Chapter 3

Mobile opportunities: poverty and mobile telephony in Latin America and the Caribbean. The case of Mexico

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Abstract

While the use of mobile telephony continues to expand at unexpected rates, academic literature seeks to explain the causes for this phenomenon as well as its social and economic impact. Not only is the speed at which mobile telephony is being adopted surprising, so to is the great extent to which it has penetrated low income sectors.

This paper, through a survey of households in poor urban areas on Mexico, offers evidence of patterns of mobile telephony use and is part of a broader research conducted in seven Latin American Countries and the Caribbean by researchers from the network Regional Dialogue on the Information Society (DIRSI).[1]

The survey explores how and why acces to mobile telephony can be used to tackle the many obstacles to development faced by poor urban sectors in Mexico. It seeks to identify the perceptions of this sector of the population on the impact of this service on their day to day lives. In particular, it looks into the perceptions of users regarding cost and its value in relation to other expenses in order to gain a better understanding of the demand for mobile communication. This survey seeks to identify the implications of access to mobile telephony to aspects such as employment opportunities and income, as well as access to government services and mobile commerce. Lastly, we attempt to identify the barriers that non-users of these services face in terms of affordability and coverage, as well as business models that offer these services.

Results show that users consider keeping in touch with family, friends and during emergencies to be the main use of access to mobile telephony; in other words, to strengthen social networks. These results are compatible with other studies that document how mobile services create and strengthen characteristics such as shared values and trust, which are key components of social capital (Chapman, 2004). Communication for work or business purposes do not play a key role; however, it is interesting to note that users that do employ mobile telephony for business use it much more intensively. Given that the mobile applications offerd by governments, banks and businesses are still in their infancy, it is not surprizing that they are seldom accessed. The main barrier that was identified for non-users to adopt mobile telephony continues to be affordability.

[1] www.dirsi.net.

The survey results clearly showed that there are also opportunities to implement market strategies that focus on low income earners through plans for acquiring handsets and usage aimed at those toward the bottom of the income pyramid.

Keywords: mobile telephony, mobile applications, social networks; bottom of the pyramid

Introduction

While the use of mobile telephony continues to expand at unexpected rates, academic literature seeks to explain the causes for this phenomenon as well as its social and economic impact. Not only is the speed at which mobile telephony is being adopted surprising, so too is the great extent to which it has penetrated low income sectors. There are around one billion mobile telephones in developing countries today; penetration of this service into Latin America grew from 13 percent in 2000 to close to 94 percent in 2009, not only covering medium to low income sectors in urban areas but poor rural zones as well.[2]

Access to mobile telephony is becoming increasingly affordable and poor people are willing to spend a significant amount of their income on mobile services. (See Bayes et al., 1999; Vodafone, 2005; World Bank, 1999). However, affordability still remains an important limit to its use which is why the poor employ a variety of cost control strategies in the use of mobile phones. Moreover, there is a homogenous widespread use of these strategies across the developing world. (Donner, 2007a; Zainudeen et al., 2006). Under conditions of economic constraint, for example, beeping has become "a widespread, transnational adaptation to (or appropriation of [e.g., Bar et al., 2007]) the basic mobile/cellular infrastructure" (Donner, 2007a).[3]

Cross country comparisons of technology adoption find that deviations between levels of adoption are explained by different economic, political and cultural contexts. For example, variations in the nature of national telecommunications reforms and regulatory frameworks explain, to a significant degree, differences in information technology adoption (Gutierrez, 2003; Wallsten, 2003; Mariscal, 2007). However, despite these variations, mobile adoption has occurred at a very rapid pace across

[2] Source: INEGI (2009). See http://www.inegi.org.mx/est/contenidos/espanol/rutinas/ept.asp?t=tinf146&s=est&c=4874.
[3] Donner (2007a) has defined Beeping as the practice when "a person dials a mobile number and disconnects the call before the caller picks up the call. The caller's number is recognized by the recipient's phone if it has been previously stored in it, and the recipient knows that the caller has sent a signal of some kind".

regions and it appears to look alike in each developing country. Howard et al (2009: 2), suggests that:

"*the economic gulf that overrides differences between, say, Papua New Guinea and the UK, fades even further into the background as technology users grapple with concerns about creating and maintaining social connection, engage with new media and forms of exchange, and working out what being modern actually means*"

To be sure, economic and socio-demographic variables determine different levels of mobile penetration across countries. However, studies that document patterns of mobile telephony use across countries show that this universal technology is being adopted by the poor in similar ways. They all highly value the use of mobile phones, use it for similar reasons and employ similar cost reduction strategies in its use.

This paper will look at mobile phone use in low income households in Mexico and then show its similarity to other countries in Latin America. It will also show how cost-reduction strategies are also similar to those found in other developing regions. Through a survey of households in poor urban areas it seeks to identify the perceptions of this sector of the population on the impact of this service on their day to day lives and the strategies used to diminish costs. It also identifies the profile of users in order to gain a better understanding of the demand for mobile communication.

With a great degree of similarity to studies in other countries, results show that users consider keeping in touch with family and friends to be the main use of mobile telephony; in other words, it appears to strengthen social networks. These results are compatible with other studies that document how mobile services create and strengthen characteristics such as shared values and trust, which are key components of social capital (Chapman, 2004). Communication for work or business purposes does not play a key role; however, it is interesting to note that users that do employ mobile telephony for business use it much more intensively. Given that the mobile applications

from governments, banks and businesses are still in their infancy, it is not surprising that they are seldom accessed. The main barrier that was identified for non-users to adopt mobile telephony continues to be affordability.

This paper is organized into four sections. The first offers a literature review while the second looks at the context for mobile expansion in Mexico. The following section contain information on users —their use patterns, strategies used to diminish costs and the perceived benefits of access to the service. The paper ends with some conclusions and policy considerations.

Mobile services and the underserved population

Recently, there has been an increased academic interest in understanding the causes and impacts of the dramatic spread in the use of mobile telephony in developing countries. From the supply-side perspective, studies find that market mechanisms such as pre-paid and calling party pays have significantly contributed to mobile expansion in developing countries (Hodge, 2005; Mariscal et al., 2006; Stork et al., 2006).

Another key variable identified with mobile network deployment is competition; the higher degree of competition in the mobile sector relative to the fixed sector has played an important role in the growth of mobiles around the world (Petrazzini et al., 1996; Wallsten, 2001). This is a result, to a significant degree, of the fact that mobile services were initiated in a more liberalized market than fixed services.

From an institutional perspective, Andonova (2006) compares mobile deployment with Internet penetration in developing countries through an econometric exercise that includes variables which try to capture the quality of institutional factors such as political rights and liberties. The result is that Internet and fixed penetration are highly correlated with institutional efficiency which suggests that the digital divide is the result of an institutional divide. However, she finds that mobile deployment is less dependent on a solid institutional environment than is Internet infrastructure. The rationale behind

this is that mobile technologies contain fewer site-specific assets; they are built on cheaper, easily re-deployable infrastructure than fixed or Internet technology. Thus, mobile telephony has expanded in the less friendly institutional environments that generally prevail in developing countries.

In terms of the impact of mobile diffusion, studies interested in the development component of ICTs (Information Communications Technologies for Development; ICT4D) seek to identify how mobiles may contribute to economic growth as well as to poverty reduction. At the macroeconomic level, Thompson and Garbacz (2007) identify a positive impact of mobiles on productive efficiency in developing countries while Waverman et al. (2005) find that the mobile dividend in developing countries is higher than in developed countries given that it is largely the only source of communication.

