

Chapter 1

The telecommunication sector in Mexico

Chapter 1 describes the chief elements of a largely inefficient telecommunications industry, which features among the highest consumer prices in the OECD, little competition, and low market penetration rates at a significant cost to the economy and welfare of the Mexican population. The chapter clearly attributes this outcome to the failure of an effective policy and regulatory framework, and the behaviour of an incumbent operator with significant market power.

The statistical data for Israel are supplied by and under the responsibility of the relevant Israeli authorities. The use of such data by the OECD is without prejudice to the status of the Golan Heights, East Jerusalem and Israeli settlements in the West Bank under the terms of international law.

1.1. Introduction

This report aims to review policies and regulations in the telecommunication service sector in Mexico and put forward recommendations aimed at furthering regulatory reform and stimulating market competition and investment in the sector, as a building block for the future development of the Mexican economy. OECD countries have recognised that the communications sector, and in particular high-speed Internet access provided by fixed and wireless broadband, represents a key infrastructure for improving productivity and economic growth, and enabling governments to improve significantly the provision of public services.

Governments across the OECD have put forward broadband plans that aim to achieve national geographic coverage and improve speeds of broadband delivery (see OECD, 2010a). One important focus of these plans is making high-speed broadband available in remote areas and overcoming barriers to broadband adoption. The policy and regulatory reform in the communications sector therefore concerns the provision of high-quality telephony services at efficient prices and extension of telephony service coverage. However, it also has significantly wider economic and social implications for the growth of the Mexican economy, for industry expansion and social cohesion. The broadcasting sector, in particular with the development of digital terrestrial television, is also playing an increasingly important economic role, and the shift to digital TV is helping to liberate spectrum for use by high-speed mobile broadband services.

Audiovisual services, especially cable, free-to-air or satellite television, also play a key role in shaping the telecommunications industry, and play an increasingly important role as technological convergence develops. The broadcasting industry does not fall directly under the scope of this report, but is addressed in connection with current developments in convergence. More specifically, current trends tend to blur what used to be a clear line of separation between both industries. Telecommunication operators have entered the broadcasting sector as television services providers, and broadcasters are increasingly willing to provide telecommunications services. This situation creates challenges and opportunities for both market players and regulators.

Mexico, in particular, needs the economic boost which high-capacity Internet access can provide. It has the lowest GDP per capita among OECD countries, equivalent to 31% of the GDP per capita of the United States, and has a very uneven distribution in regional GDP per capita (see *OECD Factbook*). GDP per hour worked (labour productivity) is 2.5 times less than the OECD average and represents (with Chile) the lowest among OECD countries. While Mexico's population growth rate is above the OECD average, it has a relatively low population density (although higher than the US and the OECD average). At the same time, 36% of the population is rural in Mexico, compared to the OECD average of 26%. Mexico is also characterised by relatively high inequality in income distribution. In terms of the sectoral contribution to value added, services represent 61%, industry 36% and agriculture just above 3%.

OECD's Economic Survey of Mexico (2011) highlighted implementation of structural reforms, including in network industries, as a key requirement for long-term growth, raising productivity and improving the pace of convergence towards average OECD living standards (OECD, 2011a). Relative to other OECD countries, the telecommunication sector in Mexico is characterised by a high level of concentration, weak competition, a relatively poor level of infrastructure development, high prices and

low take-up of services. Policy changes and regulatory reform can play a large part in improving these benchmarks.

Since the late 1990s, when competition was initially introduced in the Mexican market, there have been positive developments in the telecommunication market. However, these changes are far from sufficient when compared to developments in other OECD countries.

1.2. The national context for telecommunications policies

Inefficient telecommunication markets impose a significant cost on the Mexican economy and the welfare of its population. The Mexican telecommunication sector is characterised by high prices, which result in low penetration rates. Prices, as shown in Section 1.4, are among the highest in the OECD. Penetration of both fixed and mobile telecommunication services is among the lowest in the OECD (see Section 1.4). Broadband development and penetration has long been among the weakest in the OECD. At present, Mexico has the third lowest broadband penetration in the OECD.

The poor development of telecommunication infrastructure in Mexico is due to a large part to lack of effective competition, and the resulting high level of market concentration. In turn, this has implications for consumers, leading to lower levels of consumption as a result of high prices across the range of telecommunication services. This has resulted in a significant welfare loss for users in Mexico. This welfare loss is incurred by existing users who are overcharged in their use of telecommunication services, and from the welfare loss resulting from unrealised subscriptions to telecommunication services. Consumer welfare loss in the Mexican telecommunication sector over the period 2005-09 is estimated at USD 129.2 billion, or an average of USD PPP 25.8 billion per year. The latter amount is equivalent to 1.8% of Mexican GDP per year (or USD PPP 240 per capita per year). Given the very skewed distribution of income in Mexico the burden of this loss in consumer surplus weighs significantly on a large segment of Mexico's population. Rural populations in particular are the most impacted by this welfare loss. As socio-economic indicators clearly have an influence on telecommunications uptake, the analysis accounts for wealth (GDP per capita) and other factors, such as education, to estimate the loss in consumer welfare. Consequently, it cannot be argued that current uptake levels are due to socio-economic factors alone.

The estimated loss in consumer surplus results from two components: overcharging of existing consumers and unrealised subscriptions. Consumer overcharge constitutes 52% of the total average loss in consumer surplus for 2005-09 (USD PPP 13.4 billion); unrealised subscriptions account for 48% (USD PPP 12.4 billion). The following tables show the calculated consumer welfare loss by telecommunication service (Table 1.1) and the estimated loss in consumer welfare by service area (Table 1.2). The growing digital divide is an important economic and social issue that needs to be tackled. Annex C provides further details with respect to welfare loss.

Table 1.1. **Estimated average annual loss in consumer welfare (in USD PPP million) resulting from excessive pricing of telecommunication services in Mexico, 2005-09**

Type of telecommunication	Overcharge of existing consumers	Unrealised subscriptions	Total
Fixed telecommunication	6 510	7 039	13 549
Mobile telecommunication	7 260	2 747	10 007
Broadband	918 ¹	4 070	4 988
Total	13 386	12 449	25 835

Note: The loss in consumer surplus suffered by existing consumers because of low broadband speeds is not quantified.

Table 1.2. **Estimated average annual loss in consumer welfare (expressed as a percentage of Mexican GDP) resulting from excessive pricing of telecommunication services in Mexico, 2005-09**

Type of telecommunication	Overcharge of existing consumers	Unrealised subscriptions	Total
Fixed telecommunication	0.4%	0.5%	0.9%
Mobile telecommunication	0.5%	0.2%	0.7%
Broadband	0.1%	0.3%	0.3%
Total	0.9%	0.9%	1.8%

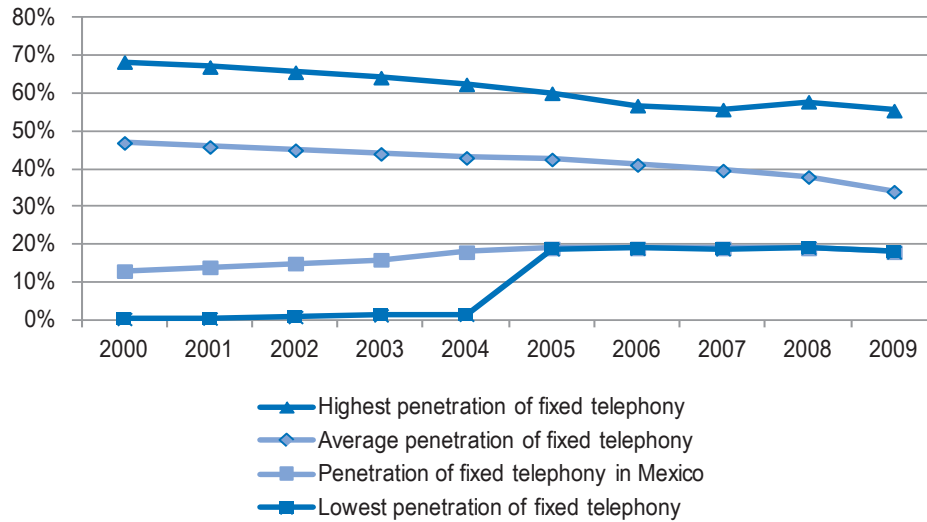
The foregoing does not imply a lack of progress in the development of Mexico's telecommunication markets. Areas of growth include: fixed lines and their take up,¹ the development of the mobile market, the entry of cable television companies into the telephony market (from 2007), and price declines. There has been improvement in institutional operation and, in recent years, a greater commitment to implementing regulatory reform. However, the data indicate that other OECD countries that opened their markets to competition at about the same time showed significantly more progress in reaping the benefits of competition and distributing those gains to consumers. In addition, progress in Mexico in terms of geographic availability of infrastructure and services has been quite uneven.

