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Affordability of Mobile Phone Services in Latin America

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- Capacity building
- Institutional Development and Fundraising

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Abstract

This study aims at contributing to the discussion about the regulatory tools that could improve access to telephone services by the poor. We analyse the costs and alternatives the poor face when buying telephone services, as well as the level of expenditure this represents in their consumption basket. In other words, we seek to evaluate the affordability of telephone services (and of mobile telephony in particular) among the poor. Further, we also try to identify changes in the regulatory framework and business practices of the operators that could expand the current market frontier.

This research is based on our own review of tariffs for fixed, mobile and public telephony in the largest Latin American countries, as well as on income and expenditure data collected by the respective national statistics institutes. In this first stage, we collected data from Argentina, Brazil, Chile, Colombia, Mexico, and Peru, which represent 78% of the total mobile regional market. In each market, we collected prices for every tariff plan (both pre- and post-paid) offered by the major mobile operators. In addition, we collected data about fixed and public telephony tariffs for the incumbent operators in each country.

The results confirm that the poor have to pay higher prices to access telephone services in the main Latin American markets. This is reflected in the price differences that exist between the pre-paid system, used by the vast majority of

low income users, and the post-paid systems. Although competition has stimulated the reduction of tariffs in the mobile sector, there is still a wide tariff differential with respect to fixed and public telephony. However, the paper shows that the fixed-mobile tariff differential is lower than expected when using the basket methodology as opposed to unit prices. This means that the preference of the poor for mobile telephony is not only due to convenience factors (expenditure control in the pre-paid system), but also to the tariff structure for each of these alternatives.

Another interesting result refers to the impact of mobile marketing models on mobile expenses by the poor. Our research shows that change in operators' business practices, such as per second billing or micro-prepay, would result in a significant cost reduction for low volume users of pre-paid mobile phones. Moreover, our analysis shows that the cost of mobile services has a significant inhibiting effect on the consumption of the poor. The cost of a low volume mobile service basket (that only includes 25 short outgoing calls and 30 SMS per month) represents a very significant percentage (well above 5%) of the income of the poor in six key Latin American markets.

In sum, those at the bottom of the income pyramid still find it hard to afford a minimum level of mobile services. This in turn explains the various cost control strategies observed across Latin America, together with the shared use of mobile phones, the widespread use of payphones for outgoing calls and the resale of lower pre-paid credit offered by some operators. A strong inhibiting effect on mobile teledensity and the actual use of services can be expected from actual tariff levels. This raises multiple questions about the future growth trajectory of the mobile telephony market in the Latin American region.

Introduction

The significant worldwide growth in telephony penetration during the past decade is mainly due to the introduction of mobile service in developing countries (ITU 2006). While in developed countries mobile service is a complement of the fixed network extended to almost every home and company, in developing countries, this new platform opens opportunities to segments of society with limited access to traditional telephone services. Various studies show that mobile phones have become a more effective tool for the globalisation of telephone service. This is because they have become affordable by an increasing number of poor, both in Latin America and in developing countries in general (Waverman et al. 2005; Mariscal et al. 2006).

That said, efforts to globalise service and government subsidy programs in Latin America continue to be focused on fixed telephony and, although to a lesser extent, to Internet access (Regulatel 2006). This means that the poor bear the total cost of mobile phone access, while in many cases other higher income segments are benefited by subsidised access to local fixed telephony. In other words, inasmuch as mobile tariffs are, as will be seen later, significantly higher than fixed tariffs, the poor not only end up paying a higher cost but also have to make a proportionally greater sacrifice to access telephone service. This is not only due to the well-known unequal income distribution in Latin America, but also because of an inefficient subsidy system, which is inappropriate for the access structure in the region.

This research aims at contributing to the discussion about the regulatory tools that might improve access to telephony services for the poor. This is done through the analysis of the costs and alternatives these segments face in order to acquire telephone services, together with the share of expenditure represented by these services in the consumption basket of the poor. In other words, we are trying to evaluate the affordability, or purchasing power, of telephone services (mobile telephony in particular) among the poor. Furthermore, we try to identify those changes in the regulatory framework and operators' business practices that may enable the expansion of market

boundaries, in terms of both telephone penetration and effective usage of telephony and new services provided through the mobile platform.

The research also attempts to answer some of the queries about the telephone service price structure in the region and the behaviour of lower income users, such as:

Why do the poor use mobile phones instead of fixed or public payphone services? Which is the most expensive/cheapest alternative? Which factors does this estimate rely upon?

How do business models and marketing practices affect service affordability? What service alternatives are more appropriate to the income and consumption patterns of the poor?

