examining the scope of policies designed to achieve the goal of universal access.

In addition to social goals, telecommunications services play an undeniable role in the economy in being a critical factor for the design, production and marketing of goods and services. The efficiency of these processes depends ever more on the increasingly widespread use of an affordable telecommunications platform, operating to high standards of quality.

The 1990s were marked by a significant improvement in access to telecommunications services in a large number of developing countries, particularly in Asia, Africa and Latin America, making it a veritable decade of connectivity. However, this phenomenon of increased coverage of such services did not occur to the same extent in all countries, with some experiencing a less marked improvement over the decade. Among such countries was Mexico where, despite being the country witnessing a significant increase in coverage of these services, notably mobile networks, universal access to telecommunications services is still far from being achieved.

In developing countries gaps have remained in the market mainly because of regulatory failure, combined with exceptionally challenging geography and extremely low population densities, isolation and extreme poverty.<sup>i</sup>

A frequent spark of debate has been the challenges posed in offering connectivity to poorer or more remote communities. However, technological innovations in telecommunications services have allowed these difficulties to be greatly overcome: new technologies have considerably reduced the costs of deploying the underlying infrastructure for these services—the case *par excellence* being mobile services and wireless networks—in addition to falling prices of devices and services to end users on the international market, along with a substantial improvement in functionality in terms of transmission of data, Internet and video traffic.

A further set of factors highlighted in the literature as having an influence on telecommunications service coverage concerns shortcomings in public policies and government regulation encouraging investment in the industry and the implementation of pro-competition policies. In addition, public policies and regulation for social development in telecommunications are focussed on those sections of society living in poverty.

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The gap in access to telecommunications services is the result of a number of complex factors related to the structuring of the different telecoms services markets in Mexico, with a concentration of power among very few providers, as well as the failed nature of attempts to regulate the dominant providers in question and difficulties encountered by regulators in the drafting and implementation of policies targeting lower-income regions and communities (Casanueva & Pita, 2010; Del Villar, 2009a and 2009b; Noll, 2009; Maddens, 2005 and Casanueva & del Villar, 2002).<sup>ii</sup>

In designing policies and establishing regulatory frameworks to ensure access to telecommunications services, governments have seen their ability to implement policies and enforce these regulations increasingly hampered. Some of the difficulties relate to the asymmetry between regulatory bodies and the economic influence of operators exercising market power: namely in Mexico, Telmex-Telcel, a conglomerate of Teléfonos de México (Telmex) with 78.4% of land lines and Telefonía Celular (Telcel) with 77.3% of mobile lines in 2010<sup>iii</sup> operating the two largest telecommunication networks and consequently the major interconnection capability in the country (see Figure 1, Telmex-Telcel's market power, according to the Federal Competition Commission, Mexico's anti-trust agency).

**Figure 1.**

Telmex was declared by the Federal Competition Commission (CFC) to have *market dominance* or “substantial market power” with respect to intercity or local traffic, as well as the market of digital subscriber lines (April, 2009)<sup>iv</sup>. As of July, 2011, more than two years after this declaration, any specific regulation for Telmex, has been issued or implemented in regard to these two resolutions.<sup>v</sup>

On 21 January 2010, CFC declared Telcel to have substantial market power (dominance) in mobile services. Telcel has four times more subscribers and five times more revenue than its closest competitor. Telcel's revenues are inconsistent with those of a competitive market.<sup>vi</sup>

On 13 May 2011 the CFC issued a resolution declaring Telmex to be an agent with market dominance or “substantial market power” in broadband Internet services. Telmex has 60 per cent of subscribers, the closest competitor having a 23 per cent share, of those served by Telmex.<sup>vii</sup>

The aim of the present research is to examine the implications that this market power held by the dominant telecommunications companies has on ensuring affordable access to telecommunications services, to high quality standards, under conditions of social equity.

The paper begins by examining the coverage of telecommunications services in various regions of the country, ranked according to their respective level of development (and poverty). In order to put Mexico's progress into perspective, the study presents international comparisons from over the last decade (2002-2009) of telephone density in those continents with the largest proportion of developing countries, namely Latin America, Asia and Africa. Then, the paper analyses the scope of public policies on universal service provision designed by Mexican authorities to achieve the goal of universal and presents the main research results of these policies.

The source underlying this research is the nationally-scoped *Household Survey of Access to and Use of Information Technologies* (2010). Additional information on regional economic development reported here was based on the “Poverty Indexes” established by the *National Council*

for the *Evaluation of Social Policy (2010)* along with financial information and employment statistics, both from Mexico's Census Bureau (2010). Additionally, we used *Annual Reports* prepared by the Ministry of Communications, statistics published by the *Federal Telecommunications Commission (2010)* and by the *International Telecommunications Union (2002-2009)*, and documents prepared by government agencies charged with designing and monitoring telecommunications policies on universal service, principally the Ministry of Communications, and information published by investment banks (2010). Finally, in-depth interviews were conducted with the former representatives of the *Office of Rural Telephony* which previously monitored the implementation of social and universal telecommunications policies.

In the light of available evidence, the article discusses possible explanations for the apparent failure of the universal service or social coverage policies that were implemented to bring telecommunications services to Mexico's neediest, as well as the difficulties faced by the regulatory bodies behind the design and implementation of pro competition policies that could have contributed to enhancing Mexico's telephone density by offering affordable services in regions without coverage.

## **II. Telecommunications services in Mexico**

The paper begins by examining the coverage of telecommunications services in various regions of the country, ranked according to their respective levels of development (and poverty). Subsequently, the growth and reach of these services in Mexico is placed within the context of other developing countries in Latin America, Asia and Africa.

Our analysis of the density of residential and non-residential landlines and mobile telephone lines suggests that a significant proportion of communities are left without coverage of these services. Although by and large, access to mobile lines offers an alternative form of connectivity, a breakdown of service availability by region should be taken into account.<sup>viii</sup>

In 2010, an average of only 5 out of 10 homes had access to landline services and 8 out of 10 people to a mobile line. Mobile services have witnessed significant growth over the decade (2000 and 2010), averaging 61.0% annually, which may go some way towards compensating for the lack of landlines in homes. However, in the most developed states, mobile services go hand in hand with the availability of landlines (see Table 2)

For the purpose of our estimates of the density of residential lines, the number of lines per 1,000 people is taken (ENOE, 2010).<sup>ix</sup> As argued above, telecommunications play a key role in the economy, hence the importance of assessing the density of these lines in workplaces and institutions.

In 2010, there were on average only 20 lines per 1,000 employed personnel, with that number rising to 66.7 lines<sup>x</sup> in Mexico City. In the case of non-residential lines (institutions and businesses), it is unlikely that access to mobile services could have compensated for the lack of landline services in institutions and workplaces.

While mobile services saw an average annual growth of 61.0% between 2000 and 2010, this increase stands in stark contrast to the growth observed for landlines, both residential (11.3% average annual increase) and non-residential (just a 17.3% average increase), for the same period (Cofetel, 2010. See Table 1).

**Table 1. Number and average annual growth of land and cellular lines: 2000-2010.**

(Millions)								
Residential 2000	Resid. 2010	Non Resid. 2000	Non Resid. 2010	Cell. 2000	Cell. 2010	Resid. Growth 2000-10	No Resid. Growth 2000-10	Cell. Growth 2000-10
85.4	172.1	315.5	80.6	14.1	91.4	11.3	17.3	61.0

Cofotel, 2011.

