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Global Broadband and Innovations Program ICT Sector Assessment: Guatemala June 28, 2012



June 28, 2012

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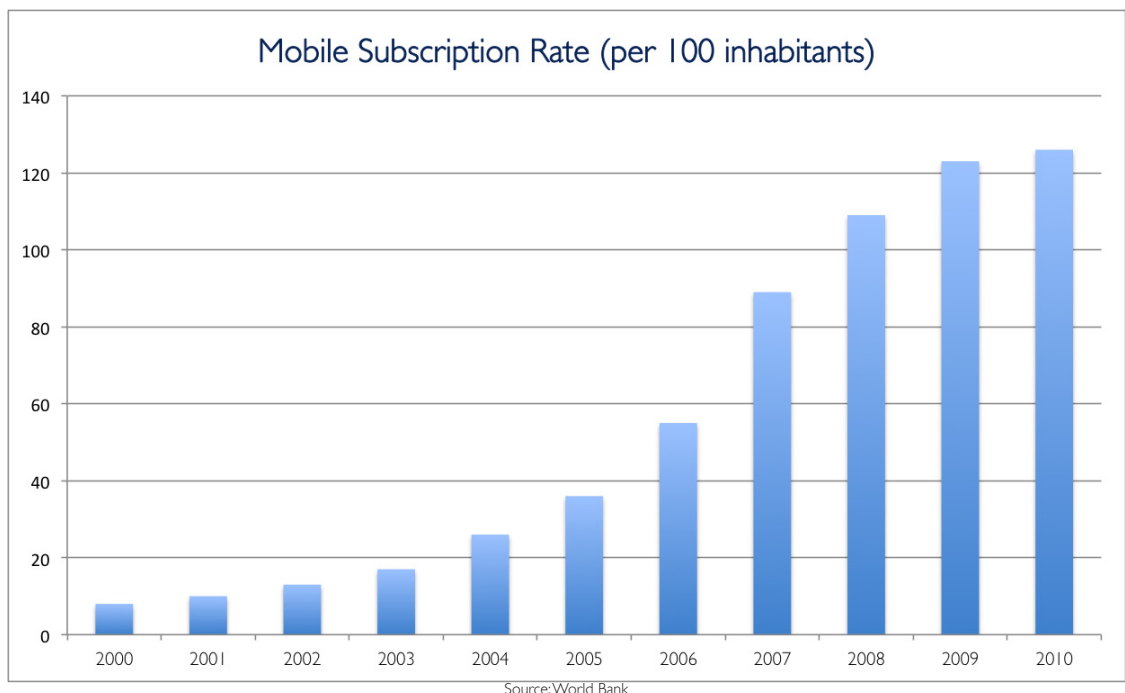
Table of Acronyms

ADSL	Asymmetric Digital Subscriber Line
AMI	Mesoamerican Information Highway
BPO	Business Process Outsourcing
CAFTA-DR	Central American Free Trade Agreement, +Dominican Republic
CDMA	Code Division Multiple Access
CONCYT	National Council of Science and Technology
COMTELCA	Comisión Técnica Regional de Telecomunicaciones
FONDETEL	Fondo para el Desarrollo de la Telefonía
GSM	Global System for Mobile Communications
GUATEL	Empresa Guatemalteca de Telecomunicaciones
HSPA+	Evolved High-Speed Packet Access
ICT	Information and Communication Technology (-ies)
iDEN	Integrated Digital Enhanced Network
ISP	Internet Service Provider
IPR	Intellectual Property Rights
ITES	Information Technology Enabled Services
KOICA	Korea International Cooperation Agency
INTECAP	Instituto Técnico de Capacitación y Productividad
LLU	Local Loop Unbundling
MNO	Mobile Network Operator
PCS	Personal Communication Services
PTT	Push To Talk
RRDTCA	Red Regional Digital de Telecomunicaciones de Centroamérica
SIT	Telecommunications Superintendency
TOEFL	Test Of English as a Foreign Language
USAID	United States Agency for International Development
USAF	Universal Service/Access Fund
WAP	Wireless Application Protocol
WiMAX	Worldwide Interoperability for Microwave Access

Introduction

The rapid growth of the Guatemalan Information and Communications Technology (ICT) sector since 1999 is emblematic of how good government policies can enable the success in telecommunications. Liberalization of the Guatemalan telecommunications market, which began in 1996, created fierce competition between operators and led to an expansion of connectivity throughout the country. The mobile penetration rate grew from less than 1 percent in 1997 to 126 percent in 2012. The dynamic telecommunications market opened the door to Guatemala's entry into Business Process Outsourcing (BPO) in the early 2000s, and in 2011 that sub-sector accounted for 16 percent of the country's overall service exports.

Even with a robust telecommunications and BPO market, the rest of the ICT sector is still hampered by inadequate infrastructure and a lack of appropriate human capital. Its most immediate needs include expanding broadband connectivity throughout the nation and strengthening engineering programs across the university system. The central government has been focusing on these issues through its National Council of Science and Technology (CONCYT), a multi-sector body chaired by the Vice President that includes the Minister of the Economy, industry leaders, and rectors of universities. CONCYT developed a National ICT Policy in 2008 that aimed to expand infrastructure, establish telecenters, and improve ICT education, among other things, but it is unclear how much of this program the government was able to implement. Today, Guatemala stands on the cusp of rapid ICT-led economic growth, but it is at risk of lagging as the mobile market nears saturation. As USAID looks to support the Guatemalan government's development priorities it is important to understand the dynamics at play and effectively target interventions. This report is designed to help make such decisions.



History of ICT

The year 1996 served as a turning point in Guatemalan history and also witnessed significant changes in its telecommunications sector. In January of that year, Álvaro Arzú was elected President on a platform of engaging with Guatemala's guerilla groups and ending its 36-year civil war. More broadly, he aimed to create an inclusive society that would offer more equitable services to all citizens. Part of this agenda included telecommunications. Prior to 1996, the state-owned Empresa Guatemalteca de Telecomunicaciones (Guatel) held a monopoly on fixed telephony, and Comcel, owned by Luxembourg-based Millicom, held a monopoly on the nascent mobile market. Telephone penetration was only 3 percent, and mobile subscriptions numbered only in the tens of thousands. Shortly after being installed, Arzú appointed a new director of Guatel with one simple request: I want a lot of phones, everywhere, fast.¹

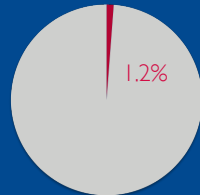
The General Telecommunications Law of 1996 paved the way for breaking Guatemala's fixed and mobile monopolies by legalizing competition and allowing for the privatization of Guatel. The formal peace agreements, which ended the civil war and were signed in Oslo in December of that year, helped to create an investment climate that attracted foreign telecommunications firms. To supervise the liberalization of the sector, a new regulatory agency, Superintendencia de Telecomunicaciones (SIT), was created. From the outset SIT sought to attract competition by creating what was arguably the most open regulatory environment in the region, with no licensing fees for anyone wishing to establish themselves as a telecommunications operator, and no limit on the number of operators active in the country. They also did this very quickly. The norm in Latin America was for liberalization to happen over the course of a transitional period, but in Guatemala the law took down the main competition restrictions immediately. The process of privatizing Guatel started in mid-1997 when the government formed a new company, Telecomunicaciones de Guatemala (Telgua), in preparation for the divestiture. Most of Guatel's assets were transferred to Telgua, and Guatel kept only its rural telephone network, which would remain in public hands after the privatization. In 1998 the government sold 95 percent of its stake in Telgua to Luca, S.A. for just over \$700 million, with the stipulation that Luca begin allowing interconnection by early 1999. One of Luca's first actions with Telgua was to launch a mobile branch of the company, which they accomplished in 1998 under the name PCS Digital. Luca did not retain ownership of Telgua for long. In 2000 Telmex bought a controlling stake (of both Telgua's fixed assets and its mobile arm, PCS Digital), which it then passed to América Móvil in 2001.