What is the dispersion of the tariff levels existing in mobile services? What level of dispersion exists among countries? What factors account for this dispersion?

What is the estimated telephone service affordability for the poor in Latin America? What factors account for the difference between countries? How does it compare to international experience and benchmarking?

What public policy tools are available to expand the telephone market boundaries without introducing market distortions? What role can mobile operators play in the services' globalisation?

This research is based on fixed, mobile and public telephony data gathered for the six main Latin American markets, together with income and expenditure data from the respective national statistics institutes. In this first stage, we collected data from Argentina, Brazil, Chile, Colombia, Mexico, and Peru, which represent 78% of the total mobile phone regional market.¹ In each market, we collected prices of every tariff plan (pre- and post-paid) offered by the major mobile operators. We also collected data for the established operator for fixed and public telephony. Data were initially collected from the operators' websites

¹ In a second stage, the analysis will be extended to other countries of the region.

and later verified through telephone contacts and visits to sale points. In every case prices correspond to October 2006.²

The analysis results confirm the higher costs the poor have to pay to have access to telephone services in the main Latin American markets. This is reflected in the price differential found between the pre-paid system, chosen by the vast majority of low income users, and the post-paid system. Although competition has stimulated mobile tariff reduction, there is still a wide tariff differential with respect to fixed and public telephony. That said, we show that in the case of the fixed-mobile comparison, the tariff differential is lower than expected when measured with baskets instead of unit prices. In sum, low income users' preference for mobile telephony is not only due to factors of convenience (e.g. mobility) and spending patterns (e.g. spending control under the pre-paid system), but also because of the tariff structure for each of these alternatives.

Another interesting result refers to the impact of mobile marketing models on the expenditure on such services by low income users. Our research shows that the implementation of changes in the operators' business practices, such as per second billing or micro-prepay, would result in a significant cost reduction for low volume pre-paid mobile users. The most interesting finding is that these changes, assuming that they reduce the cost of the service basket, can stimulate both the demand (through a neutral impact on the operators' revenues) and the diversification of services on the mobile platform.

Finally, the analysis shows that the cost of mobile services has a significant inhibiting effect on the access and consumption of the poor. The cost of a low volume mobile service basket (that only includes 25 short outgoing calls and 30 SMS per month) represents a very significant share of the income of the Latin American poor. For example, in the case of those whose income equals the poverty line in each country, the monthly cost of such mobile basket represents

² For data gathering, we thank Antonio Botelho and Yuri Arrais (Brazil), Leonardo Mena and Francisco Gutierrez (Chile), Jorge Dussan and Luis Gamboa (Colombia), and Judith Mariscal and Carla Bonina (Mexico).

between 17% and 20% of their income (Argentina, Chile and Colombia), reaching over 40% in Peru.

In short, for those who are at the bottom of the income pyramid, the ability to pay for a minimum mobile phone service basket is limited. This explains the cost control strategies that have appeared in the main markets in the region. These strategies involve the shared use of mobile terminals, the continued use of public phones for outgoing calls, and the resale of credit in amounts lower than those offered by the operators. Indeed, the current tariff structure has an inhibiting effect on the penetration level and use of the services. This in turn triggers doubts about the future growth of the mobile market as countries approach the affordability frontier.

This research is organised as follows. In the first section, we discuss affordability issues and revise the existing literature about telephone service affordability both in Latin America and worldwide. The second section covers the service basket analysis methodology (as opposed to unit price analysis) used throughout this research, highlighting its advantages and disadvantages. In the third section we present the results of the basket methodology and explain the main factors affecting the price level in each market. The fourth section of this article compares the affordability analysis results vis-à-vis different income measures, while section five analyses the relative prices of the various service alternatives (mobile vs. fixed vs. public). Finally, the conclusion summarises the major findings and their regulatory implications, together with some of the pending queries for future research.

1. Mobile phone affordability: Theoretical framework and international benchmarking

1.1 Affordability and market boundaries

The affordability of goods and services is a fundamental dimension in order to assess people's welfare. This is particularly important when examining the consumption of goods and services that are vital for survival, such as water and food in general, or for economic and social insertion, such as education and

information and communication tools. It is hence possible to define a group of minimum goods and services that a person within his/her respective economic and social status has to consume. A person or family that, for whatever reasons, cannot access this minimum basket will face significant barriers in the valuation of their assets as well as on the improvement of their living standards.