Jensen's study (2007), from a microeconomic perspective, on the fisheries market is perhaps one of the most influential papers to analyze the impact of ICTs on welfare. Through a weekly survey applied in three districts in Kerala during six years, Jensen finds a significant positive impact of information in these poorly developed markets. He finds that the addition of mobile phones reduced price dispersion, waste and increased fishermen's profits and consumer welfare. These findings offer evidence that counters the criticism ICTs should not be a priority for poor countries that lack access to health and education.

From a sociological perspective, the impact of ICTs has been studied from a social capital analysis. In these studies, the economic sphere is not separated from the social context; the concept of social capital is useful as a lens to study economic activities. ICTs and mobile services, in particular, contribute to create or strengthen some of the fundamental features of social capital such as networks, shared values, social trust and norms of a community (Chapman, 2004). Fafchamps and Minten (2002) provides

evidence that social capital has a significant effect on the performance of economic agents separate from human and physical capital.

However, some of the results of studies that link social capital to ICTs conclude that this relationship is ambivalent (Huysman et al., 2004). In communities where there is a pre-existing high level of social networks (or capital) it is easier to establish ICT networks. At the same time, the establishment of ICT networks leads to the creation of social capital but high levels of social capital make ICT communication less useful (Huysman et al., 2004).

Following the same line of inquiry, seeking to identify the social role of mobile phones, Goodman (2005) applies a survey in South Africa and Tanzania and finds that mobile use increases social capital in the communities under study. Using the topology of Granovetter (1973), Goodman finds that mobile telephony use mediates strong links with family members and close friends while weak links with others such as businessmen, teachers or doctors provide information and possible economic and social opportunities (Goodman, 2005). Mobiles facilitated participation in social networks, thus enabling people to strengthen social capital and benefit from the opportunities provided.

This paper falls into the category of a more broad economic and social perspective, that of exploring if and how mobile phones are helpful to diminish poverty by identifying the patterns of use by poor income groups in developing countries (Donner, 2007a; Horst and Miller, 2006; Zainudeen et al., 2006). The application of surveys by Horst and Miller (forthcoming) in Jamaica and the Philippines show that diasporas use mobile phones to communicate with family for both economic and social reasons. Donner (2007b) finds that mobile ownership increases the income of micro entrepreneurs in Rwanda by increasing communication and enriching social networks. In this same

area, Molony (2006) finds that mobile phones are used by micro entrepreneurs in Tanzania to manage reputation while creating virtual offices.

The growing importance in the use and the positive impact of mobile phones for the developing world highlight, once more, the issue of digital exclusion. New perspectives on this old issue identify the risks associated with inequality in access to ICTs and mobiles phones specifically. Tongia and Wilson (2007) focus on the costs of exclusion and find that these rise faster than the growth of the network. De Fontenay and Beltran (2008) understand the digital divide as a force that limits society's ability to achieve a higher productivity. Inequality in access to ICTs represents a shortfall of inputs to the production process; i.e. the economy is performing below its productive potential and thus inequality in general, and inequality in ICTs in particular, distort the development and allocation of human capital.

The following sections will present the results of the survey applied in Mexico that looked at the strategies employed by the poor to access and use mobile telephony services.

Context: Mobile development

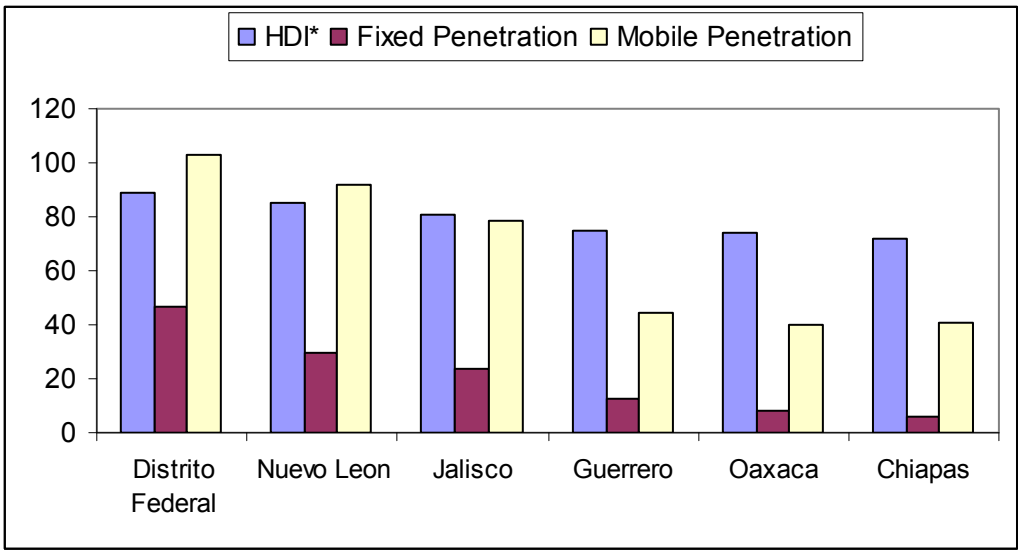
After a period of economic growth with a per capita growth in the Gross Domestic Product (GDP) that increased from US$4400 to US$8650 between 1999 and 2006, in 2009 Mexico was hit by the international financial crisis. The level of poverty that had diminished during the previous period increased again. According to the results of the National Council for the Evaluation of Social Development Policy (Coneval, 2009), dietary poverty increased from 13,8 percent in 2006 to 18,2 in 2008.

The Mexican telecommunications sector has also shown a slight slowdown. Its contribution to GDP which increased from 1 percent in 1990 to 6 percent in 2007 decreased to 5 percent in 2009. However, mobile telephony continues to grow; the rate of expansion first exceeded that of fixed services in the year 2000 and it doubled it in

2004. After the initial sector reform in Mexico in 1990, mobile penetration increased from 1 to 72 lines for every 100 inhabitants in 2009. Today, mobile telephony represents the most common form of communication access in the country.

Mobile penetration in Mexico increased not only in major urban areas but also increased significantly, albeit less, in traditionally poor states. As shown in Figure 3.1, there is still a significant geographical digital divide. However; poor states such as Chiapas have experienced a 40 percent increase in mobile penetration during the last 6 years (COFETEL, 2009).

Figure 3.1. Human Development Index (2005), Fixed and Mobile Penetration 2008



Source: COFETEL and PNUD (2009).
*HDI has been multiplied by 100 in order to have a similar scale for comparison.

In addition, according to INEGI (2008) poor Mexican households, when they have telecommunication services, spend around 4,7 percent (mobile telephony) and 6,7 percent (fixed telephony) of their total income on these services. In contrast, high income households spend just 2,8 percent and 2,3 percent of total income on mobile and fixed telephony respectively.

Mobile opportunities survey: Main results

This study is part of a larger regional survey undertaken by DIRSI in seven countries in Latin America and the Caribbean (DIRSI, 2007). [4] [5] Low income households were identified using geo-referenced data provided by INEGI (2006), from which a probabilistic sample of poor urban households was obtained. With the objective of attaining a representative and statistically independent sample of low income urban individuals at the national level, respondents were randomly selected from each of the previously identified households.