“I want a lot of phones, everywhere, fast.”

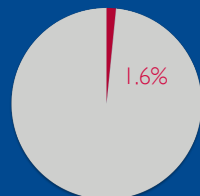
**Álvaro Arzú,
President of
Guatemala,
1996**

The privatization of Telgua and the removal of barriers to competition led the Guatemalan telecommunications sector to grow rapidly, especially mobile telephony. The mobile penetration rate increased from 7.4 to 126 lines per 100 people between 2000 and 2010, and as early as 2001 mobile lines began to out-number fixed lines. This rapid growth was spurred by a large influx of investment following liberalization, including the arrival of four new Mobile Network Operators (MNOs); PCS Digital, BellSouth, Movistar, and RED. PCS Digital was renamed Claro in 2006 (along with América Móvil's fixed assets) and BellSouth Guatemala was purchased by Spain's Telefónica and merged into their Movistar network in 2004.

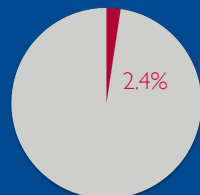
Household Broadband Penetration Rates in Guatemala 2005-2010



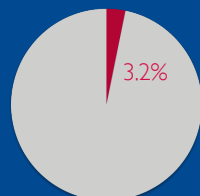
2005



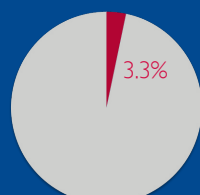
2006



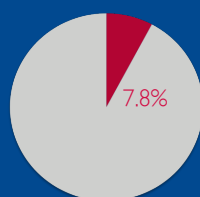
2007



2008



2009



2010

Source: Guatemala- Telecoms, Mobile and Broadband, 10th Edition:2011. Buddecomm

While mobiles are the most ubiquitous type of ICT in Guatemala, the Internet has become increasingly important. Guatemalans have had access to the Internet since 1995 when an Internet Service Provider (ISP) called Cybernet first started offering dial up connections. Broadband internet, however, did not become important until the early 2000s when Telgua began offering high speed services, using Asymmetric Digital Subscriber Line (ADSL) technology. Telgua's successor, Claro, remains the dominant Internet provider in the country, and ADSL remains the dominant type of technology. Other major options have emerged in recent years, mostly in urban areas: Movistar also offers ADSL to compete with Claro, there is a major WIMAX operator, 3G wireless connections have been growing since 2008, and cable Internet bundled with TV and voice ("triple play") is beginning to play a major role in urban markets. Rural broadband, however, still relies heavily on ADSL provided over Claro's legacy copper-wire infrastructure, and due to liberalization and a lack of competition it remains somewhat expensive.

Guatemala is keen to capitalize on its gains in the ICT sector since liberalization. It launched a National ICT Policy in 2008, which strengthened the legal framework for the sector, articulated the importance of e-government and e-commerce, and enhanced intellectual property protection. The policy also noted the need to improve the country's ICT knowledge base through education and training in order to boost productivity and competitiveness. Through CONCYT the country launched the National Program of Science, Technology, and Innovation in Information, Informatics, and Communications (2008-2012), which focused on some of the objectives outlined in the 2008 policy. It specifically targeted ICTs in education and led to the construction of university ICT centers and other technology education sites. An example is the large ICT Training Center at Intecap in Guatemala City (built with funding from the Korean government).

The period of performance of the program is about to expire, and Guatemala is now looking to find the way ahead in ICT development. To highlight the key challenges confronting Guatemala as it moves forward, the following sections outline the current state of play in the telecommunications and ICT industries.

The Telecommunications and Internet Markets

Telecommunications Market

After the privatization of Guatel and the liberalization of the market were completed in 1998, the Guatemalan telecommunications sector experienced a period of rapid growth, mostly based on mobile connectivity. In 2010, there totaled over 18 million mobile subscribers for a penetration rate of 126 percent. While mobile connectivity has boomed, fixed-line telephony growth has been stagnant. In 2010, there were only 1.41 million fixed lines in Guatemala, for a teledensity of 10.6 percent, as compared to 18.2 percent average for the Latin American and Caribbean (LAC) region.ⁱⁱ There is a large disparity in fixed-line penetration between urban and rural areas in the country. In the Department of Guatemala (which includes Guatemala City), fixed-line teledensity is 34 percent, while in the rest of the country it is less than 4 percent. In 2009, the market for fixed-line services shrank and has remained flat ever since. Mobile adoption has continued to grow but has slowed in the last few years as the market reaches saturation. Future growth potential lies in the expansion of 3G and mobile broadband.ⁱⁱⁱ

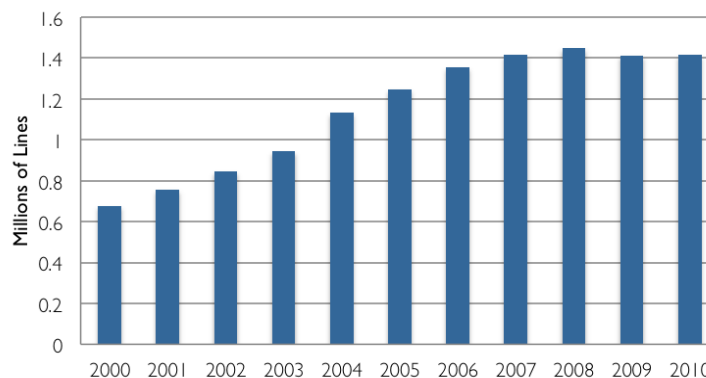
Fixed-Line

The liberalization of fixed-line services in Guatemala led to a flood of entrants, and currently there are about 18 local fixed-line operators.^{iv} Most of these are small however, and 96 percent of the market is shared between two of them. Claro, which operates most of the national copper-wire network previously owned by Guatel, still holds the largest fixed-line market share in the country (70 percent). It is owned almost entirely by América Móvil, which has held a 99.2 percent stake since 2001. Claro's chief competitor in the fixed-line market is Movistar, which is primarily a mobile network operator that offers a range of fixed-wireless voice and data services. It holds about a 16 percent share of the fixed-line market. Movistar operated its fixed-line services under the brand name Telefónica until 2009.