Several studies show that access to telephone services constitutes an important tool for the improvement of living standards in modern societies (Cronin et al. 1993; Waverman et al. 2005). Hence, this access is widely recognised as part of the range of services that governments aspire to guarantee nationwide. Even though there is extensive debate about the quantitative and qualitative specifications of the principle of universal access to telephone services, any definition has three dimensions: availability, accessibility and affordability (Milne 2006). Availability and accessibility refer to the non-discriminatory supply of the services. Affordability, on the other hand, refers to the ability to pay for the service by the various socio-economic strata, as well as to the barriers of the existing marketing models.

Affordability has two effects on the access level. The *barrier effect* prevents a person from accessing the service, while the *inhibiting effect* discourages users from making as many calls as they consider necessary. In this sense, full affordability will be attained when the inhibiting effect reaches a level where users make the number of calls they consider necessary without reducing their consumption of other essential goods and services. The underlying assertion here is the need to estimate the telephony demand elasticity. This is because we seek to identify the threshold beyond which, for a certain level of expenditure and a certain service basket, the use of telephone services becomes elastic to price.

Estimating the level of affordability of these services is fundamental for designing universal access programs. The importance lies in the fact that if the affordability threshold for a certain stratum or community is unknown, it will not be possible to estimate the market efficiency frontier. In other words, we would not be able to identify which markets are commercially sustainable without public subsidy. Further, many recent studies discuss the issue of the market

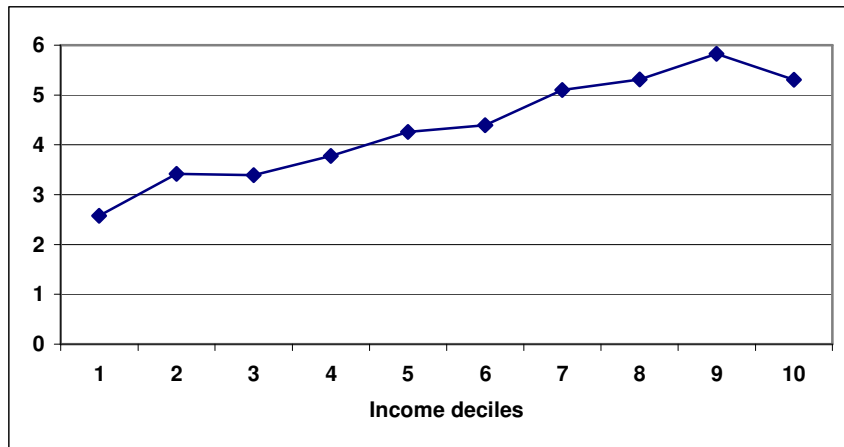
gap from the supply side (i.e. from the estimation of the coverage frontier or the availability of the service, e.g., Regulatel 2006). They do not, however, analyse the ability to pay of the various socio-economic strata or communities. By discussing this dimension, our research aims at contributing to the design of non-distortional tools for universal access.

1.2 International benchmarking

International experience shows a high degree of dispersion in terms of household expenditure on telecommunication services. In developed countries, with penetration levels above 80%, several studies suggest that the price level of a minimum service basket represents between 2% and 3% of per capita income (ITU 1998). In general, this expenditure is considered essential by households, which means that the share of total expenditure decreases as the household's level of income increases.

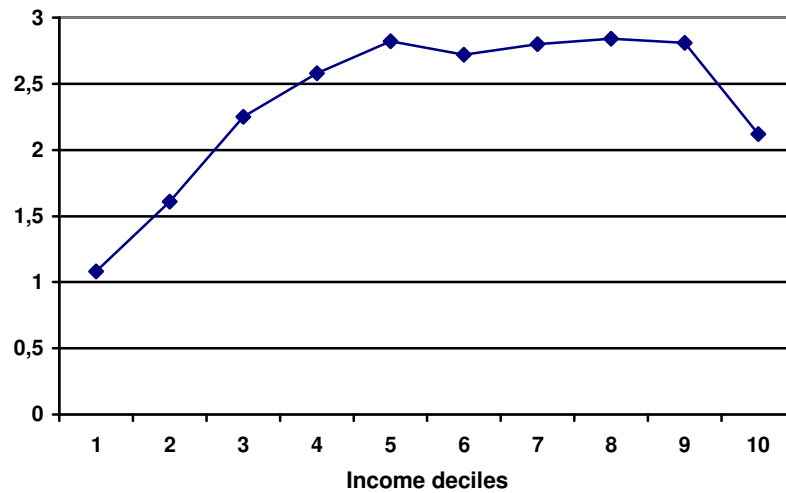
Conversely, the evidence shows that in developing countries, telecommunications expenditure behaves as a luxury good. This means that the share of such expenditure with respect to total income does not decrease but rather tends to increase as income rises, reaching a peak of almost 5% in the medium-high strata and up to 6% when including spending on communications in general (see also Ureta 2006). Nevertheless, considering the well-known concentration in Latin America's income distribution, telecommunications expenditure as a share of income tends, in some cases, to fall among the richest households. This can be observed in Figures 1.1 and 1.2, corresponding to Mexico and Brazil respectively.