The two localities selected for the application of the survey were the capital of the country, Mexico City and Tuxtla Gutierrez (TG) in Chiapas. They represent two extreme socioeconomic conditions with Mexico City having the highest economic development in the country and Chiapas the lowest. A total of 1.000 interviews were conducted, 600 in Mexico City and 400 in TG, with individuals who belonged to the socioeconomic strata of 1 to 4 out of 7; that is, the lowest strata of the country according to INEGI.[6] The target population was the bottom of the pyramid (BoP).[7]

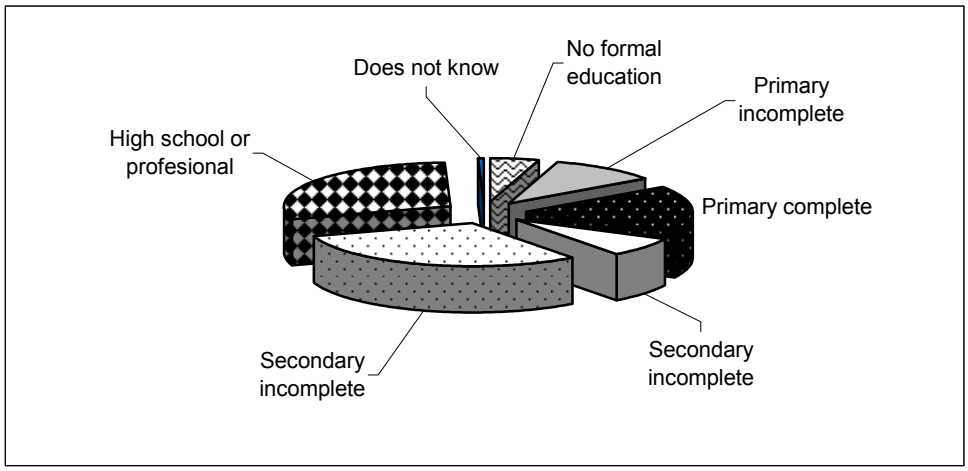
User profiles

Users in our survey were identified as those who have used a mobile telephone in the three previous months. A rather low figure, 37 percent of those surveyed, were identified as users.[8] These persons had been using, on average, a mobile phone for the past two and a half years. Of the these users, 65 percent were women and 35 percent men and 80 percent percent of users were adults between 19 and 50 years of

[4] Diálogo Regional por la Sociedad de la Información (DIRSI) is a network of professionals and institutions specialized in ICT policy and research in Latin America. We conduct research, publish and distribute papers and reports, and facilitate dialogue on ICT policy, regulation and governance in Latin America.
[5] The countries where the surveys were conducted are Argentina, Brazil, Colombia, Jamaica, Mexico, Peru and Trinidad -Tobago.
[6] For a full explanation of methodology please check the appendix of http://dirsi.net/sites/default/files/dirsi-_07_MO_mex_es.pdf.
[7] The BoP is a concept regarding the orientation of businesses to low income consumers that has challenged traditional beliefs and values about market performance. It's an approach that involves partnering with low income users to innovate and achieve sustainable win–win scenarios where the poor are actively engaged and, at the same time, companies provide products and services that are profitable. For more information see *Prahalad and Stuart (2002)*.
[8] This may be due to the hours in which the survey was applied. Due to safety concerns in the neighborhoods visited, interviews were conducted in the morning.

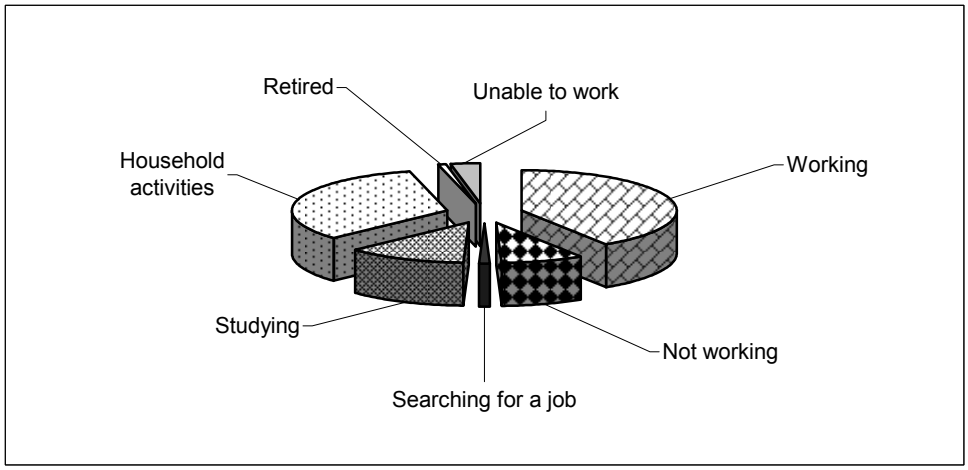
age. The percentage of users increased with the level of education (see Figure 3.2). In terms of main activity, the largest group of users were the employed, followed by homemakers and students (see Figure 3.3).

Figure 3.2. Users education level (Mexico)



Source: By Author.

Figure 3.3. Users main activity (Mexico)

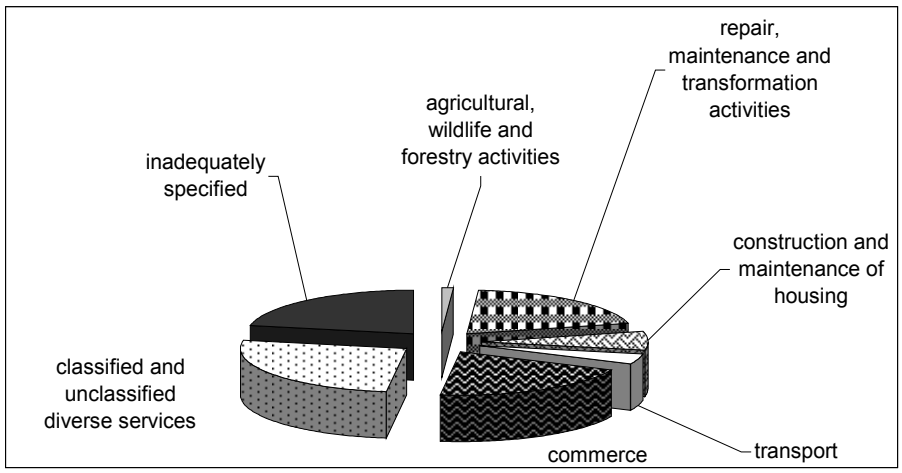


Source: By Author.

Among the 457 individuals who were employed, most were involved in commerce/retail activities, repair work and maintenance. These types of activities are generally carried

out by individuals working independently and therefore mobile services provide a useful tool for maintaining or acquiring business opportunities (see Table 3.1).[9]

Figure 3.4. Users according to occupation group



Source: By Author.