1.3. Telecommunication market participants, market performance and the regulatory regime²

The telecommunication sector in Mexico is the 11th-largest in the OECD with around USD 26.6 billion in revenue in 2009 (OECD, 2011b). Telmex, the incumbent fixed-line telecommunication operator, is the 30th-largest telephone carrier in the OECD, roughly comparable in size to OTE in Greece or Portugal Telecom. In terms of total number of fixed lines, Mexico is the eighth-largest in the OECD, but 34th in terms of fixed lines per 100 inhabitants (Figure 1.1). In the mobile sector, Mexico is the fifth-largest in total number of subscribers but, in terms of mobile subscribers per 100 inhabitants, Mexico is 33rd of the 34 OECD members (Figure 1.2). Similarly, in the broadband market Mexico

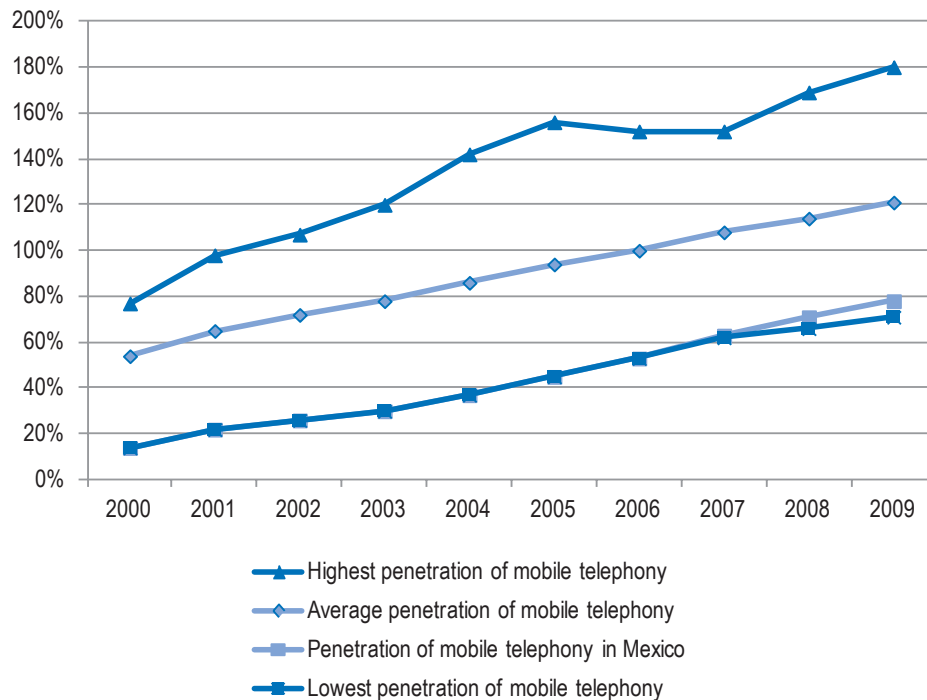
was tenth in terms of total subscriptions and 34th in terms of subscribers per 100 inhabitants by the end of 2009 (Figure 1.3). Broadband penetration has experienced faster growth in 2010. Mexico was ranked 32nd (10.45) in December 2010, with a slightly higher penetration than Chile (10.40) and Turkey (9.77). By the end of 2004 it was 0.98 (OECD average 9.71).

Figure 1.1. Fixed access paths per capita: Mexico compared to the other OECD countries

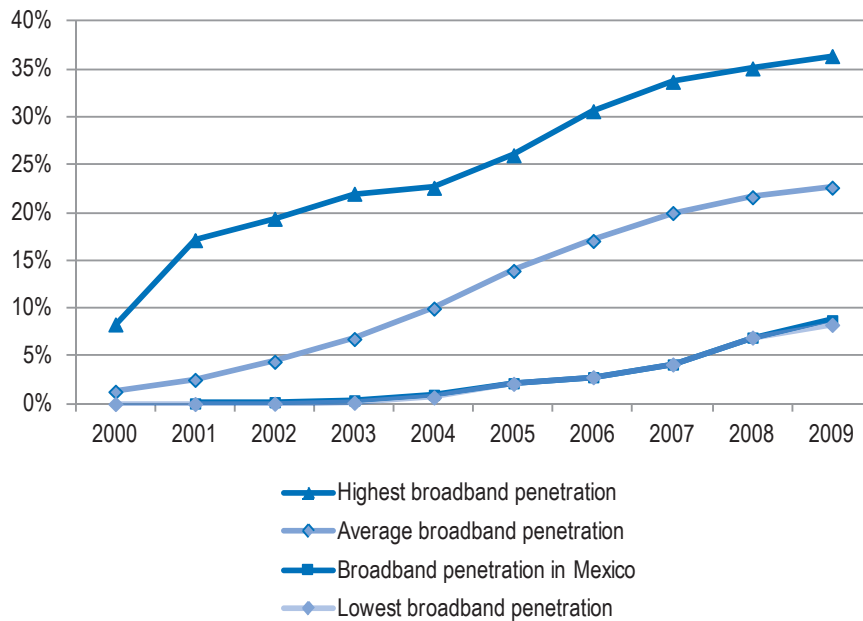


Source: OECD (2011b).

Figure 1.2. Mobile subscriptions per capita: Mexico compared to the other OECD countries



Source: OECD (2011b).

Figure 1.3. **Broadband subscriptions per capita: Mexico compared to the other OECD countries**

Source: OECD (2011b).

Telecommunication market participants and markets

Market participants

Market concentration is extremely high with Telmex, the incumbent fixed-line operator, having 80% share of the fixed market (in terms of subscriber lines), and Telcel, the incumbent's mobile affiliate, accounting for 70% of mobile subscribers. Telefónica of Spain and Nextel (owned by NII Holdings in the United States) are the only foreign operators directly involved in the Mexican market.

Fixed lines

The fixed-line market has 25 players providing local service and 62 long-distance providers. Many of these companies come under the ownership structure of the major national players. The main national operators are briefly described in the following list and Table 1.3.

Table 1.3. Key market participants in Mexico's telecommunications sector, 2011

Company name	Ownership	Market
Alestra	Onexa (100%, itself 100% owned by Grupo ALFA)	Fixed-line telephony (local, domestic long-distance, international), data, broadband
Axtel	Citigroup (10%), others (e.g. Tomás Milmo)	Fixed-line telephony (local, domestic long-distance, international), data, broadband. Acquired Avantel in 2007
Bestel	Televisa (100%)	Fixed-line telephony, corporate communications
Cablemas	Televisa (100%)	Cable, TV, broadband, telephony
Cablevision	Grupo Televisa (51%)	Cable TV, broadband, telephony
CFE Telecom	CFE (state-owned enterprise, 100%)	Leased lines, corporate communications, wholesale connectivity
Dish	MVS (100%)	DTH
GTAC (Grupo de Telecomunicaciones de Alta Capacidad)	Grupo Televisa (33.33%), Megacable (33.33%), Telefónica (33.33%)	Managing consortium of the CFE dark-fibre concession (wholesale connectivity)
GTM	Telefónica (49%), other (Mexican) investors (51%)	Long-distance services
Iusacell	Grupo Salinas (50%), Grupo Televisa (50% pending regulatory approval)	Mobile, Uefon merged in 2007 (kept as stand-alone brand)
Maxcom	Bank of America, Equity Partners (80%), Vazquez Arroyo Carstens family (16.34%), individuals and employees (3.66%)	Fixed-line telephony (local, domestic long-distance, international), data, broadband
Marcatel	Controlled through STI Telecom	Fixed-line telephony (pre-paid long distance in US)
Megacable	Teleholding S.A. (48.9%); Gupo Financiero Scotiabank (28.1%)	Cable, TV, broadband, telephony
MVS	HM Capital Partners, Familia Vargas, Bolsa Mexicana de Valores	
Nextel Mexico	NII Holdings (100%)	3G, Enhanced specialised mobile radio (ESRM)
Sky Mexico	Grupo Televisa (59%), News Corp (30%), Liberty Media (10%)	DTH
Telcel América Móvil	América Móvil (100%: América Móvil is controlled by Carlos Slim Helú and members of his immediate family, who, taken together, own a majority of the common stock of América Móvil)	Mobile
Telefónica Mexico (Movistar)	Grupo Telefónica (100%) owns a stake in GTM (see below)	Mobile
Teléfonos de Mexico (Telmex)	América Móvil (59.5%). AT&T keeps a relevant stake. América Móvil has the majority power to designate all board members. América Móvil announced a tender offer to purchase all outstanding shares of Telmex in August 2011 in order to obtain 100% ownership (pending regulatory approval)	Fixed-line telephony (local, domestic long-distance, international), data, broadband
Televisa (Since April 2011, 50% owner of Iusacell, pending regulatory approval)	Grupo Televisa (100%), owns Cablevisión (51%), Cablemás (100%), TV1 (~50%), Sky (59%)	Broadcasting programming
Total Play Telecomunicaciones S.A. de C.V.	Grupo Salinas	Broadband, fixed-line telephony, cable
TV Azteca	Azteca Holding (56%), free float (44%)	Broadcasting programming
Uninet	Telmex (100%)	ISP (largest MPLS network in Mexico)
Other local and regional cable companies	Various ownership structures	Cable TV, broadband, telephony. Local and regional coverage

Source: Company and interview data.