Though Guatemala City hosts a relatively modern telecommunications network, in rural areas the fixed-line infrastructure is significantly less developed. Guatemala is still, as of 2011, a country with more rural people than urban ones, and reaching them with reliable fixed-line service has been challenging. As such, Guatemala has always had a fixed-line penetration that is low when compared to its Latin American neighbors. However, the 2000s saw significant growth in fixed lines,

spurred on by both the decade's economic boom and a significant legal action. The sale of Telgua to Luca, S.A. in 1998 has always been tainted by accusations of bribery and corruption, and a settlement was reached with Claro in 2001, to drop all inquiries in exchange for, among other things, a large rural telecommunications program. As a result, between 2001 and 2004, Claro installed 380,000 rural phone lines: some fixed, some mobile, some public. Yet from 2009 fixed-line teledensity began to fall. This was in some part due to the economic slump, and may yet recover as the Guatemalan economy again begins to accelerate.

Fixed-Line Subscriptions in Guatemala



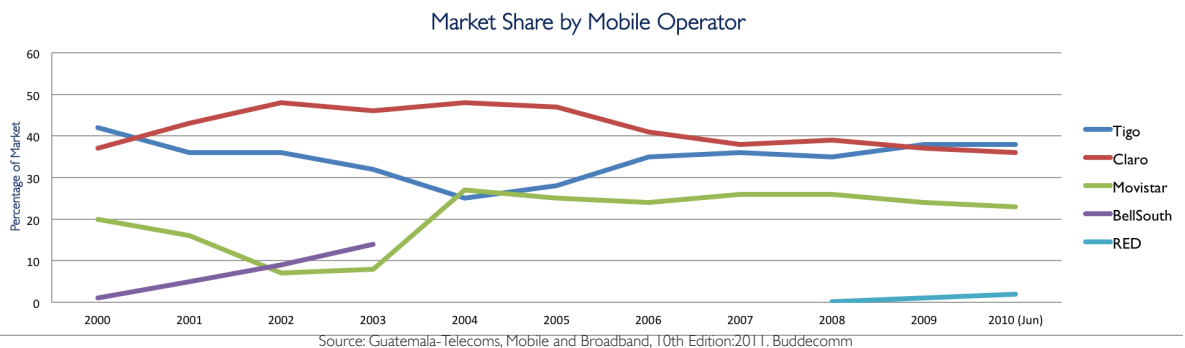
Mobile

Guatemala's mobile market is considerably more dynamic than its fixed-line market. There are four mobile operators in Guatemala who together service over 18 million subscriptions (a number equal to 126 percent of Guatemala's population).^v The competition in the market since liberalization has improved service and decreased prices, which has helped increase adoption. Over 90 percent of mobile subscriptions in Guatemala are pre-paid, as these services are lower in price and more flexible. However, pre-paid calling prices are still somewhat high by the standards of developing countries. The ITU reports that in Guatemala the average price of a one minute on-net call during peak periods is 11 US cents, with text messages a more reasonable four cents each.

Although there are more mobile subscriptions than people in Guatemala, these subscriptions are concentrated in urban areas. Mobile telecommunications coverage is only available to 76 percent of the country's population. This is due to a combination of economics and geography. Sparse populations often make it unprofitable to cover rural areas, and Guatemala is very rural. As of 2011, the country still had more than 50 percent of its citizens living in rural areas.

Guatemala's four operators (and their parent companies) are Claro (América Móvil), Tigo (Millicom), Movistar (Telefónica), and RED (Intelfon). A fifth, Digicel, has held a license from SIT since 2006 and has been rumored to be on the verge of entering the market, but as of yet has not done so. At the end of 2011, Tigo was the market leader with a 49 percent share. Claro held 31 percent, Movistar owned 19 percent, and RED's share was estimated at below 2 percent.^{vi} The first three companies have standardized on GSM, while RED utilizes the iDEN network (the technology used by Spirit/Nextel which allows for Push-to-Talk).^{vii} Claro and Tigo have offered 3G in Guatemala since early 2008, and Movistar added the service in late 2009.^{viii} As of early 2012, these three operators are in various stages of planning and implementing 4G using HSPA+ technology.

With such a high mobile penetration rate concentrated entirely among 76 percent of the population, saturation of the addressable market is a real possibility. Operators are attempting to overcome this challenge by creating faster networks and selling more complex content and services over mobile connections. This is leading toward convergence of telephony and internet. However, it is important to keep in mind that future mobile growth will also depend on finding innovative ways to reach new customers in previously unserved areas. This will also have an important overall economic development impact, and later the report focuses on the government's actions to facilitate this type of network expansion.



Claro (América Móvil)

América Móvil bought Telgua from Luca S.A. in 2001, giving them ownership of the majority of Guatemala's fixed copper infrastructure as well as a growing mobile operation called PCS Digital. By 2006 the Claro brand name had been applied to both branches of the company's voice offerings. Claro is currently the second largest mobile operator in Guatemala behind Tigo, having slipped in recent years due to Tigo's effective marketing of low-cost, prepaid top-up cards. As of 2011 it had nearly 6.5 million subscribers for a market share of 31 percent.^{ix} Their network is standardized on GSM, and in 2008 they became the first company in Guatemala to launch 3G services.^x

**Movistar (Telefónica)**

Movistar is a subsidiary of Telefónica Latinoamerica, which is the Latin American arm of Spain's Telefónica. It entered the Guatemalan market in 1999, shortly after liberalization, and overlaid its CDMA network in mid-2004 with GSM. In 2001, it became the first MNO to offer Wireless Application Protocol (WAP) services, allowing mobile handsets to connect to the Internet. In late 2004, the company greatly expanded its presence in Guatemala by purchasing all the assets of BellSouth, which had previously been a major mobile player. This helped their market share jump from 8 percent to 27 percent in one year. By 2011, however, this had fallen to 19 percent. In June 2011, Movistar had over 4.1 million subscribers.^{xii}

**Tigo (Millicom)**

Millicom has had a hand in the Guatemalan mobile telecommunications market since 1990, when its local subsidiary Comcel was the only operator in the country. They held a monopoly for eight years before Telgua created PCS Digital, and the two firms (now Tigo and Claro) have been in fierce competition ever since. While Tigo's status as the original mobile operator in the country helped them to retain market dominance at the start of the liberalization movement, Claro overtook them from 2001 to 2007. By the end of 2008 however, Tigo had regained its title as market leader based on low-cost prepaid mobile packages. In 2011, Tigo held a market share of 49 percent and counted over 7 million subscribers. The network is standardized on GSM, and launched 3G services in 2008.



In 2011 Tigo signed a tower sharing agreement with Movistar, the first arrangement of its kind in Guatemala, to expand their network coverage while reducing investment cost.^{xi} Under the tower sharing agreement, both network operators have access to towers owned by the other.