In Mexico City, improved connectivity is observed, both in terms of landlines (102.2%) and mobile lines (102.6%), and hence there is a complementary relationship between these services.

While the density of mobile services is high in those states with higher levels of economic development and lower poverty indexes, the availability of residential lines is below average except in the states of Nuevo León and Coahuila where landline density, while not satisfactory, is above average. Indeed, in 18 Mexican states, low landline density is accompanied by higher mobile density. However, the density of mobile lines is between 60 and 70 per cent, suggesting that mobile lines have not fully compensated for the lack of landlines.

It is in more prosperous states that better access is observed both to the Internet (around a third of households) and to Pay TV, to which 3-4 out of every 10 homes have access. (INEGI, 2011. See Table 2).

In poorer states, which account for 14.5% of the country's population and 30.3% of the rural population, there is a clear shortage of both landline and mobile services. In Chiapas, for instance, only 18.4% of households have landlines (1.8 homes in 10) and around half of the population have mobile lines (49.2%). The state of Oaxaca presents a similar picture.

**Table 2. Telecommunication service in prosperous states, 2010.**

*State	Resid. lines <sup>1</sup>	Non Resid. Lines <sup>2</sup>	Cellular services <sup>3</sup>	% Internet household <sup>4</sup>	Pay TV <sup>4</sup>	GDP per capita <sup>5</sup>	Poverty Index <sup>6</sup>
<b>National average</b>	<b>48.1</b>	<b>23.5</b>	<b>81.3</b>	<b>21.3</b>	<b>28.9</b>	<b>6,103</b>	<b>30.7</b>
<b>Mexico City</b>	<b>102.2</b>	<b>65.7</b>	<b>102.6</b>	<b>36.1</b>	<b>28.3</b>	<b>13,158</b>	<b>28.7</b>
Nuevo León	65.9	40.0	99.5	35.3	33.2	10,518	21.1
Coahuila	55.0	21.9	96.9	25.3	33.6	7,106	27.9
Baja California Sur	50.4	23.3	153.4	28.7	37.3	6,749	30.9
Baja California	54.4	19.6	87.8	37.2	42.2	5,949	32.1
Sonora	46.8	16.9	93.3	31.4	43.2	6,071	33.8
Quintana Roo	36.7	26.3	100.7	31.2	48.0	7,294	34.5
Colima	55.3	16.7	99.8	26.4	33.4	5,376	34.7

<sup>1</sup>/ Residential lines per 100 households. <sup>2</sup>/ Non residential lines per 1,000 of employed personnel (ENOE, 2010), <sup>3</sup>/ cellular lines, per 100 persons (COFETEL, 2010). <sup>4</sup>/ INEGI: Household Survey of Access and Use of Information Technologies (2010). <sup>5</sup>/The Treasury: System of National Statistics, 2009 (base 2003). <sup>6</sup>/ "Poverty Indexes," National Council for the Evaluation of Social Policy (2010).

In states such as Guerrero, Tlaxcala and Zacatecas, 4 out of every 10 homes have landlines and 4 out of 10 people have a mobile lines (INEGI, 2011: see Table 3).

The number of non residential lines is also extremely low, with an estimated density, a line per one thousand employees. This lack of connectivity is unlikely to be made up for by the availability of

mobile lines (see Table 3). A shortage of lines in workplaces and institutions is a situation which serves to perpetuate poor productivity, ultimately impacting on the creation and widespread availability of quality employment.

**Table 3. Telecommunication services and poverty, 2010.**

*State	Resid. lines <sup>1</sup>	Non Resid. lines <sup>1</sup>	Cellular services <sup>1</sup>	% Internet household <sup>2</sup>	Pay TV <sup>2</sup>	GDP per capita <sup>3</sup>	Poverty Index <sup>4</sup>
<b>National average</b>	<b>48.1</b>	<b>18.5</b>	<b>81.3</b>	<b>21.3</b>	<b>28.9</b>	<b>6,103</b>	<b>45.8</b>
<b>Mexico City</b>	<b>102.2</b>	<b>65.7</b>	<b>102.6</b>	<b>36.1</b>	<b>28.3</b>	<b>13,158</b>	<b>28.7</b>
Chiapas	18.4	6.1	49.2	5.1	13.7	2,497	78.4
Oaxaca	24.5	7.2	47.0	8.4	10.3	2,654	67.2
Tlaxcala	41.4	7.7	54.1	9.8	21.4	3,010	60.4
Guerrero	43.4	10.6	52.0	10.9	17.3	2,961	67.4
Zacatecas	42.6	8.6	56.4	13.0	27.3	3,653	60.2
Durango	46.8	13.9	45.2	18.5	21.9	4,986	51.3

14.5 % of Mexico's population (Mexico City not included).

30.3 % de la población rural de México. <sup>1</sup>/ Residential lines per 100 households. Non residential lines per 1,000 of employed personnel (ENOE, 2010), cellular lines, per 100 persons (COFETEL, 2010). <sup>2</sup>/ INEGI: Household Survey of Access and Use of Information Technologies (2010). <sup>3</sup>/The Treasury: System of National Statistics, 2009 (base 2003). <sup>4</sup>/ "Poverty Indexes," National Council for the Evaluation of Social Policy (2010).

The increase in poverty in some of these states was dramatic, such as in Zacatecas, which rose by almost 10 points on the multidimensional poverty index used. A similar though less dramatic case is that of Oaxaca, whose index score rose by 5.4 points (Coneval, 2011, see Table 4).<sup>xi</sup>

**Table 4. Poverty Index, 2008- 2010 (poorest states).**

State	2008	2010	2008-2010
<b>National Average</b>	<b>43.4</b>	<b>45.8</b>	<b>-2.4</b>
Zacatecas	50.4	60.2	-9.8
Tlaxcala	59.8	60.4	-0.6
Oaxaca	61.8	67.2	-5.4
Guerrero	68.4	67.4	1.0
Chiapas	77.0	78.4	-1.4

Poverty Indexes: 2008 and 2010. National Council for the Evaluation of Social Policy.

In the poorest states, fewer than 2 households in 10 have Internet and Pay TV, with the exception of Zacatecas, where almost 3 out of every 10 households have Pay TV. The low density of Internet and Pay TV is an indicator of these states' low potential for access to broadband in the near future.

Those living in areas lacking coverage or those with low incomes have turned to mobile services as an alternative means of access to telecoms services, where such services are available. The top-up card system allows users on low incomes to monitor their spending in relation to their income and to pay for their devices in instalments. However, this fails to be an economically viable alternative for the poorest members of society given that Mexico's mobile service is one of the most expensive among all developing countries. This in turn explains why states with a lower income per capita and higher poverty index also have a lower telephone density.

High mobile tariffs in Mexico may to some extent be explained by services being excessively dominated by a small number of providers.<sup>xii</sup> Higher tariffs in relative terms, and hence more sporadic uptake, have not been a guarantee of quality, with numerous complaints from end users pointing to problems with quality of service.<sup>xiii</sup>

The mobile services market in Mexico has seen market power highly focussed on a small number of providers, in addition to presenting high profitability in terms of Average Revenue Per User, one of the highest in a selection of 25 developing countries (Bank of America Merrill Lynch, 2010).