Figure 1.1: **Percentage of communications expenditure by income deciles (Mexico 2005)**



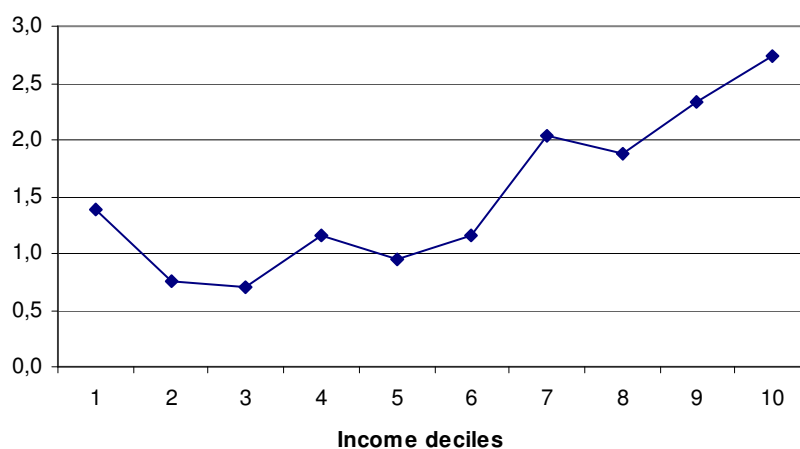
Source: INEGI Mexico.

Figure 1.2: **Percentage of telecommunications expenditure by income deciles (Brazil 2002-2003)**



Source: IBGE Brazil.

Figure 1.3: **Percentage of telecommunications expenditure by income deciles (Peru 2004)**



Source: INEI Peru.³

On the other hand, several studies based on household surveys suggest that poor households in developing countries have relatively higher telephone expenditure levels. For example, a recent study observes that Nigerian poor households spend up to 8% of their income on telephone services (Intelecon 2005). Another recent study shows levels in the range of 10-14% on telephone expenditure among poor households in Tanzania (Souter 2005). Concerning Asia, a recent study finds a telephone expenditure level of 8% among the poorest households in India and Sri Lanka (Moonesinghe et al. 2006). These studies tend to overestimate telephone expenditure, since the question about the family expenditure is generally made outside the general context of every household expenditure. That said, we observe that the poorest households often have higher levels of expenditure than expected (higher, at least, than the observed peak of 4.2% for medium-high households in expenditure surveys).

New studies are hence needed to investigate the difference between the national income survey results and the recent papers on telephone expenditure in poor households. A possible explanation of such a difference could be that the exponential increase in the use of mobile phones in poor households

³ These data underestimate expenditure as they do not consider public telephone services.

through the pre-paid system has not yet been reflected in the national expenditure surveys. In any case, recent studies show a significant willingness to pay for telephone services by poor households in developing countries. This in turn emphasises the need to examine the tariff structure and the services marketing models faced by these households for their expenditure decisions.

2. Telecommunications services basket methodology

In order to estimate poor households' ability to pay and the level of expenditure on mobile phones in different Latin American countries, we used a service basket methodology. This enables us to standardise the various plans and tariffs offered by the different operators in each country, while also allowing for international comparisons. For this purpose, the mobile service basket proposed by OECD was chosen with some relatively minor adaptations in order to reflect the service marketing models used in Latin America.⁴

Following the OECD methodology, we defined three baskets reflecting distinct user profiles:

- a. low user: with a call volume of less than one half of the medium user's volume;
- b. medium user: 75 calls per month; and
- c. high user: with twice the level of usage of the medium user.

Considering our research objectives, we only collected the (monthly) cost of the basket, ignoring the entry costs involved in the purchase of the terminal and the SIM card, as well as connection charges, if any. On the other hand, we distinguish between the prices of the baskets for pre-paid plans and post-paid plans. Baskets include monthly charges (if any) and any other charges applicable to the corresponding tariff plan. Inasmuch as the *calling party pays* (CPP) system prevails in the region, only the cost of outgoing calls is computed. Further, we collected final prices, including all the corresponding charges and

⁴ See OECD Mobile Basket Revision, available at <http://www.oecd.org/dataoecd/46/38/2505946.pdf>. Changes in the OECD basket are discussed in Appendix A.

taxes. In this way, we have the information of the actual costs that users pay in each country.