RED (Intelfon)

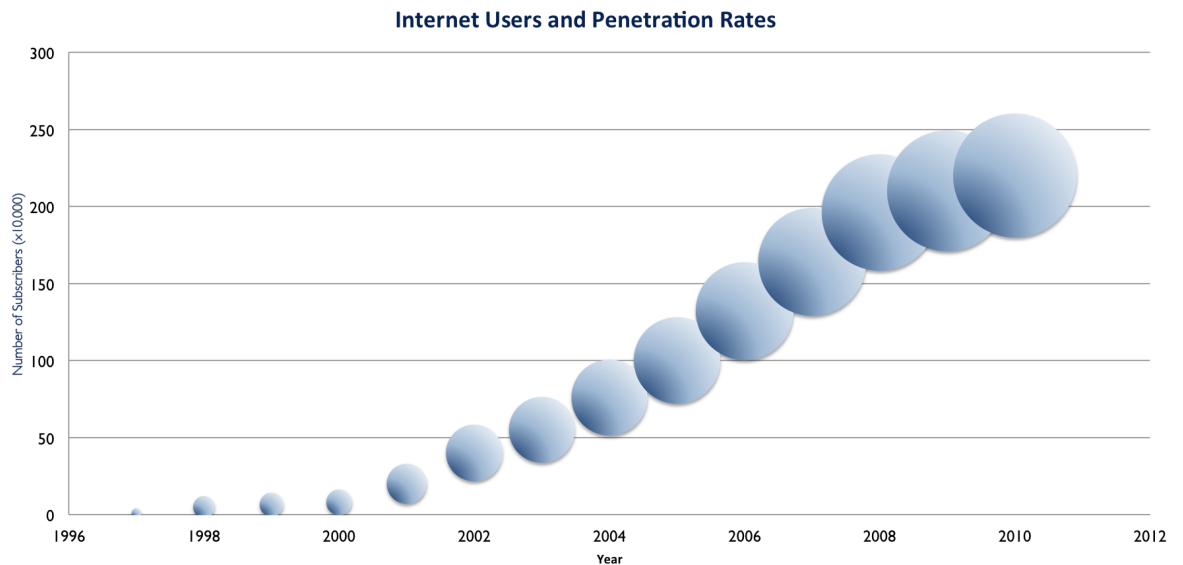
RED is the newest MNO in Guatemala, having entered the market in late 2008. It is owned by the Salvadoran company Intelfon, which has been operating in El Salvador since 2005. It differs from Claro, Tigo, and Movistar in that it primarily targets business consumers by offering pre-paid packages that use Motorola's iDEN technology. This enables Push-to-Talk (PTT), texting, and mobile services among both individuals and groups. As the newest market entrant, it owned only a small share of the market (2 percent) in 2011.^{xiii} It does not offer individual plans.



Internet Market

Over the last decade the internet market in Guatemala has expanded rapidly. Between 2005 and 2010 the penetration rate more than doubled, from 7.9 percent to 16.2 percent. In 2010, there were 2.2 million internet users in Guatemala. Broadband internet use has also grown, albeit from a much smaller base, and its penetration rate remains less than 2 percent. From 2009-2010 alone it nearly doubled, from 156,000 to 259,000.

This growth has occurred in the context of large changes to the structure of the market. In the late '90s there were over 20 ISPs in Guatemala. Most of these have gradually succumbed to competition from big mobile operators that are offering bundled telecommunications services, while other small players have emerged. The market is now stratified between a few very big players and a number of very small ones. The leading provider of broadband in the country is Claro, which uses Guatel's legacy copper network to offer ADSL services in addition to fixed telephony.^{xiv} Other competitors include Convergence Communications, an American firm that offers cable broadband (along with residential cable TV services), and Unitel, which offers a wireless broadband service based on WiMAX technology called *Yego al Internet*. Many Guatemalans also access the Internet through an extensive network of private cyber-cafes, which can be found in most towns throughout the country (although service in more remote towns can be quite unreliable).



Source: Guatemala- Telecoms, Mobile and Broadband, 10th Edition: 2011. Buddecomm

Internet Infrastructure

Guatemala's internet market benefits from the country's connection to some of the most advanced communications networks in the region. Like most other Central American countries (Honduras, El Salvador, Nicaragua, Costa Rica, and Panama), Guatemala is connected to a terrestrial broadband network called Red Regional Digital de Telecomunicaciones de Centroamérica (RRDTCA). This network is coordinated by the Comisión Técnica Regional de Telecomunicaciones (COMTELCA). It consists of a microwave transmission backbone developed by COMTELCA and Telefónica, and the network's first international connection linked Guatemala and El Salvador in 1996. This system also can interconnect with the Columbus II submarine cable through Telmex's network in Mexico.

Guatemala will also benefit from The Mesoamerican Information Highway (AMI), a terrestrial fiber optic network that will connect Mexico (and the U.S.) to Central and South America and is currently

under construction. AMI is intended to provide a path to alternate internet exchanges in the U.S. (in Dallas and Los Angeles instead of Miami). Although much fiber has been laid the network is not yet operational, and one of the missing links the connection between Guatemala and Mexico. When complete, the 1,800km fiber optic network will have nodes in six Central American countries, and will be managed by Redca, a public-private entity whose shareholders are primarily electric companies in Central America, Mexico, Colombia, and Spain. Beyond these terrestrial linkages, Guatemala is independently connected to four submarine cables: ARCOS-I, Sam-I HIAM-I, and MAYA-I. Sam-I lands on both Guatemala's Caribbean and Pacific coasts, and there is a terrestrial fiber backbone that traverses the country to connect the two landing sites, providing broadband to Guatemala's major population centers.

Local internet distribution infrastructure is however more lacking. Within major population centers there are extensive WiMAX networks, and the three large MNOs are all in the process of upgrading their base stations to 4G technology. However, outside of major population centers people rely on ADSL over the legacy copper loop, which is not as reliable as it should be. There are policies in place that are designed to improve rural access to both voice and data communications, and the report will discuss these in the next section.

ICT Access

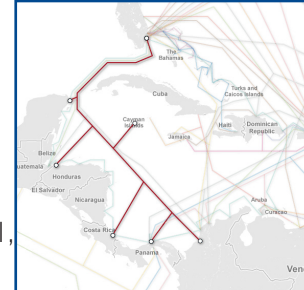
Universal Service

Like many countries in Latin America and the Caribbean, in the 1990s Guatemala established a Universal Access Fund in an effort to support private sector telecommunications providers in expanding their service to rural areas. The legal basis for the creation of the Fondo para el Desarrollo de la Telefonía (FONDETEL) comes from the General Telecommunications Law of 1996.

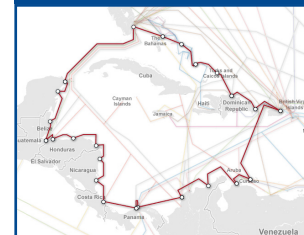
FONDETEL is run by the SIT and charged with expanding telephony to rural regions as well as to underserved urban areas. Unlike many other Universal Service/Access Funds (USAFs), FONDETEL does not charge network providers a percentage of their annual revenues. Instead, it is wholly funded through spectrum auctions. These funds are then used to subsidize the construction of telecommunications infrastructure to reach targeted populations.

Between 1998 and 2006 FONDETEL collected nearly \$18 million in fees and spent about \$8 million of it to run a large program of installing public pay phones.^{xv} They provided subsidies to install over 5,550 phones in 2,000 population centers across the country, and in doing so were able to reach 1.49 million people.^{xvi} The program came under criticism when a 2008 World Bank evaluation inspected 220 of these phones and found only 28 of them to be "adequately functioning."^{xvii} The study also noted that of the 2,000 population centers reached, only 20 percent had "adequate service."

