

Rice University's Baker Institute for Public Policy

México center



The Telecommunications Sector in Mexico: Present and Future in the Context of the 2014 Reform

Oscar Bejarano

Doctoral Candidate

Department of Electrical and Computer Engineering

Rice University

November 10, 2014

THESE PAPERS WERE WRITTEN BY A RESEARCHER (OR RESEARCHERS) WHO PARTICIPATED IN A BAKER INSTITUTE RESEARCH PROJECT. WHEREVER FEASIBLE, THESE PAPERS ARE REVIEWED BY OUTSIDE EXPERTS BEFORE THEY ARE RELEASED. HOWEVER, THE RESEARCH AND VIEWS EXPRESSED IN THESE PAPERS ARE THOSE OF THE INDIVIDUAL RESEARCHER(S), AND DO NOT NECESSARILY REPRESENT THE VIEWS OF THE JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY.

© 2014 BY THE JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY OF RICE UNIVERSITY

THIS MATERIAL MAY BE QUOTED OR REPRODUCED WITHOUT PRIOR PERMISSION,
PROVIDED APPROPRIATE CREDIT IS GIVEN TO THE AUTHOR AND
THE JAMES A. BAKER III INSTITUTE FOR PUBLIC POLICY.

Abstract

The constitutional reform of telecommunications approved in 2013 offered a historic opportunity to fix and restructure Mexico's anemic telecommunications sector. While the original reform initiative seemed to address key problems at the root of the dysfunctional system, the secondary laws have been widely criticized by public policy experts and human rights advocates. Beyond issues regarding freedom of speech, the controversy around this reform exposed other equally unacceptable realities of the new telecom sector in Mexico. Concerns focus on whether the new laws and policies will have a strong positive social impact or whether they are designed for the benefit of a minority of investors and will ultimately detract from the public welfare. This paper has three major parts. First, it compares the telecommunications sector in Mexico to that of other Organisation for Economic Co-operation and Development (OECD) and Latin American countries. Second, it discusses how telecom reform addresses some of the root causes of the sector's inefficiency, but fails in delivering the solutions outlined in the original reform objectives. Finally, it concludes that the execution of the proposed changes will be crucial for the ultimate success or failure of this constitutional reform.

I. Introduction

The telecommunications sector in Mexico has been widely described as inefficient and dysfunctional (Organisation for Economic Co-operation and Development [OECD] 2012). In general, these problems are attributed to a lack of competition, low levels of accountability, and a dearth of transparency, all of which result in high prices, low market penetration, and insufficient infrastructure development.

Mexico reports some of the highest consumer prices for telecom services among members of the OECD. The total economic welfare loss attributed to a deficient telecommunications sector has been estimated at 129.2 billion USD between 2005 and 2009, which corresponds to approximately 1.8% of Mexico's GDP per annum (OECD 2012). To address this problem, in 2013 the administration of President Enrique Peña Nieto announced a plan to extensively restructure the country's telecommunications sector. The resulting telecom reform law passed by

Congress in the summer of 2014 was the most significant amendment to Mexico's telecommunications legal framework in over two decades (Fisher 2014).¹ The reform establishes telecommunications and broadcasting services as public services of general interest, meaning the state will guarantee these services will meet certain criteria, including standards related to quality and competition. The law also addresses market regulation and a new distribution of regulatory functions among different entities. However, the key question is whether the law benefits consumers and society as a whole and follows best practice frameworks successfully adopted by many other OECD countries.

The key objectives of the original proposal as outlined by the executive branch were (Presidencia de la República 2014a; Ferro 2013): (i) eliminating monopolistic practices by promoting competition in broadcasting services as well as telephony (fixed line and mobile), data, and other telecommunication mediums; the goal is to provide better services at better prices through methods that include opening the sector to foreign investment; (ii) strengthening the fundamental rights to freedom of speech and information access; (iii) increasing the coverage of telecommunication and broadcasting services (including broadband) in order to reach a wider population; and (iv) increasing infrastructure investment while enabling a more efficient utilization of existing infrastructure to guarantee better service.

At the same time, the reform initiative sought to update the legal framework of the telecom sector by enabling stricter regulation and penalty enforcement, with the goal of establishing a more competitive and effective sector. The objective of this paper is to assess whether the proposal presented by the executive branch and the version ultimately approved by Congress can accomplish the original goals of reform. In other words, the paper asks whether the resulting reform solves the problems that motivated its creation. Furthermore, this paper assesses whether

¹ In 2013, the executive branch proposed a constitutional reform to restructure the telecommunications and broadcasting legal framework in Mexico. Once Congress approved this reform, the president drafted the secondary laws pertaining to telecommunications (the secondary laws establish the details or the "fine print" regulating the laws proposed in the constitutional reform), and submitted them to Congress for approval. Finally, in July 2014, both the executive and legislative branches approved the finalized secondary legislation in matters of telecommunications.

the reform will generate further unanticipated issues, which some critics have referred to as other “toxic” problems (Levy 2014a).

Many critics have noted that the reform does not achieve the fundamental objectives that had been stated when the bill was originally proposed, particularly with regard to economic competition, regulatory institutions, and consumer privacy (Levy 2014a). Its harshest critics, for example, have asserted that the entire legislative process demonstrated the inability of the Mexican government to dismantle existing monopolies and to legislate in favor of consumers. For instance, although reforms enabled stricter regulation of the dominant telecommunications company America Móvil, they did little or nothing to regulate the most dominant company in the broadcasting sector, Televisa (Cantu 2014), raising suspicions that the latter company was able to wrestle the government into leaving its own leading position untouched. The final law also stripped the Federal Institute of Telecommunications (IFETEL)—constitutionally considered an autonomous regulatory commission—of some of its powers in matters of economic competition and content regulation (Levy 2014). Furthermore, the reform ratifies Profeco,² the consumer protection agency, as the ombudsman for consumer complaints, in spite of decades of unacceptable performance and ineffectiveness (Levy 2014a).

Beyond questions about economic competition and institutional functions, the reform has been criticized for remaining vague in aspects that can potentially jeopardize basic civil rights such as privacy and freedom of speech. That is, the reform includes certain pernicious legal provisions with respect to: (i) content regulation, (ii) mobile phone signal blockage, (iii) retention of communications metadata, (iv) geolocation of communication devices, and (v) discriminatory measures against indigenous groups and community radios (Poder Ejecutivo 2014; Nexos 2014; Brito 2014). These and other equally objectionable provisions of the law will be further discussed in Section 0.

On a more positive note, the reform does include a few features that, in the long run, might benefit the telecommunications sector. For instance, it mandates that dominant market players share their infrastructure with potential competitors and strengthens sanctions against companies

² Profeco stands for “Federal Attorney's Office for the Consumer.”

violating regulations (Montes 2014). Moreover, consumers get to enjoy some added benefits, such as a drop in mobile phone roaming charges as well as the elimination of long distance calling fees and other charges. It is important to note, however, that most of these legal provisions have only a small impact on the performance of the overall telecommunications sector; some had already been approved before the telecommunications reform in the Norma Oficial Mexicana³ 184, e.g., the obligation of carriers to unblock cell phones for use in other networks upon termination of a contract (Norma Oficial Mexicana 2012). These provisions are very popular with consumers, however.