**Table 5. Mobile communications: average earnings per user and market concentration index (HHI), selection 25 developing countries, 2010.**

Country	*ARPU / <sup>1</sup>	**HHI INDEX / <sup>2</sup>
<b>Average</b>	<b>10.22</b>	<b>0.363</b>
Pakistan	2.28	0.229
Bangladesh	3.22	0.310
Philippines	3.66	0.437
India	3.97	0.178
Indonesia	4.06	0.339
Ukraine	4.45	0.339
Egypt	6.10	0.397
Thailand	6.16	0.342
Peru	8.48	0.467
Colombia	8.60	0.520
Nigeria	9.34	0.289
Russia	9.35	0.243
Morocco	9.54	0.469
China	9.70	0.520
Argentina	11.05	0.321
Turkey	11.83	0.407
Iraq	12.63	0.399
Venezuela	12.83	0.357
Brazil	13.56	0.246
Poland	14.09	0.283
<b>Mexico</b>	<b>14.17</b>	<b>0.549</b>
Malaysia	16.01	0.345
Hungary	18.53	0.360
South Africa	19.74	0.390
Czech Republic	23.38	0.351

\* ARPU= Average Revenue Per User. \*\*HHI=Concentration of Market Index Herfindahl-Hirschman.<sup>1 / 2 /</sup> Bank of America Merrill Lynch. Third Quarter, 2010.

Despite the fact that Telcel has been declared as having substantial market power (operating 77.3% of all mobile lines: see Figure 1) every provision made to prevent further damage has failed. Recently Mexico's Competition Commission (CFC) found Telcel to have engaged in "relatively monopolistic practices" by overcharging its competitors to connect calls to Telcel subscribers. In April, 2011, Telcel, was fined MXN 12 billion (USD 1 billion), 10 percent of Telcel's annual turnover. The regulator claimed that Telcel charged its rivals higher interconnection rates than for connecting calls between its own clients. Telcel's price squeezing behaviour leads to an increase in costs for competitors, while offering a more competitive price to end users within its own network, a clear infringement to hinder competition in both mobile and land line services. Telcel successfully appealed against the Competition Commission's decision, arguing that the President Commissioner had a personal bias against Telcel. The second voting process following Telecel's appeal excluded this Commissioner and Telcel won against the Competition Commission ruling. This result raises doubts

around the integrity of CFC commissioners and again points to regulatory capture of the CFC by Telcel.

In sum, it is among rural populations, in the poorest states of the country, where the greatest challenge lies in providing “social coverage” or universal telecommunications services for all citizens. Below we present a summary of public policies aimed at providing such universal service coverage. It can be seen that this set of policies has achieved little in terms of offering quality services to the country’s poorest.

Before examining social coverage policies in Mexico, it is pertinent to look at the achievements of other developing countries in order to put those policies into perspective. To gain such a perspective, the study thus presents international comparisons of teledensity, over the last decade (2002-2009), in those continents with the largest share of developing countries, namely Latin America, Asia and Africa.

### III. International Comparisons

A comparative analysis of the reach and growth of mobile services sheds light on universal accessibility and feasibility of telecommunications services, as mobile services have been the sector where greater growth has been experienced in less developed countries.

International comparisons highlight that, despite the significant growth in mobile lines in Mexico (62% annually between 2002 and 2009),<sup>xiv</sup> this relative growth fell behind that of the majority of developing countries in Latin America, Asia and Africa.

**Table 6. Mobile cellular services in a selection of Latin American countries: Teledensity and growth, 2000-2009.**

Country	GDP <sup>1</sup>	GDP per cápita <sup>2</sup>	Teledensity 2002 <sup>3</sup>	Teledensity 2009 <sup>3</sup>	Growth <sup>4</sup>
<b>Average</b>	<b>317.1</b>	<b>9,167</b>	<b>16.5</b>	<b>89.0</b>	<b>253</b>
Panama	44.4	12,300	17.2	164.4	1,603
Argentina	596.1	13,700	17.4	130.3	89
Guatemala	68.3	5,100	13.4	123.4	2,409
El Salvador	43.6	7,200	14.8	122.8	115
Uruguay	48.0	12,700	15.4	122.3	113
Honduras	33.6	4,200	5.0	112.4	663
Ecuador	115.0	7,600	12.4	100.1	79
Venezuela	345.2	13,100	25.8	98.4	52
Chile	257.2	14,800	39.6	96.9	48
Colombia	435.4	9,600	11.2	92.3	221
Brazil	2,172.1	10,200	19.5	89.8	81
Paraguay	33.3	4,600	29.9	88.5	73
Jamaica	23.7	8,300	13.6	88.5	88
R. Dominicana	87.2	8,400	18.7	85.5	140
Peru	275.7	8,600	8.6	84.7	230
Mexico	1,567.1	13,400	25.4	76.2	62

Ordering is based on the observed teledensity in 2009. Source<sup>1</sup> Thousands of USD and <sup>2</sup>CIA: The World Factbook. GDP per cápita (PPP), 2009. <sup>3</sup>Fuente: ITU World Telecommunication / ICT Indicators Database: 2000-2009. <sup>4</sup> Annual average growth.

The analysis puts Mexico in 16<sup>th</sup> place with respect to teledensity of mobile services (76.1 lines per 100 people) out of 22 countries in Latin America, where the average density in 2009 reached 9 mobile lines per 10 people (UIT, 2010: see Table 6).<sup>xv</sup>

It is difficult to attribute the relatively steady growth of mobile services in Mexico to the size of the country's economy, given that Mexico represents the second largest economy in the region after Brazil and has the fourth-highest GDP per capita in Latin America (see Table 7).<sup>xvi</sup> Several Latin American countries with smaller-scale economies show more rapid growth in these services, giving a more positive outlook on universal coverage of mobile services within a shorter timescale. In short, in contrast to most countries in Latin America, Mexico, where there is a lower density of mobile services, has experienced growth in access to these services that is among the lowest in the region (See Table 6). In Asia, mobile services grew by an average of 1,343% annually between 2002 and 2009. In 2002, fewer than three in ten people had access to a mobile line; in 2009, service coverage had reached 81% of the population. Below we give a selection of the poorest countries of Asia, where significant progress was seen in terms of teledensity of mobile services (UIT, 2010: see Table 7).

**Table 7. Mobile cellular services in Asia, selection of developing countries: Teledensity and growth, 2000-2009.**

Country	GDP/ per cápita <sup>1</sup>	Teledensity 2002 <sup>2</sup>	Teledensity 2009 <sup>2</sup>	Annual average growth
<b>Asia Average</b>	<b>13,617.4</b>	<b>25.7</b>	<b>81.0</b>	<b>1,343</b>
Maldivas	6,400	14.9	147.9	737
Viet Nam	2,900	2.4	111.5	1,545
Malaysia	13,900	37.3	109.7	61
Philippines	3,300	19.0	100.3	166
Thailand	8,200	16.0	97.3	257
Mongolia	3,400	8.8	84.2	169
<b>Mexico</b>	<b>13,400</b>	<b>25.4</b>	<b>76.2</b>	<b>62</b>
Sri Lanka	4,600	4.9	69.6	397
Indonesia	4,000	5.5	69.2	530
China	6,900	16.0	55.5	111
Pakistan	2,400	1.1	52.2	3,835
Bhutan	5,300	0.0	48.6	2,986
India	3,200	1.2	43.8	1,822

Ordering is based on the observed teledensity in 2009. Source <sup>2</sup>: CIA; The World Factbook. GDP per capita (PPP), 2009. <sup>3</sup>Fuente: ITU World Telecommunication / ICT Indicators Database: 2000-2009

As shown, growth of services in China and India, which face greater challenges in terms of demographics, geography and income than Mexico, are set to achieve satisfactory teledensity in the not very distant future.

