

Post-2015 Development Agenda

Mexico Perspectives



ICT Infrastructure

SPEAKER

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Table of Contents

<i>Summary: White Paper Report by Alexia Gonzalez Fanfalone</i>	1
<i>White Paper Report by Alexia Gonzalez Fanfalone</i>	3
<i>Presentation by Alexia Gonzalez Fanfalone</i>	18

Summary: White Paper Report by Alexia Gonzalez Fanfalone

Information and communications technology (ICT) has become a vital tool for development, with mobile phone access being particularly important in rural areas. Internet access is an important way to help businesses innovate and grow, especially so for the Small and Medium Enterprises (SMEs) that dominate the Mexican economy. This is important across the developing world, and it makes particularly good economic sense in Mexico: investing a Peso in expanding broadband could give back 25 Pesos worth of benefits.

Developing countries are leapfrogging today's rich world by going straight to mobile broadband access rather than investing in costly fixed lines, but there is still a big difference in levels of service. The 'digital divide' is more evident in Mexico than the average developing country, with less than 12% of citizens having mobile broadband access in 2013, in contrast to 75.1% in developed economies (in 2014, the average penetration for all developing countries was 21.1%).

Mexico is around the average for Latin America for overall access to the Internet. About 31% of households had Internet access in 2013. This gave access to over 43% of individuals, but this is lower than the figures for Colombia (52%) or Chile (over 66%). However, 85% of Mexicans have a mobile phone, so mobile broadband is well placed to deliver Internet access to rural and remote areas.

Although fixed broadband connections have their role in towns and cities, mobile broadband can give citizens across the country access to the Internet, including those in rural areas. A World Bank study in 2009 estimated that a 10% increase in broadband penetration in low- and medium-income countries boosted GDP growth by 1.34%.

The benefits it brings are enormous, but its very importance makes it difficult to take full account of its impact, which may be greater than captured in such an analysis. For example, broadband access is not just about economic growth, but also social inclusion. This can help transform societies, rather than simply boosting the growth of GDP.

Providing a mobile broadband service can be very cost effective, since it can cost only a third as much as connecting people via fixed lines. Increasing penetration to 60% by 2030 (from 11.8% in 2013) is a very smart target, delivering benefits of 25 Pesos for each Peso invested. But mobile and fixed broadband connections are complementary, and mobile networks need a backbone of fiber connections between regions. For Mexico, expanding fixed broadband coverage to 20% is also a very cost-effective target.

Expanding mobile broadband to cover 60% of the population is a vast project, which would have to bring 70 million subscribers online in the next 15 years. The costs would be large – nearly \$30 billion – but so would the growth opportunities. The value of the boost to GDP would be about \$800 billion, which amounts to over \$5,300 at current value for every Mexican citizen between now and 2030.

The Mexican government has been well aware of the importance of ICT to the economy and has introduced structural reform to the sector, starting with the creation of a new Communications Regulator in 2013. In the same year, the government launched the National Digital Strategy, and in 2014 a new sector Law came into force.

The authorities now have to enforce the regulations (in the new Law) that remove the barriers to expansion of broadband coverage, while also managing the efficient allocation of the available wireless spectrum to facilitate the deployment of 3G and 4G networks.

White Paper Report by Alexia Gonzalez Fanfalone

The Post 2015 UN development Agenda includes as a target to increase the availability of ICTs in the developing world. The research undertaken for the [Copenhagen Consensus Center](#), published last December 2014, pinned down more specific ICT targets related to broadband deployment with the aim of increasing the impact of this development goal by rendering it more precise and measurable. The [study](#) found that expanding mobile broadband about three-fold in developing regions – from 21 to 60% -- will have a significant cost (about \$1.3 trillion), which represents simply the cost of connecting up about two billion more people to the Internet, but this investment is money very well invested yielding a return **\$17** for every dollar spent.¹

The present paper attempts to put this suggested development target in the Mexican context. Using a similar methodology as the report published in December by the Copenhagen Consensus Center (CCC), it finds that investing in mobile broadband yields a significant benefit for Mexico of around **\$25** for every dollar spent.²

Mexican authorities, aware of the important role that ICTs and telecommunications have in the economy, have recently promoted a constitutional reform (approved June 11 2013) and a new sector law (that came into effect 13 August 2014) to tackle the main issues surrounding the telecommunication sector. The latter will surely play a role in increasing Internet access to the population. However, Mexico is still lagging in terms of broadband penetration, thus this paper discusses some of the main challenges to be faced in this new regulatory framework.³ These policy recommendations are intended as a way to improve the impact of public investment on ICT infrastructure.

¹ The increase of penetration would be from an average level of around 20% in 2014 to a level of 60% in 2030. The resulting Benefit-Cost Ratio (BCR) is in the realm of 14.41 to 21.74 (depending on scenario assumptions and considering a discount rate of 3%).

² The increase of penetration would be from an average level of 11.75% in 2013 in Mexico to a level of 60% in 2030. The adjusted calculation for the BCR in Mexico is in the realm of 23.34 to 27.31 (depending on scenario assumptions and considering a discount rate of 3%). Please note that all figures in this report correspond to ITU data from 2013. Given that Mexico has undergone significant reforms in the telecommunications sector in the past year (2013 to 2014), which include the creation of a new regulator, ITU is currently reviewing 2014 figures on mobile broadband penetration.

Importance of ICT infrastructure and the UN development Post 2015 Agenda

Why do we care about information communication technologies (ICT) infrastructure in the context of the next round of UN development goals? Expanding affordable access to ICT infrastructure has become a priority for policy makers because they are important enablers for social inclusion and economic development.

