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Strategic Use of Mobiles in Latin America and the Caribbean

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Abstract

The growing importance of mobile telephony for users at the bottom of the pyramid is reflected in the high proportion of their incomes devoted to this service. Evidence from communities in the developing world where low-income users have developed long term and short term strategies to minimize costs while continuing to benefit from access to communication, has opened new lines of research. Based on a survey of over 7,000 face-to-face interviews carried out in Argentina, Brazil, Colombia, Jamaica, Mexico, Peru, and Trinidad and Tobago, during April, May and June 2007, the present study explores the cost-reduction strategies employed. The first finding is that most low-income mobile phone users in Latin America and the Caribbean (LAC) own their mobile phones and rarely share them, most users buy new handsets. Using cell phones simply to receive calls is the most commonly used short-term strategy. This allows users to meet the highly-valued need to be reached by phone, even during periods when they cannot afford to purchase air time credit. Those who do use SMS cite its lower cost as compared to calls as its main advantage. In LAC region the results suggest that market and regulatory conditions have a significant impact on the use of strategies.

Resumen

La importancia creciente que el teléfono celular tiene para los grupos de bajos ingresos, reflejada en el elevado porcentaje del ingreso que destinan a este servicio, y la evidencia de localidades del mundo en desarrollo donde los usuarios han desarrollado estrategias de largo y corto plazo para minimizar los costos de este servicio sin dejar de obtener los beneficios de estar comunicados, han abierto líneas de investigación sobre este grupo de usuarios. Basado en una encuesta aplicada a más de 7,000 personas en Argentina, Brasil, Colombia, Jamaica, México, Perú, y Trinidad y Tobago, en los meses de abril, mayo y junio de 2007, el presente estudio explora las estrategias utilizadas para reducir los costos por parte de los usuarios de bajos ingresos. Entre los principales resultados encontramos que la mayoría de los usuarios son dueños de su teléfono, rara vez lo comparten y la mayoría lo compran nuevo. La estrategia de corto plazo más practicada es el uso del móvil sólo para recibir llamadas permitiendo a los usuarios seguir comunicados a pesar de que no puedan pagar el servicio de tiempo aire. Los usuarios de mensajes cortos identifican este servicio de menor costo que el de las llamadas. En la región de Latinoamérica y el Caribe los

resultados sugieren que las condiciones regulatorias y de mercado tienen un impacto significativo en el uso de estrategias.

Introduction

In many cases mobile telephony is considered *a necessary and inelastic good* (Frost and Sullivan, 2006; Bjärhov and Weidman, 2007; INEGI, 2006). Consequently, in the coming years there is expected to be considerable growth in the number of low-income mobile users in the developing world, as well as a higher degree of maturity of use among low-income consumers (Donner, 2008; Dymond & Oestmann, 2003).¹

At the same time, competition in the mobile telephony market has spurred operators to seek out new markets, especially in low-income sectors that have increasingly joined the use of this technology in the past few years. Recently, much greater importance has been placed on lower-income groups in terms of both marketing and innovation (Pralhad, 2004).²

Studies reveal that individuals who earn low incomes devote a considerable amount of their earnings to accessing telecommunications services. In general, a significant portion of telecommunications consumers spend between 2 and 3% of their income on these services, while individuals from low-income sectors in developing countries may spend as much as 10% (Intelecon, 2005; Gillwald, 2005; Souter *et al.*, 2005). Bjärhov and Weidman (2007) note that some people spend up to 40% of their income on mobile services. They further stress that the value of communication is greater than its monetary cost, and this is a fact that should be understood by companies seeking to target the market at the so-called bottom of the income pyramid. Figures like these demonstrate the increase in the consumption of these services by low-income sectors of the population and how necessary they consider communication to be. At the same time, they highlight the challenges faced by these sectors due to the high costs of mobile service and the constraints on their spending capacity.

A significant proportion of low-income mobile users make a major economic effort³ adopt strategic decisions, and employ various practices — some of them very creative— in order to take advantage of mobile telephony service models and technology to engage in communication with the lowest possible expense. Numerous studies illustrate these strategies and practices in different regions of the developing world, such as Asia (Zainudeen *et al.*,

¹ For this study, maturity in mobile phone usage refers to the degree of adoption and knowledge of the device and the services offered by mobile telephony. Maturity is normally acquired through practice over time.

² There are numerous examples such as Unilever and Procter & Gamble in India, Casas Bahia in Brazil and Cemex in Mexico, among others, that demonstrate that people in developing countries with annual incomes of less than USD \$ 1,500 seek both competitive prices and quality in the products they purchase.

³ The National Institute of Statistics, Geography and Informatics (INEGI, 2006a) reports that low-income users have increased their expenditure on mobile telephony from 1.5 to 2.9%. However, this increase has implied a decrease in expenditure on other areas such as cleaning products, home maintenance, personal grooming, clothing and footwear.

2006; Chakraborty, 2004; Aminuzzaman, 2005) Africa (Donner, 2007; Gamos Ltd, 2003; Dymond & Oestmann, 2003) and Latin America (Frost & Sullivan, 2006 & Ureta, 2008).⁴

Of particular interest is the work of Zainudeen *et al.* (2006), who distinguish between short-term and long-term strategies. Both involve conscious decisions with the main goal of reducing the costs associated with mobile telephone use. The difference lies in the frequency with which such decisions are made. Short-term strategies, such as beeping or missed calls and the use of short text messages (SMS) are practiced on a daily basis. On the other hand, long-term strategies involve non-daily decisions, such as whether or not to purchase a mobile handset, whether to purchase a new or used handset, what type of payment plan to choose—prepaid or postpaid—and the use of different types of telephony: mobile only, mobile and public, mobile and fixed.

Within this context, the aim of this study is to explore the cost-reduction strategies employed by low-income mobile telephony users in Argentina, Brazil, Colombia, Jamaica, Mexico, Peru, and Trinidad & Tobago, and the similarities and differences between usage in the various countries in the region.

This research study forms part of a project entitled Mobile Opportunities: Poverty and Telephony Access in Latin America and the Caribbean undertaken by the Regional Dialogue on the Information Society (DIRSI). As a fundamental component of the project, a survey on mobile telephony usage patterns was conducted in seven countries in Latin America and the Caribbean: Argentina, Brazil, Colombia, Jamaica, Mexico, Peru, and Trinidad and Tobago. The survey sought to assess the impact of mobile telephony access on low-income population sectors with regard to the following aspects: employment opportunities and income, relations with the government and social services, and the strengthening of social and family networks. Fieldwork was conducted between April, May and June, 2007.

This document is divided into five sections. The first section presents the context in Latin America and the Caribbean regarding poverty and mobile penetration. The following section explains the cost reduction strategies experiences in locations of South Asia, Africa and Latin America. The third section shows the research methods. The fourth explains the main findings, while the last presents the concluding remarks.

⁴ Neither the studies mentioned nor the present study can claim to be nationally representative.

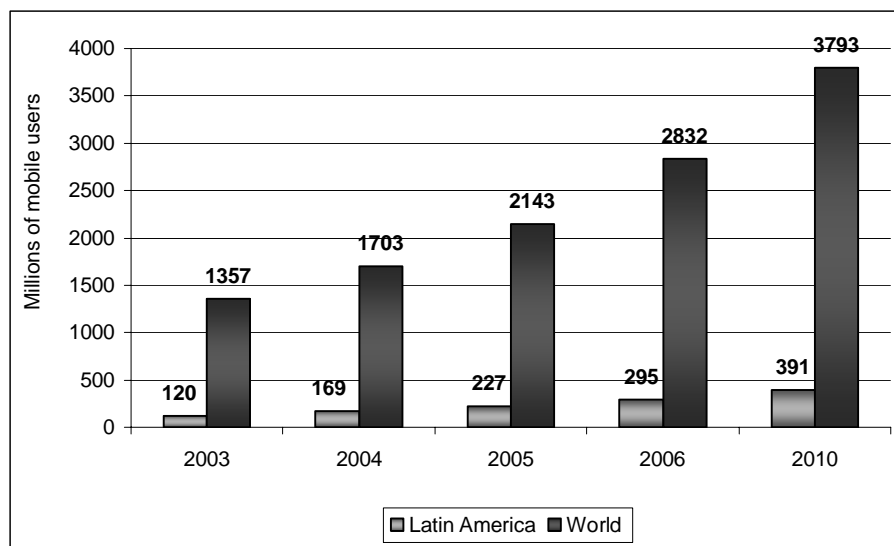
Latin America and the Caribbean (LAC) Poverty and Mobile Penetration

In 2007, LAC experienced a positive economic performance, reflected in a 5.6% increase of the GDP, equivalent to an increase in product per inhabitant of 4.2%. The LAC population is estimated at approximately 522 million. According to data from the Economic Commission for Latin America and the Caribbean, 36.5% of the population (194 million) lives in poverty while 13.4% (71 million) is destitute, living on less than a dollar a day (ECLAC, 2007).