In spite of the negative aspects of the finalized reform—most of which will have to be revisited over time—government officials have finally recognized the crippled state of the telecommunications sector in Mexico and its impact on the overall economy (OECD 2012). The stated objectives of the reform, along with the National Infrastructure Program 2014-2018 (Presidencia de la Republica 2014b), acknowledge and address these major problems and seek to enable a more efficient utilization of existing infrastructure while encouraging investment in new infrastructure. Furthermore, a few first steps, such as the installation of the first Internet Exchange Point (IXP),⁴ have already been taken (Consortio para el Intercambio de Tráfico 2014). The existence of an IXP will aid the reduction of costs related to Internet traffic exchange while also reducing traffic latency,⁵ thus improving a consumer's Internet usage experience.

Nonetheless, we will argue that the enacted legislation seems far from achieving what the 2013 constitutional reform proposed. Specifically, the secondary laws fell short of what was expected from a “historical” opportunity to overhaul the telecommunications legal framework. The legislative process demonstrated that the de facto powers of the sector, namely, the monopolies, could still prevent the creation of real public policies in favor of open competition and, ultimately, in favor of consumers. Given this mixed picture, the success of the telecom reform on improving the telecommunications sector in Mexico will be largely determined by the future

³ Norma Oficial Mexicana or NOM refers to a set of technical regulations established by the government in order to oversee “products, processes, or services,” that could represent a risk for the general population, animals, or the environment (Secretaría de Economía 2014).

⁴ See Section IV for more information about IXPs.

⁵ Accessing and retrieving information from another device in the network (e.g., a server) involves a round-trip data transmission that incurs in an inevitable latency, especially if data traverses a large number of hops.

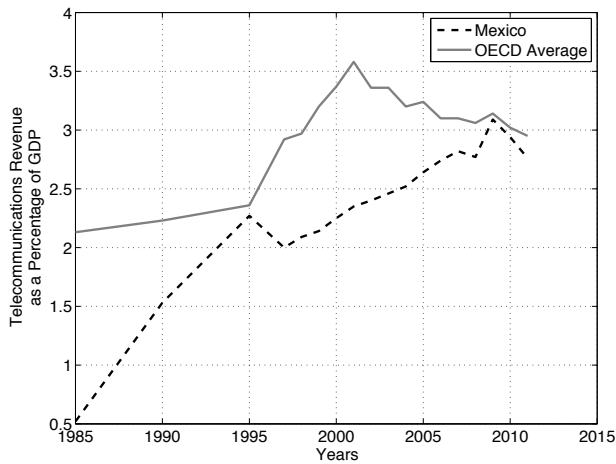
execution of the competition clauses and the infrastructure program. In addition, the role of IFETEL as a truly autonomous regulatory commission will be crucial in guaranteeing that rules are set and enforced to control the behavior of dominant market players and to enable the entry of foreign and domestic investment into the sector. The next five sections assess the ability of the final legislation of the telecommunications reform in Mexico.

II. The Current State of the Telecommunications Sector in Mexico

Information and communications technologies (ICT) are essential to the economic growth of a country. In particular, a country's ability to compete with other nations around the world is increasingly highly correlated to the use and adoption of ICT (Jana Palacios 2013). Since 1985, the role of the telecommunications sector in Mexico's GDP has rapidly increased.⁶ Nonetheless, this contribution has largely remained below the OECD average due to a crippling lack of competition and ineffective regulation (OECD 2012). As shown in Figure 1, since 1985 the revenue from the telecommunications sector as a percent of GDP has been consistently lower in Mexico compared to that of the average of all OECD countries. More importantly, the telecommunications sector and the integration of ICT into Mexico's productive activities "exhibit important deficiencies with respect to the size of the Mexican economy" (Jana Palacios 2013).

⁶ Available data from OECD database starts in 1985.

Figure 1. Telecommunications revenue as percentage of GDP for Mexico and OECD countries



Source: OECD 2013

Data between 1985 and 1995 was available in five-year intervals; data between 1997-2011 is on annual basis.

The estimated welfare loss of 1.8% of Mexico’s GDP per year is a result of a combination of consumer overcharge (high prices), which constitute 52% of the total average loss in consumer surplus, and unrealized subscriptions (low penetration), which constitute the remaining 48% (OECD 2012). The scarcity of competition in the telecommunications sector has made telecommunications services in Mexico one of the most expensive in the OECD. This has led to excessive costs for subscribers and low investment in infrastructure. For example, the average monthly subscription for speeds between 2.5 and 15 Mbps in Mexico exceeds 90 USD PPP⁷ (the most expensive among all OECD countries); the second-most expensive country, Luxembourg, remains below 60 USD PPP. Similarly, for speeds below 2.5 Mbps, Mexico is the fourth most expensive country in the OECD (OECD 2012).

In terms of investment in public telecommunications per capita, in the first decade of the 21st century, Mexico ranked last out of the 34 countries of the OECD. From 2000 to 2009 the sum of public telecommunication investment per capita in Mexico amounted to only 326 USD, whereas

⁷ PPP refers to “purchasing power parity” and is used as a model for establishing an appropriate exchange rate between different currencies. It is an effort to capture differences in domestic prices between economies.

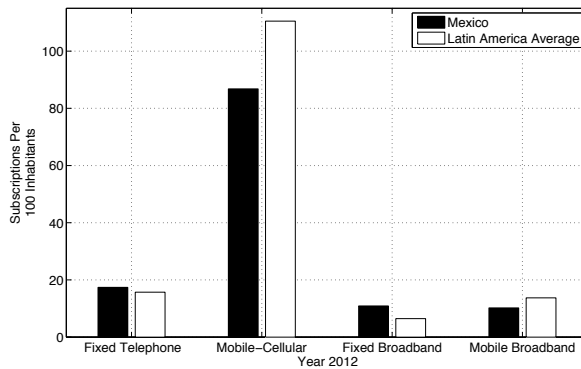
the OECD average reached 1447 USD (OECD 2012). It is worth noting that an increase in investments from 2009 to 2011 put Mexico ahead of Turkey, taking it from the 34th to 33rd place (OECD 2013).

Service penetration rates have remained among the lowest of the OECD. In 2010, in terms of total number of fixed lines (telephone service), Mexico occupied the 8th place in the OECD; however, it ranked 34th in terms of lines per 100 inhabitants. Similarly, in the mobile sector it was the fifth largest in total subscribers but ranked 33rd in terms of subscribers per 100 inhabitants. Finally, in the broadband sector Mexico ranked 10th in terms of total subscriptions, but 34th in subscribers per 100 inhabitants (OECD 2012). For the most part, from 2009 to 2011 Mexico remained in the same position or moved up only one position in the OECD rankings—i.e., by taking Turkey’s place in the category of total fixed broadband subscriptions per 100 inhabitants (OECD 2013).

Mexico has both the lowest GDP per capita among the OECD countries and an uneven distribution in regional GDP per capita (OECD 2013). In addition, the GDP per hour worked is near 40% of the OECD average and the rural population is 10% higher than that of the average (OECD 2013). As noted in prior work—e.g., that of Jana Palacios and Jerry A. Hausman—Mexico’s socioeconomic situation leaves the country at a disadvantage when compared to other OECD countries. Consequently, this paper includes a comparison of Mexico against other nations with similar development characteristics, such as the rest of the Latin American countries shows a comparison of telephone and broadband service penetration in Mexico against the rest of Latin America.⁸ In general, for fixed services Mexico remains above Latin America’s average; however, for mobile services it is still underperforming against the average.

⁸ Including Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Cuba, Dominican Republic, Ecuador, El Salvador, Guatemala, Haiti, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Puerto Rico, Uruguay, and Venezuela.