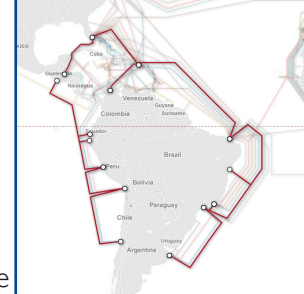
Guatemala's Undersea Cables



MAYA-I



ARCOS-I



SAm-I

Source: submarinecablemap.com

FONDETEL is restricted from engaging in rural internet deployment because the 1996 law explicitly limits the fund to promoting the expansion of voice communications

Since 2009, FONDETEL has recalibrated its work on public phones and is installing an average of 500 satellite public phones in rural areas each year. However, the Fund is restricted from engaging in rural Internet deployment because the 1996 law explicitly limits it to promoting the expansion of voice communications. This poses multiple challenges as the government looks to efficiently promote the expansion of converged voice and data services to rural areas.

The restriction is such that the SIT is now looking to constitute a second fund explicitly for that purpose.

Public Access

Currently five companies access FONDETEL subsidies to provide public pay phones in Guatemala: Movistar, Cablenet, Claro, Tigo, and Telenorsa. Cablenet, Claro, and Telenorsa utilize fixed lines for their pay phones, while Tigo uses mobile lines, and Movistar uses both.^{xviii} As of June 2011, there were 50,869 pay phones throughout Guatemala.^{xix} This is down from 53,220 in mid-2008.^{xx}

Community phones, which are operated by individuals in publicly accessible areas, are also spread throughout the country and are provided by five companies (Movistar, Tigo, Telenorsa, BNA, and Claro). Since the fixed line infrastructure is poor in rural areas, most community phones are mobile phones provided by Movistar and Tigo. By mid-2008, there were 8,600 community phones, down from 9,080 in 2003.^{xxi} It is quite likely that the decline in the number of community phones was simply due to more people obtaining their own phone as the mobile market grew.



Source: Jim Kelly

Guatemala does not have a large national public telecenter program, and the facilities that exist are operated either through the benefits of international cooperation, private companies, or NGOs. Guatemala was the first site of the “POETA” project, a Microsoft-affiliated initiative that was designed to provide ICT access to persons with disabilities, and INTECAP, a non-profit operating over 20 job skills training centers throughout the country, makes heavy use of ICT. INTECAP recently partnered with the Korean International Cooperation Agency (KOICA) to build a center specifically focused on ICT skills.

Local Loop Unbundling/Line Sharing

In an effort to increase competition in the telecommunications market, the SIT has regulated that each telecommunications provider in Guatemala has the right to interconnect to other operators' networks. This includes the legal right to an arbitration hearing if operators are unable to agree on an interconnection plan. Fines of up to \$100,000 can also be imposed by the SIT if any operator declines to interconnect. Prior to the implementation of CAFTA-DR, the United States government requested that Guatemala reform many of its telecommunications laws in order to open its market to U.S. operators. This included requiring Guatemalan network providers to unbundle their networks to U.S. resellers and the Guatemalan government to regulate international calling rates.^{xxii}

While Local Loop Unbundling (LLU) is a part of the telecommunications regulations in Guatemala, the ability to ensure implementation is difficult. Other countries like Argentina have developed wholesale broadband markets, but there is no such market in Guatemala. The incumbent Claro still owns all the relevant ADSL infrastructure and can charge high access fees to their competitors in order to use it.^{xxiii}

The Non-Telecommunications ICT Sector

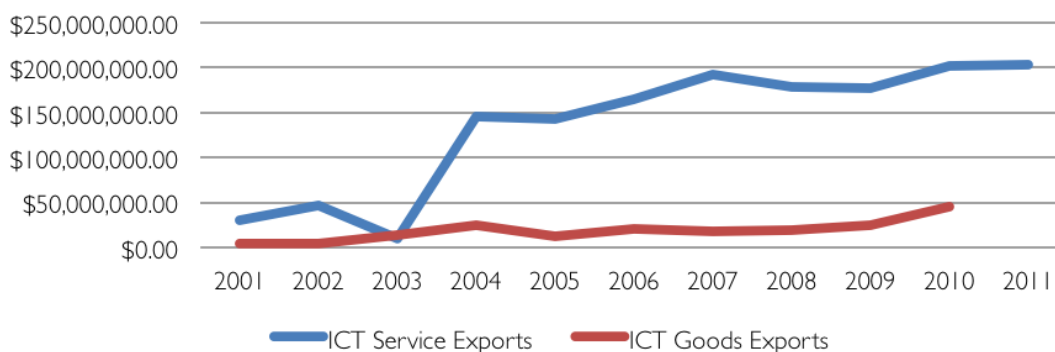
In this section the report focuses on the production of ICT goods and services in Guatemala. ICT goods generally refers to hardware: computers, telephones, circuit boards, servers, switches, and the like. ICT services consist primarily of voice and data telecommunications; IT consulting and support services such as web hosting, e-commerce support, and network management services; IT-Enabled Services and Business Process Outsourcing (ITES/BPO); and software services.^{xxiv}

As is the case in most developing countries, the ICT sector in Guatemala is dominated by the telecommunications industry. The large players, América Móvil, Telefónica, and Millicom, are among the largest revenue earners in the country, and therefore that subsector was discussed in its own section of the report. Guatemala's non-telecommunications ICT sector is small, with combined exports of ICT goods and services reaching around \$403.5 million (nominal) in 2010.^{xxv} This made up only 3.7 percent of the country's total exports, but represented a larger ICT export basket than any other Central American country except Costa Rica (which is home to a very large Intel computer-chip manufacturing plant).

Technology Subsectors

The country is significantly more involved in ICT services than in ICT goods, and despite the sector's small size, ICT service exports have grown rapidly over the last ten years, more than quadrupling in real terms since 2001. In 2011, Guatemala exported \$362 million (nominal) of ICT services, and the industry employed 25,000 people.^{xxvi}

Guatemala's ICT Goods and Services Exports (Constant 2001 USD)



E-commerce

Included in the 2008 National ICT Policy, the Law for the Recognition of Communications and Digital Signatures created a framework for regulating e-commerce in Guatemala. This framework, based on rules that are widely accepted around the world, provides legal and technical security to the transmission of electronic messages. Prior to this law, there was no legislation that protected electronic monetary transmissions or signatures. These protections ushered in significant increases in e-commerce

use among Guatemalans. In 2009, they spent \$8 million online, a 10 percent increase over 2008.^{xxvii} By September 2011, 30 percent of Guatemalan internet users had purchased products online over the last year.^{xxviii} Yet, despite this expansion in Guatemalan e-commerce, the country still performs poorly compared to its neighbors. Its e-commerce use was recently ranked lowest within Latin America according to Tendencias Digitales.^{xxix}

Software Services

Software services are a more complex product and a nascent industry in Guatemala. The country has however taken first steps into this sub-sector and is looking to grow more fully as a supplier of these products. The national exporters association has a small software arm, called the “Digital GT Committee,” with 14 members.^{xxx} Venture capital firms are coming from Silicon Valley looking for investment opportunities, and there are at least eight such firms currently operating in the country.^{xxxi} A technology park in Guatemala City called “Campus Tec” houses a number of innovative software firms and offers incubation to start-ups. A key advantage of Guatemala in this sector is its low labor cost relative other Latin American countries, and investors see opportunities to create software here and export it to places like Colombia and Mexico. Further down the line, they see Guatemala’s large short-term migration flows to the United States as a link upon which to develop products for that market.