- **América Móvil (Telmex):** Prior to 1990, Telmex was the monopoly incumbent. In 1990, Telmex (which was nationalised in 1972) was partially privatised through sale of a controlling interest to a consortium led by a Mexican conglomerate, Group Carso, which included Southwestern Bell and France Telecom as minority foreign partners. As part of the privatisation, Telmex was granted a Concession, which expires in March 2026.³ The Concession allows Telmex to provide voice, data, text, sound and video transmission services. Notably, Telmex is not allowed to provide television services over its telephone/broadband network either directly or indirectly. Telmex was given a monopoly in the provision of long distance and international service until 1997, to allow the company time to achieve network expansion targets and “rebalance” its rate structure before new firms were allowed to compete with it. Telmex was required to expand the number of basic service lines by a minimum average annual rate of 12% during 1990-94. Telmex’s Concession also contained conditions requiring an accounting division of fixed-line local calls and long-distance (international and domestic) calls; prohibition of monopolistic practices; an obligation to reduce the waiting period for repairs and installation, improve the quality of service, and improve services in rural areas (at least one telephone service to each town with 500 inhabitants or more by 1994); automatic switching services for all communities with more than 5 000 inhabitants; and 2 public payphones for each 1 000 persons (increasing to 5 per 1 000 persons by 1998). Telmex must also provide regulators with four-year working plans and is subject to specific price regulation based on a price cap system applied on the weighted average of a basket of regulated services. After 1995, automatic switching had to be made available in all communities with at least 100 requests for it, and improvements had to be made in quality of service, particularly regarding response to reported failures. AT&T is a minor but significant shareholder in Telmex, as a result of SBC participating in the privatisation process in 1990.
- **Axtel**, the second-largest fixed-line operator, has 5% of the fixed-line market. It offers local, long distance, broadband and data services, such as virtual private lines, dedicated private lines, frame relay and web-hosting. Axtel’s business plan focused on competing with Telmex in local telephony by bypassing phone lines and using fixed wireless communications instead. In 1999, the company began operating in Monterrey, and expanded to Guadalajara and Mexico City in 2000. In December 2006, Axtel acquired Avantel, a provider of Internet protocol (IP) solutions to business, government and residential customers. Avantel brought spectrum in various frequencies to Axtel, as well as connectivity in 200 cities in Mexico. By 2007, Axtel had expanded its coverage to 20 of the most important Mexican cities.
- **Alestra** provides fixed-line telephony (local, domestic long-distance, international), corporate VPN services and broadband services. It was partly owned by AT&T up until the end of 2010.
- **Maxcom** was awarded a concession in 1997 as Mexico’s first competitive fixed-line local and long-distance provider. The initial concession covered Mexico City and 100 other cities in Mexico, and has since expanded to allow for the provision of nationwide fixed-line local telephony service. Maxcom has a mobile virtual network operator (MVNO) agreement with Telefónica.

- **Marcatel** is a fixed-line operator that provides domestic and international long distance, pre-paid cards and dedicated Internet access. It has a 2 100-kilometre fibre optic network connected by switching centres in a number of Mexican cities and crossing the United States-Mexico border. The operator has concluded an agreement with Telefónica (Movistar) to operate as an MVNO using Telefónica's network facilities.

Mobile

Competition in the Mexican mobile market began in the 1990s. This market has been the main driver of telecommunications industry growth, growing at a compound rate of 40% over the period 1996-2009, compared to 20% for the OECD on average. Mexico lagged significantly behind other OECD countries in the development of mobile in 1996, so its high growth reflects a process of catch-up starting from a low penetration rate.

Cellular minutes per mobile user (with 165 minutes per month per user in 2009 and 191 in 2010) are relatively high in Mexico. There are four operators with national coverage (plus the Unefon brand, which is owned by Iusacell). These operators own a number of regional licences (numbering 84). The main mobile operators are listed below:

- **Telcel**, originally Telmex's mobile subsidiary, was founded in 1989, and is Mexico's largest mobile phone carrier with a 70% market share. Telcel is 100% owned by América Móvil. Telcel holds concessions to operate a wireless network in all nine geographic regions in Mexico using the 850 MHz, the 1700-2100 MHz (following Tender 21) and 1900 MHz radio spectrum. Telcel officially launched its 3G (850 MHz Band) service in February 2008. América Móvil is very active in the Latin American market and constitutes the leading mobile provider in countries such as Argentina, Colombia, Ecuador and Guatemala. It also offers fixed-line services in a number of those countries.
- **Telefónica (Movistar)** is the second-largest mobile operator in Mexico after Telcel. After ten years of operation it accounts for about 22% of the market in terms of customers and about 12% in terms of revenue. Telefónica possesses the 850 MHz spectrum, but not in all Mexican regions. This has made it harder for the company to compete with Telcel. Telefónica also holds spectrum in the 1900 MHz and 1700-2100 MHz bands (following Tender 21). It migrated from code division multiple access (CDMA) to the global system for mobile communications (GSM) in 2003-05. It jointly owns a fixed-line subsidiary (GTM) with around 0.5 million fixed lines, and owns one-third of the Grupo de Telecomunicaciones de Alta Capacidad (GTAC) consortium, which won the auction to lease CFE dark fibre.
- **Iusacell** was granted a 50-year concession to provide basic telephony service for select rural and suburban areas throughout Mexico in 1957. Its franchises cover more than 70% of the population. Iusacell operates a switched data company, Iusanet, and offers private line bypass through Satellitron with microwave facilities and fibre optic capacity, which is leased from the state-owned electricity monopoly *Comision Federal de Electricidad* (CFE). In March 2007, Iusacell merged with Unefon, a wireless telephony operator focused on Mexico's mass market. The company has national coverage, and integrates the only two providers of wireless telecommunications services in the country with CDMA technology. In April 2011, Grupo Televisa, which has a 70% share of the Mexican free-to-air TV market, decided to purchase a 50% stake in Iusacell (pending regulatory approval).

- **Nextel** has attracted about 4% of the Mexican mobile market in terms of subscribers with most of its customers being post-paid business customers. This has resulted in a nearly 13% revenue-based market share. It began installing its 3G network in October 2010 after winning a spectrum bid (*BNAmericas*, 2011). In 2010, Televisa received regulatory approval to acquire a stake in Nextel and quadruple play appeared imminent. However, the Televisa-Nextel merger did not take place. Nextel is expected to proceed with its plans to provide 3G services in between 20 and 25 markets in Mexico by 2012. It is migrating its integrated digital enhanced network (iDEN) technology to 3G, and provides a distinctive push-to-talk (PTT) service. It obtains its numbering resources from its subsidiary Opcom.

Pay-TV (cable and direct-to-home)

There are 5.5 million cable television (CATV) subscribers in Mexico and approximately 46% of homes served by cable. Cable companies include Cablemas, Cablevision, Maxcom and Megacable. Televisa and Megacable have CATV market shares of 45% and 28%, respectively. Thus far, the participation of cable firms in the provision of telephony services is low at only 5.5% of total subscribers (June 2011). Competition in the provision of broadband services is greater, with 31% provided by cable companies. The strategies of cable companies mainly rely on bundling cable television services with telephony and/or broadband. Cable TV competes directly with the direct-to-home (DTH) pay-TV providers analysed below. Cable companies have also put pressure on the incumbent in the fixed telephony market.

The cable television market has undergone considerable consolidation changes in recent years. Grupo Televisa acquired Cablemas, Cablevision and TVI, among others. The consolidation wave has not merged operators in the same geographic area, with a few exceptions. The main cable companies are as follows:

- **Megacable** is the largest cable operator in Mexico, offering service in 48 major cities. In 2007, Megacable acquired a 50% stake in rival operator, Multioperadora de Sistemas, and in 2010 it acquired Omnicable.
- **Cablemas** is the second-largest cable television operator in Mexico, and has the broadest coverage, operating in 85 cities and providing telecommunication service nationally. It is now fully owned by Grupo Televisa, which has a dominant share in the broadcasting market. The company was the first cable operator in Mexico to offer a triple-play service, including cable television, high-speed Internet and IP telephony. Following the takeover by Grupo Televisa, some must-offer obligations were imposed by Cofeco in 2008 (see below).
- **Cablevision** is a cable operator founded in 1966. It provides cable television, fixed telephony and broadband services, as well as leased lines. It is owned by Grupo Televisa (51%) and covers 2.2 million households in the Mexico City area, where it is the largest cable operator.
- **Maxcom** is a facilities-based telecommunication provider that launched operations in May 1999, and is currently offering local, long-distance, data, CATV and IP-based services. In March 2006, Maxcom acquired Grupo Telereunion, which enabled it to expand its network. In September 2007, with the agreement of Cofetel, Maxcom moved into the mobile market via a reseller agreement (MVNO with Telefónica).

In connection with the pay-TV market, pay-television services provided over DTH platforms should be mentioned here, as they are in direct competition with cable-based pay-TV services (as of June 2011, DTH accounts for 47% of pay-TV subscribers). This market was historically dominated by Sky (Televisa), although this dominance has recently been shaken by the entry of Dish. Following an alliance with Telmex to retail Dish services, this low-cost DTH pay-TV provider has managed to acquire 2 million customers in only two years, representing nearly 40% of the DTH pay-TV market. As shown in Table 1.4, Grupo Televisa is by far the largest player in the pay-TV market as a whole (through its cable subsidiaries and Sky), providing domestic programming, an important input for pay-TV services.

Broadband

Broadband is the other principal driver of growth in Mexico's telecommunications market. Both cable modem and ADSL have continued to enjoy strong subscriber growth of 46% in 2007-09, stimulated largely by allowing the cable companies to enter the broadband market and compete with Telmex. There is significant scope for growth given Mexico's broadband penetration at 10 per 100 inhabitants, equivalent to 40% of the OECD average. Telmex (and other providers) only sell broadband bundled with a fixed line (despite the regulator's attempts to force unbundling of these services).