Average cellular telephony penetration in Latin America is approximately 60 subscribers for every 100 inhabitants, which is above the world average of approximately 54 subscribers for every 100 inhabitants. Cellular telephony penetration in the region has more than doubled the penetration of fixed telephony. In 2006, the greatest increase in mobile communication occurred in Latin America, raising the total number of subscribers to 296 million.

A number of estimates suggest that by 2010, the number of cellular telephony subscribers in the region will increase by 80%. In other words, growth in the region most probably will continue to be the highest worldwide, with the market in the US expanding by 58%, in Western Europe by 20% and in the Asia-Pacific region by 65% (see graph 1).

GRAPH 1. MOBILE TELEPHONY SUBSCRIBERS IN LAC AND THE WORLD

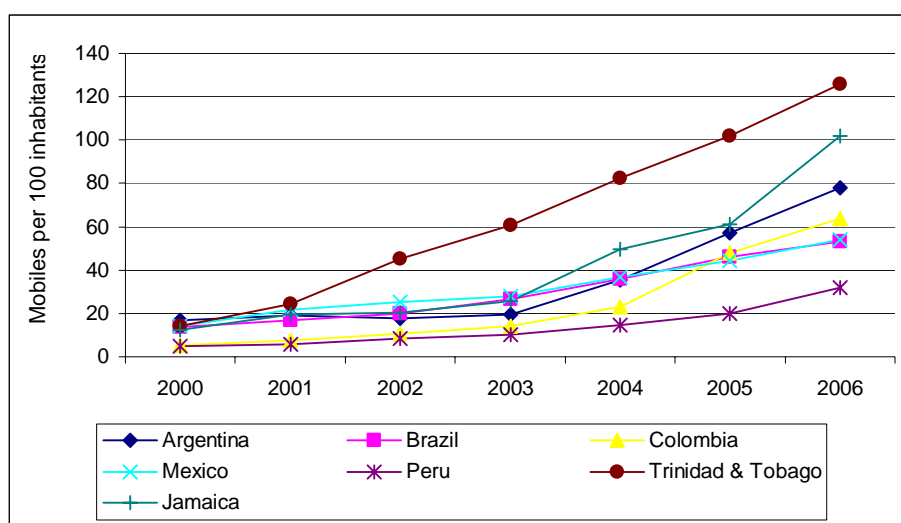


Source: Enter *et al.* (2007).

In terms of coverage, countries in the region have experienced high growth rates, totaling 90% in Brazil, 86% in Argentina, 81% in Mexico, 69% in Colombia, 68% in Peru and up to 100% in Jamaica and Trinidad and Tobago

(see graph 2). The increase in the region is obviously also reflected at the country level, albeit at different rates. For example, in Jamaica and Trinidad and Tobago, penetration for every 100 inhabitants is over 100 mobile phones, whereas in Argentina, it is nearly 80 mobile telephones for every 100 inhabitants, 65 in Colombia, nearly 60 in Mexico and Brazil, and 23 in Peru. The increase in penetration has largely been due to regulatory and commercial policies such as the “calling party-pays” billing system, the prepayment modality and significant investments (Mariscal, 2005 and 2006).

**GRAPH 2. PENETRATION OF MOBILE TELEPHONY
IN SOME LAC COUNTRIES**



Source: ITU (2007).

Cost Reduction Strategies: The Experiences in Locations of South Asia, Africa and Latin America

People at the base of the pyramid face the difficult task of fulfilling their families basic needs –food, shelter, education, clothes, health, and information, among others– with limited, unstable incomes. They are careful about spending and implement a series of decisions and strategic practices to reduce costs to expand the benefits of the goods and services they require. Empirical evidence shows that cellular telephony is highly valued by the low-income population, which carries out a series of strategies to minimize costs while remaining easy to contact.

A significant proportion of low-income mobile users make a major economic effort, adopt strategic decisions, and employ various practices – some of them very creative– in order to take advantage of mobile telephony

service models and technology to engage in communication with the lowest possible expense (Donner, 2007).

The research conducted by Zainudeen *et al.* (2006) among the 'financially constrained' in 11 localities in India and Sri Lanka led them to conclude that the size of the initial investment—in other words, the purchase of a mobile handset—continues to be the main barrier for non-users and even for those who use mobile service only occasionally. The authors found that the high cost of mobile services and the constraints on their incomes have led these users to develop strategies involving the adoption of short-term and long-term decisions to reduce costs. For example, they face the decision of whether to invest in a mobile handset or use a rented or borrowed one instead, and, once they have decided to purchase a handset, they must decide whether to purchase a new or used device. According to the data from Zainudeen *et al.*'s sample, 70% of owners had purchased new handsets and only a third of Indian users had second-hand devices, while 10% had obtained their handset free of charge, either as a gift or by some other means. While joint ownership of mobile phones was not observed to be a common strategy, in 15% of cases in India and 7% in Sri Lanka the mobile phone was considered to be a household phone and thus was available for use by the entire family.

The same authors found that these sectors of the population tend to use a combination of telephony modes (fixed, mobile and public)⁵ as a means of reducing costs. For instance, 26% of mobile phone owners choose to make calls on public phones because they consider it to be more economical, while a considerable percentage also makes international long distance calls from public phones because of the international direct dialing facilities they offer. A third reason for using other modes of telephony is that only 21% of mobile users automatically recharge their phones when their credit runs out, which means that there are periods when they can only receive calls on their mobiles.

Once individuals in Indian and Sri Lankan communities have acquired a mobile phone and chosen a type of payment plan, their use of short-term strategies for reducing costs is somewhat limited. The main short-term strategy by far was to control the length of local calls (around 70%) and, in lesser proportion, of national-long distance or international-long-distance calls. This is not an innovative strategy, but rather, given the high cost of making calls from a mobile phone, a common practice in developing

⁵ Traditionally, public telephony has involved fixed-line or satellite phones in booths or offices that provide service to the public. Today, however, there are numerous cases of mobile public telephony, in what are called 'calling centers' in some places. These initiatives have been particularly successful in areas where there is no fixed-line service and mobile networks have been installed. Examples include *Grameen Bank*, which provides financing for women micro-entrepreneurs to offer mobile telephony service to the public in rural areas of Bangladesh; and *MTN Publicom*, which provides public telephony service using mobile technology through a franchise business model. In Ecuador, *Bell South* operates 600 mobile public telephones in restaurants, stores and service stations (Dymond & Oestmann, 2003).

countries. Other strategies used, though less frequently, were to disconnect the phone after exceeding a certain number of charges, to call only certain numbers (less than 20%), and to use SMS.

In low-income communities in Botswana, Ghana and Uganda, it was found that 80% of the people surveyed used a telephone regularly. This indicates a substantial demand (Gamos, 2003). The duration of outgoing calls was shorter than that of incoming calls. This could be due to the fact that outgoing calls were made from rural to urban areas, and people in rural areas generally have smaller incomes than those in urban areas. This practice demonstrates that for calls between family members and friends the expenditure is made by the person with the highest income.

In Uganda, it was observed that the practice of 'beeping' is a short-term strategy commonly employed among mobile users, as is also the case in numerous other African countries. It is most frequently used so that the person who 'beeps' (dials a number but disconnects before the call is answered) does not have to pay for the call, since the person who is 'beeped' calls back and thus assumes the cost. This practice is made possible by the caller ID and call log features of mobile phones. Gamos, (2003) reported that 45% of mobile phone users who received missed calls or beeps called back. The person who calls back is the person with the ability to pay.

The practice of beeping is widespread in the developing world, Donner (2007) notes that there are three kinds of beep. The first is a 'callback beep', used to signal the recipient to call back and therefore pay for the call. The second is the 'pre-negotiated instrumental beep', used for practical purposes as a means of sending a prearranged message, for instance, "one ring means, 'I'm home', two rings means, 'I'm at work', and three rings means, 'Pick me up now'. The third type is the 'relational beep', which is also previously arranged and is used to transmit personal messages like "I miss you", "I love you", and so on.⁶ Donner concludes that the practice of beeping is simply a means of taking the fullest advantage of the technological features of mobile phones (call logs and address books) and payment systems (calling party pays).