Strategies used to access mobile services

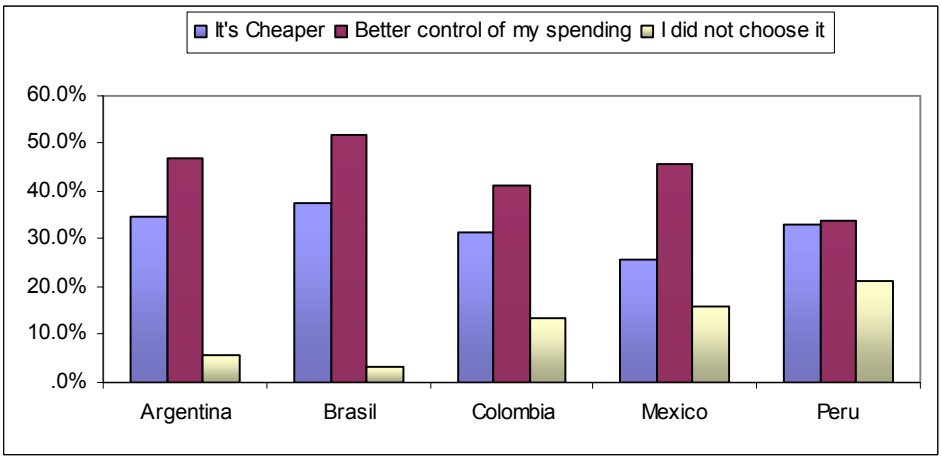
Unlike the results of surveys applied in Africa and Asia,[10] in Mexico and Latin America, the majority of mobile telephone service users, 80 percent, own a handset. Most of the owners, 66 percent, have purchased their handset, of these, 86 percent bought it new and 14 percent bought it used. The primary option for users who do not own a handset to access service is to borrow the mobile telephone of a friend or family member (83 percent). Moreover, in contrast to other regions of the world, in Latin America and in Mexico specifically, mobile phones are mainly used individually; there is no evidence of community use.

Of the users who own a handset, 92 percent have a prepaid connection while 7 percent use a post-paid plan. This is consistent with information gathered nationally which shows that 91 percent of mobile telephone subscribers use the prepaid system. It is also consistent with worldwide users in developing countries; the mechanism to acquire

[9] The χ^2 statistic was used in the contingency tables (*crosstab*) in order to prove whether there is any statistical difference between two or more groups in respect to one variable when the group is classified by categories. This is known as the test for independence.
[10] Other similar surveys were conducted in Africa and Asia by RIA and LIRNE respectively. For more information about them please check: http://www.researchictafrica.net/, http://lirne.net/.

mobile access is prepaid. The main reasons given in the survey for deciding on prepaid plans rather than rental plans are: better control of expenses, it is cheaper (25,54 percent) and it is easier to obtain than a rental plan (15,8). It is surprising to find that a reason for using prepaid is that it is cheaper as this is generally not true. However, this may be due to the fact that many users cannot access credit lines. The reasons people in diverse countries in Latin America decide on prepaid mechanisms to acquire their mobile are very similar as shown in Figure 3.5.

Figure 3.5. Why did you choose a prepaid phone?



Source: By Author.

Patterns of use

Survey results show that 70 percent of users made at least one call in the week preceding the interview. The average volume of outgoing and incoming calls made and received from a mobile telephone over the course of this week were 7 and 8 respectively, which shows poor consumers minimize costs by using mobile phones more often for receiving calls than making calls. As shown in Table 3.1, that is a common strategy among poor Latin American users, who, on average, report more incoming calls than outgoing calls. Moreover, outgoing call intensity is low compared with the low volume basket presented by the Organization for Economic Cooperation and Development (OECD, 2009).

Table 3.1. Outgoing and incoming calls per week

Country		Average of Calls	Outgoing / Incoming calls
Brazil	Outgoing	10	1,0370
	Incoming	11	
Peru	Outgoing	7	1,2215
	Incoming	9	
Mexico	Outgoing	7	1,0646
	Incoming	8	
Colombia	Outgoing	13	1,0614
	Incoming	14	
Argentina	Outgoing	10	1,0844
	Incoming	11	

The primary motive given for using mobile telephony in Mexico was to make and receive calls from family members within the country and to keep in touch with friends. Use of mobiles to get information from the government, businesses, and family members abroad was close to 0. As shown in Table 3.2, motives for calls are very similar among the 5 countries surveyed. Even though we found that communication with family and friends was the most significant use, it is a fact that work related calls are significant too.

Table 3.2. Motives for calls per week

	Countries				
Reason	**Argentina**	**Brazil**	**Colombia**	**Mexico**	**Peru**
Work	3	2	4	1	2
Friends	4	4	4	2	2
Family in the country	3	4	5	4	3

Source: By Author.

Table 3.3 shows the average number of outgoing calls by gender and age group. In the five countries studied men make more calls than women. The behavior of age groups is also very similar across these countries: young people from 19 to 30 years old are the ones who reported the largest volume of outgoing calls. Mexico, Peru and Argentina are the countries where communication intensity is lower, even in the 19 -30 years old group, where people said they made 7 calls on average per week. Finally,

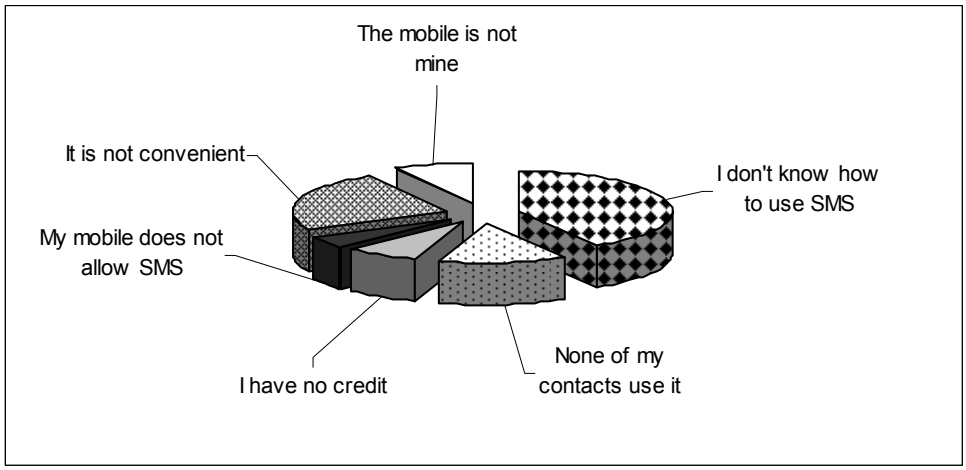
our data also showed that those individuals belonging to a relatively higher socioeconomic stratum communicated more than those from lower socioeconomic strata.

Table 3.3. Average outgoing calls by gender and age groups

	Country				
Gender	Argentina	Brazil	Colombia	Mexico	Peru
Men	12	13	17	8	8
Women	7	9	11	7	7
Age bracket					
from 13 to 18 years	7	14	11	6	4
from 19 to 30 years	10	11	15	8	7
from 31 to 50 years	11	11	13	7	7
from 51 years and older	10	6	9	7	6

Source: By Author.

Figure 3.6. Main reason for not sending a sms (Mexico)



Source: By Author.

In terms of short message services (SMS) patterns, only 52,5 percent of Mexican users send or receive messages. The main reason given by those who do not is that they don't know how, while the second reason in order of importance is that they are not deemed convenient (see Figure 3.6).

Users generally sent and received more messages than the number of calls they made and received. As with calls, most of these messages were made to friends and family.

As for delivery of government services through SMS, the service is recent (August of 2006) and their use has not been sufficiently disseminated.[11]

The results show that mobile applications are seldom used. The services most commonly used are downloading a *ringtone* or *wallpaper*, followed by participation in prize drawings. Mobile banking services, for example, are still in their infancy in Mexico. Experience in other regions such as India, for example, is consistent with these results; the telephone is the preferred means of communicating with family, while people prefer to undertake government application processes in person at the respective agency (Souter et al., 2005).