With the Internet being such an important resource in the modern world, broadband has become a vital platform that boosts economic growth and has the potential to lift people out of poverty (e.g. a World Bank 2009 study showed a 10% increase in broadband penetration increased GDP growth by 1.34% in low to medium income countries). Not only does it help firms' productivity, but also health, education and government services can be delivered through this platform. Therefore, there is a strong case for governments to include broadband access in the next set of UN global targets.

Why do ICTs matter for Mexico?

Several studies have identified ICT infrastructure, and in particular mobile telephony, as a key enabler of rural economic development through different channels like increasing price efficiency and reducing travel costs (see Aker 2010, Parker et al. 2012, Jensen 2007, Fafchamps & Minten 2012).⁴ Furthermore, mobile broadband has the potential to cover a vast country such as Mexico so the government can deliver services such as e-health and e-education to all of its citizens. In general terms, broadband increases efficiency as well as fostering innovations in Small and Medium Enterprises (SMEs) as it increases firms' productivity and produces significant savings by reducing transactions costs. The latter is particularly important for Mexico as SMEs constitute 99.8% of all firms in Mexico, generating 52% of the GDP and 72% of the jobs in the country.⁵ In fact, the Mexican government is very well aware of the benefits this infrastructure has to offer and has recently led structural reforms in the telecommunications sectors, as

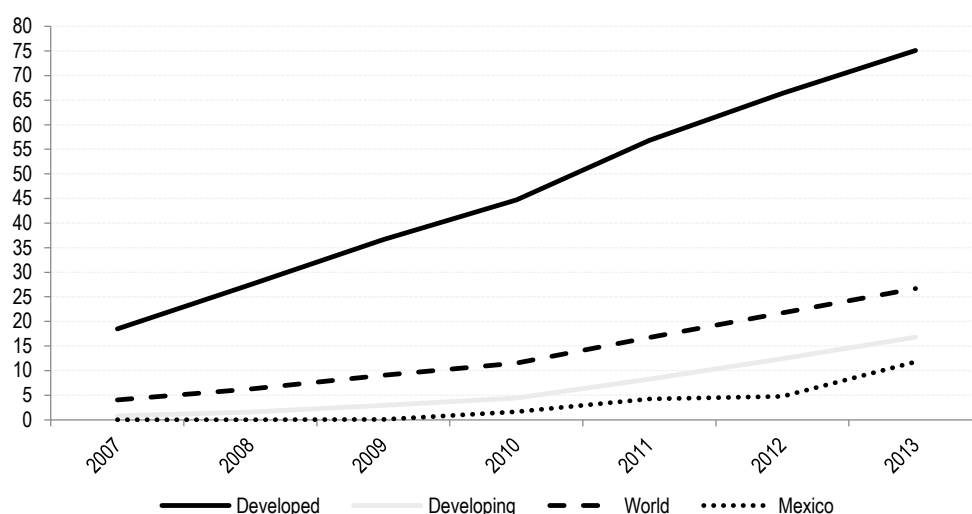
⁴ Through different channels like increasing price efficiency and reducing travel costs (see Aker 2010, Parker et al. 2012, Jensen 2007, Fafchamps & Minten 2012). See http://lirneasia.net/wp-content/uploads/2014/07/4-LIRNEasia_Kapugama_Mobile-phone-impacts_250814.pdf for a review of existing literature. Also find Parker et al (2012) here <http://faculty.london.edu/nsavva/RML22Jul.pdf>

⁵ <http://www.promexico.gob.mx/negocios-internacionales/pymes-eslabon-fundamental-para-el-crecimiento-en-mexico.html>

well as drafting a National Digital Agenda (2013) to ensure broadband coverage as well as competition in the sector.⁶

However, despite tremendous growth in broadband availability around the world in recent years, major differences persist among developed and developing countries (e.g. mobile broadband penetration was only 21.1% in developing countries in 2014 compared to 83.7% in the industrialized world). This '*digital divide*' is even more striking in Mexico, despite recent efforts, as mobile broadband penetration was 11.75% in 2013, less than the average of developing countries of 16.8% for the same year, and far behind developed economies' average of 75.1% in 2013 (Figure 1).⁷

Figure 1: Active mobile Broadband subscriptions per 100 inhabitants



Source: ITU-ICT Eye <http://www.itu.int/net4/itu-d/icteye/Topics.aspx?TopicID=7>

Therefore, Mexico has a strong case for investing in broadband as it could potentially harness incredible growth opportunities. Although Mexican authorities have taken pivotal steps to increase availability of broadband, with further help of the international donor community and adequate regulations in place, it could drastically reduce the *digital divide*.

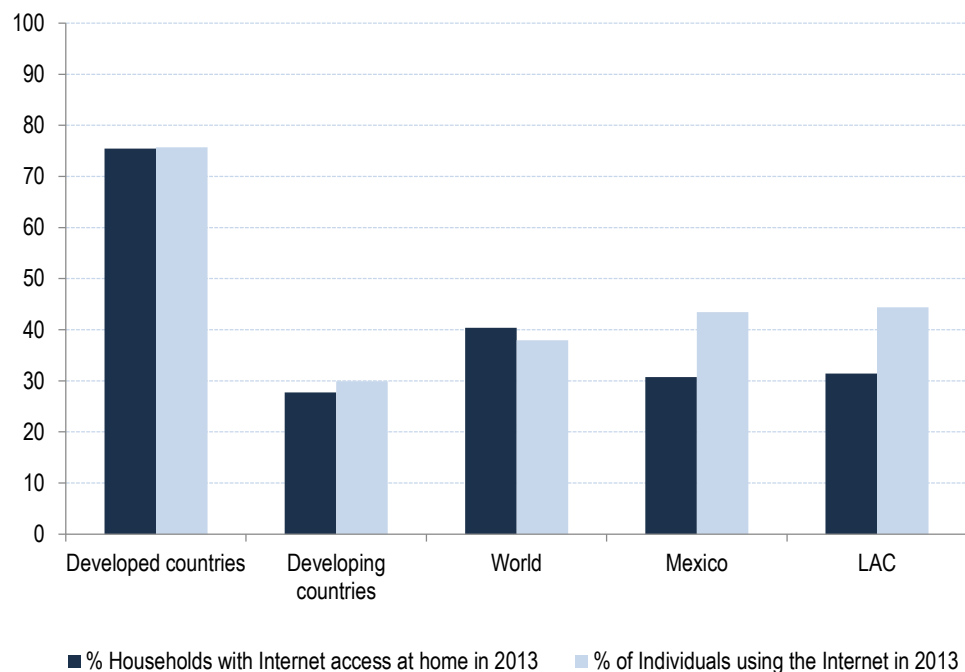
⁶See <http://cdn.mexicodigital.gob.mx/EstrategiaDigital.pdf>