The baskets correspond to the following volumes of calls and text messages (SMS) per month:

Table 2.1: **OECD mobile service baskets**

<i>Basket</i>	<i>Outgoing calls</i>	<i>SMS</i>
Low volume	25	30
Medium volume	75	35
High volume	150	42

Source: OECD (2002).

Since our objective is to measure service affordability among the poor, the analysis is focused on the low volume basket. That is, we focus on those users who make less than one short call per day or send one daily SMS in a given month. In addition, four destinations are defined: local area fixed line calls, national fixed line calls, same network mobile (on-net) calls, and other network mobile (off-net) calls. To take into account the time when calls are made, we distinguish between peak time calls, off-peak time calls, and weekend calls. The weights regarding destination, time of day and length of calls are detailed in Appendix A.

As is well known, every mobile operator offers a wide variety of plans and options. We collected tariffs for every plan offered by the main mobile operators in each country (see details in Appendix A), and then calculated the monthly cost for a low volume user. To estimate the low volume basket we took as reference the cheapest post-paid plan (i.e. the lowest monthly charge) and the lowest denomination pre-paid card offered by each operator. This selection is based upon both the known consumption patterns and income volatility of poor households.

The value of the baskets has been estimated both in current US dollars and in purchasing power parity (PPP) dollars. As we know, there is a debate about the appropriateness of using any of these measures, e.g. making short term

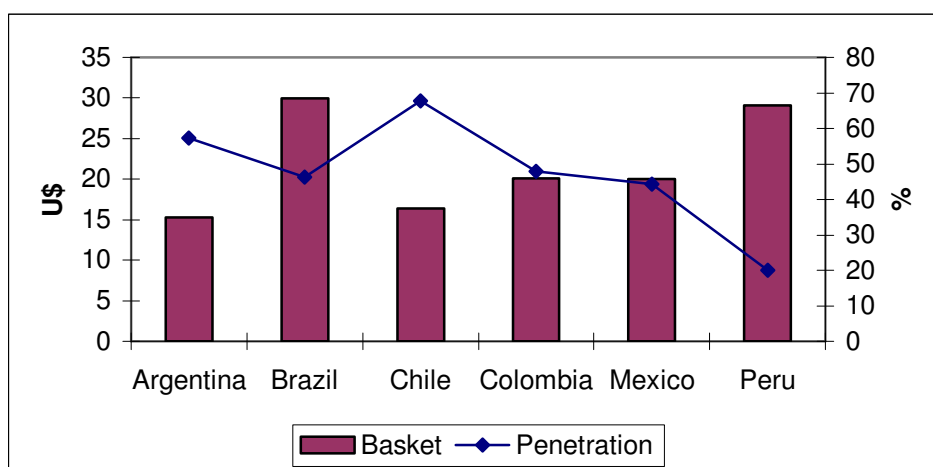
comparisons using the purchasing power parity rate (Taylor and Taylor 2004). On the other hand, however, except for the transportation costs and import duties, together with the transaction component in the goods and services basket used to determine the parity rates, the parity rate is a good indicator of the real purchasing power of the US dollar in each country. In view of these debates, we preferred to make the comparisons using both exchange rates. However, to make the analysis clearer, the comparison between the results expressed in current US dollars and in PPP dollars is shown in Appendix C.

3. Mobile telephone rates in Latin America: Main results

3.1 Comparison across countries

Figure 3.1 summarises the results found for the countries studied, expressed in current US dollars (at the exchange rate of October 2006). Given the predominance of the pre-paid system in the region, particularly among the poor, our analysis is focused on the cost of the low volume basket in this service mode. The graph also illustrates the mobile teledensity in each market.

Figure 3.1: **Monthly cost of the pre-paid, low volume mobile phone service basket (current US dollars) and mobile teledensity**



Source: Own calculations.

The results reveal a significant price dispersion in both current US and PPP dollars (see Table B.1 in Appendix B). Overall, we observe the highest prices in Peru and Brazil, while Chile and Argentina have the lowest prices. Further, results suggest a strong effect of the low volume basket price level on mobile phone service penetration. Although the limited number of cases does not allow us to quantify this effect, these results are consistent with the various studies that suggest a significant price elasticity of telephone service access and usage in developing countries.⁵

3.2 Pre-paid versus post-paid systems

Various studies have demonstrated the formidable impact of the introduction of the pre-payment system for mobile phones on the use of the service in poor developing countries all over the world (Samarajiva 2007; Mariscal et al. 2006). This is mainly due to the numerous advantages such a system offers to users who have fluctuating or seasonal income and little access to the formal credit system, who live in precarious housing conditions and/or work in the informal sector. According to recent estimates (IADB 2006), these characteristics