1.4. Development of competition

Competition has been slow to develop in Mexico. In the past, regulatory decisions encouraging competition have not been taken when necessary, and have been delayed and frustrated by regulatory capture and the legal system, including the use or abuse of *amparos* (legal injunctions). However, although much remains to be done, over the last few years there have been clearer and more forceful initiatives to improve the competitive situation in the telecommunication market.

Each market segment (fixed-line, mobile telephony, broadcast television, pay-TV and broadband) is dominated by a single firm with a significant difference in market share separating it from its closest competitor (Table 1.4).

Fixed-line market

The incumbent, Telmex, has a fixed-line market share of 80% (Table 1.4). A number of incumbents in several OECD countries have similar market shares, but this does not imply that the level of competition in those markets is similar to that in Mexico. Competition in many OECD countries has developed by providing new entrants the ability to access the incumbent's network, with due attention given to promoting infrastructure competition. Such competition has partly developed through service competition, using pre-selection and carrier selection for telephony, and through bitstream access, line sharing and full local loop unbundling. In some cases, unbundled lines may still compute as part of the incumbent's market share. To put this into perspective, the average incumbent's market share in fixed-line telephony in the European Union is 65% in terms of revenues, and 59% in terms of volume, far lower than that of Telmex.

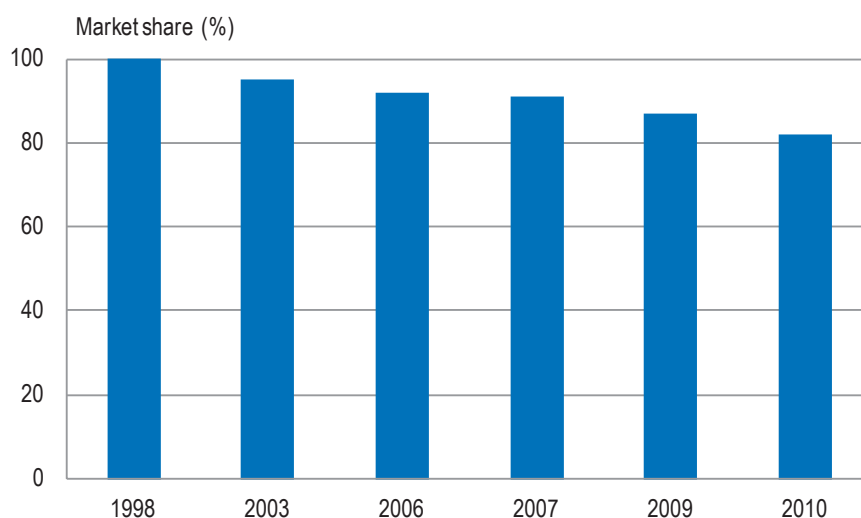
Table 1.4. Market share in Mexico's telecommunication market, May 2011

Operator	Fixed line	Mobile	Pay TV	Internet (fixed)	% total market share revenue
América Móvil (Telmex & Telcel)					
<i>Market share</i>	79.6%	70%		74%	66%
<i>Revenue share</i>	79.9%	69.2%		66%	
Telefónica					
<i>Market share</i>	2.4%	21.8%			7.1%
<i>Revenue share</i>	1.9%	12.3%			
Televisa					
<i>Market share</i>	2.1%		48.9%	6%	5.7%
<i>Revenue share</i>	1.4%				
Nextel					
<i>Market share</i>		3.8%			7.2%
<i>Revenue share</i>		13.5%			
Iusacell					
<i>Market share</i>		4.4%			2.7%
<i>Revenue share</i>		5.0%			
DISH			16.6%		
Others					
<i>Market share</i>	15.9%		33.6%	20.0%	11.3%
<i>Revenue share</i>	16.8%			28.0%	
Total	19.6 million lines	91.3 million subscribers	10.2 million subscribers	11.4 million subscribers	USD 27 billion

Source: Estimates based on submissions made to the OECD and company reports.

Broadband development has also led many Internet service providers (ISPs) in OECD countries to offer voice over Internet Protocol (VoIP) services, increasing competition in voice markets. Other means of access have not been implemented in Mexico, other than pre-selection for long distance and international service. From 1996 to 2009, growth in the number of fixed lines in Mexico averaged 6.2% per year. This is higher than the OECD average where fixed-line growth over the same period was negative, reflecting reduction in demand for fixed lines in 21 of the 34 OECD countries. Although there has been a decline in market share for Telmex, this decline has been very slow (Figure 1.4). The growth in fixed lines has also begun to decline steadily in Mexico from 13% in 2000 to zero growth from 2009, as has occurred in other OECD countries.

Despite earlier growth, penetration of fixed lines remains very low in Mexico. Fixed-line penetration has increased from 6 lines per 100 inhabitants in 1990 to 17.4 in 2010. This is well behind the OECD average of 37 per 100 inhabitants. Moreover, penetration is very uneven. The Federal District, the state with the greatest number of lines per capita, has a teledensity of 46.3 fixed lines per 100 inhabitants, while Chiapas and Oaxaca, the country's poorest states, have 5.4 and 7.2 fixed lines per 100 inhabitants respectively.

Figure 1.4. **Telmex's market share in fixed line telephony, 1998-2010**

Source: IMCO 2011.

Data on market share of long distance are not available, but long distance is providing a much lower share of revenues to operators, as in most OECD countries. Telmex's revenue structure with regard to local, long distance, Internet and other services has changed over time (Table 1.5).

Table 1.5. **Trends in Telmex's revenue sources (%)**

	1990	2000	2010
Local	31.6	45.8	36.1
Long distance	64.6	28.3	15.8
Internet	–	1.6	15.6
Other	3.8	24.3	32.5
Total	100	100	100

Source: Telmex Annual Reports.

Mobile market

The mobile market in Mexico grew at an annual compound rate of 40% from 1996 to 2009 compared to the OECD average of 19%. The high rate of growth also reflects a mobile penetration rate of 1 per 100 inhabitants in 1996, whereas the OECD average was 11 per 100 inhabitants. By 2009, Mexico's penetration rate was 78 per 100 inhabitants, compared to 102 for the OECD (Figure 1.5). The estimated penetration was 86 in September 2011.⁴ The mobile penetration rate in Mexico was lower than in Latin American countries; for example, in Colombia it was 93%, in Ecuador 97%, in Venezuela 98%, in Brazil 101% and in Argentina 123%. Among OECD countries, Mexico has the highest share of pre-paid mobile subscribers: 88% of total subscribers compared to 43% for the OECD. Moreover, the number of cellular minutes per subscriber in Mexico is above the OECD average (the 7th largest of 32 countries), also higher than in other Latin American countries.⁵

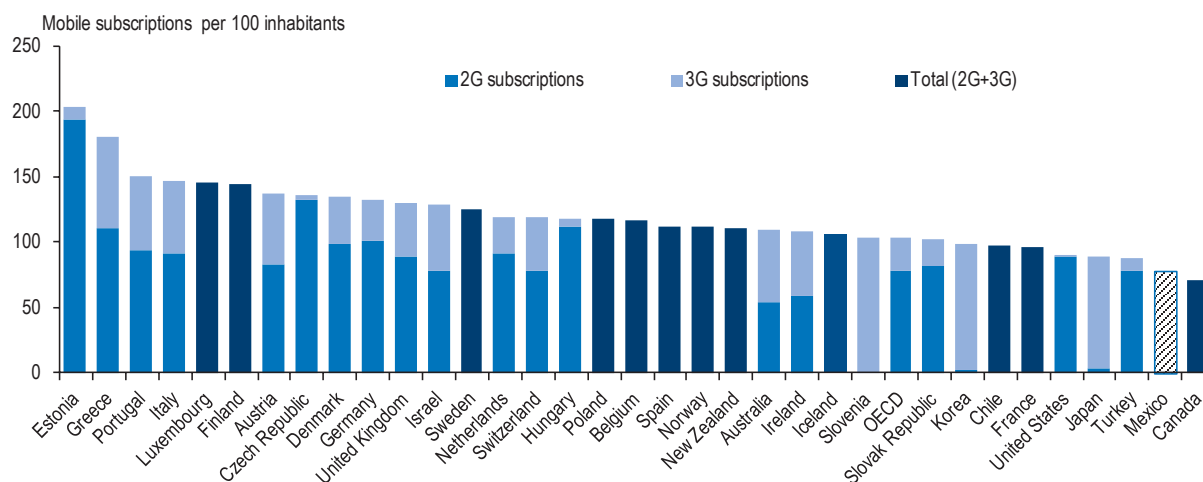
Table 1.6. Market share of the largest mobile network operators in the OECD, 2009

	<i>Number of operators</i>				
	1	2	3	4	5
Australia	37.4	30.7	25.7		
Austria	42.3	30.1	19.8	7.8	
Belgium	37.7	26.5	25.8		
Canada	35.7	28.7	27.4	8.2	
Chile	42.1	38.3	19.6		
Czech Republic	38.8	38.3	22.6	0.3	
Denmark	43.7	27.4	18.9	7.0	2.7
Estonia	28.2	16.2	13.2		
Finland	38.0	36.0	24.0	2.0*	
France	42.8	33.2	16.3		
Germany	36.2	32.0	17.5	14.3	
Greece	44.5	31.2	24.3		
Hungary	43.4	34.5	22.1		
Iceland	44.2	30.6	16.0	0.4	
Ireland	39.6	32.8	21.8	5.8	
Israel	34.7	32.0	29.1	4.2	
Italy	35.1	33.9	20.9	10.1	
Japan	48.4	27.5	19.0	3.5	2.3
Korea	50.6	31.3	18.1		
Luxembourg	51.2	34.7	14.2		
Mexico	70.9	21.9	4.4	3.7	
Netherlands	52.6	24.0	23.4		
New Zealand	52.3	49.1	4.0		
Norway	52.5	26.8	8.5	3.1	
Poland	31.3	30.6	29.5	7.7	0.5
Portugal	45.0	38.5	15.6		
Slovak Republic	52.6	37.3	10.0		
Slovenia	56.3	28.1	8.1	0.8	
Spain	43.6	30.4	20.4	2.5	
Sweden	41.5	32.0	16.9	8.4	
Switzerland	60.3	19.4	16.7	1.5	
Turkey	56.3	24.8	18.8		
United Kingdom	24.6	20.6	20.2	15.8	6.2
United States	32.0	30.0	18.0	12.0	9.0

* Includes subscribers for a small network-based mobile operator and two MVNOs.