Figure 2. Telephone and broadband subscriptions per 100 inhabitants in 2012



Source: International Telecommunications Union, 2013

III. Eliminate Monopolies and Strengthen Competition

For many years, the telecommunications sector in Mexico (including radio and television broadcasting) has been characterized by extremely high market concentrations in which a single dominant operator controls infrastructure, pricing, and service penetration in a given service or complete sector. In some cases, these operators have also been able to shape and influence regulatory decisions. The 2014 telecommunications reform was heavily focused on strengthening competition through regulations, by eliminating the abuse of dominant market positions, and by providing foreign investment incentives. While the reform seemingly succeeded at establishing the framework for regulating dominant operators per sector, it failed to eliminate monopolistic practices.

A. Telecommunications Operators in Mexico

In 2011, America Móvil was considered the ninth-largest telecommunications company in the world with 48.8 billion USD in revenue (OECD 2013). In 2013 the company moved up to eighth position, with total revenues of 60 billion USD (Yahoo Finance 2013). Moreover, America Móvil’s subsidiaries, Telmex and Telcel, consistently register high earnings before interest, taxes, depreciation, and amortization (EBITDA)⁹ margins. For example, in 2008 Telmex registered an EBITDA margin of 47%, whereas the average margin for other major telecom

⁹ EBITDA is a measure of a company’s financial performance and it is calculated by subtracting expenses (excluding interests, taxes, depreciation, and amortization) from total revenue.

operators based in OECD countries remained significantly lower—e.g., the average for Canada, France, Spain, Sweden, United Kingdom, and United States was only 28%. Similarly, Telmex’s sister company, Telcel, reported a margin of 64% compared to the average of 37.6% for other OECD mobile operators (OECD 2012). As of May 2011, the market share for America Móvil in Mexico stood at 74% for fixed Internet service, 70% for mobile service, and 79.6% for fixed line (OECD 2012).

Although average Internet speeds in Mexico have steadily increased in recent years, America Móvil’s subsidiary, Telmex, has severely underperformed against smaller competitors. In 2014, Ookla—creator of the most popular broadband testing service in the world—in collaboration with PC Magazine, collected a set of measurements in Mexico and ranked different ISPs according to a weighted score involving both download and upload transmissions speeds (Sosa 2014). The measurements revealed that Telmex consistently ranked last at both the municipal and national levels.¹⁰

Overall, in the first quarter of 2014, Akamai Technologies reported average Internet speeds in Mexico of 4.0 Mbps with a year-over-year (YoY) increase of 24% (Akamai Technologies 2014). This finding puts Mexico fourth among other countries in the Americas, following the United States, Canada, and Uruguay. Nonetheless, compared to other OECD countries, these speeds are much slower and prices for consumers are much higher (OECD 2012).

B. Outcomes and Implications of the Telecommunications Reform in Matters of Economic Competition

The telecommunications reform of 2014 established a framework that considers dominant operators—i.e., those companies with a market share of 50% or higher in a given sector, such as telecommunications or radio and television broadcasting (Presidencia de la Republica 2014a). Therefore, under the reform, ICTs are classified into two main categories (or sectors): telecommunications and broadcasting. Telecommunications encompass fixed and mobile telephony, the Internet, and pay TV via cable or satellite; broadcasting is composed of free/open

¹⁰ The source does not provide thorough details about the methodology used to collect these measurements. Therefore, a more rigorous study is needed to provide stronger evidence with respect to the performance of all these ISPs.

television and radio. The decision to consider dominance on a per-sector basis represents a direct hit on America Móvil due to its position as the leading operator in the telecommunications sector; however, it also leads to a vast number of loopholes that benefit other big companies, such as Grupo Televisa, at the expense of consumers and promotes the creation of monopolies. More specifically, the legislation obligated America Móvil to either reduce its market share or comply with the asymmetric regulation necessary to enable the entrance of new competitors (e.g., by obligating dominant players to share their infrastructure). In contrast—notwithstanding the excessive market concentration of Televisa on TV services—in the broader per-sector sense, the company does not “qualify” as a dominant operator.

The decision to regulate operators based on per-sector instead of per-service (i.e., services such as free TV, radio, pay-TV, fixed-line, mobile phone, or Internet) deviates from both (i) the best practices followed by most countries (OECD 2012; Herrera 2014) and (ii) basic principles of fair competition. With respect to the latter point, consumers purchase services and not full sectors (Herrera 2014). This means that by regulating dominant players per service, the regulator guarantees that operators, such as Televisa, do not engage in practices that directly and negatively affect consumers due to excessive market concentration in a particular service.

To illustrate the negative repercussions of a purely sector-based regulation, consider the two following events. First, immediately after the reform was approved, Televisa acquired Cablecom. Prior to the acquisition, Grupo Televisa had approximately 58% of the pay-TV market (Negrete 2014), which, in theory, should position it as a dominant operator. However, since pay TV “belongs” to the telecommunications sector where America Móvil is the dominant operator, in the broad sense, Televisa cannot be dominant. This means that Televisa is able not only to increase its concentration in the pay-TV market, but it also does not even need to inform IFETEL about any potential acquisition (Swaan 2014). Second, in terms of the broadcasting sector, while Televisa has approximately 56% of the free TV market, it holds only 35% of the radio market. Since the law considers both free TV and radio as part of the broadcasting sector, the average of the two services drops below 50%, implying that Televisa is not a dominant operator in this case either (Montalvo 2014).

Consequently, companies with such a significant market share in a particular service can continue expanding their dominance without adequate regulation or concentration limits. That is, the law essentially allows for monopolies in each individual service. To make the situation even worse, IFETEL can only deem operators dominant on a per-sector basis and not per-service.

C. Foreign Investment and the Reform

In the telecommunications and broadcasting sectors, foreign investment is crucial to enable strong competition. The extremely high costs required to enter the market limit the number of potential players (Alvarez 2012). Foreign investment provides the opportunity to attract companies that are well established in other regions of the world and have enough resources to compete against existing operators. The reform had the objective of attracting foreign investment with the goal of increasing competition in Mexico, while at the same time opening the door for Mexican companies to enter international markets (Presidencia de la Republica 2014a). The reform allows foreign investment of up to 100% in telecommunications, including satellite communications; however, it limits investment in broadcasting services at 49%, subject to a reciprocity clause that would allow Mexican players to operate in other regions (Vargas 2014). Unfortunately, the interest of foreign investors has been rather low for several reasons. First, in terms of broadcasting services, investors believe that free TV is much less profitable than many years ago (Hernandez 2014). Second, Televisa and TV Azteca together occupy 94% of the entire market, leaving little room for third parties. Even more discouraging is that, even after two decades in the market, TV Azteca has not been able to gain more than a 30% share (Lucas 2014a). Victor Hugo Ortega, professor in telecommunications at the Tecnológico de Monterrey, points out that the reform is positive in terms of attracting capital, but not in terms of attracting interest from foreign operators (Lucas 2014a). In other words, the reform fails to create an environment that is both attractive and safe for foreign investors.

D. Discussion

So far, the telecommunications reform has failed to establish the rules that could eventually lead to a healthy sector characterized by multiple operators and strong competition. In fact, most of the proposed amendments seem to promote the formation of monopolies that not only affect prices but also service quality, e.g., Internet speeds and television programming content. On one

hand, the reform cornered America Móvil into selling a large portion of its assets in order to remain below the 50% threshold that would otherwise make it dominant in the telecommunications sector. Therefore, certain benefits that smaller competitors would have obtained from enforcing asymmetric regulation (such as the sharing of infrastructure by America Móvil) will most likely disappear. On the other hand, Televisa has the path cleared to take a virtually limitless share in multiple individual services.