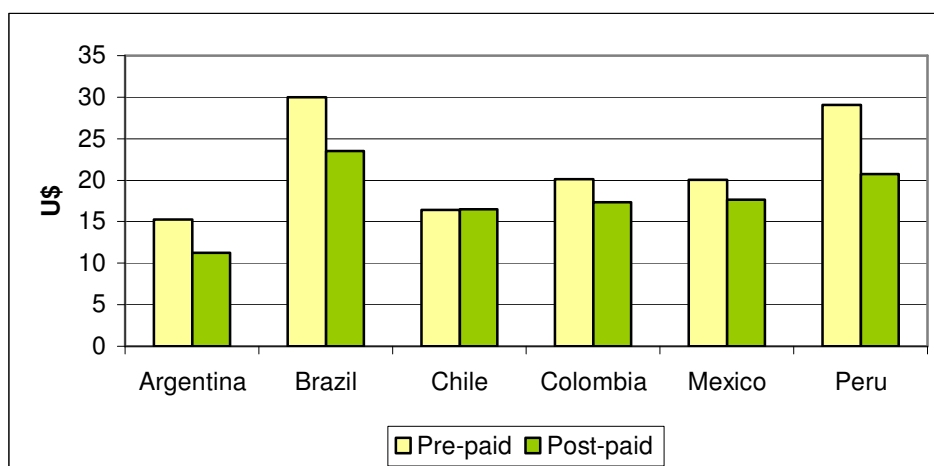
⁵ See Wheatley (2006) in particular.

describe 70% of the region's inhabitants. This then highlights the importance of the pre-paid system for access to the service by the poor.

Nevertheless, if one only considers the unit cost (per minute or per SMS) of pre-paid service, it is higher than the cost of the same service under the post-paid system. This means that the pre-paid system would represent a sort of punishment for lower income users who, without credit access, have no possibility to access the post-paid system. Some recent studies however question this premise, stating that considering a service basket that reflects the consumption patterns of the poor (vis-à-vis the unit cost of the service), pre-paid service costs are comparable, and in some cases even lower, than the post-paid ones (LIRNEasia 2006).

Figure 3.2 shows the cost differential of the low volume basket according to the system used (pre-paid versus post-paid) in the major Latin American markets. The graph shows that in most, pre-paid basket prices are higher, with differences ranging from 13% in Mexico to 40% in Peru. In other words, in most countries, pre-paid users do pay higher rates for their mobile phone calls. This happens even when the operator's administrative costs to operate such a system tend to be lower, given the lack of billing, payment collection and credit risk costs (Oestmann 2003). That said, we found that in Chile, the most developed market in the region in terms of teledensity and one of the most competitive, the cost of the basket is extremely similar in both cases. This suggests a potentially convergent trend between pre- and post-paid prices in the future.

Figure 3.2: **Pre-paid versus post-paid prices for the low volume basket (current US dollars)**



Source: Own calculations.

In addition, it is interesting to note that our data gathering evidenced that most of the operators offer so-called “controlled” plans that combine pre-paid and post-paid features. That is, these plans involve a fixed monthly rate to make a certain number of calls or send a certain number of SMS, after which it is possible to add extra credit with pre-paid cards. These newer modalities seem to have had a significant impact, given that they enable low income users to access the better rates offered by post-paid service, while at the same time carefully controlling their monthly expenditure.

3.3 Micro-prepay and billing effect

Due to the importance of the pre-paid system in the region, and especially for telephone service access for the poor, we believe it is important to analyse the different service marketing modes. In addition, one would like to learn from the best business and regulatory practices that allow service access and increase the effective ability to pay of the poor. In this section we discuss two business models that would trigger a reduction of pre-paid service costs: the instrumentation of a micro-prepay system and per second service billing, as opposed to per minute billing.

Micro-prepay enables an individual to add small amounts of credit (e.g. enough to make only one short call or to send a few SMS) to a pre-paid account. This

can be done directly by the user or through third parties (retailers). From the point of view of low income users, the greatest advantage of this system is that they can add credit in small amounts for immediate consumption, instead of being obliged to buy cards with higher denominations, and are thus able to better adapt expenditure to their actual consumption needs. On the other hand, from the operator's point of view, a micro-prepaid system that uses an electronic platform makes the credit distribution chain safer and more efficient.