Source: OECD (2011b).

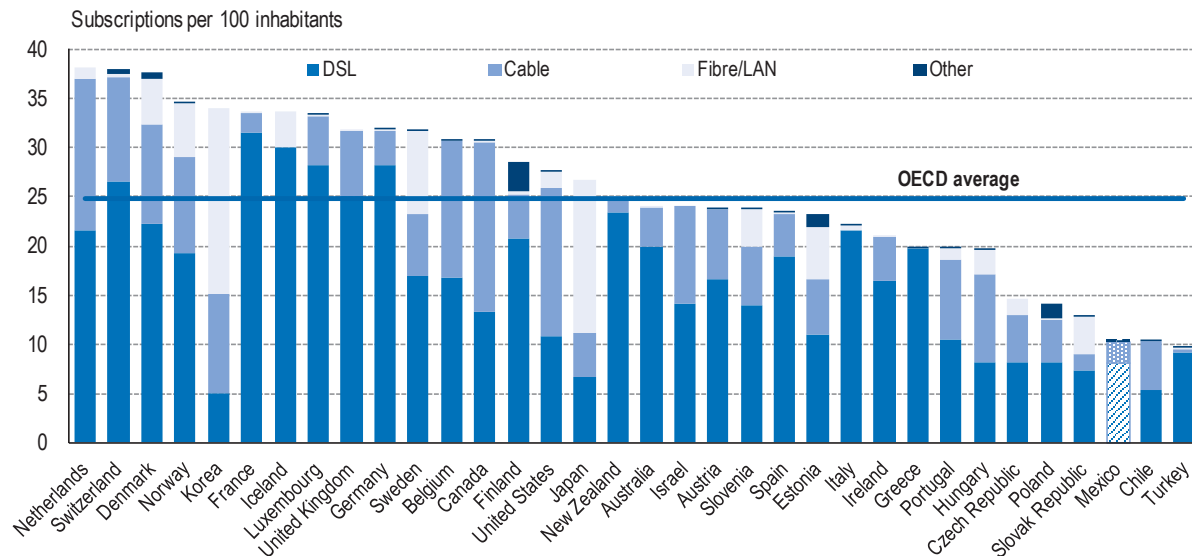
Figure 1.5. Cellular mobile subscriptions per 100 inhabitants, 2009, 2G and 3G



Initially, Mexico used the “receiving party pays” charging system for mobile, but switched to “calling party pays” in 1999. This led to a rapid increase in market penetration, from 8 per 100 inhabitants in 1999 to 14 in 2000. In mobile telephony, Telmex’s sister company, Telcel, accounts for about 70% of subscribers, while the second-largest operator, Telefónica Movistar, has about 22% (and around half this figure in revenues). This represents a very low market share by comparison with other OECD countries (Table 1.6). Telcel provides a certain number of uncharged on-net calls, which creates difficulties for other market entrants to gain market share.

Broadband

The development of the broadband market started late in Mexico. However, given that it began from a low level of penetration, market growth rate has been high. In 2006, broadband penetration in Mexico was 2.9 per 100 inhabitants. By 2009, it was nine and by the end of 2010 Mexico had ten broadband subscribers (11.4 in June 2011) per 100 inhabitants, compared to 25 for the OECD (Figure 1.6). The Ministry of Communications and Transport (*Secretaría de Comunicaciones y Transportes*) has established a goal of broadband penetration of 22 users per 100 inhabitants by 2012. This is unlikely to be met, despite very high growth over the last two years (22.7% year to year in June 2010). The broadband market has the highest growth of all communication markets in Mexico, even though it suffers from a lack of competition, with Telmex still accounting for the majority of ADSL subscribers, which would not occur in a competitive market. The main cable TV providers, Cablemás, Cablevisión and Megacable, have begun to market triple-play bundles of cable TV, broadband and telephony and, as a result, their broadband subscriber base has continued to enjoy healthy growth through 2009 and into early 2010. However, cable modem technology accounts for just less than one-quarter of total subscriptions. There is significant scope for additional growth as Mexico’s broadband penetration is less than half of the OECD average. Moreover, there is also scope for improvements in quality since speeds remain quite low relative to other OECD countries.

Figure 1.6. **Broadband subscribers per 100 inhabitants, December 2010**

Source: OECD Broadband Portal, www.oecd.org/sti/ict/broadband.

Other markets: pay-TV

The cable television market should be considered in conjunction with pay-TV services provided over DTH (satellite) technology. The only significant player until 2008 was Sky (Grupo Televisa), until Dish (owned by MVS) entered the market. Since then, the market dynamics have changed significantly. First, the market has expanded, as Dish has targeted a much lower income subscriber base. Dish reduced the number of channels in the bundle, and reduced prices by 70% (from MXN 500 down to MXN 150 approximately). This strategy has resulted in Dish gaining around 2 million subscribers in around two years. Crucial for this success was the Dish-Telmex partnership, which allowed Dish to sell its packages through the Telmex retail store network. Telmex also provides billing services and bundles a telephone line with Dish's DTH package (which can also be purchased separately). Competitors argue that the low-priced Dish/Telmex bundle is anti-competitive, that Dish is being subsidised by Telmex, and that Telmex's license prohibits it from providing pay-TV services. They have filed unsuccessful suits before the competition authority.

Price and quantity indicators

Price is one of the most important indicators of performance. In an efficient, effectively competitive market, prices (wholesale and retail) are driven down towards costs.

Competitive entry into the provision of long-distance and international services has led to pronounced decreases in prices in these markets across the OECD. Prices have also declined in Mexico; nevertheless, when benchmarked with other OECD countries, prices in Mexico are still high.⁶ Fixed-line communication prices in Mexico remain among the most expensive among OECD countries. This is imposing a cost on consumers and is especially serious for the cost of business communications, in particular small and medium enterprises, which in Mexico represent the predominant type of enterprises. Price comparison of the OECD residential 140 calls fixed-line basket and the 260 calls business basket are shown in Figures 1.7 and 1.8.

Figure 1.7. OECD residential 140 calls fixed-line basket, February 2011, VAT included