A similar phenomenon has been documented in communities in Bangladesh, where mobile telephony has become so widespread and familiar that it is now the communication tool with the greatest rate of use and demand. Public access to mobile phones has been spread through 'calling centers' that sometimes consist of no more than one mobile phone and a bench. The strong competition in the market for these services has led some

⁶ For all three types of beeping, there must be a prior relationship and certain level of trust between the two parties. It is not a practice that can be used with strangers or at the beginning of a relationship. Beeping and the message intrinsically transmitted are determined by the context and the length and type of relationship between the parties. The main characteristic of this practice is that it reduces the cost of mobile use while allowing people to remain in communication.

centers to extend credit to their customers and even to offer different options such as the possibility of taking the phone home with them to use. The prevalence of mobile telephony has led to the development of a 'culture of missed calls' or beeping in Bangladesh (Chakraborty, 2004). As in other African countries, this practice involves the use of pre-established signals and messages, and its purpose is to allow for communication at the lowest possible cost (Gamos, 2003).

The use of text messaging, or SMS, is also associated with reducing the costs of mobile telephone usage. Unlike the case of beeping, there is no need for a prior relationship or pre-established agreement, which makes SMS more useful for practical matters that do not involve personal relationships: education, health, remittances, emergencies, security and contact with government agencies, among others. For example, in Botswana and Ghana it was found that the main benefit associated with the use of SMS was the low cost. The use of SMS is also popular in India, with the peculiarity of there being high usage of pre-written messages stored in the phone's memory (Bhagat, 2007).

The potential of text messages lies in their low cost. They could be seen to be, and be used as, a substitute for electronic mail in developing countries, where Internet penetration is very low (Dymond & Oestmann, 2003). In particular, considerable expectations have been raised by the possibilities offered by 'm-transactions', especially in the context of 'm-banking', to make deposits, manage bank accounts, send remittances and submit payments through mobile phones. These opportunities would be particularly significant for individuals from low-income sectors who lack of access to banking services (Coyle, 2007). SMS can also make it possible to carry out transactions for a wide range of purposes, such as government affairs, health, education, and security (Jonasson & Kruse, 2007). Carrying out transactions with a mobile phone is an incipient practice in developing countries. There are various examples in which its potential is being tested in the developing world (Nokia, 2008; Vaughan, 2007; Roman, 2007; Ivatury & Pickens, 2006; Williams & Torma, 2007).

The strategy of community use of mobile phones has been adopted in some communities in India and Bangladesh. In villages in rural India, community use is a common practice, and as such, the shared use of mobile phones among residents is viewed as natural.

With regard to the Latin American and Caribbean region, there is little empirical evidence of cost-reduction strategies. In a study undertaken by Frost and Sullivan (2006) for GSM Latin America in rural and semi-urban areas in Argentina, Brazil, Mexico and Colombia in 2005, it was found that one in every four people surveyed was a mobile phone user. Of these, 80.7% owned their own mobile phone while the other 19.3% of mobile users were non-owners who shared a phone with a relative, friend or their place of work. In

general terms, shared use and ownership are most common among members of the same household because they do not have the resources for individual ownership. Mobile phones are considered a necessary good, given that 62% of users said that spending on mobile communication is the last expenditure they would reduce and that they would use the service more if it were less costly.

As in the case of other developing countries, the combined use of mobile, fixed and public telephony is a common practice in communities of Latin America. The use of fixed telephony does not necessarily involve a fixed telephone in the user's household, but could instead mean the use of a fixed telephone in the workplace or at a friend's or relative's home. Among the low-income population, mobile telephony is a substitute for fixed telephony. Mobile users in communities of Brazil, Argentina, Colombia and Mexico employ cost-reduction strategies on a daily basis, including the beeping technique that is so common in Uganda and which is used either to signal the recipient to call back or to communicate a pre-established message. Mobile users in Colombia, a country in which there is a high degree of insecurity, use beeping to let their families know that they have safely reached their destination (Frost and Sullivan, 2006), reflecting the analysis of beeping provided by Donner (2007) which indicated that beep's uses and meanings are determined by the context and the relationship between the sender and recipient.

In the case of these four Latin American countries, the use of SMS is more common among young people and is viewed as a strategy for reducing costs. The rather low use of SMS in general could be attributed to a lack of maturity among users as well as to the use of mobile phones that do not permit text messaging (Frost and Sullivan, 2006).

In a study of low income families of Santiago de Chile, Ureta (2008) mentioned that the amount of credit available for making calls is always limited due to a lack of funds. Mobile use is extremely necessary and restricted; family members can only make calls considered to be of great importance and these must be short. They are thus forced to develop strategies—extremely short calls and the use of *pinchazos* or beeping—to help them “win the fierce battle to keep the mobile in permanent operation” (Slater & Kwami, 2005, p. 10, cited in Ureta, 2008).⁷

Research Methods

Survey

This research study forms part of a project entitled Mobile Opportunities: Poverty and Telephony Access in Latin America and the Caribbean undertaken by the Regional Dialogue on the Information Society (DIRSI). As a fundamental

⁷ Neither the studies mentioned in the literature nor the present study can claim to be nationally representative (See Annex 1).

component of the project, a survey on mobile telephony usage patterns was conducted in seven countries in Latin America and the Caribbean: Argentina, Brazil, Colombia, Jamaica, Mexico, Peru, and Trinidad and Tobago.

The number of surveys taken was just over 7,000, the country where the highest number of surveys was taken being Argentina with 1,400 and the country with the lowest number of surveys being Trinidad and Tobago, with 537. In each country, the number of surveys varied largely because of costs and the difficulty of reaching the target public defined which was located in the lowest income deciles, or in marketing terms at D and E income levels.⁸

A probabilistic sample was drawn using maps from existing georeferenced data provided by the national statistics office of each country. Individual respondents were randomly selected from each household. The goal was to obtain a representative and statistically independent sample of low income residents of urban areas in each country, although in one case (Jamaica), semi-rural areas were also included. Fieldwork was conducted between April, May and June, 2007.

The survey sought to assess the impact of mobile telephony access on low-income population sectors with regard to the following aspects: employment opportunities and income, relations with the government and social services, and the strengthening of social and family networks. The results show that in all seven countries included most of the survey respondents were women, that the interviewees' age was over 35 (and up to 48 in Trinidad and Tobago) and lastly, that in most countries the average family size in the surveyed households was 4 members (see table1).

TABLE 1. GENERAL DATA OF THE SURVEYS

	ARGENTINA	BRAZIL	COLOMBIA	JAMAICA	MEXICO	PERU	TRINIDAD Y TOBAGO
SURVEY	1400	100	800	1174	1000	1312	537
MEN	49.6%	38.9%	31.9%	47.2%	27.4%	39.3%	48%
WOMEN	50.4%	61.1%	68.1%	52.8%	72.6%	60.7%	52%
AVERAGE AGE	35	37	38	36	37	37	48
AVERAGE FAMILY SIZE	5	4	4	3	4	4	4

Source: Elaborated by the authors using DIRSI data.

⁸ In order to have an instrument for comparison among its member agencies, the Mexican Association of Marketing and Public Opinion Research Agencies (AMAI) developed a socio-economic classification system made up of six levels: A/B, C+, C, D+, D and E, where A/B represents the highest level of income and E represents the lowest.

Operationalization of the Short Term Strategies and Long Term Strategies

Strategies are all of the conscious decisions made by a user to reduce the cost of mobile telephony. A decision is considered strategic when there are two or more options to choose from. The classification of cellular telephony strategies as short-term or long-term is based on the work of Zainudeen *et al.* (2006), who argue that both categories encompass conscious decisions, the main purpose of which is to minimize the costs associated with mobile telephone usage. The difference lies in the frequency with which such decisions are made. Short-term strategies involve decisions made on a daily basis, and include practices like beeping or missed calls, and text messaging or SMS.⁹ Long-term strategies involve non-daily decisions, such as whether or not to purchase a mobile handset, whether to purchase a new or used handset, the type of payment plan chosen—whether prepaid or postpaid—and the use of different modes of telephony: mobile only, mobile and public, mobile and fixed.¹⁰ Using this same classification makes it possible to make comparisons between different regions.

The use of text messages can also be classified as a short-term strategy, However, it warrants a separate study both because text messages (SMS) have particular features, such as a lower cost per call, and because to make full use of them users must have a certain degree of maturity with cellular phone use and must be sufficiently literate to be able to send or receive messages. Carriers' supply of SMS differs from that of calls; often a certain number of SMS may be included at no cost. Text messages have a significant potential for supplying and providing government or private services, particularly among groups at the base of the pyramid. There are various examples in which its potential is being tested in the developing world (Nokia, 2008a; Vaughan, 2007; Roman, 2006; Ivatury & Pickens, 2006; Williams & Torma, 2007).