The micro-prepaid system has been successfully implemented in countries like the Philippines, South Africa and India. Various studies state that its implementation does not imply significant additional costs for the operator's network infrastructure.⁶ On the other hand, the implementation of this system in the Philippines has generated an interesting multiplier effect, starting from the establishment of an extensive phone credit retailers network (Smith 2004). In addition, micro-prepaid systems enable the development of new e-commerce applications on the mobile phone platform (so-called m-commerce), even for those who do not have any access to the formal banking system. The most illustrating case is South Africa, where almost 500,000 low income users without access to the traditional banking system use an innovative electronic banking service developed on the basis of the mobile phone platform.⁷

Table 3.1 shows that in the major Latin American markets, pre-paid users face marketing schemes that make it difficult to adjust their expenditure to their desired consumption level. The main reason behind this is that, in most cases, the minimum credit recharge represents a significant percentage (in some cases nearly 50%) of the monthly cost of a low volume basket. In other words, this does not allow for an effective adjustment of the consumption to the flow of income nor to the desired consumption. This may explain the increasing popularity of informal service re-sale mechanisms in the major Latin American cities. In turn, this enables the poor to consume small amounts of service (and

⁶ See for example Anatel, 2006.

⁷ "Phoney Finance". The Economist, 26 October 2006.

thus to adjust their consumption to their ability to pay) in exchange for a surcharge on the price established by the service operator.

Table 3.1: **Value and duration of minimum credit recharge for pre-paid⁸**

<i>Country</i>	<i>Minimum Card Value (U\$)</i>	<i>% of Low Volume Basket</i>	<i>Duration of the Minimum Card (days)</i>
Argentina	3.24	21.21	10
Brazil	4.69	15.64	20
Chile	6.70	40.80	30
Colombia	4.28	21.28	30
Mexico	9.31	46.51	60
Peru	3.09	10.63	15

Source: Own calculations.

Table 3.2 allows for the estimation of the cost-saving effects if a micro-prepaid system was implemented. This is merely a theoretical exercise, as the real price the operators would charge for the various services is unknown. That said, taking the price of the services for the card with the lowest value in each country as a parameter, it can be a helpful approximation. The micro-prepay effect results from the difference between the actual cost of the basket and the theoretical cost if the user were able to buy the exact amount of minutes and SMS included in it. In other words, this effect would arise if low volume customers were able to buy lower denomination cards at the same unit cost for calls or SMS.

Table 3.2: **Micro-prepay effect on the cost of the pre-paid low volume basket (in current US dollars)**

<i>Country</i>	<i>With micro-prepay</i>	<i>Actual</i>	<i>Micro-prepay effect</i>
Argentina	\$13.90	\$15.28	\$1.38
Brazil	\$29.07	\$29.99	\$0.92
Chile	\$13.72	\$16.42	\$2.70
Colombia	\$17.07	\$20.12	\$3.05
Mexico	\$18.29	\$20.02	\$1.73
Peru	\$26.83	\$29.07	\$2.24

Source: Own research.

⁸ In some countries the duration varies according to the operator. We took the lowest value cards at the time of data collection (October 2006)...

Results show that the implementation of a micro-prepay system would generate a significant saving in mobile phone expenditure of the poor. On average, it is possible to estimate a reduction of around 10% in the low volume user's expenditure. On the other hand, Table 3.3 shows the potential saving that would result from the implementation of per second call billing.

Table 3.3: **Per second billing effect on the cost of the pre-paid low volume basket (in current US dollars)**

<i>Country</i>	<i>With per second billing</i>	<i>Actual</i>	<i>Per second billing effect</i>
Argentina	\$12.96	\$15.28	\$2.32
Brazil	\$29.99	\$29.99	\$0.00
Chile	\$16.42	\$16.42	\$0.00
Colombia	\$15.84	\$20.12	\$4.28
Mexico	\$18.63	\$20.02	\$1.39
Peru	\$29.07	\$29.07	\$0.00

Source: Own calculations.

Half of the countries included in this study already operate under this system (Brazil,⁹ Chile and Peru), while in the rest (Argentina, Colombia and Mexico) the minute is still used as the billing unit. The potential saving is even more significant, representing around 18% of the actual cost of the low volume basket. Combining the effect of a micro-prepay system and per second billing (see Table 3.4), we notice an average reduction of the basket cost of around 22%.

Table 3.4 **Micro-prepay and billing per second saving effects**

<i>Country</i>	<i>In current US dollars</i>	<i>As a % of poverty line</i>
Argentina	\$4.53	5.0%
Brazil	\$0.92	0.8%
Chile	\$2.70	3.2%
Colombia	\$6.67	6.2%
Mexico	\$5.48	5.8%
Peru	\$2.24	3.1%

⁹ In Brazil, the billing unit is a tenth of a minute (i.e. six seconds), with a minimum charge of 30 seconds. Given the call duration of our basket (see Appendix A), this billing is equivalent to per second billing.

Source: Own calculations.