IV. Update Infrastructure and Increase Coverage

Reliable, extensive, and modern telecommunications and broadcasting infrastructure is fundamental to improving service penetration/coverage as well as to providing adequate quality of service. Currently, Mexico's infrastructure is strikingly deficient due a lack of competition and incentives necessary for providers to reach out to low-profit or unprofitable regions, e.g., rural communities. Nevertheless, both the telecom reform and the 2014-2018 National Infrastructure Plan propose relatively ambitious projects for the overhaul of the current telecom infrastructure in the near future.

A. Current Situation of the Telecommunications Infrastructure in Mexico

From 1992 to 2011, Mexico invested on average only 1.10% of the country's GDP in telecommunications infrastructure (Presidencia de la Republica 2014b). Since 2009, however, the country has increased its efforts to expand and upgrade existing ICT infrastructure. Unfortunately, the World Economic Forum (WEF) reports that, despite these efforts, Mexico has not been able to compete with more advanced economies (Benat Bilbao-Osorio 2014). Mexico ranks 79th out of 148 countries in the 2014 WEF's Networked Readiness Index (NRI)—which measures the performance of multiple economies (nations) in leveraging information and communication technologies to improve social welfare and sector competitiveness—after a dramatic drop of 16 positions from the previous year. Beyond competition and regulation, the WEF attributes such poor performance to the high cost of accessibility to ICT infrastructure, the poor quality of Mexico's educational system, the low capacity of Mexican companies to innovate, and the lack of engagement in high-productivity activities and knowledge-intensive jobs (Benat Bilbao-Osorio 2014).

Similarly, the International Telecommunications Union (ITU) ranked Mexico 83rd out of 157 nations of the 2012 ICT Development Index (IDI), with a score below the average of the Americas region, where only the United States and Canada qualify as developed countries. This index measures and compares the development of information and communications technologies in various countries by combining 11 different indicators that fall within the following three categories: (i) ICT access; (ii) ICT use; and (iii) ICT skills. In other words, it considers the availability of infrastructure, service penetration, and usage, as well as the ability of citizens to utilize these services and technologies (International Telecommunications Union 2013).

In the last couple of years, the increased demand for Internet connectivity and pressure from several institutions have resulted in positive actions such as the installation of the first Internet exchange point (IXP) in Mexico (Onofre 2014). An IXP is an essential part of the Internet architecture that enables the interconnection of traffic from different ISPs. Regional airport hubs are typically used as an analogy to explain the principle behind the use of IXPs. In airports hubs, airlines exchange passengers from one flight to another in a way that is similar to traffic across an IXP (Jensen 2009). The absence of an IXP in Mexico meant that a portion of Internet traffic had to exit the country in order to be routed to the party on the other end, even when both communicating ends were within Mexico. The benefits of IXPs, especially in developing countries, are well known. In general, these benefits include increasing development of Internet infrastructure, enhancing participation in the Internet economy, and providing a platform for new competitors, thus fostering competition (Gerson 2012). In addition, IXPs reduce the cost of Internet data transit by keeping traffic local while at the same time reducing traffic latency. An example of this is found in a recent study on the impact of IXPs in Kenya and Nigeria (Michael Kende 2012), which showed promising results ranging from a dramatic latency reduction to a large increase in mobile data revenues due to the installation of IXPs.

The absence of IXPs in a country can be attributed in part to a lack of open and competitive telecommunications markets (Jensen 2009). In the case of Mexico, a report by the OECD on Internet traffic exchange argues that the dominance of Telmex is a key contributor to the absence, until 2014, of a single IXP in the country (Weller 2013). On one hand, Telmex executives argue there is no need for an IXP because only a small fraction of traffic has to exit

the country (Lucas 2013). Through agreements with companies such as Google and Akamai, Telmex has access to popular content stored in Grupo Carso Telecom's centers.¹¹ At the same time, Telmex's agreements with other ISPs allow these companies to access the content without the need for traffic to exit the country. The installation of IXPs leads to neutral Internet traffic control and management instead of a situation where a carrier dictates the rules and other aspects such as pricing. An IXP also eliminates any costs imposed by Telmex related to international incoming and outgoing data traffic. Thus, as pointed out by the Telmex executives, an IXP is not essential to maintain the necessary connectivity, but it is essential to lower the costs of traffic exchange.

Certainly, the installation of an IXP will not solve the major issues affecting the telecom sector; nonetheless, it provides an opportunity for increased competition and potentially lower prices for consumers.

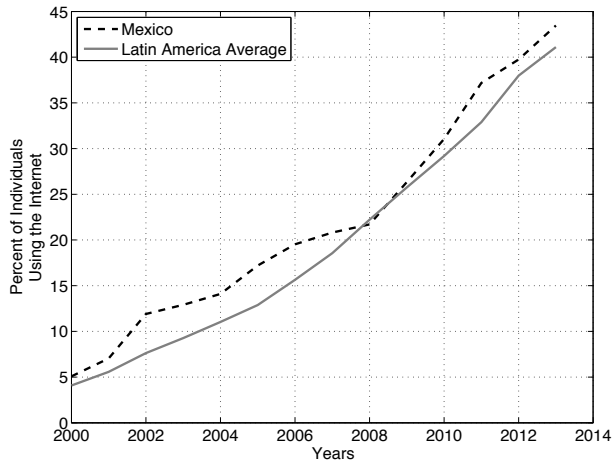
B. Increased Demand and Need for Telecommunication Services

A combination of the skewed income distribution in Mexico and the lack of market competition is hampering the use of telecommunication technologies in many regions of the country. In spite of this problem, there has been a large increase in Internet usage in Mexico in the last decade, even compared to other countries in Latin America. According to Mexico's Census Bureau, INEGI (which stands for Instituto Nacional de Estadística y Geografía), in 2013 there were approximately 46 million Internet users six years of age and older in the country. This represents about 43.5% of the entire population of Mexico, and a substantial user growth of almost 548% since 2001 (from 7.1 to 46 million users).¹² Figure 3 compares the percent of individuals using the Internet in Mexico and other Latin American countries. For the most part, Mexico shows a greater percentage of individuals using the Internet since the year 2000.

¹¹ Carso Global Telecom is the Mexico-based holding company with majority stake in Telmex.

¹² The same number is reported in the ITU 2014 ICT Indicators database.

Figure 3. Percent of individuals using the Internet in Mexico and Latin America



Source: Data from the International Telecommunications Union, 2014.

Similarly, electronic commerce has significantly increased by 57% in 2012 and 42% in 2013; about 37% of Internet users engage in online shopping of some sort (Asociación Mexicana de Internet 2013). Web advertising has grown by an average of 35% per year. Also, more than 70% of Internet users in Mexico consider email a critical tool for communication between companies and individuals. Likewise, social networking user penetration is projected to reach an average of 36.6% per year from 2012 to 2017 (eMarketer 2013). The use of online and mobile banking is also expanding. Although only about 1% of mobile subscribers are using such services, the number of banking account holders using mobile banking observed an annual growth of 182% between the years 2011 and 2012 (Consejo Nacional de Inclusion Financiera 2013).