Main Findings

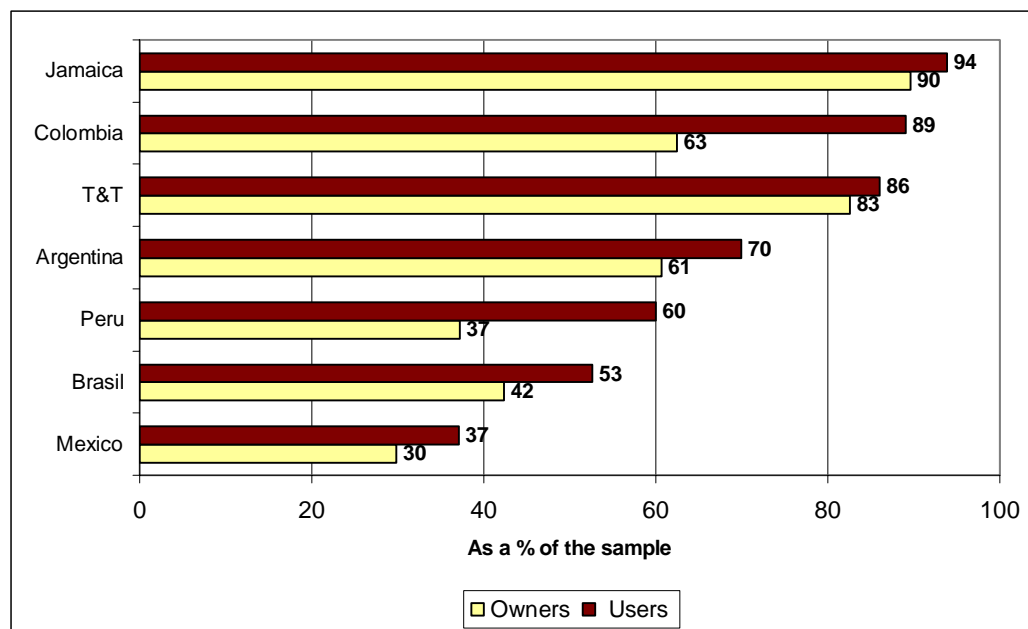
The information drawn from the DIRSI surveys shows penetration data similar to official data in the Caribbean countries, Argentina and Peru. In other cases, such as Mexico and Brazil, the penetration results identified are below official figures. It is also important to observe that in most countries, the percentage

⁹ We believe that SMS has particular characteristics, such as the need for a certain degree of user maturity for its use and considerable unexploited potential. For this reason, we devote a separate section to this strategy.

¹⁰ We consider this classification to be a clear means of presenting the different types of strategies. Nevertheless, it is not absolute, since a short-term strategy can become a long-term strategy and vice versa. For example, the decision to only receive calls once the user's credit has run out can be viewed as a short-term strategy; however, the conscious decision to purchase a mobile phone only for receiving calls would be a long-term strategy. The use of different kinds of phones on a daily basis, could be considered a short-term strategy, but is considered a long term strategy because is related to overall decisions such as whether to invest in a phone or not, to use a mobile or fixed line, etc.

of users is higher than the percentage of mobile phone owners (see graph 3). A significant percentage of users in the countries studied own their cellular phones, as can be seen in the following section.

GRAPH 3. MOBILE TELEPHONY USERS AND OWNERS OF A MOBILE PHONE (% TOTAL SAMPLE)



Source: Own elaboration with DIRSI data base (2007).

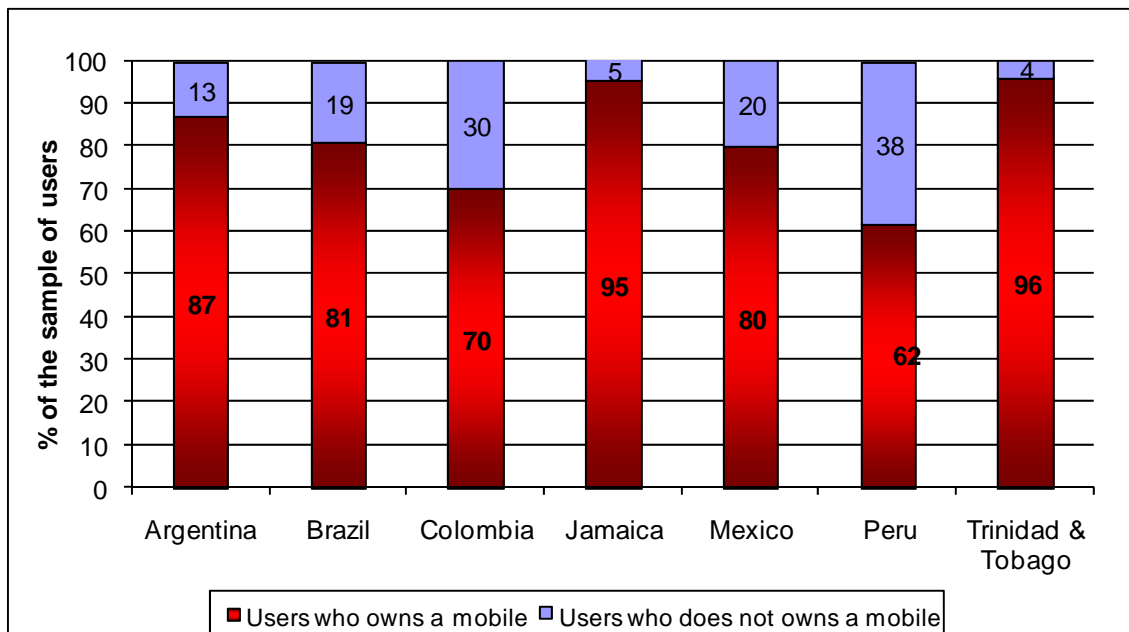
Long-Term Strategies

The main long-term strategic decision is whether or not to purchase a mobile phone, the cost of which is a considerable investment for groups at the base of the pyramid. The surveys showed that most mobile telephony users in the seven countries in the region own their handsets; thus, shared ownership is not significant. Peru is the country with the highest percentage of non-owner users, 38% (see graph 4). These non-owner users use their friends' or relatives' telephones or rent them in the street (Barrantes, 2007). Colombia has the second highest percentage of non-owner users, 30%. Apparently cellular telephony use by Colombian non-owners consists of purchasing airtime on the street, a practice engaged in by 76.4% of users and observed in all cities in this country (Gutierrez and Gamboa, 2007). The resale market in these two countries is competitive, which discourages the purchase of handsets (Galperin and Mariscal, 2007).

In the case of Mexico and Brazil, the percentage of non-owner users decreases to 20% in the former country and 19% in the latter. Non-owner users in these two countries tend to use mobiles lent to them by friends or relatives but a small percentage rents handsets from friends or relatives (Mariscal,

2007; Bothelo, 2007). Whereas in the Caribbean countries, Trinidad and Tobago and Jamaica, the percentages of borrowing and rental from friends and family are 4 and 5% respectively (Mallalieu and Cambridge, 2007; Hopeton, 2007). Although several studies highlight the shared use of mobile handsets in other regions (Moonesinghe *et al.*, 2006; Castels *et al.*, 2007), the results show that this is not common practice in LAC.

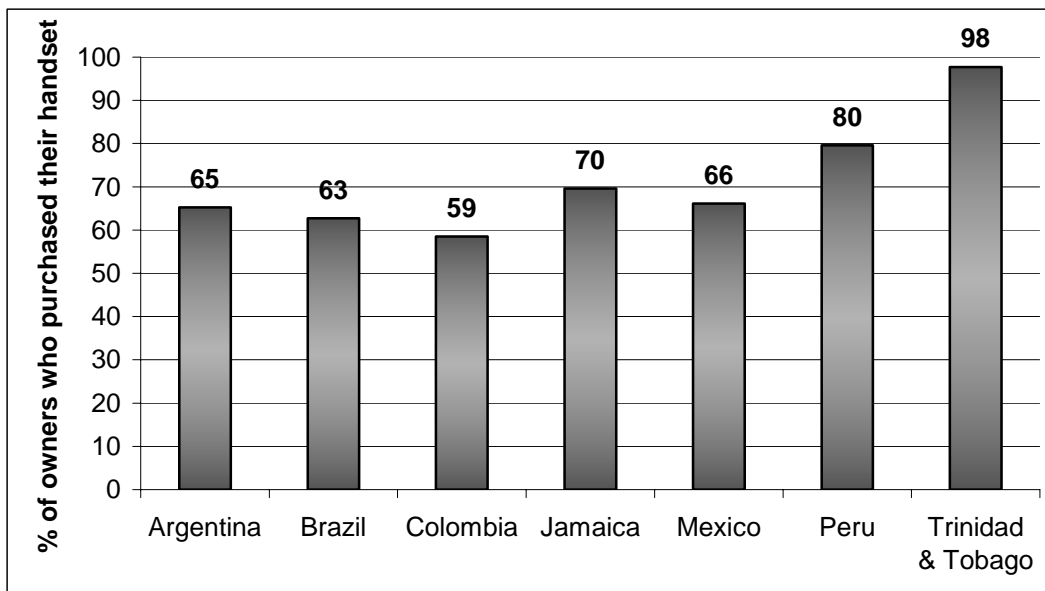
GRAPH 4. USERS WHO OWNS A MOBILE AND USERS WHO DOES NOT OWNS A MOBILE (%)



Source: Own elaboration with DIRSI data base (2007).