In the case of Africa, growth was even more impressive, reaching an annual average of 5.332% (2002-2009). In 2002, 7% of the population had a mobile line; by 2009, almost half the population (49.2%) had access to the service. While on average across the African continent, access to mobile services remains low, the rate of growth of these services shows signs of reaching universal coverage in around four years.

The average annual growth of mobile services in Latin America, Asia and Africa means we may dub the 1990s the decade of connectivity, given the achievements in coverage of these services. This includes the huge growth potential both in terms of population reach and in terms of the number of services that can be offered through increasingly "intelligent" devices, particularly with the imminent expansion of broadband, a service still in its infancy in these countries (see Tables 9 and 10).



**Table 8. Mobile cellular services in Africa: teledensity and growth (selection of countries), 200-2009.**

País <sup>1</sup>	PIB/ per cápita <sup>2</sup>	Teledensidad 2002 <sup>3</sup>	Teledensidad 2009	Crecimiento promedio anual
<b>Promedio</b>	<b>5,332.0</b>	<b>6.8</b>	<b>49.2</b>	<b>2,780</b>
Botswana	13,200	18.8	96.1	92.9
Tunisia	9,200	6.0	95.4	1,015
Algeria	7,100	1.4	93.8	4,745
Gabon	14,000	21.7	93.1	131
South Africa	10,400	29.7	92.7	57
Mauritius	13,500	21.5	84.4	63
Morocco	4,700	21.0	79.1	123
Mexico	13,400	25.4	76.2	62
Egypt	6,000	6.2	66.7	496.3
Mauritania	2,000	9.0	66.3	1,770
Ghana	2,500	1.9	63.4	1,440
Burundi	300	0.8	10.1	630
Somalia	600	1.3	7.0	88
Ethiopia	900	0.1	4.9	2,840
Mayotte	4,900	12.8		69

Ordering is based on the observed teledensity in 2009. Source <sup>2</sup>: CIA; The World Factbook. GDP per capita (PPP), 2009. <sup>3</sup>Fuente: ITU World Telecommunication / ICT Indicators Database: 2000-2009

Within this context, a central question is raised in the case of Mexico, which will be the focus for our study, with respect to which factors have influenced the relatively slower growth of services, in this case mobile services, but also of landlines, Internet and in general services offering broadband access.

What factors have led to Mexico being left behind compared to the levels of connectivity seen in other developing countries and to the truly exponential growth witnessed in some?

How can such gaps in connectivity and in the relatively slow growth in coverage of services in Mexico compared to other countries be explained, given that in many cases these latter countries are ones with a lower level of economic development and lower income per capita?

In order to investigate the factors that have led to the shortfall in coverage of telecommunications services, the next section provides a brief analysis of policies aimed at providing for the poorest regions of the country, that is, policies directed towards universal service or social coverage (1990-2010).

### III. Public policies on universal service provision

This section discusses the scope of public policies on universal service provision designed by Mexican authorities to achieve the goal of universal access, namely: Monitoring by the regulatory authorities of compliance on the part of the incumbent telecommunications operator, Teléfonos de México (Telmex), in fulfilling its social obligations as the dominant operator, following the company's privatisation in 1990; and government policy aimed at providing connectivity—basic telephony services—to rural communities.

These policies were mainly deployed by private operators, generally the incumbent operators. Which operators had a stake was based on public tender processes organised by the government,

which has resulted in further lucrative business for the incumbent operators but with limited achievements in terms of access to these services by the poor.

**1. Telmex License: Universal Service Obligations and Network Growth**

Although Telmex’s license included clauses governing universal service obligations, rural telephony and public telephone booths, as well as network expansion, Telmex’s commitment to these clauses ended in 1994 and the results fell very much short of the objective of providing a basic universal telecommunications service to rural areas.<sup>xvii</sup>

The following paragraphs give a summary of the main clauses relating to Telmex’s universal service and network growth obligations. We also include an empirical analysis showing the outcomes of the implementation of these policies, reflecting the achievements of network growth, rural telephony and public telephone services or telephone booths (1990-1998).

**1.1. Expansion of the number of basic telephone lines by a minimum of 12% per annum**

The 12% telephone line expansion requirement, as mentioned, ended only four years after the 1994 privatisation of the sector. From 1991 to 1994, Telmex’s average annual line expansion was 11.8%, and thus close to meeting the 12% requirement. However, once such an expansion requirement ceased to exist, average line expansion fell to only 6.8% in the period 1994-2000 (see Table 9).

**Table 9. Five Year Average Growth in Telephone Lines and GDP (1965-2000).**

Period	Telephone lines	GDP
65-70	12.8%	6.9%
70-75	12.9%	6.5%
75-80	10.5%	6.7%
80-85	6.4%	1.9%
85-90	7.6%	1.7%
90-94	11.8%	3.6%
94-00	6.8%	3.5%

Source: SCT; “Anuarios Estadísticos” (1965-2000).

**1.2. Rural telephony: Basic telephone service to communities with more than 500 inhabitants (1990-1998).**

As a result of the negotiations between government policy makers in the field of telecommunications and the group of investors, Telmex’s licence freed them from their obligation to serve communities with fewer than 500 inhabitants, which according to the Census of 1990 represented 21.16 million people or 47.2% of inhabitants in rural communities in Mexico (INEGI: Census, 1990).

An analysis of the impact of Telmex’s rural telephony operations indicates very limited results. The impact on telephone density, following Telmex’s compliance with requirements for basic telephone service provision in rural towns, was extremely low, even when telephone density was estimated as the number of lines per thousand inhabitants. This estimate shows that the country’s average telephone density was 1.35 lines per 1,000 inhabitants in rural communities (500 to 2,499 inhabitants), and if the definition of rural communities included “enlarged rural communities” (from 500 to 4,999 inhabitants), the telephone density estimate drops to half the previous figure, or 0.65 lines per thousand inhabitants. Based on this analysis it is possible to assert that fulfilment of the overall

requirements, namely provision of rural telephony and the installation of public telephone booths in rural areas, had very much fallen behind the goals set by Telmex's licence which presents the telephone density, according to our definition, in the five more prosperous states and in the five poorest states in Mexico (see Table 10).

Thus, in spite of the fact that public telephone booths were the strategy most used by Telmex to fulfil its universal or social obligations, compliance with the commitment of providing public access through public telephone booths was insufficient. At the end of 1998, Telmex admitted that it had only installed 3.19 public booths per 1,000 inhabitants.

**Table 10. Telephone Service to Communities with More than 500 Inhabitants.**

State	Lines per 1,000 inhabitants towns 500-2,499	Lines per 1,000 inhabitants towns 500-4,999	Rural communities communicated by Telmex, 1990-1994	Total Population Towns 500 to 2,499	Total Population Towns 500 to 4,999	GDP per capita
<b>National Average</b>	<b>1.35</b>	<b>0.65</b>	<b>16,738</b>	<b>13,339,307</b>	<b>27,937,529</b>	<b>83.2</b>
Chiapas	1.00	0.44	950	951,521	2,136,825	37.8
Oaxaca	1.24	0.65	1,362	1,095,547	2,102,278	39.8
Tabasco	1.31	0.78	678	517,227	863,855	47.6
Guerrero	1.27	0.63	932	732,388	1,470,855	47.8
Tlaxcala	0.77	0.37	109	141,396	294,861	47.9
Campeche	1.43	0.70	135	94,653	193,781	121.7
Quintana Roo	1.54	0.74	122	79,123	164,691	126.4
Coahuila	1.65	0.70	238	144,448	337,934	129.8
Nuevo León	3.30	0.79	232	70,211	293,812	173.5
Distrito Federal	0.00	0.00	0	13,268	26,550	188.0

1/ Source: Our estimation based on SCT, Annual Reports, several years. 2 / Source: INEGI, Census 1990.