Evidently, there is a tendency toward activities and transactions that completely rely on telecommunication infrastructure, especially on the Internet. In addition, newly imposed rules by the Mexican Tax Authority (SAT) with respect to electronic invoices, as well as incentives provided by the government to incorporate technology into basic education, are expected to further increase utilization of broadband services. The growth in demand and dependency on telecommunication services require strong investments in resilient, efficient, and extensive infrastructure with the capacity to provide all these services to all citizens of Mexico.

C. Future Investment Plans

The budget allocated to the telecommunications sector by the National Infrastructure Plan seeks to guarantee the constitutional right of all citizens to broadband¹³ access (Presidencia de la Republica 2014a). The plan envisions a strong investment of 51.8 billion USD on both terrestrial and satellite infrastructure between 2014 and 2018. Of this 51.8 billion USD, 39 billion USD—or 75% of the total investment—is expected to originate from the private sector. Most of the money will be spent on the construction of new infrastructure, and a small fraction will be used for extending existing infrastructure (PricewaterhouseCoopers Mexico 2014).

In a nutshell, the strategy outlined in the plan has the following objectives (Presidencia de la Republica 2014b):

First, the plan proposes extending the existing fiber optic backbone that belongs to the Comisión Federal de Electricidad (CFE) and allowing other operators to use it to provide their services. Currently, as a state-owned electric utility, CFE has the second-largest fiber optic network in Mexico, after Telmex. In 2012, out of a total of 306,000 km of fiber optic that belonged to different operators, CFE's network consisted of approximately 22,000 km. CFE's "subnetwork" covers approximately 50% of the population. For many years the CFE used this network solely to control its electricity/energy infrastructure. However, in 2006—via a concession granted by the Secretariat of Communications and Transportation (SCT)—CFE gained the right to offer a telecommunications service as an information/data carrier; nevertheless, CFE is not obligated to provide any service on such infrastructure (Alvarez 2012). The 2013 constitutional reform ordered the CFE to transfer the network concession obtained in 2006 (including equipment and infrastructure) to Telecomunicaciones de Mexico (Telecomm Telégrafos¹⁴)—a public, decentralized institution that provides telecommunications, telegraph, and basic financial services in Mexico—for the operation and exploitation of these resources. Approximately 700 million USD is targeted for this project.

¹³ The term broadband has no exact technical definition and has been primarily used for marketing purposes. The fast evolution of technology makes it difficult to establish a fixed minimum threshold in terms of bits-per-second. According to the Infrastructure Plan, Mexico will adopt the threshold recommended by the ITU and OECD; nonetheless, these do not necessarily agree with each other. IFETEL needs to establish the exact speed and periodically update this according to the deployment of new technologies.

¹⁴ See <http://www.telecomm.net.mx/>.

Second, in combination with the 2014 telecom reform, the plan proposes the installation of a mobile services network that uses both the 700 MHz and 2.6 GHz frequency bands. This project will require an investment of approximately 10 billion USD. The reform mandates the complete transition from analog to digital TV by the end of 2015. In some regions of the country, especially in north Mexico, the 700 MHz band is used for free TV broadcasting services. Thus, with this transition, a portion of the spectrum will be “liberated” and can be used for purposes other than TV broadcasting, e.g., broadband/data access.

The government opted to adopt an uncommon business model that establishes a public-private partnership where the state will select a wholesale operator that will deploy and manage the 700 MHz band in collaboration with Telecomm. At the moment, it is believed that the state intends to only provide infrastructure resources to operators instead of providing service to end-users. Nonetheless, further details about the operation of the network need to be addressed by IFETEL. Currently, several foreign operators such as Nokia Networks, Huawei, Cisco, Alcatel-Lucent, Ericsson, and Motorola have started drafting project proposals for the exploitation of approximately 90 MHz within the 700 MHz band (Lucas 2014b). The winner will be selected by mid-2015.

It should be noted that the operation of the 700 MHz band and the extension/utilization of the CFE fiber network are part of the same project. This project has the objective of deploying and managing a large wholesale network that exploits both resources.

Third, the plan allocates 1.4 billion USD for the project Mexico Conectado, which has the objective of achieving “universal” Internet access within the nation—that is, to provide broadband access to 250,000 public areas including hospitals, schools, libraries, parks, etc.

Fourth, 600 million USD will be invested in the consolidation of the satellite system in Mexico, Mexsat, which will provide both fixed and mobile satellite connectivity across the entire nation. This project involves the deployment of two more satellites (Centenario and Morelos III), in addition to the one already in orbit (Bicentenario), as well as the joint operation of these three satellites.

While the National Infrastructure Plan is ambitious, the metric that will be used to determine its success is rather weak and imprecise. Although widely used to measure the number of broadband Internet users, this indicator (i.e., indicator HH7) only measures how many individuals (6+ years old) have had access to the Internet in the last 12 months, from any location (International Telecommunication Union 2014). That is, it does not directly reflect how many homes have broadband access or whether individuals are frequent/active users. This metric should be combined with other indicators that are also recommended by the ITU such as (i) metric HH6, which measures the proportion of households with Internet; (ii) metric HH8, measuring the proportion of individuals using the Internet, by location; and (iii) metric HH12, which measures the proportion of individuals using the Internet, by frequency.

Surely, such a large investment in infrastructure can potentially spur competition and improve both service costs and quality. These infrastructure projects are necessary for Mexico's telecommunications sector to keep up with 21st century technologies and services already provided in other countries. As outlined here, however, aspects of the plan lack detail and audacity, and its successful execution is still pending.

V. Strengthen Consumer and Citizen Rights

The reform provides some direct benefits to consumers, including the elimination of certain fees such as long distance charges. Nonetheless, it also raises major concerns with respect to the violation of the fundamental rights of all citizens. The final outcome of the reform notably contradicts the original objectives, especially in matters of consumer rights. In fact, it explicitly violates the rights to privacy, free speech, and assembly by proposing the following modifications (Nexos 2014; Presidencia de la República 2014a; Brito 2014):

First, the law demands that cell phone carriers collect and retain consumer data such as origin and destination of a call, date/time, duration, etc. (i.e., communications metadata) for a period of 24 months, without any transparency clauses related to the process. Second, it provides “competent authorities” with the ability to intervene in private communications, and to obtain the

real-time geolocation of citizens without a court order. Third, it enables the arbitrary interruption of telephone service to stop the perpetration of a crime.

Congress passed these items on the pretext of national and public security. Nonetheless, ironically, they raise major security concerns, especially during emergencies (e.g., indiscriminately blocking cell phone signals, and violation of privacy). In addition, passing these legal provisions revealed misleading and deceptive actions by the government during the legislative process. In particular, the modification with respect to signal blockage was supposed to be removed “to avoid debates related to nonessential topics” as indicated by Senator Emilio Gamboa, who is affiliated with the PRI (Aristegui Noticias 2014). Nonetheless, at the end, Congress passed this provision.

The first two items above potentially violate the right to privacy, whereas the third item infringes on freedom of speech, assembly, and, possibly, free press. The key problem with these provisions is the ambiguity with which they were drafted. For instance, while privacy is not an absolute right and can be curtailed via judicial intervention, human rights guidelines outlined in the United Nations Universal Declaration of Human Rights should be meticulously followed (Aristegui Noticias 2014). A proper procedure would involve indicating which authorities can rightfully perform such actions, the specific circumstances under which this can be enforced, and the required regulation to avoid abuse of authority (Aristegui Noticias 2014); nonetheless, none of these steps are clearly addressed in the reform. This is worrisome, especially in light of Mexico’s reputation for high levels of corruption.