⁷ Please note that all figures in this report correspond to ITU data for the year 2013. Given that Mexico has undergone significant reforms in the telecommunications sector in the past year (2013 to 2014), including the creation of a new regulator, ITU is currently revising 2014 figures on mobile broadband penetration levels.

Status quo of Broadband Infrastructure in Mexico

Mexico performs similar in terms of households connected to the Internet when compared to developing countries' average as well as the Latin America and Caribbean (LAC) regional average (e.g. in 2013 30.7% of Mexican households had Internet access, compared to 28% in developing countries and 31% in the LAC region). However, it still faces a persistent *digital divide* with respect to developed economies, as 75% of households in developed countries had access to Internet in 2013 (Figure 2). With 43.7% of individuals having access to Internet in Mexico in 2013, it fared almost 10 percentage points worse than Colombia (i.e. 52%), lagged behind Chile (i.e. 66.5%), and was way behind developed countries' average of 76%.⁸

Figure 2: Household and Individual access to the Internet in 2013



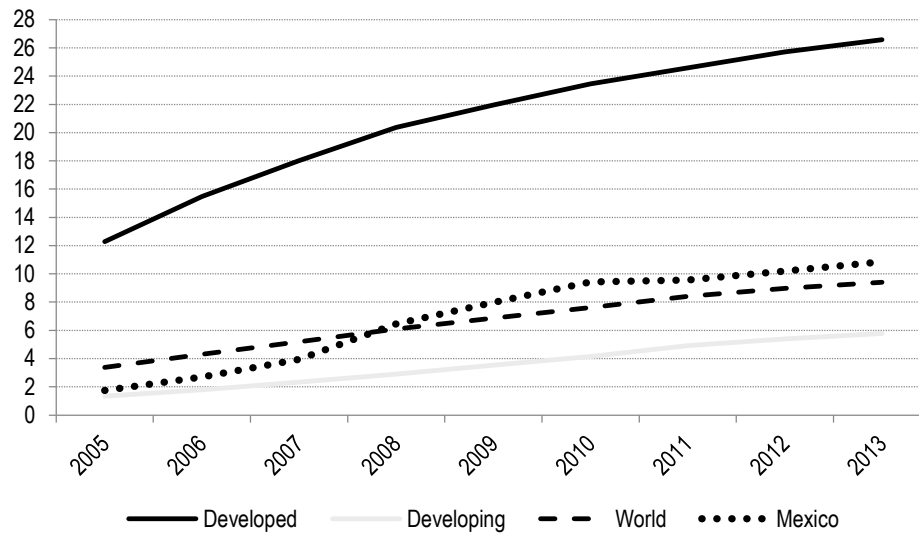
Source: ITU-ICT Eye <http://www.itu.int/net4/itu-d/icteye/Topics.aspx?TopicID=7>

Mexico's fixed broadband penetration of 10.85% in 2013 was slightly above the developing countries' average of 6%, and fairly aligned with the regional average (i.e. LAC average was 8.7% in 2013).⁹ However, it is still far from developed countries' average of 26.6% (Figure 3).

⁸ See <http://www.itu.int/ITU-D/ict/statistics/explorer/index.html>

⁹ Source of data is ICT Eye for the year 2013, taking into account the average of The Americas, excluding the United States and Canada.

Figure 3: Fixed (wired) broadband subscriptions per 100 inhabitants, 2005-2013



Source: ITU-ICT Eye <http://www.itu.int/net4/itu-d/icteye/Topics.aspx?TopicID=7>

Furthermore, Internet connections in Mexico are 2.5 times slower than connections in the United States (i.e. 4.5 Mbps versus 11.1 Mbps, Akamai 2014), and slower than the average broadband connection speed in Chile (i.e. 5). High broadband penetration, meaning connections with speeds above 10 Mbps, are still quite insipient in Mexico (e.g. only 3.5% of connections exhibit these speeds, compared to 5.8% of connections in Chile, 9.9% Uruguay and 39% in the United States, see Figure 4).¹⁰

¹⁰ "State of the Internet Q4 2014": <http://www.akamai.com/stateoftheinternet/soti-visualizations.html#stoi-map> . Also see <http://www.akamai.com/dl/soti/q4-2014-soti-infographic.pdf>