Unfortunately, according to the definition of Universal Service set out in Telmex's licence and because of the government's lack of leverage at the time of privatisation, the universal service obligation ceased and areas that were served with at least one public booth increased slightly in 1995 and 1996 and ceased to grow indefinitely from 1997 (Table 11).

**Table 11. Service provision by Telmex  
Communities with a population of 500 or more inhabitants.**

Cumulative	Annual	%
4,350	2,854	190.8
16,542	4,006	32.0
<b>Annual average growth: 1990-1994</b>		<b>93.4253</b>
16,735	193	1.2
16,738	0	0.0
16,738	0	0.0
16,738	0	0.0
<b>Annual average growth: 1994-2007</b>		<b>0.0014</b>

Sources: SCT, Annual Reports (2000 and 2007).

According to Telmex's license, the commitment to provide a basic service under the overarching aim of universal access through public booths in Mexico is far outweighed by the challenge of providing services to the poorest communities of Mexico. This is true more particularly in the context of a huge shortage of telecommunications services in the country as a whole: on average, there is provision to only five households out of every ten (48.1%) and 18.5 non residential lines per thousand employed personnel (see Table 3).

## 2. Rural telecommunications services for communities of fewer than 500 inhabitants: direct government subsidy

This section analyses the policy directly implemented by the Ministry of Communications, aimed at providing telecommunications services to rural communities of between 100 and 499 inhabitants. These programmes originally focused on small towns and villages with fewer than 500 inhabitants (1990- 2002) but later on, with the establishment of the Social Coverage Fund (FONCOS), the focus of these programmes shifted to communities of between 400 and 2,500 inhabitants.

The programme was directly financed by the Ministry of Communication (1995-2006) and targeted communities with fewer than 500 inhabitants

The subsidy focussed on the neediest rural communities, generally located in remote and isolated areas (see Table 14). Nevertheless, telephone density in these small towns remained extremely low, as was the case of services provided by Telmex in larger communities, where the estimated telephone density is 0.45 lines per 100 inhabitants when population data for these communities is taken from the 2000 Census and 0.44 with population data taken from 2005 (Count of Population and Housing, 2005, see Table 12).

**Table 12. Rural Telephony, Lines Installed by Secretary of Communications, Towns between 100 and 499 Inhabitants, 1995-2007.**

	Communities	Lines 2007	Teledensity /100, 2000	Teledensity /100, 2005	GDP per capita
<b>Total</b>	<b>184,748</b>	<b>34,676</b>	<b>0.45</b>	<b>0.44</b>	<b>70.88</b>
Chiapas	19,237	3,560	0.48	0.42	28.6
Oaxaca	10,025	2,540	0.41	0.37	32.5
Tlaxcala	1,138	117	0.41	0.41	37.3
Michoacán	8,965	1,861	0.45	0.45	39.9
Chihuahua	12,095	896	0.43	0.53	102.9
Quintana Roo	1,800	177	0.46	0.44	107.5
Campeche	2,595	240	0.49	0.35	121.7
Baja California	3,918	248	0.56	0.56	93.0
Campeche	2,595	240	0.49	0.35	121.7
Nuevo León	5,169	561	0.50	0.57	133.1

Source: Our estimations based on INEGI, Censo de Población y Vivienda, 2000; Conteo Población y Vivienda, 2005; Ministry of Communications, *Annual Report* (2000-2007) and Bank of Economic Information (BIE), 2007.

The information provided by the Ministry of Communications (Office of Rural Telephony) showed that 33,242 lines were installed between 1995 and 2006. An analysis of this information also showed a very rapid growth in the number of installed lines between 1995 and 2000 (135.42 per cent yearly average growth) and that the pace of growth declined considerably over the following years, where the yearly average growth observed between 2001 and 2010 was only 1.28 per cent. There was no evidence of growth between 2006 and 2009.<sup>xviii</sup>

The results of the former analysis are even more dramatic considering the outcome of the fieldwork aimed at verifying the operational state of equipment towards the end of 2009. Here the data showed that only 41.5 per cent of the installed lines were in operation and out of these, 58.5 per cent of the lines were out of service and abandoned.<sup>xix</sup>

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growth) and that the pace of growth declined considerably over the following years, with the yearly average growth observed between 2001 and 2010 being only 1.28%. There was no evidence of growth between 2006 and 2009.<sup>xx</sup>

1995		4,000
1996		9,369
1997		10,545
1998		20,208
1999		23,063
2000		31,083
<b>Average Annual Growth 1995-2000</b>	<b>135.42</b>	
2001		31,083
2002		31,453
2003		31,820
2004		32,326
2005		32,841
2006		33,240
2007		33,242
2008		34,658
2009		34,658
2010		34,658
<b>Average Annual Growth 2001-2010</b>	<b>1.28</b>	

Sources: Ministry of Communications, “Rural Telephony” in SCT (2000-2009). Ministry of Communications, “Rural Telephony” in SCT (2010) “Main Statistics on the Communications and Transport Sector.”<sup>xxi</sup>

The former observations raise doubts over the commitment made by the government to bridging the connectivity gap in the smallest and poorest communities of Mexico. It also raises questions over the nature of the agreements signed by the Ministry of Communications and operators undertaking the installation of the telephone lines, specifically operation and maintenance in accordance with acceptable quality standards. The personnel interviewed agreed that the contracts included maintenance and quality clauses, which poses additional questions on the strength of the Ministry as a regulator capable of enforcing these clauses.

### 3. Social Coverage Fund (FONCOS)

In 2002 the Social Coverage Fund (FONCOS) was established as a trust fund with an allocation of 75 million US dollars [xxii] provided by the Ministry of Finance to the Ministry of Communications. Its main purpose was for the funding of social telecommunications services, focussed on serving communities of between 400 to 2,500 inhabitants.

The Ministry of Communications designed two different public tender processes: STB-1 and STB-2.<sup>xxiii</sup> For STB-1, the subsidy for the chosen operator consisted of both financial and bandwidth resources for 10 years (renewable), which were reserved by the government for social coverage purposes. The subsidy to the end user included all expenses relating to the installation and rental of the equipment, so that the end user had only to pay for call traffic, charged for via pre-pay cards.

For STB-2, the subsidy to the successful bidder consisted of bandwidth resources only. The end user was charged for installation costs and call traffic, exonerating them from payment for the rented equipment. In this case, the subsidy for the chosen company consisted only of the licence to operate bandwidth resources for 10 years (also renewable). In the second round of the tender process, Telmex was the only bidder. In both public tenders Telmex, the incumbent operator, was chosen.

There were two changes to the terms of the contract signed between Telmex and the Ministry of Communications. The first was related to the inability to serve 737 communities due to the fact that these towns lacked an electricity infrastructure or due to difficulties imposed by weather contingencies.