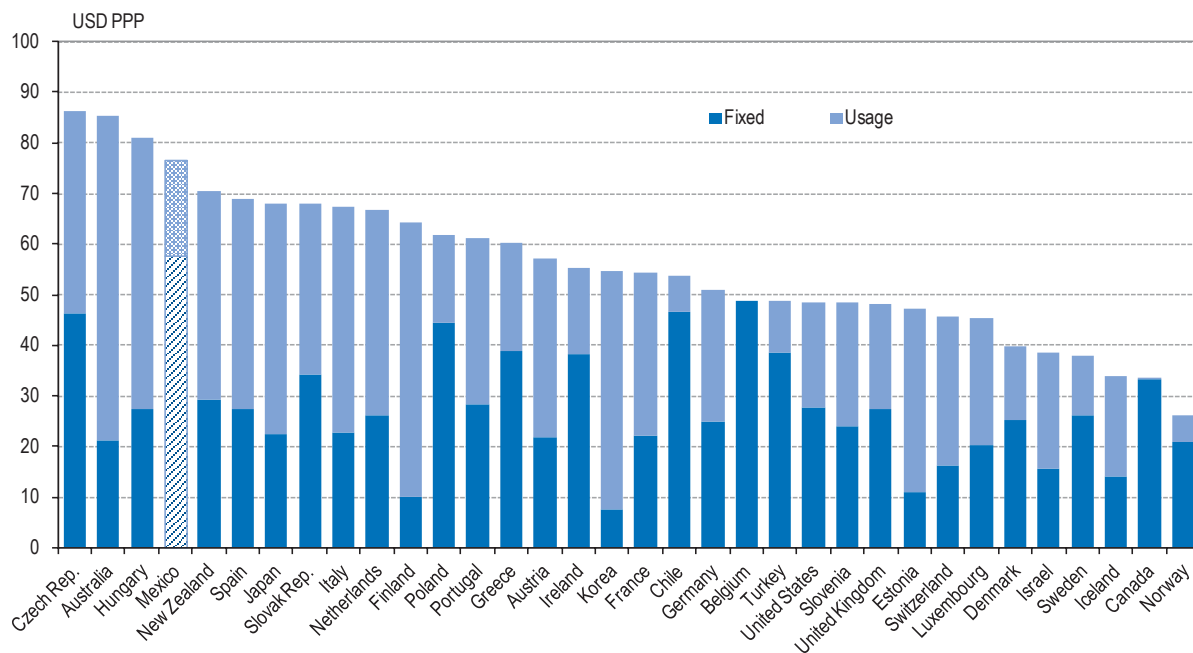
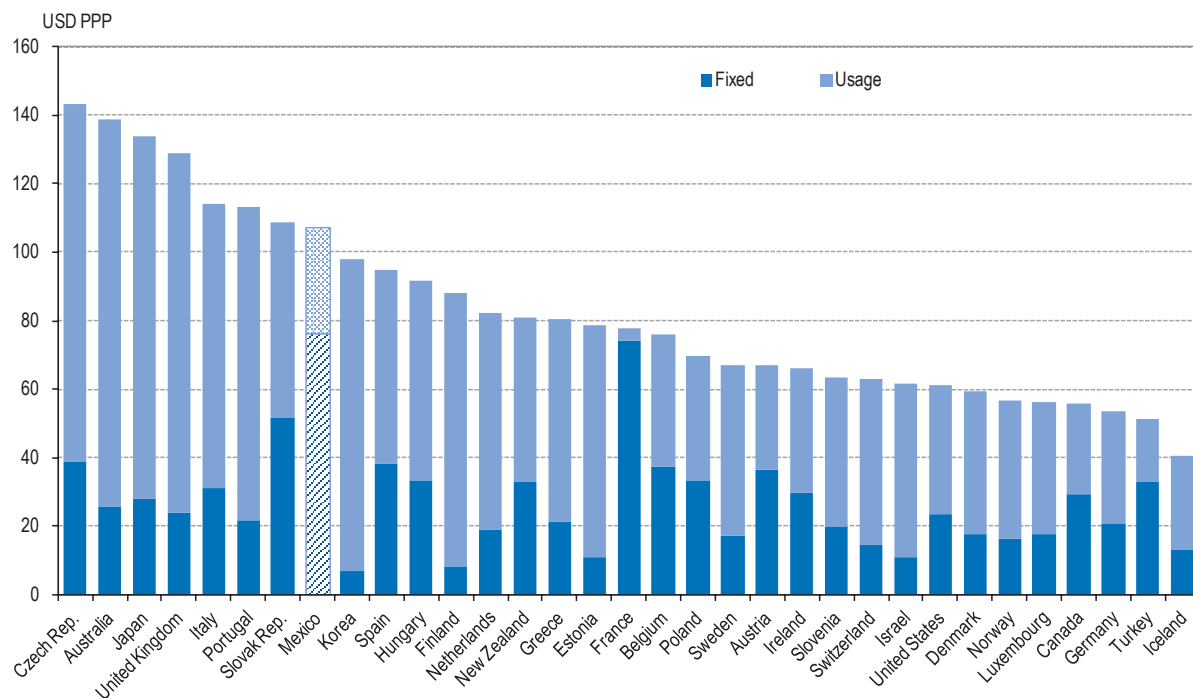
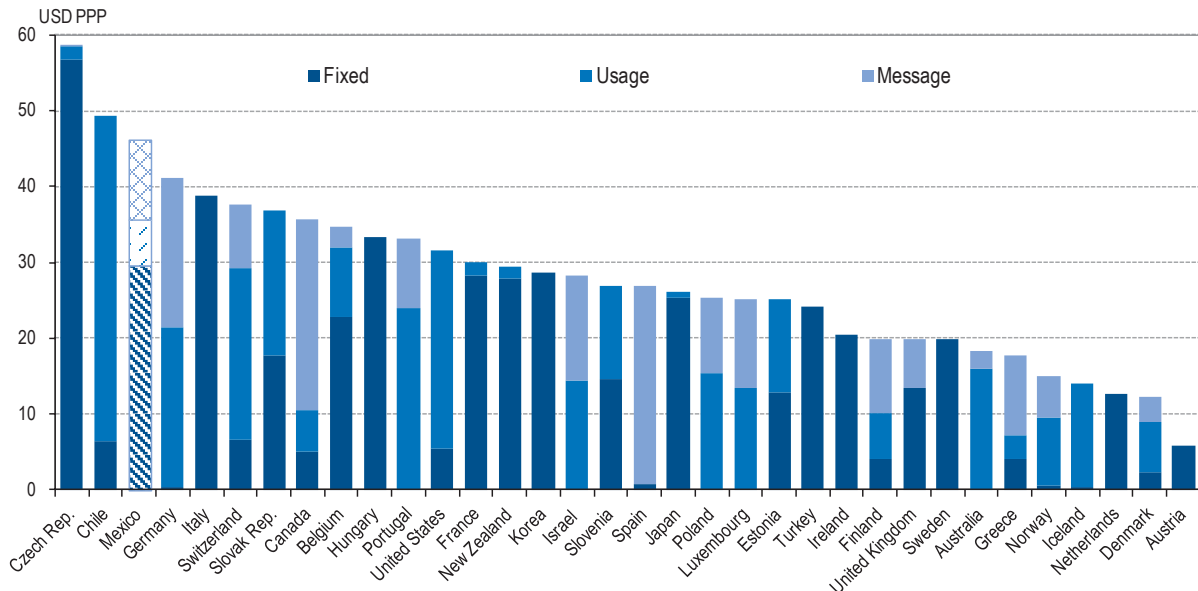


Figure 1.8. OECD 260 calls business fixed line basket, February 2011, VAT excluded



Prices for mobile communications are more in line with OECD countries and have improved in recent years, but are above the OECD average in all cases except for the low usage pre-paid and the 900 calls basket. Mexico's rank in the 100 call mobile basket is shown in Figure 1.9.

Figure 1.9. OECD 100 calls mobile basket, February 2011, VAT included



The relative prices for Mexico in the baskets, compared to the OECD average and the cheapest OECD country, are shown in Table 1.7.⁷

Table 1.7. Mexican prices in the OECD price baskets relative to the OECD average and cheapest OECD country (based on February 2011 price baskets, USD PPP)

	Mexican prices as % of:	
	OECD average	OECD cheapest
<i>Residential call baskets</i>		
20 calls	124.44%	267.96%
60 calls	194.90%	312.54%
140 calls	137.27%	295.49%
420 calls	145.13%	450.79%
<i>Business call baskets</i>		
100 calls	132.80%	248.03%
260 calls	130.00%	264.25%
<i>Mobile call baskets</i>		
30 calls	132.50%	370.44%
100 calls	165.52%	798.96%
300 calls	109.51%	544.72%
900 calls	96.03%	628.16%
Pre-paid 40 calls	94.92%	338.19%

International mobile roaming

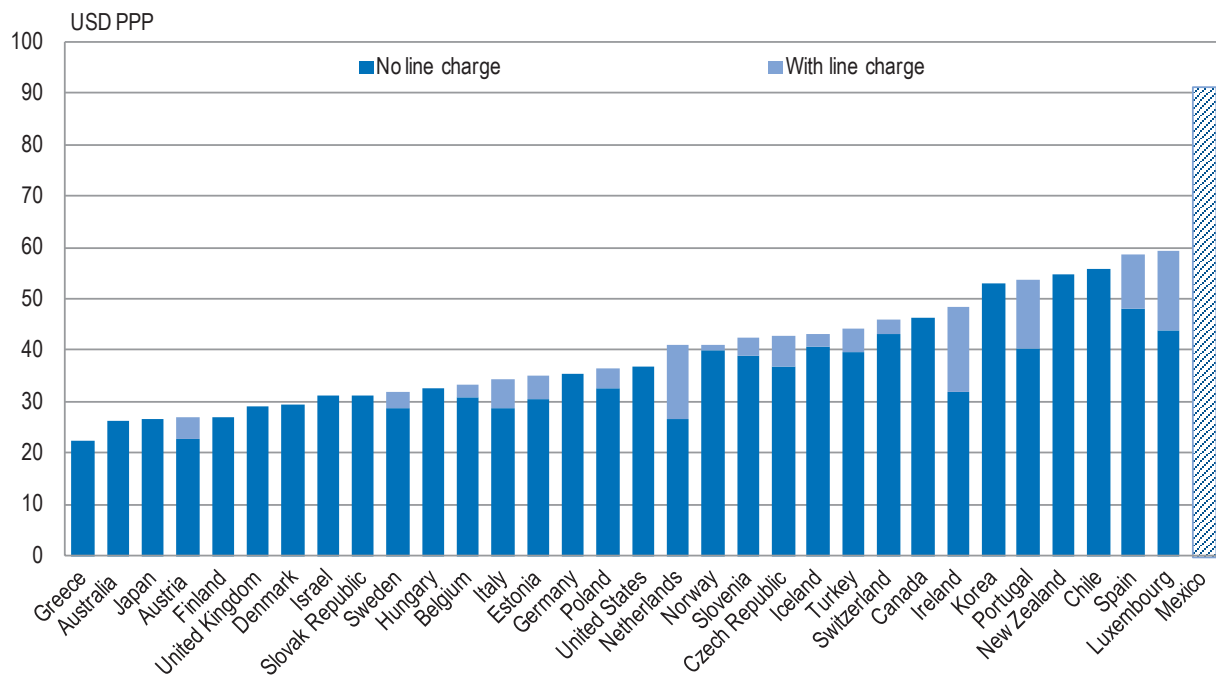
International mobile roaming service is one area where regulators in OECD countries have failed to increase competition and achieve reasonable prices for consumers and businesses. A series of OECD reports⁸ have highlighted some of the structural problems, namely low consumer awareness of high prices and substitutes, bundled purchase with domestic services so consumers do not pay attention to roaming prices, and international jurisdiction issues, which make it harder to act on the wholesale rates charged by foreign operators.