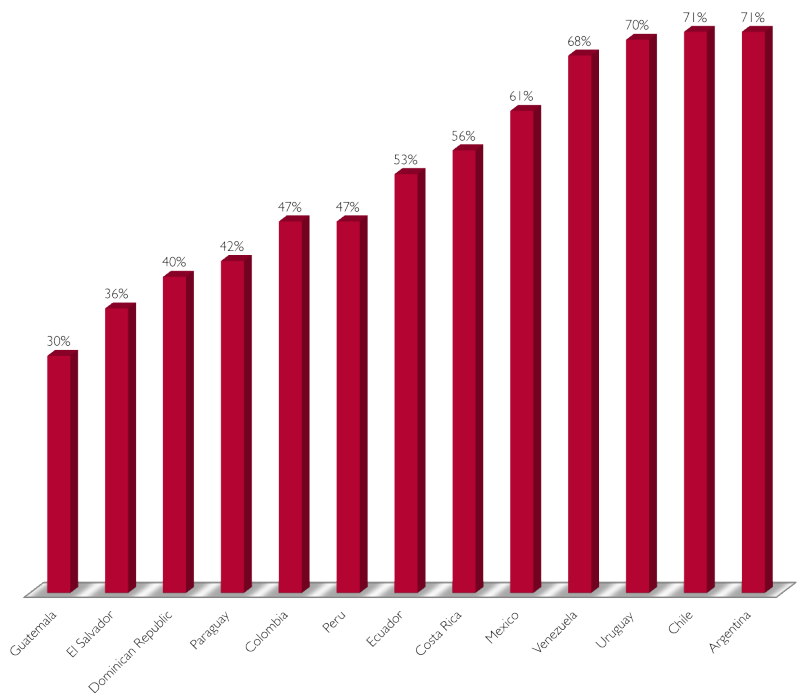
ITES/BPO

Business Process Outsourcing (BPO) was Guatemala’s first step into the non-telecommunications ICT sector in the early 2000s, and according to the government agency Invest in Guatemala, there are now about 50 large operations in the country. The industry grew rapidly in the early 2000s with the arrival of a few well known international firms, including Capgemini and ExxonMobil, but stagnated shortly thereafter. A recent coordinated effort by Invest in Guatemala has led to reinvigorated growth. By March 2011, there were about 16,000 BPO jobs in Guatemala—making it the biggest non-telecommunications ICT sub-sector in the country.^{xxxii} Other companies with large BPO operations in Guatemala include ACS (owned by Xerox), Transactel, Atento, and Genpact.^{xxxiii} Roughly half of the call centers provide in-country services while the other half focus on the United States, Mexico, and Central America.^{xxxiv}

Strengths and Weaknesses

Guatemala’s ITES/BPO sector benefits from the country’s proximity and similar time zone to the United States. It also benefits because the Spanish spoken there tends to be of a neutral accent, helpful when

Percentage of Internet Users Who Bought Online



Source: Tendencias Digitales

servicing the Mexican and U.S. Hispanic markets. Its biggest advantage, however, is perhaps the cultural affinity of its youth for United States. Many have relatives there, or have even lived there themselves at some point. A VP for Human Resources at one of the largest BPO firms in the country recently told a reporter that "students are very Americanized, and there is no need for cultural immersion programs once they're hired."^{xxxv}

The country also enjoys a sizable labor-cost advantage over Costa Rica (previously the premier BPO destination in Central America), and excellent international connectivity (four undersea cables and terrestrial links with Mexico). It benefits from an open and transparent regulatory environment, and the largest number of university graduates of any Central American country. Its membership in the CAFTA-DR free trade area removes many barriers to foreign investment in the country.

The sector is held back, however, by the English language capability of its residents, and this is in part due to a lack of resources. Although Guatemala has the largest population in Central America, it has fewer bilingual schools than any of its regional neighbors (26 to Honduras' 410). Efforts to improve the English ability of Guatemalans include instituting a TOEFL requirement for university graduation, and implementing a nationwide English program in primary schools. The Guatemalan Export Association sponsors intensive English training for 2,000 newly hired BPO workers every year, but frets that this is not enough of an intervention. Further, Guatemala lacks a sufficient number of technical engineers, and the World Economic Forum ranks its math and science curricula as 130th in the world.^{xxxvi}

The ICT sector in Guatemala is further hindered by a poor business climate. The country ranks 97th on the World Bank's Ease of Doing Business Index, with particularly low scores in Starting a Business (165th) and Protection of Investors (133rd).^{xxxvii} They are ranked in the bottom 50 percent of countries in every category except Electricity, Registering Property, and Obtaining Credit. Similarly, the World Economic Forum's 2012 Global Information Technology Report suggests problems in this area for Guatemala.^{xxxviii} Its low score in Political and Regulatory Environment (128th) is mostly an indictment of the judicial system and intellectual property protection.^{xxxix}

Projections for future growth

Opportunities for business process outsourcing should continue to present themselves. Invest in Guatemala is now active and has a long-term plan, a lack of which hindered the country in the mid 2000's. With labor costs rising in Costa Rica and other competitors suffering from either more extreme drug-related violence (Honduras), uncertain political situations (Nicaragua), or a lack of international connectivity (El Salvador), Guatemala should remain an appealing nearshoring destination. The country can improve its chances in this sub-sector; however by improving English language education in secondary schools.

The opportunity provided by BPO is important, but real growth in ICT will have to be associated with moving into higher value services, particularly software. It is here that Guatemala needs a comprehensive strategy on how to become the "India of the Spanish-speaking world." India's software boom began with three things: a strong technical university system, good links to the U.S., and tax incentives on hardware imports for firms that exported software. Guatemala has the ties to America, but it needs a more active software promotion policy and stronger math and science curricula in its universities. It also needs to make it easier for software entrepreneurs to form companies. Though they opened a one-stop business window in 2008, it is still too difficult for entrepreneurs to obtain the necessary financing.

ICT and Priority Issues in Development

The discussion so far has focused entirely on the specifics of the ICT sector without linking it to social and economic development goals. Here, the report explains how ICTs can be used to make improvements in priority development areas in Guatemala. Given the country's status as one of the poorest in Latin America and one of the most unequal in the world, its high rate of sociolinguistic diversification and history of conflict, and its unique environmental endowment, we will focus on three areas: Inclusive Economic Growth, Democracy and Governance, and Environment and Natural Resources Management.

Inclusive Economic Growth

Though its per capita GDP, at nearly \$2000, is higher than several of its Central American neighbors, Guatemala suffers from extreme inequality. As of 2006, the last year for which the World Bank reports data, the Gini Coefficient was a very high 0.56. USAID/Guatemala has stated that the country is one of the three most unequal in the world. It is also home to a large number of distinct socio-linguistic groups. It is therefore imperative to level the economic playing field across the country's full population, and ICTs can serve as tool to help do that. ICTs make it easier for all people to access the same information, helping to prevent cronyism and reducing barriers to entry in an industry. They lower risk, expand markets, and help people adopt better business practices more quickly. These benefits are not programmatic. They do not depend on a certain public program to implement a specific type of ICT tool targeting a specific population to obtain results. Rather they accrue simply from having a large ICT user base and from encouraging people and businesses to use telephones and to access the Internet.