There are several other negative aspects of the reform directly affecting consumers (Brito 2014; Alvarez 2014; Lucas 2014c). First, the reform includes an increase of 2% (for a total of 18%) of time allotted for daily advertising content in television without constraining this amount on a per-hour basis (subject to the production of national content such as local news, or other entertainment programs), meaning that more publicity content can appear during prime time hours.

Second, the law discriminates against indigenous groups and community radios by limiting their funding sources to government funding only, i.e., federal/provincial/municipal funding, thus potentially compromising their editorial independence. These groups are not allowed to commercialize any of their broadcasting time and rely solely on the budget provided by these three government levels (about 1% of the total federal, state, or municipal budget). Additionally, in contrast to commercial radio, which is not limited to a particular portion of the electromagnetic spectrum used for AM/FM radio, indigenous groups and community associations were assigned a specific portion at the high end of the FM band. This band is already occupied in several regions of the country, thus preventing such groups from using those frequency channels.

Third, under the law, the Secretariat of the Interior (or SEGOB), a secretariat created for political control, will supervise and regulate content and punish violators. This is a function that should be the responsibility of the regulatory body instead.

Fourth, the law requires providers of applications, services, and content, to comply with competent authorities in matters of traffic monitoring.¹⁵

On a positive note, the reform does provide some direct benefits to consumers: (i) the elimination of long distance calling fees (fixed-line and mobile); (ii) free balance verification on prepaid phones; (iii) an extension of the balance expiration date on prepaid phones; (iv) the ability to switch carriers in less than 24 hours and without any constraints; (v) free Internet access in 250,000 parks and public areas; and (vi) the right to access to all free TV channels via pay TV without any additional cost (Presidencia de la Republica 2014).

At the moment, however, the negative aspects of the reform substantially outweigh the direct and immediate benefits for consumers. There are concrete modifications that will contribute to immediate lower prices, but these changes can be best described as superficial and will not be

¹⁵ The law does so without specifying which authorities or activities it refers to. This puts at risk Internet net neutrality and opposes net neutrality principles (Kramer 2013).

able to solve any of the core problems—a weak regulatory environment, insufficient infrastructure, and a lack of market competition—affecting the telecom sector.

VI. Sector Regulation

Effective and adequate regulation is fundamental to the development of the telecommunications sector. Historically, the regulatory framework pertaining to information and communications technologies in Mexico has been considered weak and deeply flawed. In fact, the WEF currently puts Mexico in 114th place with respect to the efficiency of law-making bodies, i.e., the national Congress (Benat Bilbao-Osorio 2014). This deficient framework can be attributed to a combination of factors. These include the lack of an autonomous regulatory agency that oversees all sector activity, a cumbersome concession-granting process, a unique but unacceptable injunction system (affecting new entrants and the policymaking process), and a poor penalty enforcing structure (Alvarez 2012; OECD 2012). While the 2013 constitutional reform took a major step forward in the overhaul of the regulatory institutions by granting IFETEL full autonomy, the secondary laws introduced several clauses that violate this autonomy. Unfortunately, this will lead to a seemingly perpetual injunction-based system where the decisions of the regulatory body will continue to depend on other state institutions.

A. Regulatory Institutions in Mexico Before the 2013 Constitutional Reform

For many years, the three major institutions regulating the telecom sector and implementing public policy processes had been the SCT, the Federal Telecommunications Commission (COFETEL), and the Federal Competitiveness Commission (COFECO).¹⁶ Although COFETEL was created with the purpose of establishing a regulatory agency, its authority has been largely undermined by its direct dependence on SCT in multiple areas.

In theory, the SCT was primarily responsible for the political aspects surrounding the telecommunications sector, including granting and revoking concessions, whereas COFETEL oversaw technical aspects/standards, pricing, and competition issues, including resolving

¹⁶ In June 2013, the Federal Competitiveness Commission (COFECO) became the Federal Commission on Economic Competition (COFECE).

disputes between competitors. In practice, however, in most instances COFETEL only provided opinions and acted as a consulting body to SCT. In addition, its powers for imposing sanctions were very limited. Likewise, COFETEL had “insufficient budgetary independence” (OECD 2012). These were some of the limitations that made it difficult for COFETEL to perform the tasks required to achieve its objective. In contrast to COFETEL’s situation in telecommunications matters, in terms of TV and radio broadcasting, COFETEL retained a wide range of powers with respect to regulation and sanctions. Even though COFECO and COFETEL had similar institutional status, COFECO—unlike COFETEL—had the power to take enforcement actions in competition matters.

In general, there was never a clear distinction between policy formulation and regulatory functions (OECD 2012), meaning that the responsibilities of SCT and COFETEL were not clearly separated by the law. This led to overlapping functions and to an ineffective regulatory framework commonly known as a “double window” (Alvarez 2012; Jana Palacios 2013).

B. The Concession Process, Injunction System, and Penalty Enforcement

Historically, the concession process in Mexico—for both mobile and fixed communications—has been unnecessarily complex and time consuming. This process falls directly under the double window mechanism where COFETEL provides suggestions with respect to the clauses and obligations attached to a given concession, and then SCT decides whether to grant the concession or not. This is not only slow and inefficient, but also prevents the entrance of potential new competitors. Based on OECD recommendations, this process should follow a model of market access where registration is sufficient for market entrance purposes in certain sectors such as fixed communications. Certainly, due to the scarcity of frequency bands, all spectrum-related matters should undergo a more rigorous concession-granting process.

Similarly, the legal injunction system adopted by Mexico limits the power of decisions made by regulatory institutions. An extremely high number of injunctions have allowed companies to temporarily suspend or even nullify regulatory decisions (OECD 2012). In some cases, the intervention of a court is necessary to ensure fair regulation, but the original decision made by the regulatory agency should remain active at least until a court reaches a decision with respect

to that particular injunction. By freezing regulatory decisions, market incumbents can cause significant financial damage to new entrants. In addition, there have been situations in which the judiciary manages to define certain policies and regulations even if they are not within its area of expertise (OECD 2012). The abuse in the use of injunctions has been considered one of the greatest problems in fostering competition in Mexico's telecommunications sector.

Finally, the lack of penalty enforcement has led to a constant violation of concession obligations. Fines imposed in Mexico are considered extremely low, especially for dominant players; the more severe ones are considered too extreme and unreasonable (OECD 2012). For example, license revocation is the strongest tool that can be used by SCT; however, it is unrealistic to think this would be a sanction used against Telmex, for example, because the entire country depends on its services.

C. Telecommunications Reform and Its Impact on Regulatory Institutions

In matters of telecommunications, perhaps the most fundamental adjustment within the 2013 constitutional reform pertains to regulatory bodies. The reform dissolved COFETEL and created IFETEL. Following well-known best practices around the world, IFETEL was given full autonomy (OECD 2012). Unfortunately, the reform's secondary laws considerably weakened this autonomy.

The secondary laws distributed telecom-related powers and responsibilities among the following institutions: IFETEL, Profeco, SCT, SEGOB, Secretaría de Hacienda, and Secretaría de Educación. Although IFETEL is responsible for regulating and promoting competition in telecommunications and broadcasting matters, it will depend highly on these other institutions. For example, in matters of content, IFETEL can review and evaluate material but cannot impose any sanctions. Sanctioning, rather, is decided by SEGOB, thus yielding control of broadcasting content to the government and possibly exposing consumers to greater political manipulation. Similarly, in terms of consumer rights, any dispute between a telecom service provider and a consumer is responsibility of the Profeco and not IFETEL.