Immigration is a common phenomenon in Mexico which is reflected in this sample. The survey came across areas where very few men of working age remained as many had already immigrated to the United States. However, very few households reported receiving money transfers; only 2 percent of the households visited received money wired from other countries and a further 2 percent from some other location within the country. Only 4 (of the 371) mobile telephony users received money; three others used the mobile telephone to agree on money transfers and two others stated that they would use this service if it was available.

Table 3.4. Mobile transactions have you ever used your mobile telephone to…? (Mexico)

	Yes	**No**
Undertake application processes or bank transactions	2,6	97,4
Communicate with a government office	1	99
Download a ringtone or wallpaper	11	89
Participate in a competition or drawing	2,1	97,9
Carry out other types of transactions	1	100

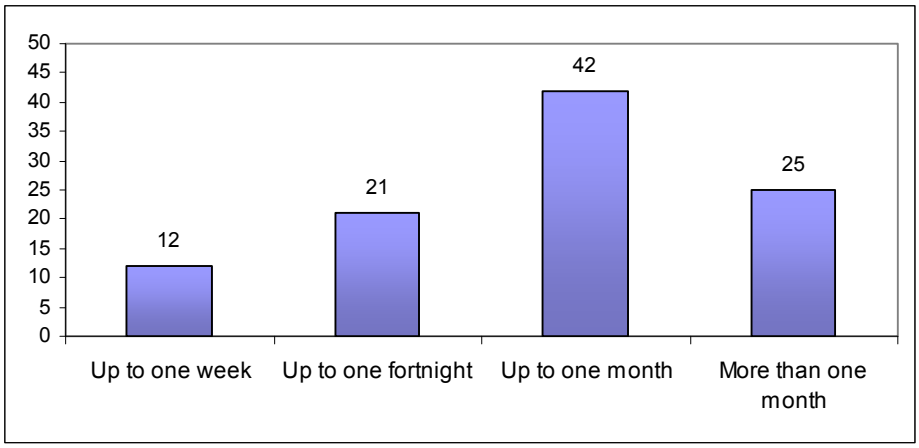
Source: By Author.

[11] http://www.gob.mx/movil/index.jsp.

Expense patterns

There are significant differences as to who covers the cost of the service depending on the type of connection. In Mexico, eighty percent of prepaid plan users cover their own costs, while for the remaining 20 percent, a family member pays whether it be the user's parent or spouse. The average daily expense for post-paid plan users was US$0.88 compared to US$0.52 for prepaid plan users. The frequency of recharge is shown in Figure 3.7; the majority of users recharge credit once a month.

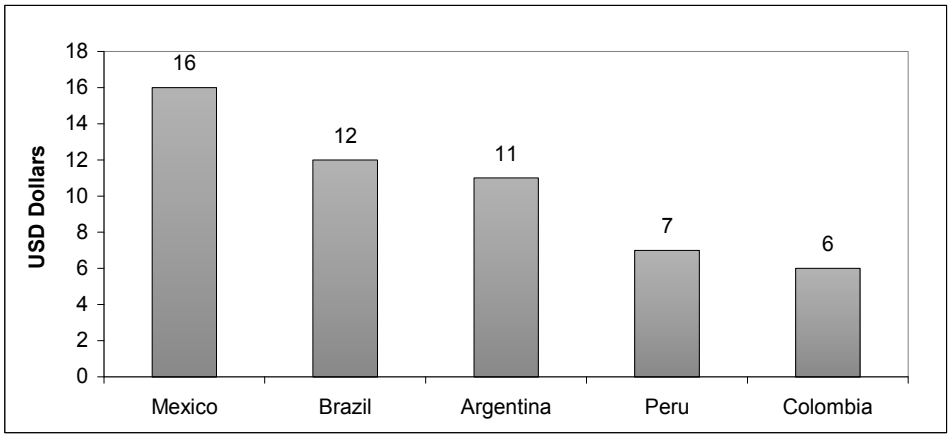
Figure 3.7. Frequency of recharges in Days



Source: By Author.

We found different amounts of money spent on mobile services across countries. As shown in Figure 3.8, Mexico is the country where the poor spent the most money on their mobile service. It is important to note that, on average, Mexican consumers spend more than double that of Peruvian and Colombian consumers.

Figure 3.8. Average monthly spending on mobile service



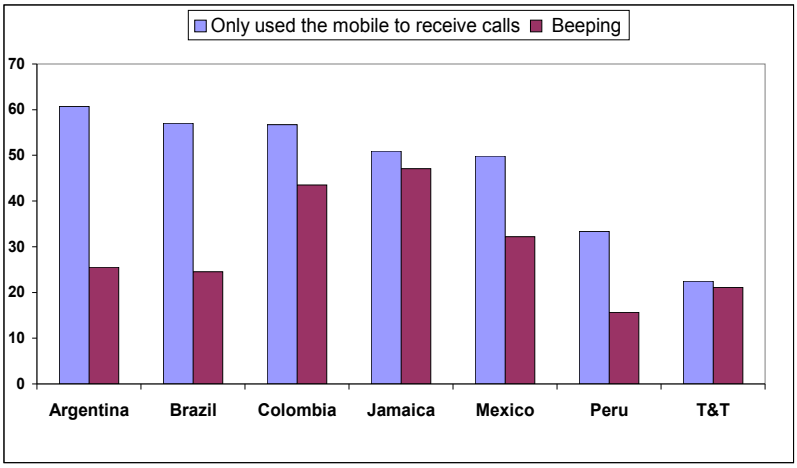
Source: By Author.

Cost control strategies

Donner (2007a) has documented the use of beeping as a widespread strategy for minimizing cost. This strategy along with receiving more calls than those made are a response to the calling party pays system implemented in most countries.

In order to minimize cost, 50 percent of users in Mexico only utilized their mobile to receive calls, 37 percent sent messages, 27 percent only made calls when tariffs were lower, 25 percent employed the strategy of 'beeping' and 7 percent used mobiles rented in the street. These strategies are also used in other Latin American countries as shown in Figure 3.9.

Figure 3.9. Most common cost-reduction strategies (% of users)



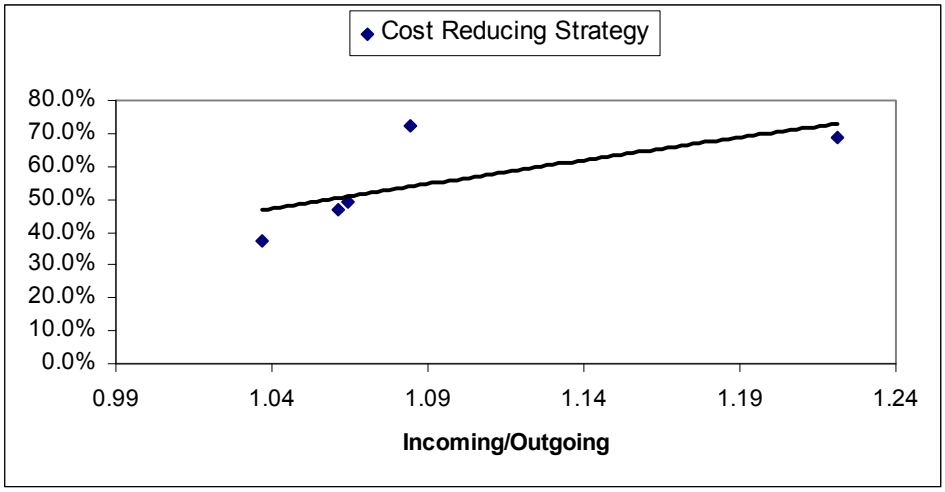
Source: By Author.