The second change to the original contract consisted of exchanging bandwidth resources reserved by the government for social coverage purposes for bandwidth with high commercial value for Telmex. This change had severe implications for both the implementation of the universal service process and in terms of the dominant control of infrastructure on the part of the incumbent operator. This latter implication had negative consequences due to the lack of competition in the telecommunications services markets, thus affecting society and the economy as a whole.

In November 2006, a few weeks before the end of the presidential and ministerial administration of 2000-2006, an exchange of frequency bands took place: its 21 MHz allocation in the 1.5 GHz band, which was originally allocated by the Ministry of Communications to Telmex as part of the Social Coverage Fund, was exchanged for 10 MHz in the 450 MHz band. The Ministry of Communications did not exercise its power to monitor the use of these frequency bands.

The exchange of frequency bands turned out to be commercially advantageous for Telmex, since the 450 MHz band was the most appropriate for the provision of wireless services with technology known as CDMA450. Among the advantages of the use of frequency resources with this technology are:

- The ability to digitalize and interleave calls, allowing a large number of simultaneous calls without interference.
- An additional advantage consisting of having greater coverage per cell, thus requiring a smaller number of cells, resulting in a more cost-effective technology.
- This frequency band also makes use of CDMA2000 1X and CDMA2000 1xEV-DO technologies, which allow for high speed data transmission, equivalent to the Digital Service Line or DSL.

The exchange of bandwidth resources dedicated to social telephony for resources with ten years of high commercial value was carried out by the Ministry of Communications and allowed Telmex access to and use of these resources without going through an open public tender. This raised questions over Telmex's interest in participating in the Social Coverage tender process.

Former representatives of the Office of Rural Telephony argued that Telmex's true interest was to acquire the use of those frequency bandwidth resources with a potentially high financial return, thus evading the higher transactional and monetary costs involved in taking part in an open public tender, which has been the allocation mechanism for radio bandwidth resources for commercial use established by the government in accordance with the Federal Law on Telecommunications (1995).[xxiv]

The previous analysis leads us to consider the role of the government authorities in organising tender processes and allocating public finance and bandwidth resources for social coverage. In this case, the Ministry of Communications played a different role by granting valuable infrastructure resources to be used commercially, at a very low cost for the incumbent operator.

Additionally, and based on fieldwork and remote monitoring performed by the Office of Rural Telephony, the audit of services offered by Telmex under the Social Coverage Fund (FONCOS) showed that, out of the programme objective of 109,016 telephone lines (75,797 lines under the STB1 program and 33,219 under the STB2 program), only 88,791 were actually installed, which implies that 20,225 lines were never installed.

There was a brief period, after 2006, when the new administration of the Ministry of Communications audited the services delivered by Telmex, under the Social Coverage Fund. The Ministry Office of Rural Telephony identified numerous irregularities, for example the installation of two land line connections in the same household, which proved less costly for Telmex (19,397 lines). A similar discovery was made of lines that were not connected to any specific household, which prevented verification that they were operational (6,983 lines). In contrast, before 2006, the Ministry of Communications had punctually paid Telmex, based on the invoices that the company presented. For a brief period of time the Ministry of Communications initiated a process to impose sanctions on Telmex and to suspend payments to the company. However, this process never got beyond the walls of the Ministry because different groups within the Ministry restricted the sanctioning process. Furthermore, the group that initiated this process no longer serves in the Ministry of Communications.

Here again, the analysis reveals the role of the regulator, firstly in the tender process, and specifically, in the process of allocating bandwidth resources with a high potential return for Telmex. Furthermore, the regulator did not supervise the use of these resources, which were specifically allocated for social communications coverage.

This finding suggests regulatory capture and corruption on the part of the regulator (Bohem, 2005), xxv taken to a serious extreme since the regulator did not exercise its power in preventing the re-allocation of resources originally targeted at the country's poorest. This failure to act in turn strengthened the market power of Telmex.

Secondly, the regulator did not impose sanctions on Telmex for its breach of the agreement on social coverage. The role of the regulator was eclipsed, most probably by numerous instances of lobbying, resulting in a failure to consider the wellbeing and social inclusion of the poorest sector of the population.

So far the limited success of the different public policies aimed at providing universal service has been presented as being due firstly to the limited extent to which clauses set out in Telmex's licence were invoked and secondly to the violation of various agreements, including the FONCOS contract with Telmex.

There are then at least three main findings that can be drawn from the previous analysis: firstly, that the provision of universal service or universal access has been extremely limited in addressing the market gaps in Mexico's rural areas, and telephone density in the different services continues to be very low. Twenty one years after privatisation of the public telephone company, connectivity and telephone density remain a major challenge for public policy in Mexico.

The second major finding is the continual breaching by Telmex of its universal access or service commitments, not only as was originally stated as part of its licence, but later as the result of a contract that was signed with the Ministry of Communications making it the main supplier of these services. Finally, the third finding is the limited leverage of the telecommunications authorities and their difficulty in enforcing contracts and agreements, as well as in imposing sanctions.

There is an extremely low density telecommunications infrastructure in rural areas, with the exception of the mobile infrastructure present in some of these areas. This has led end users to rely increasingly on mobile services, which are more costly than regular services.

**IV. Access charges as a recent successful regulation: Strengthen the regulator? Or A dispute between two major networks in the age of digital convergence?**

Pro-competition measures have been successful in improving density and indeed the distribution of telecommunications services in several developing countries. Such measures include the requirement by the regulator to provide interconnection on a non-discriminatory basis, in compliance with high quality standards, and to base charges on long-term incremental cost, particularly for those networks with market power.

Various shortcomings highlighted show the difficulties faced by regulators in enforcing compliance with interconnection regulations and other pro-competition measures.

The last fifteen years have witnessed controversies between new telecommunications service providers and Telmex-Telcel, the incumbent operators. The resolutions issued by the regulator in favour of new entrants have been successfully appealed against by Telmex-Telcel. The appeal rulings have also been applied against other pro-competitive resolutions, such as a new definition of Local Service Area, which would have significantly reduced the cost of long distance calls, mainly in rural areas, and the Rules on Interconnection issued by Cofetel, establishing guidelines on access charges or interconnection tariffs, in case of a disagreement between two licensed operators, establishing that access charges should be based on the average total incremental cost over the long term.<sup>xxvi</sup>

Recently, in March, 2011, however, Telmex-Telcel’s power has been challenged by a controversy over interconnection tariffs initiated by a group of 20 telecommunications and broadcasting companies. The group is led by Televisa, the largest Mexican broadcaster with a prime time audience share of over 70% and a close government ally since its inception in 1951. This alliance has suited the government extremely well, since Televisa exercises powerful control over the media. Televisa is shaping up to be a major player in the quadruple play market.

The controversy over interconnection tariffs was referred to the Supreme Court. In early May. The Court ruled against Telcel, allowing the implementation of the regulator’s resolution on interconnection tariffs, based on the cost model proposed by COFETEL, notwithstanding the appeal filed by Telcel.

**Table 14. Interconnection charges, 2001-2011**

2001 – 2002	0.1250 USD
2002 – 2006	0.0975 USD
2007 – 2010	0.0800 USD
2011-	0.0320 USD
Change 2001-2011	-74%

Source: Cofetel

This recent turn of events has shifted the balance of forces, transforming the previous situation of “extreme regulatory capture” on the part of Telmex-Telcel into one in which various operators compete for an influencing role in the regulator’s decisions.