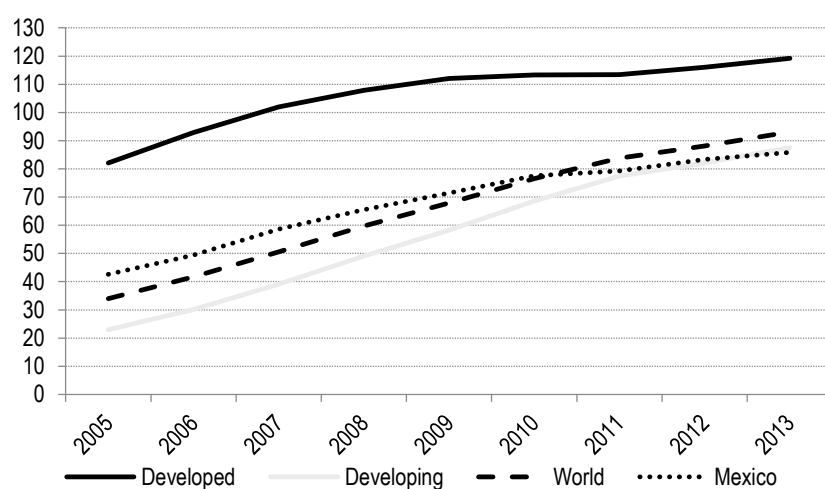
Figure 4: High Speed Broadband Connectivity, America (Akamai)

Global Rank	Country/Region	% Above 10 Mbps	QoQ Change	YoY Change
17	United States	39%	-0.3%	20%
18	Canada	38%	14%	44%
45	Uruguay	9.9%	37%	371%
50	Argentina	7.4%	32%	444%
53	Chile	5.8%	73%	371%
59	Mexico	3.5%	27%	77%
62	Colombia	2.0%	73%	528%
63	Brazil	1.9%	19%	125%
–	Ecuador	2.4%	0%	105%
–	Peru	1.3%	66%	674%
–	Panama	0.9%	13%	79%
–	Costa Rica	0.8%	2.3%	111%
–	Venezuela	0.2%	-11%	166%
–	Bolivia	0.1%	0%	89%
–	Paraguay	0.1%	73%	418%

Source: Akamai, State of the Internet Q4 2014 Figure 23, High Broadband (>10 Mbps) Connectivity by Americas Country

On the bright side, most people from developing countries are getting online for the first time through mobile phones (LIRNEasia, 2014). In Mexico, similar to most developing countries, mobile telephony is the most readily available ICT good in the population (e.g. mobile telephony penetration grew from 13.5% in the year 2000 to 85% in 2013, see Figure 5).

Figure 5: Mobile telephony subscriptions per 100 inhabitants, 2005-2013



Source: ITU-ICT Eye <http://www.itu.int/net4/itu-d/icteye/Topics.aspx?TopicID=7>

Therefore, mobile broadband may play a crucial role to reach end users in rural and remote areas in Mexico given that it is a cost effective solution. However, it is important to state that fixed broadband infrastructure is complementary to the deployment of mobile broadband networks, as the latter rely on good backhaul and backbone fiber connectivity. Although fixed networks are indeed present in Mexico, they have been characterised by a historical incumbent owning most of the infrastructure. Thus, Mexican authorities should strive to tackle the infrastructure bottlenecks prevalent in wholesale broadband services.

ICTs and the Sustainable Development Goals: the Post-2015 Agenda and Mexico

Given its importance for development, ICT infrastructure deployment has been embedded in the current draft of Sustainable Development Goals for the Post-2015 Agenda (e.g. “increase availability of ICT infrastructure”). The [research paper on ICT Infrastructure from the Copenhagen Consensus Center](#) reduced the scope of this target to “broadband availability” to increase the precision and impact of this goal.

Broadband is such an important enabling technology that it is difficult to estimate the complete impact on the economy, which will vary with local circumstances (i.e. geographical conditions, technology used to deploy networks, regulatory frameworks, etc.). Nevertheless, the CCC study found investing in mobile broadband in the developing world seems like a really smart move as it results in an average benefit **\$17** for every dollar spent (Auriol and Fanfalone, 2014).¹¹

To adapt the Cost Benefit Analysis to the Mexican context, a similar methodology is used. Given its cost effectiveness, the main target selected is to **increase mobile broadband penetration in Mexico up to 60%** (from an 11.8% level in 2013) by the year 2030 (see Table 1 below).¹² Mobile broadband is likely to play a significant role in Mexico given geographical conditions, insipient fixed networks (i.e. 16.8% fixed voice subscriptions per 100 inhabitants, and around 10.9% fixed broadband penetration according to ITU data in 2013), and large mobile voice penetration (i.e. 85.8%). Furthermore, it is a cost effective solution for developing countries as the cost per user of deploying a mobile network may be three times lower than a

¹¹ The precise target was: Increase mobile broadband penetration around three-fold in developing regions of the world by the year 2030 (with a Benefit-Cost ratio ranging from 14.41 to 21.74), with the BCR depending on the scenario assumptions and considering a discount rate of 3%.

¹² As stated before, all figures in this report correspond to ITU data for 2013. Given that Mexico has undergone significant reforms in the telecommunications sector in the past year (2013 to 2014), including the creation of a new regulator, ITU is currently revising 2014 figures on mobile broadband penetration.

fixed network (Rahunathan, 2005). Nevertheless, two other targets -expanding fixed broadband to 20%, and achieving universal mobile broadband coverage by the year 2030- can also be consulted in Tables A1-A3 of the Annex. It is important to note that expanding fixed broadband in Mexico to 20% is also a very cost-effective target for Mexico. In general, both fixed and mobile broadband infrastructure are complementary, thus efforts to expand the access of both networks is a smart move for governments.