Table 3.5, shows a comparative analysis of the relation between the balance of incoming and outgoing calls with other cost reducing strategies, namely, beeping and SMS. It is interesting to observe that those countries in our sample that show a high imbalance in the former use other strategies more intensively. That is, users who call less and receive more calls will make more use of beeping and SMS to communicate. One way to interpret this is that poor users value mobile communication highly and if they don't make many calls they will be strategic in the use of mobiles by employing other means. Figure 3.10 shows a positive relation between the imbalance in incoming versus outgoing calls and the use of other reducing strategies.

Table 3.5. Relation between incoming and outgoing calls

Country	Incoming / Outgoing Calls	Beeping Strategy	Just SMS strategy	% User who use both strategies	% Users using a cost reducing strategy
Perú	1,2215	47,1%	40,6%	19,0%	68,7%
Argentina	1,0844	15,2%	69,8%	13,0%	72,0%
Mexico	1,0646	24,5%	36,9%	12,0%	49,4%
Colombia	1,0614	43,5%	8,9%	5,5%	46,9%
Brazil	1,0370	31,8%	11,6%	6,0%	37,4%

Figure 3.10. Incoming/outgoing vs. cost reducing strategy



Perception of costs

The majority of post-paid plan users (47,8 percent) in Mexico consider the service to be cheap, while the majority of prepaid plan users (44,6 percent) consider it affordable. Given the high percentage of their income spent on mobile services, one might expect a more negative perception regarding prices.

An exercise was undertaken to gain a better understanding of user reaction (elasticity) to changes in income and price of the service. As shown in Table 3.7, consumption would not decrease significantly if either prices or their income changed. That is, mobile services appear to be a necessary good.

Table 3.6. Elasticity of demand (Mexico)

What would be your reaction if…	I would not change my consumption pattern	I would increase my consumption to some degree, but not double it	I would double my consumption	I would more than double my consumption	I would no longer use it
The monthly cost of using your mobile telephone halved?	50,0	32,9	10,1	7,05	-
The monthly cost of using your mobile telephone doubled?	28,9	15,1	20,1	12,42	23,15
Your monthly income doubled (in respect to using mobile telephony)?	69,8	21,1	6,0	2,35	-
Your monthly income halved (in respect to using mobile telephony)?	39,3	13,4	12,8	11,41	22,48

Source: By Author.

Mobile telephony: Perceived benefits

Strengthening family relationships, relations with friends as well as use in case of emergencies are the areas that are perceived as most enhanced by the use of mobile services. The first two are also the areas that register the greatest number of calls made and received. Regarding benefits to quality of life, in general, 50 percent of users indicated that access to mobile telephony has not benefited them in any way. When this response is viewed by level of education, the better educated believe that it has not benefited them at all, which could be due to the fact they they are more likely to have other means of communication at their disposal, whether it be a fixed telephone line at home or Internet use (see Table 3.8). Again, these answers are basically the same compared to those for other Latin American countries as seen in Table 3.9. And as Zainudeen et al (2006) reports, communicating with family and friends are the most important reasons for mobile telephone use in Asia.

Table 3.7. Aspect of life which access to mobile telephony has improved (Mexico)

	None	Little	Some	A lot
Work or business*	31,1	15,5	23,3	27,5
Relations with friends	22,1	24,8	20,2	28,6
Family relationships	6,5	22,9	19,9	48,0
Emergencies	18,6	19,4	18,9	39,6
Inf. health serv.	67,9	12,7	6,5	7,3
Inf. education serv.	76,3	10,2	5,9	2,7
Inf. government serv.	82,2	8,9	2,7	0,5
Security in day to day life	47,4	19,7	13,7	15,1
Social recognition	74,7	10,2	7,0	3,5
Quality of life	50,4	21,0	15,6	9,4

Source: By Author. *Of the 371 users, only the 193 who work are considered.

Table 3.8. Aspect of life which access to mobile telephony has improved

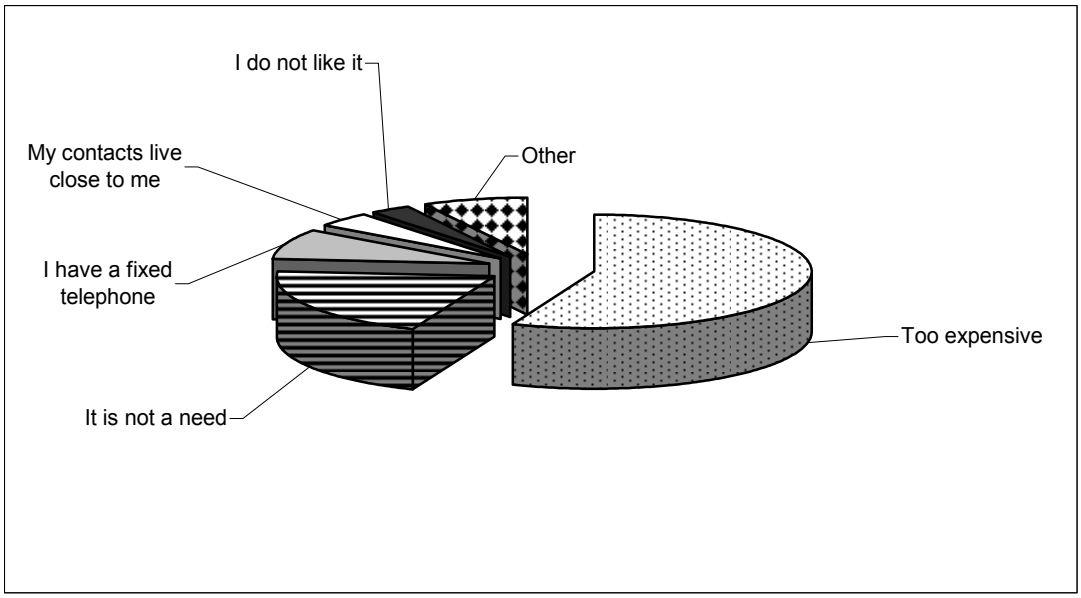
	Argentina	Brazil	Colombia	Mexico	Peru
Family	71%	54%	65%	48%	52%
Friends	69%	45%	42%	29%	30%
Emergencies	47%	46%	37%	40%	14%
Work	43%	31%	43%	27%	26%

Source: By Author

Non users: Perspectives, future adoption and willingness to pay

The majority of Mexican non-users live in households classified as poor (65 percent), a high proportion are women (66 percent) and the main activities engaged in are housework (47 percent) and employment (31 percent). The main reasons given for not using mobile telephone services are that they are considered very expensive, viewed as unnecessary or there is a fixed telephone at home. (See Figure 3.11).

Figure 3.11. Main reasons for not using mobile telephone services (Mexican)



Source: By Author.