Mexico is no exception, and international roaming prices remain extremely high. For example, a three-minute local call while roaming in OECD countries would cost a Mexican user USD 8.65 (OECD average – USD 6.76). International data roaming for a Mexican user would cost USD 66 (PPP figures) for downloading 5 MB of data (the OECD average is USD 41.5 PPP). These excessive prices are not justified by underlying costs. Mexico should begin identifying and addressing excessive international mobile roaming prices, especially among those on the most travelled routes.

Broadband

Broadband services are very expensive in Mexico and the speeds offered are very slow compared to the OECD average. The prices for an average monthly subscription for speeds between 2.5 and 15 Mbps (with and without line charges) are given in Figure 1.10. For speeds below 2.5 Mbps, Mexico is the fourth most expensive country in the OECD area.

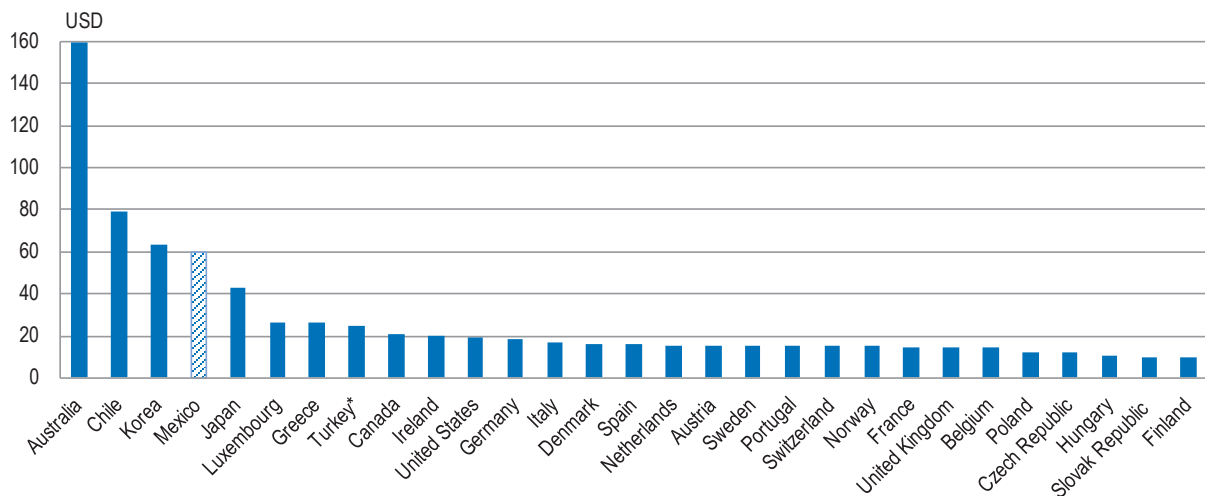
Figure 1.10. Average monthly subscription for speeds between 2.5 and 15 Mbps, USD PPP



Source: OECD (2011b).

Mexico is hampered by the fact that it lacks an Internet Exchange Point (IXP). In fact, it is the only OECD country without one. IXPs allow Internet service providers to exchange traffic domestically more efficiently and cheaply, rather than sending traffic outside the country then returning it to terminate it. An IXP allows for the exchange of traffic at a single point, reduces transit costs, eliminates cross-border transportation costs, and provides an incentive to create national content. Most IXPs have been set up as part of a co-operative effort by ISPs. The government should strongly encourage ISPs to set up an Internet exchange point. Small ISPs (including cable companies) have an interest in so doing, even if the incumbent is reluctant to join. In comparing IP transit charges among OECD countries for which data are available (29 countries), Mexico is among the more expensive with an average of USD 60/Mbps per month for a full-port STM-1/OC-3 (155 Mbps) international IP transit port (see Figure 1.11). While broadband prices reflect the price that domestic consumers pay to access the Internet, IP transit prices can be considered a reflection of the cost of Internet connectivity to the rest of the world. Some refer to IP transit prices as the wholesale price of Internet access. In countries with Internet exchanges, the price is an average of the offers available on the market for 155 Mbit/s of IP transit. In countries without an Internet exchange point, the price reflects the additional cost of connectivity needed to reach the Internet exchange point where IP transit service is available.

Figure 1.11. IP transit prices, Q1 2011



Note: Each price represents the average collected IPT price across all covered cities in each country.

*Data for Q1 2010.

Source: Telegeography.

Quality of service

Quality of service (QoS) has improved significantly in OECD telecommunication markets since the 1990s. This is the result of improvements in telecommunications technology such as digital switching and fibre optic cable. Digitalised networks allow, for example, greater reliability, faster connections and increased bandwidth. One such important development in Mexico was the replacement of Telmex's microwave long-distance network with fibre optic lines.

Telmex's concession requires publication of QoS indicators during the first quarter of every year. Every four years Telmex has to obtain approval of its updated indicators. If these requirements are not fulfilled Cofetel can recommend that the *Secretaría de Comunicaciones y Transportes* (SCT) impose penalties on Telmex. These penalties should be sufficient to provide an incentive for compliance. The changes in key service quality indicators that Telmex is required to meet are presented here (Table 1.8). The QoS data cover the period 1990-98; data regarding subsequent performance have been provided to Cofetel, but arguments of confidentiality have been used to prevent publication. Given the size of Telmex's network and the need to enhance transparency and public scrutiny, there is a strong case for publication of these data, as is routine in many countries. In its 2010 Annual Report, Telmex states that the time taken to install a line in 2010 was 5.8 days compared to two years in 1991, and that the percentage of fixed lines with faults has fallen from 13.5% in 1991 to 1.97% (Telmex, 2010). Other operators also have a requirement to fulfil a minimum number of QoS objectives. These should also be published.

Quality of service information for relatively less profitable areas (*e.g.* in rural regions) should also be published. Telmex, in proposing to channel rural lines through a separate company (Telmex Social), is acknowledging the importance of separating out rural data from urban data.

Table 1.8. **Telmex's quality of service 1990 compared with 1998**

Indicator	1990 (%)	1998 (%)	2000*	2003*
Local service				
Index of service continuation	80.2	91.4		
Percentage of call failure	10.0	2.8		
Repair within same day	45.0	80.4	74.3	98.2
Repair within three days	80.0	94.0		
Index of quality of service for basic service	91.2	97.8		
Obtaining dial tone within four seconds	97.0	99.9		
% of calls reaching destination	92.0	98.3		
Public payphones out of service as % of total	13.0	1.9	1.7	1.3
% of calls that are answered by the operator	90.0	92.6		
Long-distance service				
Index for quality of service for long distance	90.0	98.1		
% of calls that reach their destination	90.0	99.3		
% of calls that are answered by the operator	90.0	95.3		

*Data in columns for 2000 and 2003 are for Mexico as a whole and not necessarily specific to Telmex. However, as the largest fixed operator its data carry a large weight.

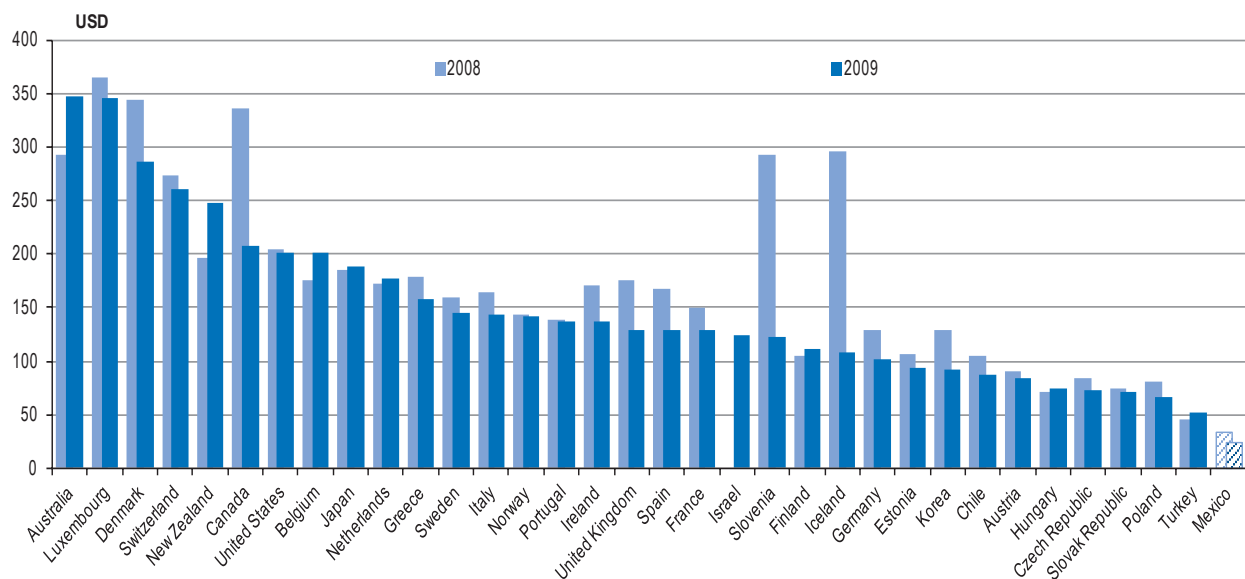
Sources: Telmex (1998); OECD (2001, 2005).