Additionally, the secondary laws do not require companies that are not considered dominant in a specific sector—including Televisa—to inform IFETEL of corporate acquisitions. As noted, although IFETEL was given the power to declare a company dominant, it can only do so if dominance occurs in a sector, not in a service. With respect to the injunction system, under situations that involve competition penalties, these penalties will only proceed after the injunction process is finalized. For example, in case of a competition-related violation that leads to a fine, the party requesting the injunction does not have to pay IFETEL until the legal situation is resolved (Poder Ejecutivo 2014).

On a more positive note, in terms of concessions and licensing, the roles have been reversed and IFETEL can now grant and revoke concessions whereas SCT can only provide its opinion on this matter. In addition, IFETEL was given some authority to impose sanctions in cases where concession obligations have been violated. IFETEL is also responsible for the bidding and frequency spectrum resource assignment processes, as well as for resolving conflicts in matters of interconnection¹⁷ (Poder Ejecutivo 2014).

In order for IFETEL to perform its duty as an “autonomous regulator,” however, it is actually forced to work directly with institutions that belong to the state. The new reform has led to a much weaker institutional framework than what was initially expected with the 2013 constitutional reform. Certainly, some of the provisions that appear in the secondary laws contradict those outlined by the constitutional reform and can be brought to the Supreme Court for evaluation, especially those related to the autonomy of IFETEL. Unfortunately, IFETEL decided not to initiate such an evaluation process, therefore renouncing to its rights and obligations as established in the constitution (Aristegui Noticias 2014b). IFETEL has been operating for only a few months and it is difficult to predict its future performance. As mentioned before, the success of its role as regulator will depend on the execution of its remaining responsibilities and powers.

¹⁷ Interconnection refers to the establishment of a physical link between networks belonging to two or more different operators/carriers.

VII. Conclusions

The objectives of the 2013 constitutional reform on telecommunications reflected an understanding by different government institutions of the weakness of the Mexican telecommunications sector. Unfortunately, the multiple bill drafts proposed by the executive and the legislative branches, as well as the legislative process itself, revealed that the state is not willing to take the steps necessary to eliminate the root cause of deficiencies in this sector. In particular, to ensure that consumers benefit from lower prices and better quality of service, adequate market competition and strong sectorial regulation are imperative. So far, however, the 2014 telecommunications reform does not seem to meet the first objective; it has similarly failed at establishing a strong basis for autonomous regulation. More importantly, most provisions in the reform fell short of their original objectives. Regulations to increase competition across the industry actually only targeted one player—América Móvil. IFETEL obtained only partial “autonomy.” Consumers will benefit from a few cost reductions but will have to sacrifice more of their privacy and basic human rights. Legal provisions such as data retention, content regulation by SEGOB, and geolocation, among others, will only lead to greater government control over citizens without providing significant benefits to them.

It will take time to determine the positive and negative effects of the reform on the telecommunications sector. The infrastructure plan and a few of the responsibilities assigned to IFETEL can be of great benefit to the sector. Again, however, the ultimate success of reform will depend upon execution.

Acknowledgements

This research paper was made possible through the advice and support of Tony Payan, Ph.D., director of the Mexico Center at Rice University’s Baker Institute for Public Policy, and Dylan McNally, Mexico Center research analyst.

References

- Akamai Technologies. 2014. "Akamai's State of the Internet." Retrieved September 2014 from http://www.akamai.com/dl/akamai/akamai-soti-q114.pdf?WT.mc_id=soti_Q114.
- Alvarez, C. L. 2012. *Derecho de las telecomunicaciones*. Universidad Nacional Autónoma de Mexico: Mexico City.
- Alvarez, C. L. July 2014. "Regalos a Televisa y TV Azteca." Retrieved August 2014 from Aristegui Noticias, <http://aristeguinoticias.com/0107/Mexico/regalos-a-televisa-y-tv-azteca-articulo-de-clara-luz-alvarez/>.
- Aristegui Noticias. April 2014. "Habrá cambios a leytelecom; descartada, censura al Internet: Gamboa." Retrieved July 2014 from Aristegui Noticias, <http://aristeguinoticias.com/2304/Mexico/habra-cambios-a-leytelecom-descarta-censura-al-internet-gamboa/>.
- Aristegui Noticias. September 5, 2014. "¿Cómo le hizo el IFT para ignorar 52 irregularidades de la Ley Telecom?: De Swaan." <http://aristeguinoticias.com/0509/mexico/como-le-hizo-el-ifetel-para-ignorar-52-irregularidades-de-la-ley-en-telecom-mony-de-swaan>.
- Asociacion Mexicana de Internet. 2013. Estudio de Comercio Electronico Mexico. Retrieved from Asociacion Mexicana de Internet AC, https://www.amipci.org.mx/estudios/comercio_electronico/131028_-_Comunicado_Estudio_Comercio_Electronico2013-Proyecto-V3_-_REV.pdf.
- Benat Bilbao-Osorio, S. D. 2014. *The Global Information Technology Report 2014*. World Economic Forum.
- Brito, C. July 2014. "#DesventajasTelecom que ni Televisa ni el gobierno te van a decir." Retrieved August 2014 from Animal Politico, <http://www.animalpolitico.com/blogeros-blog-invitado/2014/07/12/desventajastelecom-que-ni-televisa-ni-el-gobierno-te-van-decir/#ixzz37GZ9LoSY>.
- Cantu, J. July 2014. "Ley telecom: La frustracion." <http://www.proceso.com.mx/?p=377310>.
- Consejo Nacional de Inclusion Financiera. 2013. "Quinto Reporte de Inclusion Financiera." Retrieved August 2014 from Consejo Nacional de Inclusion Financiera, <http://www.cnbv.gob.mx/Inclusión/Documents/Reportes%20de%20IF/Reporte%20de%20Inclusion%20Financiera%205.pdf>.

- Consortio para el Intercambio de Trafico. April 2014. *Inauguracion del Primer IXP Mexicano*. Retrieved August 2014 from IXP, <http://ixp.mx/>.
- eMarketer. November 2013. "India leads worldwide social networking growth." Retrieved November 2014 from eMarketer, <http://www.emarketer.com/Article/India-Leads-Worldwide-Social-Networking-Growth/1010396>.
- Ferro, I. July 2013. "Summary: Mexico's telecom reform." Retrieved from Americas Society Council of the Americas, <http://www.as-coa.org/articles/summary-Mexicos-telecom-reform>.
- Fisher, L. May 29, 2014. "Mexico's telecoms war." Retrieved June 2014 from Latin America Bureau, <http://lab.org.uk/Mexicos-telecom-war>.
- Gerson, P. S. August 11, 2012. "A primer on Internet exchange points for policymakers and non-engineers." Retrieved September 26, 2014, from Social Science Research Network, http://papers.ssrn.com/sol3/papers.cfm?abstract_id=2128103.
- Hausman, Jerry A. and Agustin J. Ros. June 2012. "Correcting The OECD's Erroneous Assessment of Telecommunications Competition in Mexico." *CPI Antitrust Chronicle*.
- Hernandez, L. September 8, 2014. "Poco apetito de inversionistas." Retrieved September 14, 2014, from 24 Horas, <http://www.24-horas.mx/poco-apetito-de-inversionistas/>.
- Herrera, J. A. July 10, 2014. "Preponderancia y dominancia." Retrieved September 12, 2014, from Capital de Mexico, <http://capitaldeMexico.com.mx/index.php/entre-bandas-detalle/54350-preponderancia-y-dominancia>.
- Instituto Nacional de Estadística y Geografía. 2014. "Estadísticas a Propósito del Día Mundial de Internet." INEGI.
- International Telecommunications Union. 2013. "Measuring the Information Society."
- International Telecommunications Union. 2014. "Manual for measuring ICT access and use by households and individuals."
- International Telecommunications Union. 2014. "World Telecommunication/ICT Indicator Database."
- Jensen, M. 2009. "Promoting the Use of Internet Exchange Points: A Guide to Policy, Management, and Technical Issues." Internet Society.
- Kende, Michael and Charles Hurpy. April 2012. "Assessment of the impact of Internet Exchange Points—empirical study of Kenya and Nigeria." A report for the Internet Society.