Only 18 percent of Mexican non-users indicated that they intended to acquire a handset over the next twelve months. The main reason given was so that they could be reached in case of an emergency (43 percent), the second reason was to keep in touch with family (28 percent) and the third reason was that they thought it convenient for making and receiving calls (25 percent). Eighty four percent of those who planned to acquire a mobile telephone would choose a prepaid plan. Those who want to acquire a prepaid telephone indicated in the same proportion that it was cheaper and offered greater control of expenses.

Conclusions

The results of the survey applied in Mexico provide evidence that users of mobile telephony among low income sectors highly value this service and view it as particularly necessary to communicate with family and friends. These results, which may be viewed as strengthening social networks, are compatible with other studies that document how mobile services create and reinforce characteristics such as shared values and trust, which are key components of social capital (Chapman, 2004). Moreover, once users begin to apply mobile telephony to work settings, they use it

more intensively than those that do not use it for work related activities. There seems to be a learning curve that users must go through in order to take advantage of mobile telephony for business purposes.

The fact that these services appear to be inelastic at the BoP offers evidence that mobile services are not a luxury; they represent a useful tool for low income sectors of the population. The adoption of mobile technology for communication at the BoP is a first step towards a more transformative process that may allow for an even more productive use to address poverty. Public policies and business strategies need to accelerate the dissemination of mobile services to more users at the BoP.

Regulatory policies need to promote an increased penetration of mobile telephony by reducing barriers to entry to this sector; this will promote competition and tariff reduction. The telecommunications sector in Mexico still faces significant regulatory barriers to entry that include lack of spectrum allocation, limits to foreign investment and most importantly, an institutional deficit in the process of design and implementation of policy. Business models designed to deliver services and products to the BoP would also accelerate the dissemination of mobile services.

Evidence based research is also needed to identify the barriers to an increased adoption not only of mobile voice services but of mobile applications. Mobile technologies have the potential to dramatically enhance the living conditions of the poor by offering access to health programs and by promoting civic engagement and economic empowerment.

Appendix: Methodology

The aim of the process is to obtain a probabilistic sample of individuals living in conditions of poverty in urban zones of Mexico. As our sample framework we propose to use the basic geostatistical areas (AGEB in Spanish) which are the basic units of the national geostatistical framework (MGN in Spanish) and constitute a solid technical and methodological reference; these are classified as urban and rural according to the criteria used by the National Institute for Statistics and Geography (INEGI in Spanish).

This study will only use the urban AGEBs considered in the metropolitan areas (MA) of both Mexico City and Tuxtla Gutiérrez, Chiapas. The arrangement and classification of the AGEBs used in sampling for the study “Telephony Access in Latin America and the Caribbean”, are also used in the document Socioeconomic Regions of Mexico (improved version of levels of wellbeing in Mexico) by the INEGI. This document divides the country on the basis of three unique yet complementary geographical levels: states, municipalities and AGEBs. There are 7 socioeconomic strata in this division each representing the socioeconomic level of the population with a different value. The document assumes that the population belonging to stratum 7 enjoys the highest socioeconomic level or are the most favored; at the other end is the population belonging to stratum 1 which has the lowest socioeconomic level or is the least favored.

The number of municipalities considered in the Tuxtla Gutiérrez Metorpolitan Area is 2, which are shown in Table A.3.1:

Table A.3.1. Tuxtla Gutiérrez Metropolitan Area

CODE	MUNICIPALITY
07027	CHIAPA DE CORZO
07101	TUXTLA GUTIÉRREZ

Source: SEDESOL / CONAPO / INEGI. Delimitation of Metropolitan Areas in Mexico. Mexico 2004.

The number of municipalities considered in the Mexico City Metoropolitan Area is 75, which are shown in Table A.3.2:

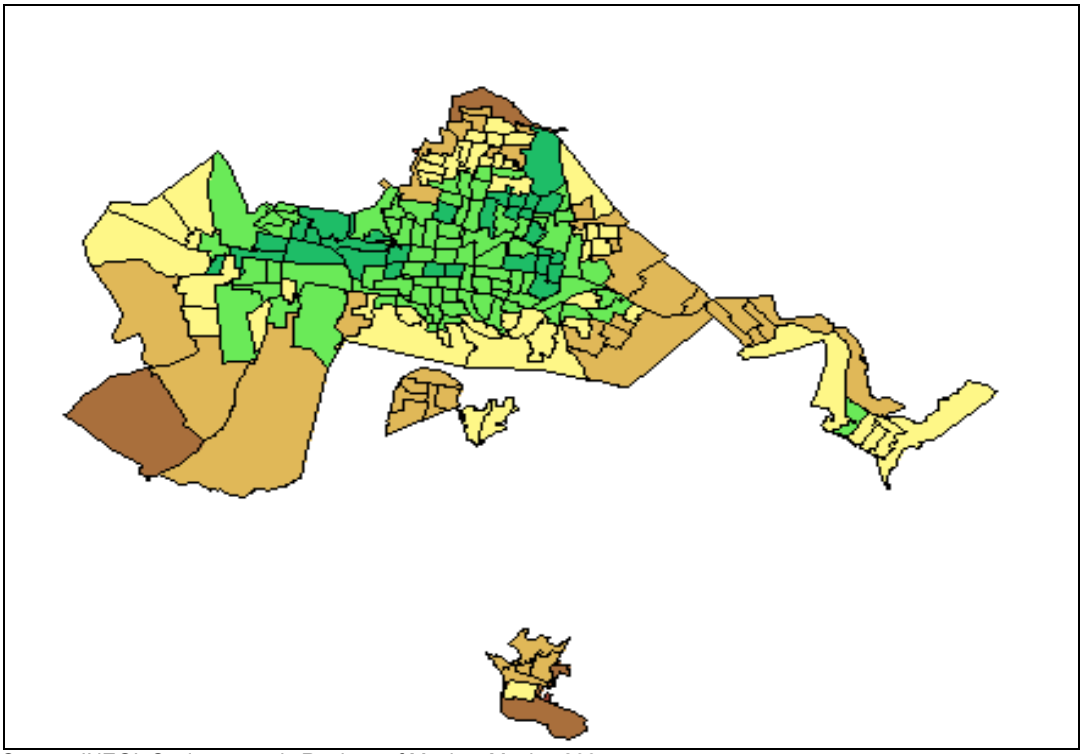
Table A.3.2. Mexico City Metropolitan Area