In the seven countries comprising the sample, we found that most users purchased their cell phones (see graph 5), Trinidad and Tobago being the country where the highest percentage of users buys their handsets (98%). Colombia is the country with the lowest percentage of users that purchased their handsets (59%), which, once again, can be explained by the competitive supply of cellular telephony rental service in the street (Gutiérrez and Gamboa, 2007). In the case of Argentina, nearly a third of the interviewees stated that they had been given their handsets, a figure that was twice as high among young people. This practice favors the entry of low income sectors into the market (Galperin and Molinari, 2007).

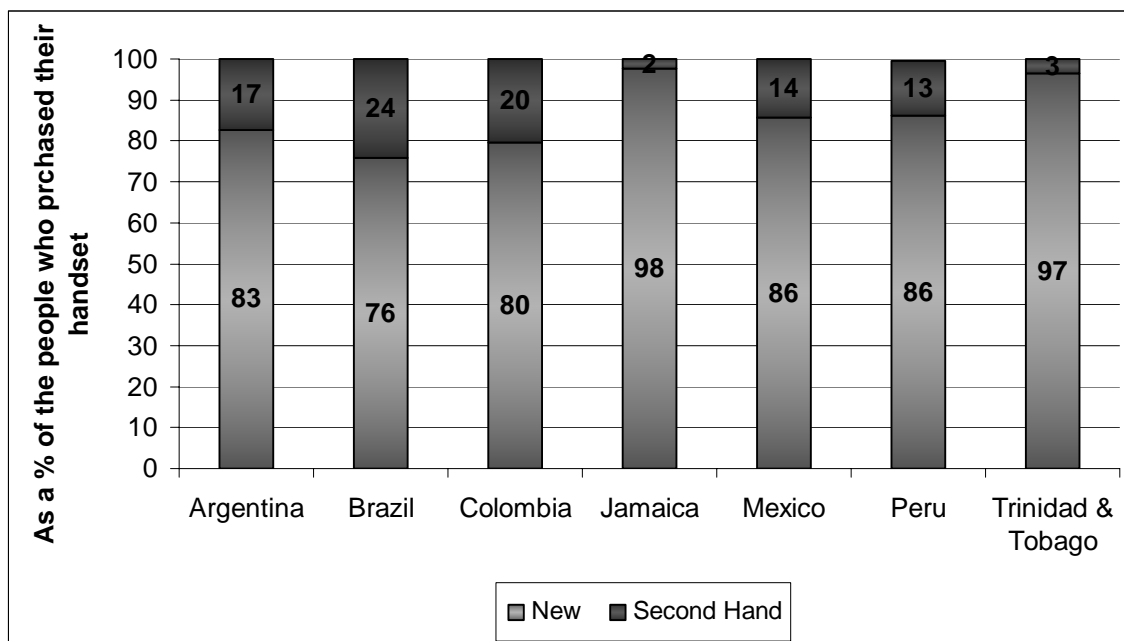
GRAPH 5. OWNERS THAT PURCHASED THEIR HANDSETS (%)



Source: Author's own graph based on DIRSI data base (2007).

Most LAC users bought new handsets, with Jamaica having the highest percentage of new mobile phones, followed by Trinidad and Tobago (97%). Brazil is the country where the lowest percentage of users bought new handsets (76%), followed by Colombia (80%). Second-hand mobile phones do not account for a significant percentage of the total LAC market. Operators' policy of subsidizing handsets has partly increased the number of user-owners and permitted the acquisition of new handsets. This behavior is different from that of low-income users in Southeast Asia (Moonesinghe *et al.*, 2006) where a third acquire their mobile handsets on the underground market where prices are lower, thereby partly reducing income barriers. The trickle-down effect, where handsets belonging to those with greater purchasing power make their way down to low-income sectors only appears to be important in Brazil and Colombia; it does not usually occur in the rest of LAC (see graph 6).

GRAPH 6. OBTAINING THE MOBILE PHONE (NEW-USED, % OF TOTAL OWNERS)

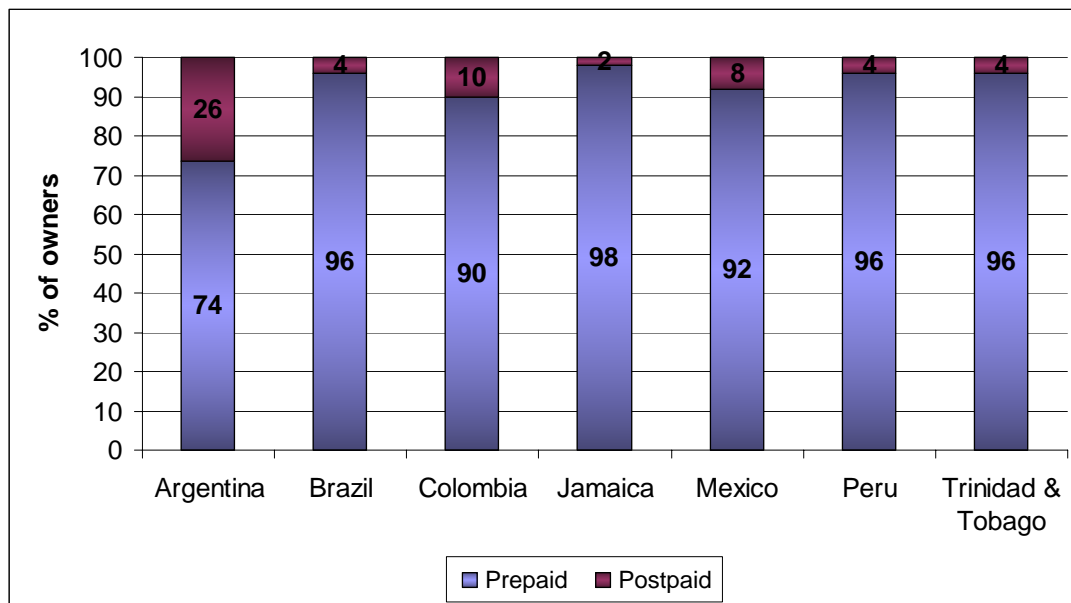


Source: Author's own graph based on DIRSI data base (2007).

Another long-term strategy involves the decision about the type of service plan contracted: prepaid or postpaid. The sample shows that use of prepayment plans predominates. In six out of the seven countries, over 90% of users opt for pre-payment, with the use of post-payment plans fluctuating between 2 and 10%. A different pattern is observed in Argentina, where pre-payment is preferred by 74% of users, and post-payment and other plans are more commonly used (26%) (see graph 7). This behavior is due to the use of control plan¹¹ (Galperin and Molinari, 2007). The literature points out that pre-payment is more flexible and adapts to the income and spending patterns of users at the base of the pyramid, where uncertainty regarding employment and income is a constant which means that they are unable to commit themselves to paying a fixed monthly rate (Mariscal and Rivera, 2006).

¹¹ The controlled rent plan is far less common. In this modality, the user is committed to paying a low-cost, fixed rent and may increase his credit, or airtime, by purchasing cards. This plan includes both pre- and postpaid features.

GRAPH 7. PREPAID AND POSTPAID PLANS (%)



Source: Authors' own graph based on DIRSI data base (2007).

Post payment plans are usually cheaper per minute of airtime than pre-payment plans, although the users surveyed perceive pre-payment plans as being more economical. This can be explained in part by the fact that it is difficult for users to obtain accurate information that would enable them to compare prices between the rates of different plans. Moreover, users may consider pre-payment plans to be more economical, because they pay a smaller amount—assign fewer resources—than they would have to with a post-payment plan.