Table 1: Mobile Broadband Target analysed for Mexico

Target examined for Mexico	Equivalent broadband target in Copenhagen Consensus Center (CCC) Infrastructure Report
Increase mobile broadband penetration in Mexico from 11.75% in 2013 to 60% in the year 2030	Target 4 of CCC report: Increase Developing countries' mobile broadband penetration from 21% in 2014 to 60% in 2030

Increasing mobile broadband subscriptions up to 60% (per 100 inhabitants) in 2030 yields high returns for Mexico with a resulting average benefit **of around \$25** for each dollar spent (Table 2).¹³ This would require vast amounts of network investment as it represents the cost of getting **70 million subscribers online**. However, it would also reap significant benefits in net present value terms for the period of 2015-2030, ranging around USD 750 billion (Table 2).¹⁴ In other words, each Mexican would receive a one-off benefit of around USD 5,324 (in net present value terms) corresponding to the externalities generated in the economy in the next 15 years.¹⁵

Table 2: Benefit to Cost Ratio of increasing mobile broadband penetration to 60% in Mexico (years 2015-2030)

Discount Rate 5%			Discount Rate 3%		
NPV Benefits*	NPV Costs*	BCR*	NPV Benefits*	NPV Costs*	BCR*
USD millions (MXN)	USD millions (MXN)		USD millions (MXN)	USD millions (MXN)	
USD 752,362.27	USD 30,521.79	24.7	USD 895,927.70	USD 35,375.11	25.3
MXN 10,412,693.82	MXN 422,421.57		MXN 12,399,639.37	MXN 489,591.52	

Notes: (*) The Benefits and costs are expressed in USD (MXN) millions and are the average of two different scenarios that vary in the calculation of benefits, based on the Copenhagen Consensus Infrastructure Assessment paper (see Table A4 of Annex for

¹³ The average BCR is considering two different scenarios to calculate the NPV that yields a BCR 22.79 and 26.64 with a 5% discount rate, and 23.34 and 27.31 with a 3% discount rate. The resulting average BCRs are 24.71 and 25.32, respectively.

¹⁴ Figure using a 5% discount rate. The average benefit is taken from \$695-813 billion (see Table A4 in the Annex for details).

¹⁵ Assuming the average NPV of Benefits in Table 2 with a 5% discount rate, and dividing this figure among the projected population estimate for Mexico in the year 2030 (UN) of 141,306,000 inhabitants.

details). The exchange rate for MXN/USD considered is 13.84 based on the IRS yearly exchange rate for 2014.¹⁶ A conservative estimate of the elasticity of the impact of broadband in the economy is considered (i.e. 0.014). Furthermore, a status quo GDP for Mexico of USD 1,260,914,660,977.1 and a high cost of infrastructure deployment is assumed (i.e. USD 640 for a wireless line and USD 1910 for a fixed line).¹⁷

Overall, both BCR --the one found in the CCC study of December 2014 (i.e. 17 USD per dollar invested) and the BCR calculated for Mexico (i.e. 25) -- indicate that there are incredible growth opportunities for Mexico to harness while investing in ICT infrastructure. The higher BCR for the Mexican case may be related to the benefits derived from a higher percent change in mobile broadband lines (i.e. Mexico is starting from a slightly lower level of mobile broadband penetration than the average of developing countries), and that it starts off with a higher GDP level than the average of developing countries (e.g. GDP per capita in Mexico was USD 10,308 whereas the average for low and middle income economies was USD 4,168).¹⁸ That is, the impact of broadband on GDP growth will have incredible spillover effects in a country such as Mexico, as it is large in terms of population with a large portion of young people (i.e. the median age of the population is 27) and a high GDP level. The latter creates ripple effects as this ICT infrastructure reaches a critical mass.

The present study assumes a conservative estimate of the impact of broadband on GDP growth (i.e. elasticity of 0.014 based on Koutroumpis, 2009), which is quite similar to other studies, such as Katz, 2012, that found this elasticity to be 0.0158 for Latin America and the Caribbean region (LAC). The main caveat of this methodology is that it simplifies the assumptions of deployment costs (that may vary given the regulatory framework in Mexico). Thus, caution should be exerted when analysing the BCR in the Mexican context as network deployment costs may be higher due to geographical characteristics of the country (e.g. two mountain chains with a quarter of the population living in rural areas), and the competitive features of the market (e.g. a very strong mobile market incumbent a market share of around 71% market share, which albeit, may change in the near future).¹⁹

¹⁶ <http://www.irs.gov/Individuals/International-Taxpayers/Yearly-Average-Currency-Exchange-Rates>

¹⁷ See <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD/countries/MX?display=default> for Mexico's GDP and <http://www.worldbank.org/en/publication/global-economic-prospects/regional-outlooks/lac#2> for growth estimates.

¹⁸ See <http://data.worldbank.org/income-level/LMY>

¹⁹ Mobile broadband market share measured in terms of subscribers for the post-paid segment (3Q 2014, Source: IFT trimestral report). See http://the-ciu.net/nwsltr/320_1Distro.html for mobile telephony market shares in terms of revenues. This may change in the new future as the Mexican Telecom incumbent is contemplating selling assets to comply with new regulation: <http://www.forbes.com/sites/doliaestevez/2014/07/09/in-a-surprising-move-mexican-billionaire-carlos-slim-to-sell-telecom-assets-in-compliance-with-new-anti-trust-rules/>

Given the importance of ICTs for development, what type of regulatory measures should be kept in mind for Mexico?

Mexican authorities since 2012, aware of the importance of ICTs in the economy, have led a structural reform in the telecommunications sector, starting by a constitutional reform (approved June 11 2013) that created a new Communications Regulator (IFT). Later, the 13th of August 2014, a new sector Law came into effect to tackle the main issues surrounding the telecommunication sector.²⁰ Also, the government launched in November 2013 the National Digital Strategy.²¹ All these reforms will surely play a role in increasing Internet access to the population. Thus, given the large benefits that broadband can still deliver to Mexico, this section discusses further policy recommendations as a way to improve the impact of public investment on ICT infrastructure.

Lowering the cost of network deployment

Deployment of broadband infrastructure is an expensive undertaking given the fixed costs it entails. Any regulatory measure that reduces the cost of network deployment should help public funds have a greater impact. In this sense, Mexican authorities should strive to properly enforce regulations (contained in the new Law) that remove barriers to infrastructure deployment. Such policies include: wholesale obligations for broadband markets, promotion of infrastructure sharing agreements, and streamlining municipality urban planning rules.