Several studies have shown a positive economic impact of ICTs on economic growth at the macro level.^{xi} The results are most pronounced for broadband internet. These studies show that a 10 percent increase in broadband penetration boosts overall GDP anywhere from 0.24 percent to 1.50 percent.^{xii} Researchers agree that, within this range, low and middle-income countries benefit more. Further, the growth obtained from broadband expansion creates jobs. For example, in Brazil, broadband was found to add up to 1.4 percent to the employment growth rate.^{xiii} Public policies should therefore focus on increasing the use of ICTs, especially broadband, both through supply and demand-side incentives. On the supply side, this can include funding mechanisms to support the construction of more extensive infrastructure. On the demand side, it can include training programs in computer and internet skills, both at the basic and advanced level. In Guatemala, it could also include funding for the creation of local language content.

Democracy and Governance

Guatemala's ethno-linguistic divisions and the legacy of its 36-year civil war mean that effective governance, especially in remote areas, is an important part of the development process. In such situations a priority for intervention is to make sure that people feel a part of the governance system: that it works for them, that their voices are heard, and that their interests are accounted for. These are loose approximations of the more formal ideas of government effectiveness, citizen participation, and transparency. ICTs can improve citizens' relationship with the government in the context of all three of these concerns. To improve the functioning of a government's relationship with its citizens ICTs can provide needed information online and allow for official documents to be submitted electronically, a suite of activities referred to as e-government. They can allow governments to issue transfer payments

to citizens electronically, so they arrive in a cell phone account effortlessly. To increase citizen participation in government, new ICT tools that rely on crowdsourcing technology are gaining traction in a number of countries. Perhaps the most well-known tool, a reporting platform called Ushahidi, was developed in Kenya as a way of reporting outbreaks of violence in the aftermath of the disputed elections of 2007 and was more effective than public systems of response. Because it is open source and relatively easy to set up, the platform has been used around the world. It has already been used in Guatemala, for a project called Espanta-Casos. Through this Ushahidi deployment, users can report robberies using their cell phones. These reports are then mapped, with the goal of encouraging community involvement, increasing reporting and ultimately reducing the instances of theft.



This screenshot shows a map created by Espanta-Casos, an Ushahidi deployment used in Guatemala to help report and reduce the instances of robberies.

Source: Taringa.net

At a more basic level ICTs allow citizens to stay engaged with political issues that they might not otherwise be able to follow. This creates more buy-in to the governance system. Lastly, ICTs are strong promoters of transparency. ICT tools can be used to monitor elections, to verify the truth of political statements and inform the population of their validity, and to hold politicians to account. As a final illustrative example, the National Consolidation Program in Colombia (the agency in charge of re-integrating territory previously under guerrilla control) has stated numerous times how helpful it is to connect municipalities where they work to telecommunications and the Internet. To that end they have partnered with USAID to pilot very low cost connectivity projects in these areas to try to make such infrastructure more viable. It will allow them to run information campaigns, embed crowdsourcing technology into local governance systems, and improve the interaction of citizens in remote areas with the national government. The same sort of initiative could be well employed in Guatemala.

Environment

The Mesoamerican Forest, which includes all of Guatemala, is listed by Conservation International as one of the World's top 25 biodiversity "hotspots," meaning that it is home to an exceptional amount of biodiversity and also exceptionally endangered. The country's ecotourism potential is huge, and hinges largely on parks within the 2.1 million hectare Maya Biosphere Reserve, which is under threat from logging, poaching, and activities associated with illegal drug smuggling. The reserve has lost 13 percent of its land area in the last 20 years.^{xliii} ICTs can help to prevent further habitat erosion and biodiversity loss by improving the ability of public environmental stewards to monitor behavior, combat illegal activity, and create incentives for conservation behavior. Improved imaging and mapping technologies including GIS, can allow local officials to monitor deforestation and respond rapidly, but this requires extensive internet infrastructure in remote areas. A dense cellular network among rural communities could allow for anonymous reporting of destructive and illegal behavior, helping authorities to respond. It could also allow local officials to monitor water and soil quality and biodiversity more effectively. ICTs are therefore enablers of environmental stewardship, and ICT infrastructure can play an important part in Guatemala's conservation strategy.

Recommendations for USAID Intervention

In the process of presenting this overview of the ICT sector in Guatemala the report identified a number of constraints to both ICT expansion and the translation of ICT growth into improved development outcomes. These are issues for the Guatemalan government, private sector, and civil society to tackle, but there is ample room for USAID to provide development assistance. Based on findings from this report, the following possible technical assistance activities are recommended:

1 Facilitate the national expansion of broadband infrastructure.

Beyond its international linkages and the backbone that connects them, Guatemala lacks significantly in ICT infrastructure. These resources are difficult for the private sector to provide on its own because the customers it would allow companies to reach are often too poor to offer an investor a good return. Such infrastructure would include fiber backbone to remote municipalities as well as local distribution, ideally under a “whole municipality” approach that includes an ICT center in a school as well as wireless access. This infrastructure should be capable of offering both wireless voice and broadband services. FONDETEL is unable to facilitate this type of support because of its legal restriction to telephony. The Guatemalan government is trying to constitute a parallel fund to support internet infrastructure, and could greatly benefit from technical assistance to organize it. Then, once that fund is endowed it will strongly benefit from technical assistance in capacity building, strategic planning, and backbone project development.

2 Support efforts to enforce local loop unbundling and provide more competition in the DSL market.

To date the regulator has been unable to establish a wholesale market for broadband in Guatemala. Technical assistance in the form of a targeted regulatory reform project could make a big difference in the price of broadband to the consumer, and hence its take-up rate.

3 Engage in an ICT Sector Development Program.

A thriving ICT industry requires appropriate human capital, support services for local entrepreneurs, and a policy environment that incentivizes innovation. Designed with appropriate local expertise and buy-ins, a targeted USAID program could boost the number of call-center capable English speakers, train youth in software development skills, work with the government to develop incentives for ICT sector growth (such as

tax credits for software exporting firms), and help to tackle persistent constraints to ICT investment (such as Intellectual Property Rights, or IPR). These actions would lift the stagnant non-telecommunications ICT sector, provide employment for urban youth, and increase the economic growth rate of the country.

4 Support Business Environment Reform.

It is too difficult to start a business in Guatemala. Though a one-stop business window was introduced in 2008 to reduce the total time spent in starting a business, there are still too many steps required and it is too difficult to obtain the necessary capital. USAID technical assistance could be particularly useful for the banking sector in helping it to understand the ICT market and effectively evaluate risk to reach more entrepreneurs.