In reflecting on these recent developments, we will see in the future how this increased competition may lead to better coverage, notably in regions currently lacking coverage altogether, along with a higher standard of service.

Since markets for both services, telecommunications and broadcasting, will remain highly merged (triple or quadruple play), the regulator must strengthen its position: while there will be more players in the digital service market, two of them will retain market power dominance: Telmex-Telcel and Televisa. There will thus be a greater risk of collusive behaviour between them, to the detriment of the coverage, quality of service and tariffs offered to end users.



## VII. Conclusions

After 21 years of Mexico's privatisation of the telecommunications services to the incumbent operator, Telmex (Teléfonos de México), the overarching aim of universal service is far from being fulfilled. Thus on average, only five out of every 10 households have access to a basic telephone service and in some states such as Chiapas and Oaxaca, only two out of ten households have access to a telephone line, and four out of ten people have access to a mobile service. In the poorest states, accounting for 14.5% of Mexico's population and 30.3% of the rural population of the country, four out of ten people have access to either a land line in their home or to a mobile line.

The collected data has demonstrated that in contrast to what has been the goal of the universal service policy in Mexico, namely social inclusion and overcoming poverty, the telecommunications policies have become a regressive tax for Mexico's poorest.

These shortcomings show that universal access to telecommunications services in Mexico is a representative case of "regulatory capture" (Auriol, 2010, 2008, 2005; Bohem, 2005; Guerrero, et. al., 2009; Haber, 2009; Stigler. George, 1971), where the regulators and government authorities have been "captured" by the incumbent operator and have subordinated their regulatory power to monopoly-based profit-seeking behaviour.<sup>xxvii</sup>

"Regulatory capture, rent seeking, special privileges (de facto, if not de jure), and discretionary applications of the law are a way of operating that benefits a few powerful business and trade union interests. In this context, [the institutions] shuffles and balances the interests of those in business and labor who are able to exercise voice and power as often as needed to maintain and reproduce their hold on power, while the population at large is able only to exercise its vote when scheduled in formal elections. This arrangement is far removed from a world of well-defined property rights, systemic rule of law, and transparency and accountability, which is where sound money and free trade translate into equity and growth" (Levy and Walton, 2009, 14).

There is a list of different regulations that have already been implemented by both developed and developing countries, created before the policies described above for efficient universal access and service. These policies have achieved greater density and better distribution of services and some of the following regulations could thus now be applied with greater chances of success:

- An obligation to provide interconnection on a non-discriminatory basis, according to high quality standards, and to establish charge estimates on the basis of long-term incremental cost. This applies particularly to those networks with market power: Telmex and Telcel.
- Unbundling the local loop, thus allowing non-discriminatory access to sections of the incumbent operator's network infrastructure.
- "Open access" policies – unbundling of the "last mile", capacity lease, sale of services, co-location and/or functional separation (del Villar, 2009b: 17).<sup>xxviii</sup> To guarantee a free flow of information on network capabilities, specifically on the points of presence and network architecture. This also applies particularly to Telmex and Telcel. This will contribute to creating incentives for new investment and the participation of new players, increasing coverage in regions previously lacking provision.
- Provision of services across networks on a non-discriminatory basis, to high quality standards. It is known that international networks get better roaming services from Mexican networks than the cross-network services that national networks get between one another. This has been a barrier to entry for new players that has prevented investment and coverage in regions lacking coverage. It is worth reiterating that Telcel is the operator holding control of 78% of lines and operating the largest mobile infrastructure.

- To allow mobile virtual network operators (MVNOs), which enable new players in the market to provide mobile phone services without necessarily having their own licensed bandwidth allocation, nor necessarily requiring them to have the entire infrastructure needed to provide mobile telephone services.
- Re-defining the domain of local services, whose definition currently incurs an artificial increase in prices for so-called long distance calls. Without a technical basis for such a definition, this particularly affects those rural areas whose traffic is mainly long-distance based.
- Enforcing the declaration of Telmex as an operator with (monopolistic) market power and imposing upon it special requirements regarding quality, prices and information, so as to level the playing field by allowing other operators to enter the market and promote healthy competition.
- Closely monitoring Telmex and Telcel, in order to guarantee the proper delivery of telecommunications services to the poorer areas of Mexico.

To ensure accountability and transparency in all legal processes relating to telecommunications services, regulation and competition. This not only provides legal certainty, but is a potential antidote for regulatory capture and corruption.

<sup>i</sup> Maddens, Sofie (2005) *Trends in Universal Access and Service Policies: Changing Policies to Accommodate Competition and Convergence*.

<sup>ii</sup> Casanueva-Reguart, Cristina y Antonio, Pita (2010). "Telecommunications, Universal Service and Poverty in Mexico: a Public Policy Assessment (1990-2008)." In: *Journal of Telecommunications and Information Technology (JTIT)*, No. 2, pp. 15-27; del Villar, Rafael (2009a) *The need to Deploy a New Broadband Network in Mexico*. December 16th, mimeo. Del Villar, Rafael (2009). "Competition and Equity in Telecommunications." In Michael, Walton and Santiago, Levy (2009b) *No Growth Without Equity? Inequality, Interests, and Competition in Mexico*. Washington D.C.: Palgrave Macmillan and The World Bank, pp. 321-364. Noll, Roger (2009). "Priorities for Telecommunications Reform in Mexico." In Michael, Walton and Santiago, Levy (2009), pp. 365-388. Casanueva, Cristina and Rafael del Villar (2003) "Infrastructure Regulation Difficulties, the Basic Telecommunications Industry in Mexico, 1990-2000." In W. A. H. Thissen y P. Herder (2003) *Critical Infrastructures, State of the Art in Research and Application*. Kluwer International Series. Pp. 179-207. ISBN 1-4020-7601-0. Casanueva, Cristina (2001). "The Opening of Mexico's Telecommunications Markets." In Rafiq Dossani (editor). *Telecommunications Reform in India*. Connecticut: Greenwood, pp. 277-296. ISBN 1-56720-502-X.

<sup>iii</sup> December, 2010. For Telmex: [http://www.telmex.com/mx/corporativo/relacionInver\\_reporteFinan.html](http://www.telmex.com/mx/corporativo/relacionInver_reporteFinan.html)  
For Telcel (América Móvil in Mexico) [http://www.americamovil.com/amx/cm/reports/Q/2010\\_4.pdf](http://www.americamovil.com/amx/cm/reports/Q/2010_4.pdf)

<sup>iv</sup> (<http://www.telecompaper.com/news/article.aspx?cid=679821> Retrieved: July 7, 2009) (See: <http://www.telecompaper.com/news/article.aspx?cid=679821> Retrieved: July 7, 2009).

<sup>v</sup> The Competitive Intelligence Unit" (CIU) <http://octavioislas.wordpress.com/2009/07/23/3236-mexico-the-competitive-intelligence-unit-competencia-en-mexico-%C2%BFque-20-anos-no-es-nada-telecomunicaciones/>).

<sup>vi</sup> See <http://www.cfc.gob.mx/index.php/MICROSITIO-COMUNICACION-SOCIAL/confirma-la-cfc-dominancia-de-telcel.html>

<sup>vii</sup> El Universal (2011). "Telmex dominante en mercado de Internet". 15 June 2011. See:

<http://eldictamen.mx/ntx/noticias/1/7/finanzas/2011/06/15/37468/telmex-dominante-en-mercado-de-internet.aspx>

<sup>viii</sup> The availability of information did not allow socio-economic regions to be used as units of analysis, the information only being available on a state level.