CODE	MUNICIPALITY	CODE	MUNICIPALITY	CODE	MUNICIPALITY
09002	AZCAPOTZALCO	15020	COACALCO	15065	OTUMBA
09003	COYOACÁN	15022	COCOTITLÁN	15068	OZUMBA
09004	CUAJIMALPA	15023	COYOTEPEC	15069	PAPALOTLA
09005	GUSTAVO A. MADERO	15024	CUATITLÁN	15070	LA PAZ
09006	IZTACALCO	15025	CHALCO	15075	S. MARTÍN DE LAS P.
09007	IZTAPALAPA	15028	CHIAUTLA	15081	TECÁMAC
09008	MAGDALENA CONTRERAS	15029	CHICOLOAPAN	15083	TEMAMATLA
09009	MILPA ALTA	15030	CHICONCUAC	15084	TEMASCALAPA
09010	ÁLVARO OBREGÓN	15031	CHIMALHUACÁN	15089	TENANGO DEL AIRE
09011	TLÁHUAC	15033	ECATEPEC DE MORELOS	15091	TEOLOYUCAN
09012	TLALPAN	15034	ECATZINGO	15092	TEOTIHUACÁN
09013	XOCHIMILCO	15035	HUEHUETOCA	15093	TEPETLAOXTOC
09014	BENITO JUÁREZ	15036	HUEYPOXTLA	15094	TEPETIXTLA
09015	CUAUHTÉMOC	15037	HUIXQUILUCAN	15095	TEPOTZOTLÁN
09016	MIGUEL HIDALGO	15038	ISIDRO FABELA	15096	TEQUIXQUIAC
09017	VENUSTIANO CARRANZA	15039	IXTAPALUCA	15099	TEXCOCO
13069	TIZAYUCA	15044	JALTENCO	15100	TEZOYUCA
15002	ACOLMAN	15046	JILOTZINGO	15103	TLALMANALCO
15009	AMECAMECA	15050	JUCHITEPEC	15104	TLALNEPANTLA DE B.
15010	APAXCO	15053	MELCHOR OCAMPO	15108	TULTEPEC
15011	ATENCO	15057	NAUCALPAN DE J.	15109	TULTITLÁN
15013	ATIZAPÁN DE ZARAGOZA	15058	NEZAHUALCOYOTL	15112	VILLA DEL CARBÓN
15015	ATLAUTLA	15059	NEXTLALPAN	15120	ZUMPANGO
15016	AXAPUSCO	15060	NICOLÁS ROMERO	15121	CUATITLÁN IZCALLI
15017	AYAPANGO	15061	NOPALTEPEC	15122	V. DE CHALCO SOLID.

Source: SEDESOL / CONAPO / INEGI. Delimitation of Metropolitan Areas in Mexico. Mexico 2004.

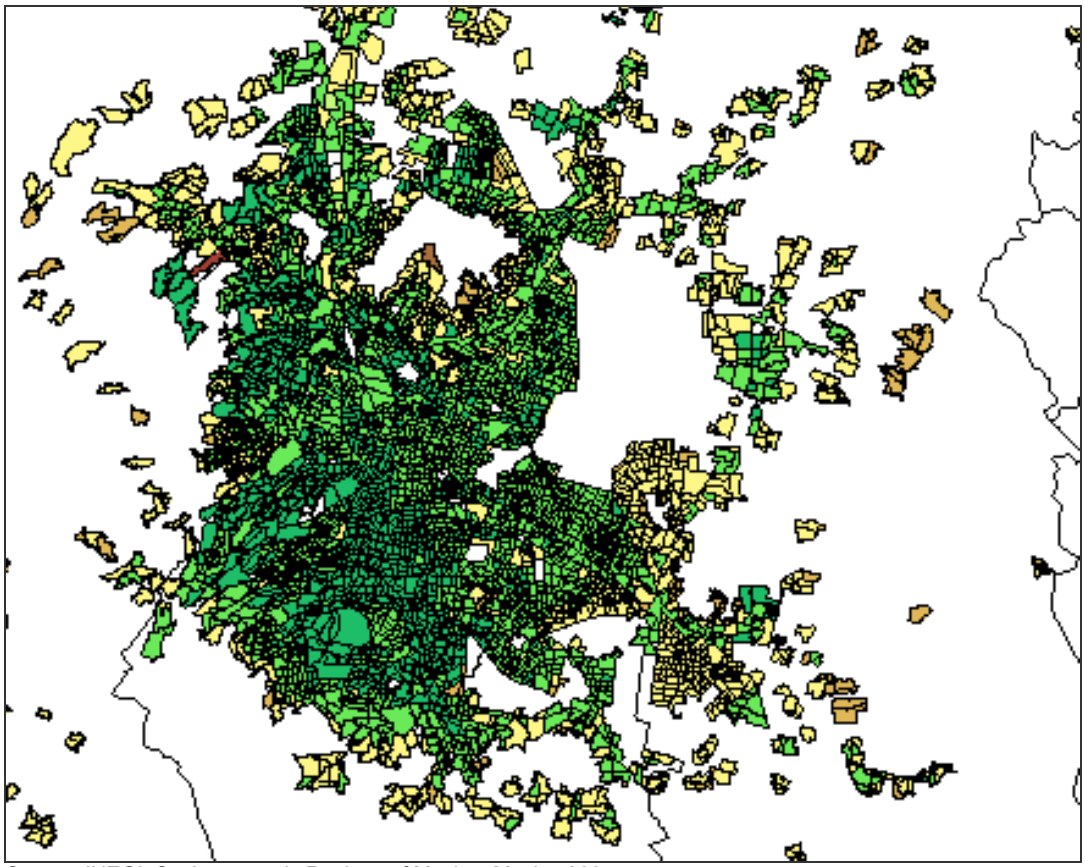
Maps A.3.1 and A.3.2 show the AGEBs classifications according to the 7 strata in the Tuxtla Gutiérrez and Mexico City Metropolitan Areas; dark green represents those areas which of the highest socioeconomic level (stratum number 7) and dark brown are those of the lowest socioeconomic level (stratum number 1); the range of colors between these two extremes represent the remaining 5 strata.

Map A.3.1. AGEB classifications in the Tuxtla Gutiérrez Ma



Source: INEGI, Socioeconomic Regions of Mexico. Mexico 2004.

Map A.3.2. AGEB classification in the Mexico city Ma



Source: INEGI, Socioeconomic Regions of Mexico. Mexico 2004.

Field notes

1. Some individuals stated that they did not understand the survey questions. This happened particularly in notably poorer communities.

2. The early arrival of the rainy season to Mexico made access to certain starting points difficult since roads were damaged by heavy rains. Transportation in other areas was seriously lacking.

3. In some areas, especially in the TGMA, some male heads of households refused to allow the survey to be applied to their spouse and/or children. If pollsters decided to move on to other housholds they would be threatened with eviction from the neighorhood. For this reason, and in these isolated cases, it was decided to interview these household heads considering them as substitutes, determining that this was less harmful to the study than complete substitution of the starting point.

4. There was a feeling amongst some pollsters that some members of households represented themselves as “head of the family” without actually holding that position. Added to this were other cases where respondents were wary of requests for personal information about other members of the household.

5. In certain parts of Mexico City pollsters entered areas with high crime rates where residents would warn them “not to pass by that corner”. In some municipalities in the State of Mexico there were confrontations with “youth gangs”. Visits were not carried out at night and pollsters withdrew from locations after dark. Work teams were sent to the majority of locations rather than individual pollsters.

6. In Tuxtla Gutiérrez, pollsters were followed by police patrols. On occasion, it was the police who would ask pollsters to identify themselves, taking down all the personal information of the work teams.

7. There was a conspicuous presence of goups of youth on street corners in the urban areas visited both in Mexico City and Tuxtla Gutiérrez. Although no incidents were recorded, the movements of work teams were shadowed on a number of occasions which left pollsters feeling threatened.

8. Although most of the homes at starting points were poor or very poor, pollsters also came across a number of buildings that did not fit this profile, which was evident from the finishings, size of the house and type of cars parked in the garage, despite the fact that streets in the neighborhood were muddy and unpaved, revealing severe flooding and in some cases, a serious lack of basic needs such as drainage, water and public transport.

In some areas there was a noticeable lack of men of working age as many had emigrated to the United States.

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