Efficient Spectrum Management

Given the potential role of mobile networks for Mexico, spectrum policy is of vital importance as 3G and 4G network deployment depends on it. How spectrum is awarded will naturally have an impact on competition dynamics. Spectrum should be awarded through market-based mechanisms, and one way to boost competition is by reserving block for entrants in upcoming auctions (OECD, 2014).

²⁰ See <http://www.hlmediacomms.com/2014/08/05/mexico-new-telecommunications-and-broadcasting-law-to-enter-into-effect-13-august-2014/>

²¹ See <http://cdn.mexicodigital.gob.mx/EstrategiaDigital.pdf>

Wholesale shared network and the risk of vertical integration

The constitutional reform and telecommunication sector law in Mexico allow for a national wholesale mobile network in a band considered internationally as prime spectrum for mobile broadband (i.e. the 700 MHz band). The Telecommunications Regulator (IFT) should ensure that this wholesale provider does not become a vertically integrated entity, as this could lead to distortions in the market, such as raising wholesale prices to competitors, that may arise when an upstream wholesaler also provides downstream services.

Lowering the cost of telecommunications services by fostering competition through mobile market regulation

Economic evidence confirms the beneficial effects of low termination rates on competition (Laffont, Rey and Tirole, 1998; Cambini and Valetti, 2003; Growitsch and Marcus, 2010). The current sector law allows for asymmetric interconnection rates and free negotiation of rates between operators (except for the preponderant agent). However, interconnection rates should be regulated ex ante, based on efficient costs, for all operators (OECD, 2012). Free negotiation of termination rates may lead to higher retail prices.²² Therefore, Mexico should give priority to further reductions in mobile termination rates which in turn, would remove distortions linked to asymmetrical rates (OECD, 2014).

²² Extensive economic literature points to firms' preferences for higher rates, with the subsequent consequence that bilaterally negotiated termination rates are likely to be set at a level that is significantly higher than cost, which in turn puts a floor under retail pricing (Laffont and Tirole 2000, Calzada and Valetti 2008, Genakos and Valetti, 2007). As all operators hold a monopoly in terminating calls on their networks, termination rates (fixed and mobile) should be established by IFT for all operators based on efficient costs.

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Table A1: Targets analysed for Mexico

Targets for Mexico examined				Equivalent broadband targets contained in Copenhagen Consensus Center (CCC) Infrastructure Report
Target 1M	Increase	fixed	broadband	Target 2 of CCC report: Increase Developing countries' fixed broadband penetration from 6% in 2014 to 20% in 2030
	penetration from 10.85% in 2013 to 20% in 2030 in Mexico			
Target 2M	Increase	mobile	broadband	Target 4 of CCC report: Increase Developing countries' mobile broadband penetration from 21% in 2014 to 60% in 2030
	penetration in Mexico from 11.75% in 2013 to 60% in the year 2030			
Target 3M	Universal	mobile	broadband in	Target 8 of CCC report: Universal mobile broadband penetration by the year 2030
	Mexico by the year 2030			

The number of subscriptions that would be covered by each of the three targets allows the calculation of the stream of costs and benefits over the period 2015-2030 (see Table A2).

Table A2: Mapping penetration targets to the change in lines needed for each target

	Mobile Broadband Penetration 2013	Subscribers 2013	Penetration target 2030	Change in penetration 2013-2030	Subs. in 2030* (millions)	Change in subs. 2013-2030 (millions)
Target 1M	10.85%	13,279,031	20%	9.15%	28.2612	14.982169
Fixed Broadband						
Target 2M	11.75%	14,377,542	60%	48.25%	84.7836	70.406058
Mobile broadband						
Target 3M	11.75%	14,377,542	100%	87.25%	139.89294	125.515398
Universal mobile broadband						

Note: *To estimate targets in terms of subscribers for the year 2030, the following estimated population figure for Mexico in the year 2030 was used: 141,306,000 (United Nations population estimates with constant mortality rate).

The resulting Benefit Cost Ratios (BCRs), according to two different scenarios that vary on the assumed growth rate of the economy, are the following:

Table A3: Benefit to Cost Ratio of ICT Infrastructure, Mexico (years 2015-2030)

	LAC growth rate			Mexico growth rate
Discount rate	5%	3%	5%	3%
Target 1M: Increase fixed broadband penetration from 10.85% in 2013 to 20% in 2030 in Mexico	32.83	33.47	38.67	39.49
Target 2M: Increase mobile broadband penetration from 11.75% in 2013 to 60% in 2030 in Mexico	22.79	23.34	26.64	27.31
Target 3M: Achieve Universal Mobile broadband penetration by 2030 in Mexico	13.03	13.35	15.20	15.60

Notes: A conservative scenario is assumed, with an elasticity of the impact of broadband in the economy of 0.014, a growth rate of the economy assumed to be around the average for the LAC region according to the World Bank (3.3%) and for Mexico (3.8%). Furthermore, the status quo GDP for Mexico of USD 1,260,914,660,977.1, and high cost of infrastructure deployment (i.e. USD 640 for a wireless line and USD 1,910 for a fixed line) is considered. ²³

Table A4: CBA of ICT Infrastructure: Increasing mobile broadband penetration to 60% in Mexico in 2030

Discount Rate	5%			3%		
	NVP Benefits*	NPV Costs*	BCR	NVP Benefits*	NPV Costs*	BCR
LAC growth rate of the economy						
	\$695,608.97	\$30,521.79	22.79	\$825,685.15	\$35,375.11	23.34
Mexico growth rate of the economy						
	\$813,115.57	\$30,521.79	26.64	\$966,170.18	\$35,375.11	27.31

Notes: (*) NPV of benefit and costs are expressed in USD millions. A conservative elasticity of the impact of broadband in the economy is considered (0.014). For the first scenario a growth rate of the economy according to the regional average for LAC from the World Bank is assumed (3.3%), and for the second scenario a growth rate for Mexico of 3.8% is assumed. Furthermore, the status quo GDP for Mexico of USD 1,260,914,660,977.1, and high cost of infrastructure deployment (i.e. USD 640 for a wireless line and USD 1,910 for a fixed line) is assumed. ²⁴

²³ See <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD/countries/MX?display=default> for Mexico's GDP and <http://www.worldbank.org/en/publication/global-economic-prospects/regional-outlooks/lac#2> for growth estimates.