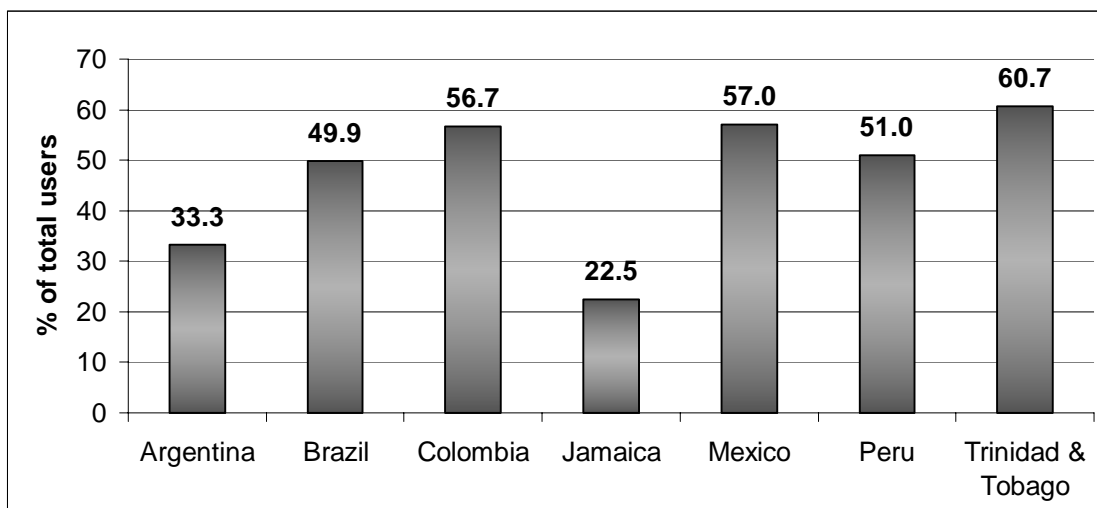
A major advantage of pre-payment for low-income users is the ease with which they can contract the service. They do not need to provide references, fill in application forms, give an address, or be credit-worthy. They simply buy the amount of credit they need, which enables the user to receive calls at no cost and control expenses without acquiring commitments. It appears that the formal requirements for acquiring a handset constitute a major barrier for poor users. The pre-payment system has enabled large groups at the base of the pyramid in LAC to gain access to cellular telephony, as in other regions of Asia and Africa (Zainudeen *et al.*, 2006; Gamos Ltd., 2005; Donner, 2007).

Short-Term Strategies

The most commonly used short-term strategy for reducing costs in LAC is to use the cell phone simply to receive calls. Between 49.9 and 60.7% of users in Brazil, Colombia, Mexico, Peru, and Trinidad and Tobago employ this strategy, meaning that it is utilized by the majority of users. There are, however, exceptions, such as Jamaica, where this strategy is employed by a mere 22.5%

and Argentina where it is only used by 33.3% (see graph 8). In the case of Argentina, this is probably due to the fact that users utilize SMS intensively, which reduces costs, thereby making other strategies unnecessary.

**GRAPH 8. USE OF MOBILE PHONE ONLY FOR RECEIVING CALLS
(% OF TOTAL USERS)**



Source: Authors' own graph based on DIRSI data.

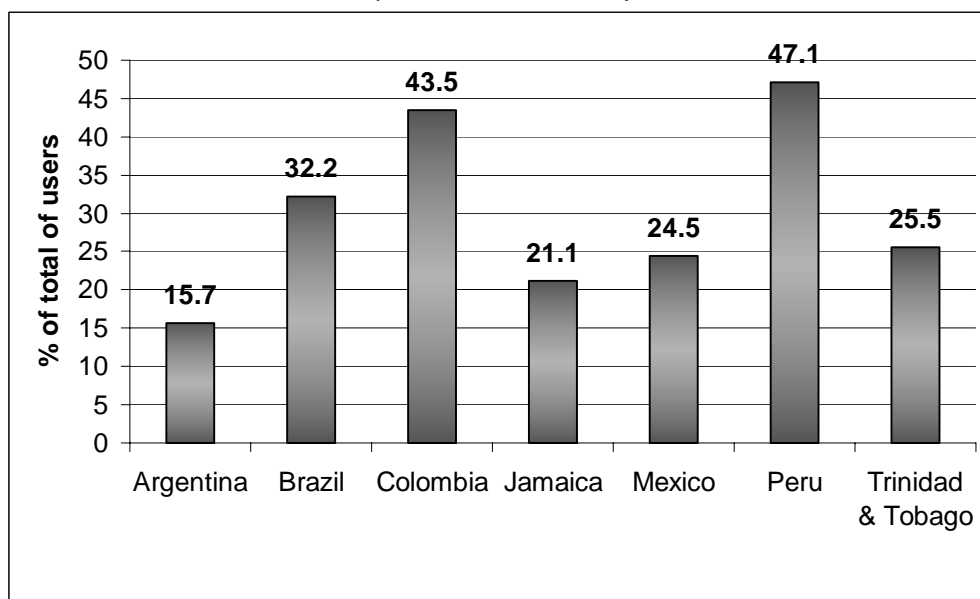
Using the cell phone only for receiving calls is made possible by the "calling-party-pays" system, which enables the user to continue receiving calls even though his credit has run out. Users at the base of the pyramid do not immediately top up their credit and may even spend long periods without credit, as in the case of users in Brazil, Colombia, Argentina and Brazil, meaning that cell phones are used as call receivers. This practice is extremely useful, since it enables users to be located and contacted, which is highly valued among users at the base of the pyramid.

According to a study conducted in Mexico (Angoitia and Ramírez, 2007) and South Asia (Zainudeen *et al.*, 2006), the use of cost-minimizing strategies decreases as poverty levels rise. This behavior can be explained by the lack of opportunities and the small scope for maneuver that the poorest users have for implementing them. The poorest users do not usually own the telephones and make few calls, but the calls they do make are very important.

Missed calls, or beeping is a strategy employed in the seven countries in the sample, although not by the majority of users. The countries where it is most commonly used are Peru (47.1%), Colombia (43.5%) and Brazil (32.2%) (see graph 9). This strategy is rarely used in the LAC region compared with locations of Africa, where almost half of the users practice it (Gamos, 2003). Once again, we find that users in Argentina and Jamaica employ this strategy least. This is probably due to the fact that the rates they pay are among the lowest in the region (Barrantes *et al.*, 2007) or, in the case of Argentina, to

the intensive use of SMS. Beeping is used to take advantage of the technological capacities of mobile phones (the recording of data on incoming calls with all the data) and the pay structure (caller pays) which allows for the distribution of costs, whereby "the rich user" pays for the call (Donner, 2007).

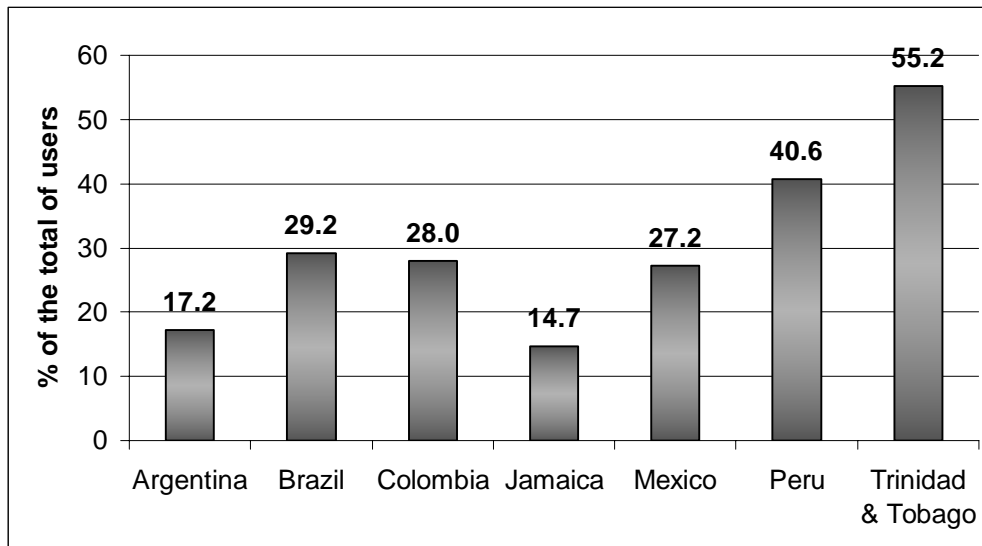
**GRAPH 9. BEEPING OR MISSED CALLS TO ENCOURAGE CALLER TO CALL BACK
(% OF TOTAL USERS)**



Source: Authors' own graph based on DIRSI data.

Making use of time periods where per call rates are lower is most common in users in Trinidad and Tobago (55.2%) and to a lesser extent in Peru (47.1%). In the remaining countries, this short-term strategy is used by fewer than 30% of users (see graph 10).