<sup>ix</sup> Encuesta Nacional de Ocupación y Empleo ("Survey on Employment and Occupation") (INEGI, 2010).

<sup>x</sup> Cofetel's estimation for Mexico City includes those districts belonging to the neighbouring state of *Estado de México*, now merged with the suburbs of Mexico City.

<sup>xi</sup> CONEVAL (2010) estimations based on the Household Survey on Income and Expenditure. Specifically on a module on living conditions: education, health, social security, housing, food and income, this last in relation to a minimum of welfare MCS-ENIGH (Módulo de Condiciones Socioeconómicas de la Encuesta Nacional de Ingreso y Gasto de los Hogares, 2010). [http://internet.coneval.gob.mx/Informes/Interactivo/interactivo\\_entidades.swf](http://internet.coneval.gob.mx/Informes/Interactivo/interactivo_entidades.swf)

<sup>xii</sup> Almost 80% of land lines (78.4%) and 77.3% of mobile lines.

<sup>xiii</sup> Even though Mexico does not have a culture of complaints among users about lack of quality of service, according to the country's national consumer watchdog (*Procuraduría Federal del Consumidor*), Teléfonos de México and Telcel and the two of the three companies to have received the most complaints due to service failures. Miranda, Juan Carlos (2011) "Profeco: CFE, Telcel y Dish, con más quejas". *La Jornada* newspaper, telecommunications section, p. 18 July.

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<sup>xiv</sup> We mentioned 60% growth above, where reference data were for the period 2000-2010. Figures here are from UIT, for the period 2002-2009.

<sup>xv</sup> The apparent discrepancy between information reported by Cofetel (2011) and UIT (2010) is due to the latter's reference period of 2002-2009. Here, UIT data are used for the purpose of comparison with other countries.

<sup>xvi</sup> Source for GDP and GDP per capita data: CIA; *The World Factbook*, for 2009 and 2010. This source gives GDP estimates which are adjusted for Purchasing Power Parity (PPP) for the purpose of comparison between countries. GDP per capita is the (PPP-adjusted) GDP estimate divided by the total population. See:

<https://www.cia.gov/library/publications/the-world-factbook/docs/>

<sup>xvii</sup> The scope of both the content relating to universal service obligations and schedule for its implementation, as well as their impact on bringing connectivity to the neediest communities, was shaped to some extent by the context in which the privatisation of Telmex took place. This context explains the lack of leverage or bargaining power of the authorities, specifically on the subject of social coverage. In the 1980s, the Mexican economy was severely indebted; the burden of foreign debt and fiscal deficit had a major effect on the approach adopted in the privatisation of Telmex, which was placed mainly on expected revenues. The government sold to a single set of investors a package that included Telmex and Telnor, in addition to the only nationwide mobile network franchise, as mentioned above, the Federal Microwave Network, as well as an ample bandwidth allocation. Thus, overnight, the emerging company became a formidable player in the sector. It was allowed to offer all types of telecommunications services, with the exception of television broadcasting services (Casanueva and del Villar, 2009; del Villar, 2009a).

<sup>xviii</sup> Is worth mentioning that there is an inconsistency between the information accounted by the Annual Report (2007) and the Office of Rural Communication, the first source reported 34,676 installed lines, and the Office of Rural Telephony accounted for 33,242, the difference between the two sources is 1,434 installed lines.

<sup>xix</sup> In the "Annual Reports" and "Main Statistics on the Communications and Transport Sector" (2008-2010) the Ministry of Communications and Transport accounted with the same number of installed services (2008-2010) with the note that the number of lines had not changed, basically the lines were in poor conditions and were replaced.

<sup>xx</sup> Is worth mentioning that there is an inconsistency between the information accounted by the Annual Report (2007) and the Office of Rural Communication, the first source reported 34,676 installed lines, and the Office of Rural Telephony accounted for 33,242, the difference between the two sources is 1,434 installed lines.

<sup>xxi</sup> Sources: SCT (2000-2009). "Telefonía Rural" *Anuarios Estadísticos*; SCT (2010) "Telefonía Rural." Principales Estadísticas del Sector de Comunicaciones y Transporte. <http://www.sct.gob.mx/>

<sup>xxii</sup> The total sum accounted by 750 million pesos, the exchange rate between Mexican pesos and US dollars at the time was around 10 Mexican pesos per US dollar.

<sup>xxiii</sup> "Basic Telephony 1" and "Basic Telephony 2".

<sup>xxiv</sup> Federal Telecommunications Law: Article 14. The licenses for the use of radiofrequency bands for determined uses will be granted through an open public auction. The Federal Government has the right to receive the agreed monetary resources. <http://www.diputados.gob.mx/LeyesBiblio/pdf/118.pdf>

<sup>xxv</sup> Boehm, Frédéric (2005). Corrupción y captura en la regulación de los servicios públicos. *Revista de Economía Institucional*, Vol. 7, n.º 13, Segundo semestre.

<sup>xxvi</sup> Federal Telecommunications Commission (2011). Guidelines to Develop Interconnection Cost Models to Settle Disputes on Interconnection access Charges, between Licensed Public Networks Operators. Official Gazette. April 12. [http://www.cofetel.gob.mx/es/Cofetel\\_2008/Lineamientos\\_Modelos\\_de\\_Costos](http://www.cofetel.gob.mx/es/Cofetel_2008/Lineamientos_Modelos_de_Costos)

<sup>xxvii</sup> Auriol, Emmanuelle (2010). "Capture for the rich, extortion for the poor." Toulouse School of Economics, June 10, pp. 1-30 (mimeo). Auriol, E. (2008). "Capture and Corruption in Public Utilities: The Cases of Water and Electricity in Sub-Saharan Africa." Toulouse School of Economics, January. Auriol, E. (2005). "Corruption in procurement and public purchase." Toulouse School of Economics, June 10, pp. 1-32 (mimeo). Haber, Stephen 2009 "Why Banks Do Not Lend: The Mexican Financial System." In: Walton, Michael y Levy, Santiago (editors). *No Growth Without Equity? Inequality, Interests, and Competition in Mexico*, pp. 283-317. Levy, Santiago and Michael Walton (2009). "Equity, Competition, and Growth in Mexico: An Overview." In: Levy and Walton, editors (2009), pp. 1-42. Guerrero, Isabel; Luis Felipe, López-Calva and Michael, Walton (2009) "The Inequality Trap and Its Links to Low Growth in Mexico". In: Levy and Walton, editors (2009). pp. 111-156. Boehm, Frédéric (2005). "Corrupción y captura en la regulación de los servicios públicos". *Revista de Economía Institucional*, Vol. 7, No. 13, Segundo semestre. Stigler, George (1971). "The Theory of Economic Regulation." *Bell Journal of Economics and Management Science*. Vol. 2. No. 1, pp. 3-21. En: <http://www.jstor.org/stable/3003160>

<sup>xxviii</sup> del Villar, Rafael, et. al. (2009) Ibid. Del Villar have found that "open access policies are: "(i) accepted, almost universally, as they have played a central role in the diffusion of broadband first generation in most of the countries that have shown a high performance, and; (ii) central reference for the for the next generation broadband technologies planning" (2009: 17).