²⁴ See <http://data.worldbank.org/indicator/NY.GDP.MKTP.CD/countries/MX?display=default> for Mexico's GDP and <http://www.worldbank.org/en/publication/global-economic-prospects/regional-outlooks/lac#2> for growth estimates.

AGENDA DE DESARROLLO DE LA ONU 2015-2030: IMPORTANCIA DE LAS TIC PARA MEXICO

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11 de Mayo de 2015
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INDICE

- I. La importancia de las TIC en las metas de desarrollo de la ONU
- II. Las TIC y su papel central en el desarrollo económico de México
- III. Medidas regulatorias para maximizar el impacto de las TIC en México
- IV. Conclusiones

INTRODUCCION

La importancia de las TIC en la Agenda de Desarrollo de la ONU post 2015

- Las redes de comunicaciones constituyen una infraestructura fundamental para el crecimiento económico, las interacciones sociales y las transacciones comerciales
- Impacto en la productividad y en la innovación
- Banda ancha: herramienta para el desarrollo y la lucha contra la pobreza.
- Mercados competitivos y eficientes son cruciales para la economía mexicana
- Internet no será solo una parte de la economía, sino que la economía estará en Internet.

La importancia de las TIC en la Agenda de Desarrollo de la ONU post 2015

El reporte del Copenhagen Consensus Center (Diciembre 2014) encontró:

- Triplicar el acceso a la banda ancha móvil (a 60%) en los países emergentes para el 2030 resultaría en un retorno promedio de \$17 por cada peso gastado.
- El presente estudio encontró que el beneficio promedio para México de incrementar la banda ancha móvil de 11.75%* a 60% sería de \$25 pesos por cada peso invertido.

*Fuente: UIT 2013 Nota: dados los cambios institucionales en 2013, los datos de 2014 de penetración de banda ancha móvil están en revisión por parte de la UIT.

México reconoce la importancia de las TIC

Reforma de Telecomunicaciones

- El gobierno mexicano reconoce el importante papel que juegan las redes de comunicaciones en la economía
 - Por ello promovieron recientemente la reforma constitucional de telecomunicaciones (Junio 11 2013) y la legislación secundaria del sector (13 Agosto 2014)
 - Asimismo, México está implementando su Estrategia Digital Nacional (Noviembre 2013)
- Los cambios dramáticos del sector, con la creación de un nuevo regulador de comunicaciones (IFT) cambiarán seguramente la dinámica de competencia en el futuro cercano:
 - A partir de enero 2015, un nuevo operador ha entrado al mercado en México: ATT

Diagnóstico del sector TIC en México

La brecha digital

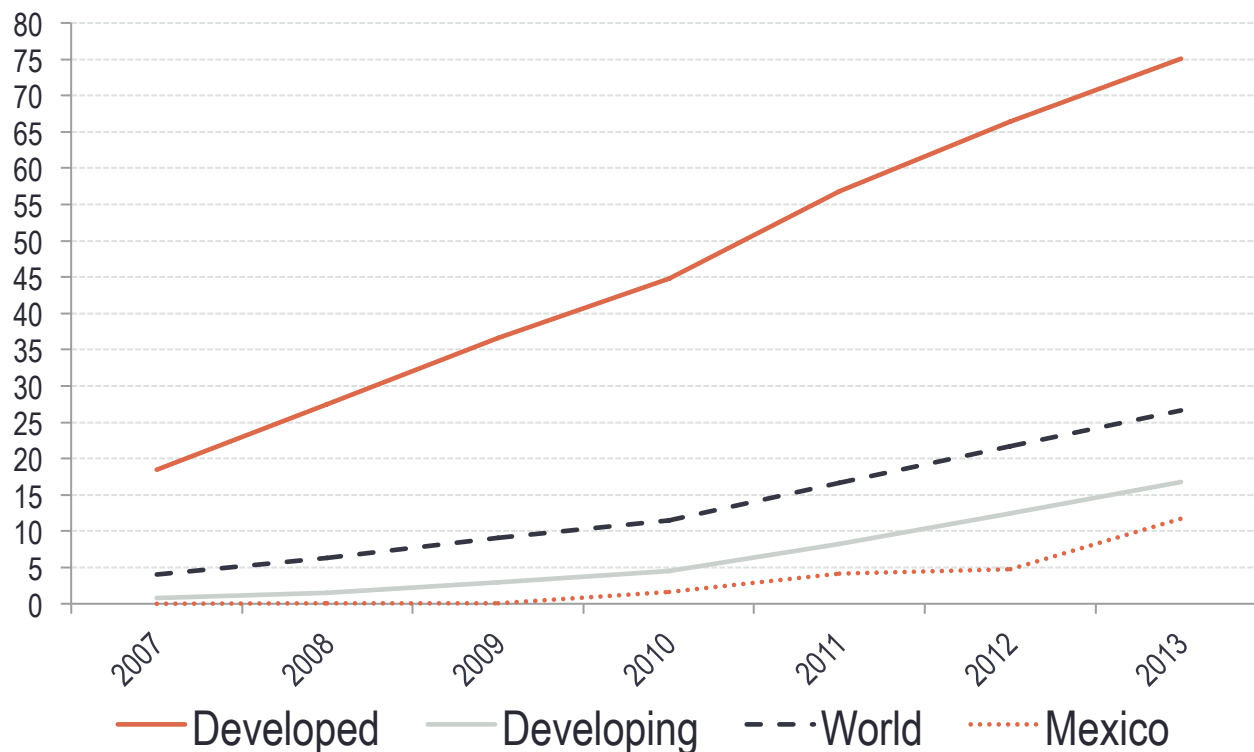
- México exhibe niveles de despliegue de infraestructura TIC similar a la region LAC (Fuente: UIT 2013)
- **Sin embargo, la *brecha digital* en México persiste:**
 - La penetración de la banda ancha móvil en 2013 era de 11.75%* (comparada con 16.8% en países emergentes y 75% en países desarrollados)
 - Penetración de banda ancha fija 10.85% en 2013 comparada con 26.6% en países desarrollados (Fuente: UIT 2013)
 - Sólo 3.5% de conexiones tienen velocidades superiores a 10 Mbps, y todas las conexiones en promedio son 2.5 veces más lentas que E.U.A. (Fuente: Akamai State of the Internet 2014)