With regard to wireless telecommunications, technology advances allowing migration to 2G then 3G services have delivered significant improvements in quality of service across OECD countries. However, availability of spectrum may represent a constraint on further improvements, highlighting the importance of spectrum allocation and management policy. As noted earlier in regard to mobile quality of service, Cofetel approved the new Fundamental Technical Quality Plan of Local Mobile Service in February 2011. The published plan has now been officially adopted and calls for 11 indicators: four for voice, four for Internet and three for SMS. It will be obligatory to publish the data generated from this new scheme. In 2010, for the first time in 12 years, Cofetel proposed that SCT sanction operators for poor QoS delivery.

Network investment and modernisation

Public telecommunications investment has fallen off since the investment programme undertaken in the late 1980s and the early years of privatisation. Beginning at about USD 16 per capita in the late 1980s and increasing to about USD 24 per capita in the early 1990s, the level of investment fell to about USD 10 per capita in 1997, well below the OECD average. With regard to public telecommunications investment per capita, Mexico ranked last (Figure 1.12), whereas the pent-up demand and need for wider coverage would give rise to expectations of a more aggressive investment programme. The cumulative sum of public telecommunication investment per capita over the period 2000-09 amounted to USD 346, compared to the OECD average of USD 1 447. More recently, in December 2010, the SCT contracted the design and manufacturing of a fleet of three satellites (MEXSAT satellite system), with investment plans of USD 1.3 billion over the next three years.⁹

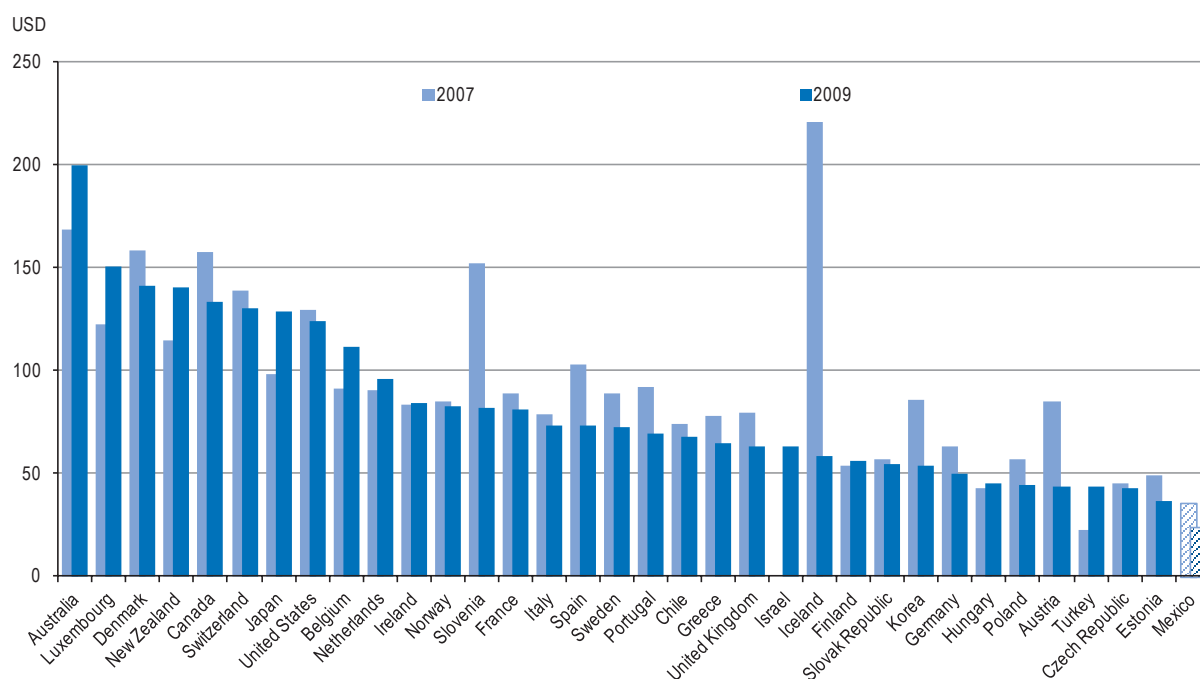
Figure 1.12. Public telecommunications investment per capita, USD



Source: OECD (2011b).

Another way of comparing investment levels is by telecommunication access paths. This provides an indicator of relative investment levels. On average, the investment per total communication access path was USD 95.7 in the OECD area. By contrast, Mexico's was USD 31.5, the lowest among OECD countries (Figure 1.13).

Figure 1.13. **Public telecommunications investment per access path in USD, 2007 and 2009**



Source: OECD (2011b).

Network investment and modernisation depends in part on profitability. The relatively low level of telecommunication investment contrasts with the high profit margins in Mexico, compared with other OECD countries. In 2008, Telmex registered an earnings before interest, taxes, depreciation and amortisation (EBITDA) margin of 47%, while the average margin for major operators in OECD countries was significantly less. For example, the average for Canada, France, Spain, Sweden, the United Kingdom and the United States was 28%. In 2008, Telcel, the major mobile operator in Mexico, reached an EBITDA margin of 64%, while the average margin for mobile operators in other OECD countries was 37.6% (OECD, 2009a).

Investment to upgrade broadband speeds

With the ongoing rise in demand for broadband, Telmex announced plans to drive fibre closer to consumers to deliver 20 Mbps speeds and compete more effectively with cable operators (Buckley, 2010b). Telmex currently offers broadband speeds of up to 5 Mbps, but has rolled out trials for its 10 Mbps broadband service. The trial will be developed in three Mexican cities. Telmex plans to commercially launch its 10 Mbps broadband service across Mexico over 2011. In recent months Telmex claims to have doubled the speeds available for its Prodigy service subscribers at no additional cost to customers. The upgraded speeds are currently provided to 95% of Telmex's 7 million broadband network users. Most of Telmex's 2010 investment budget of MXN 10 billion

(USD 765 million, equivalent to USD 7 per capita only) went on improvements to Internet service. Reportedly, Telmex is seeking to keep customers from switching to cable providers such as Megacable that offer triple-play services, including high speed broadband (Buckley, 2010a). Other operators may offer higher speeds (up to 100 Mbps), but they are largely focused on the corporate segment and/or are not widely available. Other reported investment figures were: USD 1.7 billion (MXN 23.4 billion) by Televisa in telecommunications infrastructure in 2010, USD 785 million (MXN 10.6 billion) by Axtel in 2010 to provide broadband services, USD 185 million (MXN 2.5 billion) by Maxcom in 2010, and USD 555 million (MXN 7.5 billion) by Megacable to improve the quality and speed of broadband services (based on companies' annual reports).

Notes

1. Fixed lines increased from 2005 to 2008 and then declined to pre-2005 levels in 2009.
2. In order to benchmark performance in the Mexican telecommunication market with other OECD members the data in this report uses the *OECD Communications Outlook 2011*, which provides complete end of year data for 2009 for OECD countries. End-of-year data for all OECD countries were not available at the time of drafting.
3. The concession was granted for 50 years from the date of the original concession, 10 March 1976.
4. Estimate derived from Telefónica's publication of results for the period January-September 2011 (www.telefonica.com/en/shareholders_investors/pdf/rdos11t3-eng.pdf)
5. This can be partly explained by the low penetration (and availability) of fixed lines.
6. As an example, Skype calls to mobiles are USD.336/minute for Mexico compared to USD.221/minute for Brazil and USD.229/minute for Chile.
7. Absolute price levels have been corrected to take into account the Mexican PPP (Purchasing Power Parity) index, which benchmarks prices against the countries' general consumption price level. While other metrics such as the average revenue per user (ARPU) or per minute (ARPM) may be useful to evaluate a firm's profitability, PPP prices are more relevant to assess relative price levels across countries as they take into account the purchasing power of Mexican consumers and businesses. Moreover, the application of the PPP methodology to telecommunications price baskets is an example of good use of the methodology.
8. See OECD (2009b and 2010b).
9. The project calls for an investment of over USD 1.3 billion over the next four years. The MEXSAT project expands its reach to provide countrywide broadband connectivity to be utilised by the Mexican Government Agencies. This SCT-led project is a government-wide initiative for the development of telecommunications and technology, by modernising the satellite communication infrastructure in Mexico.

The MEXSAT program consists of three satellites: two to provide Mobile Satellite Services (MEXSAT 1 and 2) and one to provide Fixed Satellite Services (MEXSAT 3). Additionally the contract includes for two tracking, telemetry and control centres and communication gateways/teleports. The MEXSAT 3 will be launched in 4Q 2012 followed by the MEXSAT 1 in late 2013 and MEXSAT 2 in late 2014. A contract for launching services is expected to be implemented by the end of 2011.

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