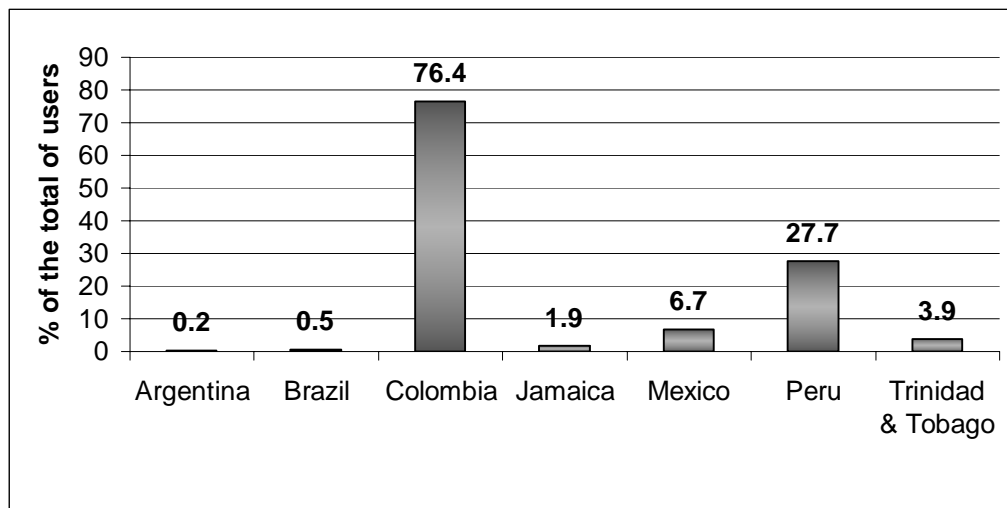
GRAPH 10. ONLY CALLS WHEN RATES ARE LOWER (% OF TOTAL USERS)



Source: Authors' own graph based on DIRSI data.

Renting cell phones in the street is regarded as a short-term strategy, since it is an everyday practice. In Colombia, 76% of users rent cell phones in the street, a form of behavior that is peculiar to this particular country. In other countries in the region it is uncommon. In recent years, Colombia has reported an increase in the sale of minutes in the "street". This service is basically informal and offers cell-to-cell service both inside and outside an operator's network, in most cases, and from cell phones to fixed phones. Both owners with pre-payment (80%) and post-payment plans (47%) use the "calls in the street" service because costs are low (Gutiérrez and Gamboa, 2007). This strategy is also employed by 27.7% of users in Peru. In the remaining countries in the sample, this strategy is only marginally used (see graph 11).

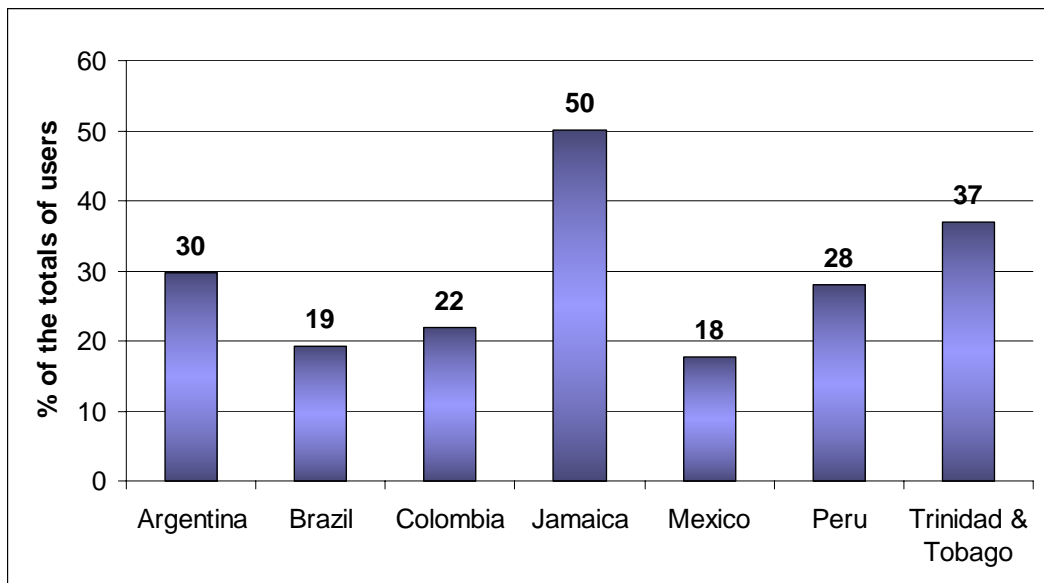
GRAPH 11. RENTED A MOBILE PHONE IN THE STREET (% OF TOTAL USERS)



Source: Authors' own graph based on DIRSI data.

Cell phones are only used by persons other than the owner in a minority of cases in LAC (see graph 12). The country where the highest percentage of users employ this strategy is Jamaica (50%), however, most users do not charge for the service and the 1.5% of users who have done so merely recover costs (Hopeton, 2007). In the remaining countries, users lend their cell phones to a lesser extent, ranging from 37% in Trinidad and Tobago (Mallalieu, 2007) to 18% in Mexico, with only an insignificant percentage charging for this. In Colombia, it was found that users with post-payment plans who lent their cell phones were more likely to charge than those with pre-payment plan. It appears that they can use this as a business or use their phones less and take advantage of unused airtime by "selling" it to another person (Gutiérrez and Gamboa, 2007).

**GRAPH 12. YOUR MOBILE PHONE HAS BEEN USED BY OTHER PERSONS
(% OF TOTAL OWNERS)**

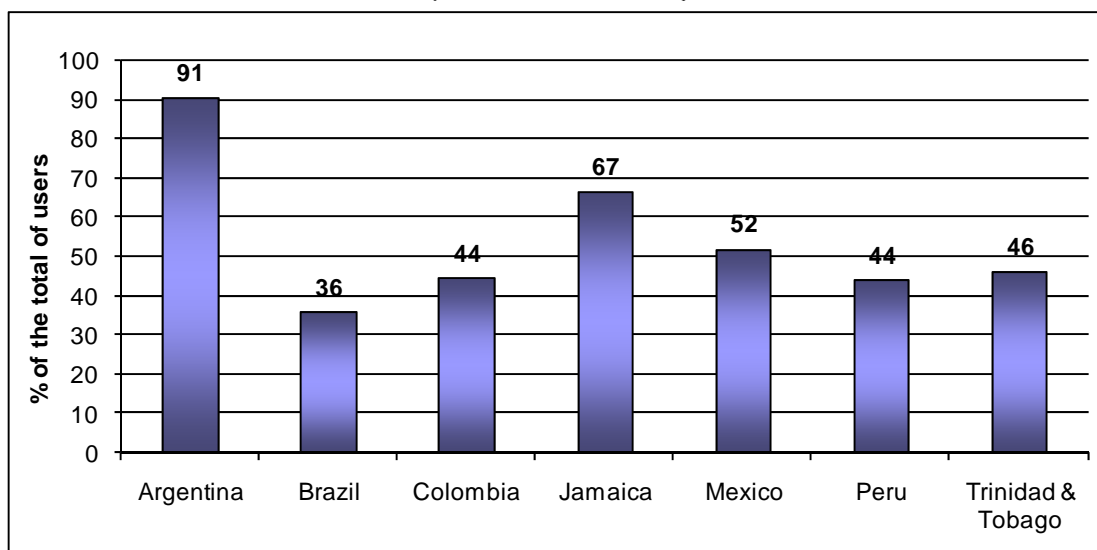


Source: Authors' own graph based on DIRSI data.

Use of Short Messages Services

A surprisingly high percentage of users in Argentina (91%) used SMS last month, particularly in comparison with users in the rest of the sample, such as Jamaica (67%) and Mexico (53%) (see graph 13). The high percentage of SMS users in Argentina can be explained by the maturity of the market and the competitive voice to data ratio of 5:1.

GRAPH 13. USE OF SMS (SENDING OR RECEIVING) DURING THE PREVIOUS MONTH (% OF TOTAL USERS)



Source: Authors' own graph based on DIRSI data.