- Kramer, Jan, Lukas Wiewiorra, et al. 2013. "Net neutrality: A progress report." *Telecommunications Policy* 37, no. 9 (2013): 794-813.
- Levy, I. August 2014. "Controversia constitucional o anular al Ifetel." Retrieved August 2014, from *El Universal*, <http://www.eluniversalmas.com.mx/columnas/2014/08/108227.php>.
- Levy, I. July 2014. "Esta no es una leytelecom." Retrieved August 2014 from Aristegui Noticias, <http://aristeguinoticias.com/1407/Mexico/esta-no-es-una-leytelecom-articulo-de-irene-levy/>.
- Lucas, N. November 11, 2013. "Innecesario un IXP mexicano: Telmex." Retrieved September 10, 2014, from *El Economista*, <http://eleconomista.com.mx/tecnociencia/2013/11/07/innecesario-ixp-mexicano-telmex>.
- Lucas, N. September 3, 2014a. "Arranca la carrera por las cadenas de TV , pero sin interes de extranjeros." Retrieved September 14, 2014, from *El Economista*, <http://eleconomista.com.mx/industrias/2014/09/02/cadenas-tv-Mexico-no-apantallan-extranjeros>.
- Lucas, N. September 7, 2014b. Motorola también se apunta para la banda de 700 MHz. Retrieved September 26, 2014, from *El Economista*, <http://eleconomista.com.mx/industrias/2014/09/04/motorola-tambien-quiere-red-compartida-banda-700-mhz>.
- Lucas, N. September 7, 2014c. "Radio indígena, la desprotegida de la reforma telecom." Retrieved September 16, 2014, from *El Economista*, <http://eleconomista.com.mx/industrias/2014/09/04/radios-comunitarias-las-desprotegidas-reforma-telecom>.
- Montalvo, T. L. July 2, 2014. "El dictamen de telecom abre la puerta para la creacion de monopolios." Retrieved September 10, 2014, from Animal Politico, <http://www.animalpolitico.com/2014/07/el-dictamen-de-telecom-abre-la-puerta-para-la-creacion-de-monopolios/#axzz3ATxHK1i3>.
- Montes, J. July 2014. "New telecom rules in Mexico clear Senate hurdle." Retrieved July 2014 from the *Wall Street Journal*, <http://online.wsj.com/articles/new-telecom-rules-in-Mexico-clear-senate-hurdle-1404579737>.

- Negrete P., et al. August 17, 2014. "Televisa captura mercado de TV de paga." Retrieved September 13, 2014, from Mediatelecom, <http://www.mediatelecom.com.mx/index.php/agencia-informativa/colaboradores/item/71698-televisa-captura-mercado-de-tv-de-paga.html>.
- Nexos. July 2014. "Telecomunicaciones: ley para un Estado policial." Retrieved July 2014 from Nexos, <http://redaccion.nexos.com.mx/?p=6354>.
- Norma Oficial Mexicana NOM-184-SCFI-2012. August 2012. Retrieved August 2014 from Diario Oficial de la Federacion, http://www.dof.gob.mx/nota_detalle.php?codigo=5265386&fecha=24/08/2012.
- Organizacion de los Estados Americanos (OEA). 2011. "Declaracion conjunta sobre libertad de expresion e Internet." Retrieved June 2014 from OEA, <http://www.oas.org/es/cidh/expresion/showarticle.asp?artID=849&IID=2>.
- OECD. 2013. *OECD Communications Outlook*. OECD Publishing.
- OECD. 2012. *OECD review of telecommunication policy and regulation in Mexico*. OECD Publishing.
- Onofre, J. S. May 16, 2014. "Primer IXP en Mexico, una realidad." *El Economista*. Retrieved September 12, 2014, from *El Economista*, <http://eleconomista.com.mx/tecnociencia/2014/04/30/primer-ixp-Mexico-realidad>.
- Palacios, J., E. Flores-Roux, and Z.A. Garcia. 2013. "Diagnostico del Sector TIC en Mexico: Conectividad e Inclusion Social Para la Mejora de la Productividad y el Crecimiento Economico. Instituto Mexicano Para la Competitividad y Telecom-CIDE."
- Poder Ejecutivo. July 14, 2014. Ley Federal de Telecomunicaciones y Radiodifusion–Leyes Secundarias. Diario Oficial de la Federacion. Mexico: Diario Oficial de la Federacion.
- Presidencia de la Republica. July 14, 2014. "Infografia–Estos son los beneficios de la reforma en telecomunicaciones." Retrieved September 12, 2014, from Presidencia de la Republica, <http://www.presidencia.gob.mx/infografia-estos-son-los-beneficios-de-la-reforma-en-telecomunicaciones/>.
- Presidencia de la Republica. 2014a. Iniciativa de Ley Federal de Telecomunicaciones y Radiodifusion.
- Presidencia de la Republica. 2014b. Programa Nacional de Infraestructura 2014-2018.

- PricewaterhouseCoopers Mexico. 2014. "National Infrastructure Program 2014-2018, Analysis and Opportunities."
- Secretaría de Economía. January 2014. "Catálogo Mexicano de Normas." Retrieved November 4, 2014, from Secretaría de Economía: <http://www.economia.gob.mx/comunidad-negocios/competitividad-normatividad/normalizacion/catalogo-mexicano-de-normas>.
- Sosa, L. May 2014. "Fastest ISPs 2014: Mexico." Retrieved August 2014, from PC Magazine, <http://www.pcmag.com/article2/0%2c2817%2c2457831%2c00.asp>.
- Swaan, M. July 3, 2014. "Reforma Telecom: poderes salvajes y poderes ausentes." Retrieved August 25, 2014, from *Animal Politico*, <http://www.animalpolitico.com/blogueros-blog-invitado/2014/07/03/reforma-telecom-poderes-salvajes-y-poderes-ausentes/#axzz3ATxHK1i3>.
- Vargas, J. C. September 1, 2014. "Cae inversion extranjera directa en el primer semestre del 2014." Retrieved September 14, 2014, from Proceso, <http://www.proceso.com.mx/?p=381066>.
- Weller, D. January 29, 2013. "Internet Traffic Exchange." http://www.oecd-ilibrary.org/science-and-technology/internet-traffic-exchange_5k918gpt130q-en.
- Yahoo Finance. "America Movil Income Statement." Retrieved September 11, 2014, from Yahoo Finance: <http://finance.yahoo.com/q/is?s=AMX+Income+Statement&annual>.