5 Support the establishment of a functional e-government program.

Though many Guatemalan ministries have websites, the availability of data and online services is limited. The government has shown a commitment to offer better e-services: in February 2012 it created new agency, called the control and transparency secretariat, to be in charge of implementing electronic government policies in the country.^{xiv} In June of this year, the Vice President stated that one of her main goals is to “establish a platform for e-government to give citizens access to information, data and statistics.”^{xiv} This is something that the country has attempted in the past, but never been able to sustain. In 2001 a World Bank project was successful in creating an electronic platform for filing taxes, but as of the middle of the decade progress had stagnated. E-government is important for citizen participation and for reducing the costs associated with doing business, and it needs to be available in multiple languages. The Guatemalan government would likely welcome a cooperation with USAID on advancing this program.

End Notes

- i. "The Guatemalan Telecommunications Miracle – A Conversation with Alfredo Guzman." Reason TV, 18 May 2011. <http://reason.com/blog/2011/05/18/reasontv-the-guatemalan-teleco>
- ii. World Development Indicators, "Telephones lines (per 100 people)." World Bank, 2011. <http://data.worldbank.org/indicator/IT.MLT.MAIN.P2?display=default>
- iii. "Guatemala – Telecoms, Mobile and Broadband." BuddeComm, 10th Edition (2011).
- iv. Ibid.
- v. Dutta, Soumitra and Bilbao-Osorio, Beñat. "The Global Information Technology Report 2012." World Economic Forum, April 2012.
- vi. "Growth in Fixed-line and Mobile in Guatemala." Superintendencia de Telecomunicaciones Guatemala, http://www.sit.gob.gt/uploads/docs/stats/ctfm/CreTelefonia_IsemI1.pdf
- vii. "Guatemala – Telecoms, Mobile and Broadband." BuddeComm, 10th Edition (2011).
- viii. Ibid.
- ix. "People." Claro. <http://claro.com.gt/wps/portal/gt/pc/personas>
- x. Ibid.
- xi. "Individual." Tigo. <http://www.tigo.com.gt/>
- xii. "Movil." Movistar. <http://www.movistar.com.gt/>
- xiii. "Servicios." RED. <http://www.red.com.gt/>
- xiv. "Guatemala – Telecoms, Mobile and Broadband." BuddeComm, 10th Edition (2011).
- xv. "Development Fund of Telephony." Fondetel. <http://www.fondetel.gob.gt/>
- xvi. Stern, Peter A. and Townsend, David. "New Models for Universal Access in Latin America." Regulatel/WorldBank (PPIAF)/ECLAC Project on Universal Access for Telecommunications in Latin America, August 2006. <http://www.regulatel.org/miembros/publicaciones/ESTU%20DIOS/SERV%20UNIV/PPIAF/informe%20final/draft%20vf/Ab%20%20Summary%20v%209.pdf>
- xvii. Mumssen, Yogita, Lars Johannes and Geeta Kumar. Output-Based Aid: Lessons Learned and Best Practices. World Bank Publications, 2010.
- xviii. "Guatemala – Telecoms, Mobile and Broadband." BuddeComm, 10th Edition (2011).
- xix. "Public Telephones in Operation," Superintendencia de Telecomunicaciones Guatemala, <http://www.sit.gob.gt/uploads/docs/stats/movilpc/lmovilpoI11.pdf>
- xx. "Guatemala – Telecoms, Mobile and Broadband." BuddeComm, 10th Edition (2011).
- xxi. Ibid.
- xxii. Ibid.
- xxiii. Ibid.
- xxiv. For a full explanation of the classification of ICT products, see the OECD's "Guide to Measuring the Information Society, 2009."
- xxv. Note that most telecommunications services are not exports; so "ICT Service exports" is a good proxy for a full disaggregation of the non-telecommunications ICT sector.
- xxvi. "Guatemala: The Triumph of Software." Al-Invest IV Informs, vol. 20 (March 2011). <http://boletines.al-invest4.eu/custom/al-invest4/imagenes/20ingles.pdf>
- xxvii. "E-Commerce On The Rise in Guatemala." Central America Data, 2 February 2010. http://www.centralamericadata.com/en/article/home/ECommerce_On_The_Rise_In_Guatemala
- xxviii. "Regional Overview: Latin America." European Travel Commission: New Media Trend Watch. <http://www.newmediatrendwatch.com/regional-overview/104-latin-america>
- xxix. Ibid.
- xxx. Barker, Dennis. "Guatemala Gets Serious About Software." Nearshore Americas, 14 March 2011. <http://nearshoreamericas.com/guatemala-software/>
- xxxi. Cave, Damien. "A Silicon Valley Dream Grows in Guatemala, Despite the Risks." The New York Times, 16 November 2011.

- xxxii. "Guatemala: The Triumph of Software." *Al-Invest IV Informs*, vol. 20 (March 2011). <http://boletines.al-invest4.eu/custom/al-invest4/imagenes/20ingles.pdf>
- xxxiii. George, Tarun. "Country Profile: Guatemala Ramps Up BPO Services, But Can it Meet Skill Labor Demands?" *Nearshore Americas*, 17 November 2010. <http://nearshoreamericas.com/country-profile-guatemala-ramps-bpo-services-meet-skilled-labor-demands/>
- xxxiv. "Call Centers & BPO." *Invest in Guatemala*. http://www.investinguatemala.org/index.php?option=com_content&task=view&id=44&Itemid=45&lang=english
- xxxv. George, Tarun. "Country Profile: Guatemala Ramps Up BPO Services, But Can it Meet Skill Labor Demands?" *Nearshore Americas*, 17 November 2010. <http://nearshoreamericas.com/country-profile-guatemala-ramps-bpo-services-meet-skilled-labor-demands/>
- xxxvi. "The Global Competitiveness Report 2011-2012: Guatemala," *World Economic Forum*, 2011. <http://www3.weforum.org/docs/GCR2011-12/CountryProfiles/Guatemala.pdf>
- xxxvii. "Doing Business in Guatemala 2012." *World Bank Group*, 2012. <http://www.doingbusiness.org/data/exploreeconomies/guatemala?topic=trading-across-borders>
- xxxviii. Dutta, Soumitra and Bilbao-Osorio, Beñat. "The Global Information Technology Report 2012." *World Economic Forum*, April 2012.
- xxxix. "Doing Business in Guatemala 2012." *World Bank Group*, 2012. <http://www.doingbusiness.org/data/exploreeconomies/guatemala?topic=trading-across-borders>
- xl. Buttkeireit, S., L. Enriquez, F. Grijpink and S. Moraje. "Mobile Broadband for the Masses: Regulatory Levers to Make it Happen." *McKinsey & Company*, February 2009.
- xli. *Ibid.*
- xlii. Kelly, Tim and Carlo Rossotto. "Broadband Strategies Handbook." *World Bank Publications*, 2012.
- xliii. Butler, Rhett. "Guatemala: Environmental Profile." *Mongabay*, <http://rainforests.mongabay.com/20guatemala.htm>
- xliv. "New Department to Develop E-Government Policies." *Business News Americas*, 14 February 2012. <http://member.bnamericas.com/news/technology/new-department-to-develop-e-government-policies>
- xlvi. "Vice President Calls for Creation of Anti-Hacking Law." *Business News Americas*, 8 June 2012. <http://member.bnamericas.com/news/technology/vice-president-calls-for-creation-of-anti-hacking-law>

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