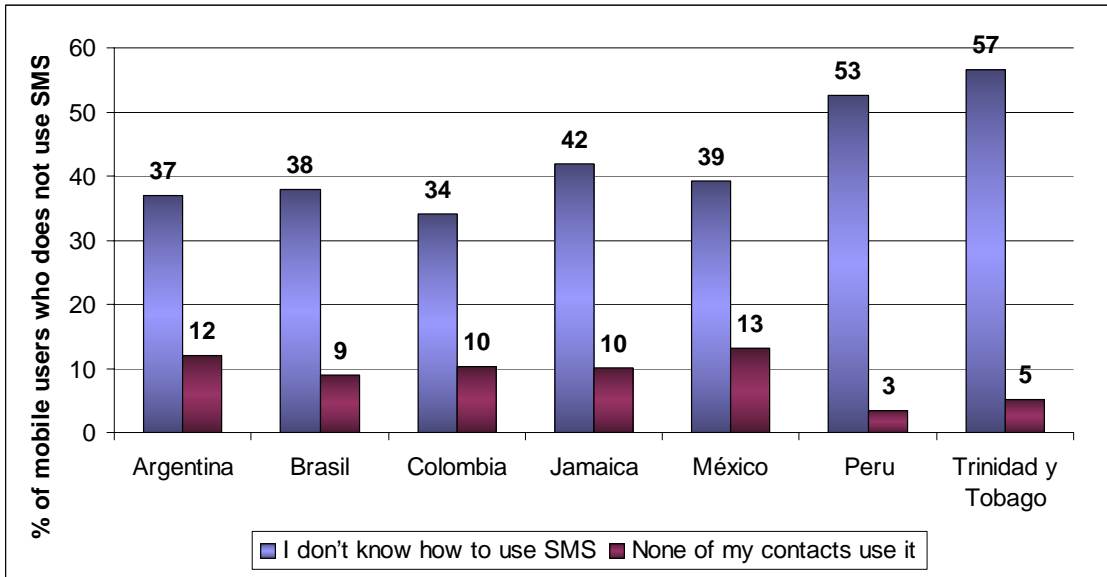
In the study on Argentina, Galperin and Molinari (2007) identified two variables that affect the use of SMS. The first is that the higher the educational attainment, the greater the use of SMS, due to the need of to be literate to send and receive messages. The second is that the greater the maturity in the use of cellular telephony, the greater the use of short messages. However in the case of Brazil it was found that the group that sent most messages belonged to the lowest income sector (Bothelo, 2007). In the case of Mexico, SMS are distributed in a similar fashion between the various ranges of maturity in cell phone use. This shows that in addition to the variables of maturity and educational attainment, there are other factors that influence the greater use of short messages, such as competitive tariffs (Angoitia and Ramírez, 2007).

In the LAC region, we found a higher number of short message users than in South Asia, where they are utilized by only 40% of users. In both regions, the lower cost of SMS as compared to that of calls was cited as its main advantage, followed by the possibility of not distracting the receiver of the message. The LAC market tariff structure encourages the use of SMS as a cost reduction strategy.

Two main reasons are given by LAC users for not using SMS, the first of which is "not knowing how to use them". This suggests that the longer the user uses the phone, the more opportunity he will have to use SMS, which is why there is a learning curve that implies time, greater skills and technological familiarity. The second reason is that "none of their acquaintances uses short messages" (see graph 14). The low use of SMS by their contacts discourages users from wanting to learn to use them. The opposite is true of Argentina,

where it is essential to use SMS because the majority of users utilize them and it has become an essential part of communicating by cell phone. This case brings us to the effect of networks (Galperin and Molinari, 2007).

GRAPH 14. REASONS FOR NOT USING MESSAGES (AS % OF TOTAL OF USERS)



Source: Author's own graph based on DIRSI data.

Conclusions and recommendations

Given the growing importance of mobile telephony for users at the bottom of the pyramid and the expected growth in the number of users in the developing world, this document offers an exploratory view of the strategies practiced by low-income mobile phone users in Latin America and the Caribbean (LAC), and evidence and identifies the strategic behaviors similar to those of low-income users in Asia and Africa.

With respect to long term strategies, we find that most users in LAC own, and rarely share, their mobile phones and that most users buy new handsets. As expected, prepayment is predominant in the region, as it is in most developing countries. This situation can be explained both by the fact that users at this income level do not meet the credit requirements for obtaining access to a rental plan and by the fact that many users acquire credit to make calls only when they have sufficient income. Doing so allows them to avoid compromising their resources by taking on the long-term commitment of a post-payment plan.

Related to the short term strategies we find that the most commonly used short-term strategy is to use cell phones only to receive calls. Doing so allows users at the bottom of the pyramid to meet the highly-valued need to be reached by phone, even during periods when they cannot afford to purchase air time credit. This finding reveals the low capacity of payment and also shows how low-income users are able to take advantage of the calling party pays system (CPP) and the prepaid plan. A surprising result is that most users in the LAC region do not employ the beeping strategy, which is widely used in parts of Africa and which some experts consider to be a worldwide phenomenon.

Our findings indicate there are a higher number of short message users in some countries of LAC than there are in other locations of South Asia. In LAC, those who do use SMS cite its lower cost, as compared to calls, as its main advantage. The evidence suggests that education and maturity are not determinant in the use of SMS; other factors, such as competitive tariffs, influence increased use of short messages.

It is important to note that the two main reasons given by LAC users for not using SMS are not knowing how to do so and not having acquaintances who use short messages. These reasons suggest that one of the causes of the limited use of other services is that users at the bottom of the pyramid do not know how to use them or do not know about them. To ensure users have the skills to take full advantage of their mobile phones, it would be helpful if operators taught new users about all the services and full potential of mobiles. Moreover, this strategy could increase traffic and the use of other services.

Certain particularities were identified in some countries in the LAC sample. In Colombia, for example, the competitive supply of minutes on the streets led to greater shared use of the cell phone by users (41%); this suggests that the shared use of mobiles could be determined by competitive public access tariffs. In Argentina, the high percentage of SMS use leads to a lower use of other short-term strategies than in other countries in the region; it is important to note that the cost of SMS are very competitive in Argentina. These two particular cases suggest that market and regulatory conditions have a significant impact on the use of strategies.

In practical terms, mobile telephony is the tool that offers access to information and communication to the greatest number of people. It is the only or the best telephony option for certain low income groups. The adoption of mobiles by users at the bottom of the pyramid is a reality. Mobile telephony constitutes a key instrument for access to public and private services in different areas. As the next wave of mobile users will be in the developing world, it is likely that the use of cost reduction strategies will increase. This study is a first step. It is important to continue with further qualitative research to understand more fully the needs, constraints, uses and benefits perceived by low income users and non users. The ICT industry and regulators should work together to establish innovative policies that facilitate the access of the population at the bottom of the pyramid to mobile telephony and that encourage such users to take full advantage of e of cost-minimizing services and strategies.

Annex 1

STUDIES OF COST-REDUCTION STRATEGIES USED IN DEVELOPING COMMUNITIES

AUTHORS	COUNTRY	LOCATION	INCOME LEVEL	SAMPLE
AMINUZZAMAN (2005)	BANGLADESH	DHAKA	UNIVERSITY STUDENTS	300 INTERVIEWS
ZAINUDEEN ET AL. (2006)	INDIA & SRI LANKA	11 LOCATIONS	LOW-INCOME COMMUNITIES	INDIA: 2,199 (7 LOCALITIES) SRI LANKA: 1,100 (4 LOCALITIES)
CHAKRABORTY (2004)	BANGLADESH	SITAKUND	DISADVANTAGED YOUTHS AND ADOLESCENTS	FIELD NOTES, IN-DEPTH INTERVIEWS, GROUP DISCUSSIONS, SOCIAL MAPS, AND ISSUE-BASED PARTICIPATORY EXERCISES
DONNER (2007)	RWANDA	KIGALI	UNIVERSITY STUDENTS SMALL-BUSINESS OWNERS	15 IN-DEPTH INTERVIEWS
GAMOS (2003)	BOTSWANA, GHANA, UGANDA		LOW-INCOME COMMUNITIES	GHANA: 630 INTERVIEWS UGANDA: 520 BOTSWANA: 630
FROST & SULLIVAN (2006)	ARGENTINA, BRAZIL, COLOMBIA, MEXICO	RURAL AND SEMIURBAN COMMUNITIES	6% HIGH-INCOME COMMUNITIES 22% MEDIUM 35% MEDIUM-LOW 37% LOW	800 INTERVIEWS
ANGOITIA & RAMIREZ (2008)	MEXICO	ZM MÉXICO CITY, TG. CHIAPAS	LOW-INCOME COMMUNITIES	600: ZM MEXICO CITY 400: TG CHIAPAS
URETA (2008)	CHILE	SANTIAGO	LOW-INCOME FAMILIES	20 IN-DEPTH INTERVIEWS

Source: Prepared by the authors based on Aminuzzaman, 2005; Chakraborty, 2004; Donner, 2007; Gamos, 2003; Angoitia & Ramirez, 2009; & Ureta, 2008.

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