*Fuente: UIT 2013. Dados los cambios institucionales en 2013, los datos de 2014 de penetración de banda ancha móvil están en revisión por parte de la UIT.

Diagnóstico del sector TIC en México

La brecha digital

- Penetración de la banda ancha móvil 2007 a 2013 (Fuente: UIT 2013)

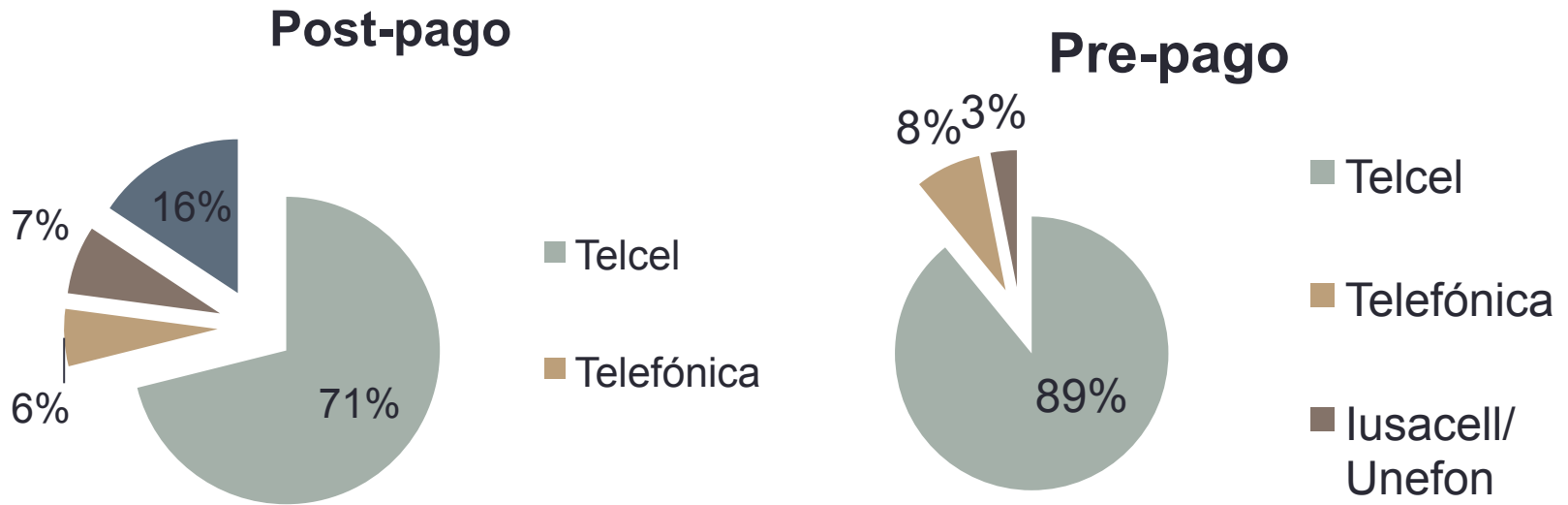


*Fuente: UIT 2013. Dados los cambios institucionales en 2013, los datos de 2014 de penetración de banda ancha móvil están en revisión por parte de la UIT.

Diagnóstico del sector TIC en México

Concentración en el mercado de banda ancha móvil

Participaciones de mercado (*por usuarios) de banda ancha móvil en México, 3Q 2014



Fuente: IFT Informe trimestral 3Q 2014

¿Qué se puede hacer para maximizar el impacto de las TIC en México?

La importancia del marco regulatorio e institucional

Medidas para incrementar el acceso y adopción de la banda ancha:

1. Reducir de las barreras al despliegue de infraestructura y manejo eficiente del espectro
 - *Subastas (licitaciones) de espectro y la Red Publica Compartida Mayorista en la banda 700 MH*
2. Servicios de comunicaciones asequibles a través del fomento de la competencia en el mercado móvil
 - *Tarifas de terminación (interconexión) móvil*

CONCLUSIONES

Reduciendo la brecha digital en México

- Existe una gran oportunidad para México de desarrollo económico al invertir en el sector TIC
 - Para maximizar los beneficios que ofrece esta infraestructura existen ciertas medidas que el gobierno aún puede atender
- Con ayuda de inversiones de la comunidad internacional, y con ciertas medidas regulatorias, México podría reducir significativamente la brecha digital.
- Por último, las metas acordadas en la ONU a finales de año guiarán **2.5 billones** de USD en ayuda internacional en los próximos años, por lo que es importante que los tomadores de decisiones, y el público en general, esté enterado de la agenda de desarrollo de la ONU.

Muchas gracias!



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