In sum, the analysis shows that there is still a wide margin for developing business models consistent with the consumption patterns of the poor. This in turn implies that regulatory bodies should encourage these changes, as they could significantly reduce the expenditure on mobile phone services by low income users. As an example, if we estimate how much this saving would represent for those who live on the poverty line, we can see that it may represent over 6% of their income, as is the case of Colombia (Table 3.4). These savings are quite significant, and given the sensitivity to mobile prices among low income users, they may imply a considerable boost in demand.¹⁰

Even more interestingly, these changes may extend the market frontier for the poor. And this, to some extent, may have an essentially neutral (or even positive) impact on the operator's total revenues. Although, as discussed before, there are various factors that affect the level of mobile phone penetration and usage in a given market, we still observe that tariff levels are one of the most relevant variables. Finally, even if the introduction of a micro-prepay or per second billing system may mean a short-term reduction in the average revenue per user (ARPU), such reduction would be compensated by the higher demand (both in terms of minutes and users) in the long run. This is shown, for example, by the case of SMART in the Philippines.¹¹

4. Affordability analysis

As we saw in the first section, the empirical study of telecommunication service affordability seeks to examine the expenditure patterns of the various sectors and their relative significance vis-à-vis other welfare variables. In this section we examine the expenditure that the pre-paid, low volume mobile phone basket represents for poor families in the countries chosen. Based on this comparison, it is possible to classify these countries according to their affordability.

¹⁰ See, for example, CRT, 2005.

¹¹ During the 12 months following the introduction of the SMART micro-prepaid system in 2003, a 14% fall in the pre-paid ARPU was compensated with a 54% increase in the user base. Source: Pyramid Research.

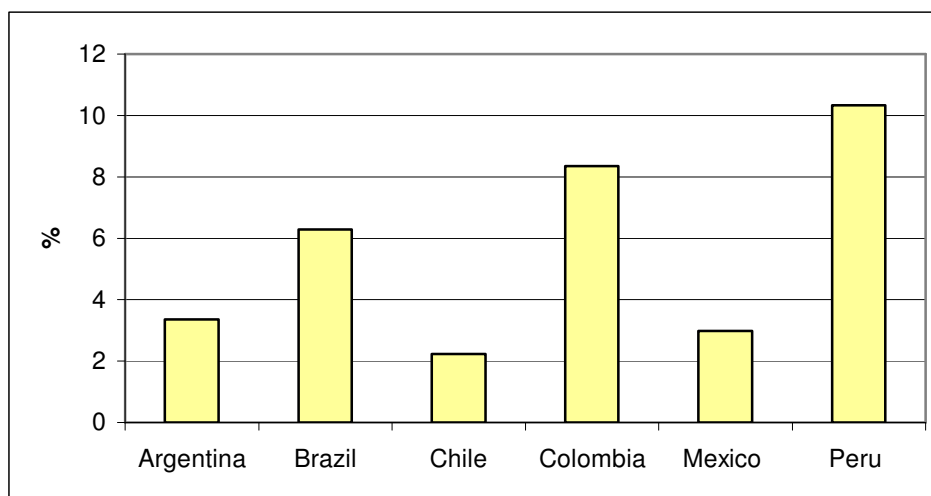
Given that expenditure surveys are not available in every country, at this stage of the research we used aggregate measures. Therefore, we chose the following variables to describe welfare levels: 1) gross domestic product (GDP) per capita; 2) average wage level; 3) minimum wages; and 4) poverty line.¹² To estimate affordability, we take the real value of the low volume basket, as this allows us to discriminate the effect of the various marketing systems of the operators (e.g., different denomination of prepayment cards and billing systems). Further, we focused on the pre-paid services because they represent the choice of a great majority of low income Latin American users.

4.1 Gross domestic product (GDP) per capita

We first analyse the importance of the value of the pre-paid, low volume basket with respect to the GDP per capita. This enables us to get a first approximation of the general service affordability level (Figure 4.1). The graph shows a clear difference between two groups of countries. On the one hand, Argentina, Chile and Mexico show an acceptable affordability level (below 4%). On the other, Brazil, Colombia and Peru have a low affordability level, reaching figures above 10% of the GDP per capita, as in the case of Peru. The same effect can be observed in terms of both current US and PPP dollars (see Figure B.1 in Appendix B). These results indicate that, in countries like Peru, the average service affordability level is low, which in turn is clearly reflected in the low mobile penetration level achieved.

¹² Appendix C presents a detailed discussion of the data used and the limitations of each one of these indicators.

Figure 4.1: **Share of monthly GDP per capita represented by the pre-paid, low volume consumption basket (current US dollars)**

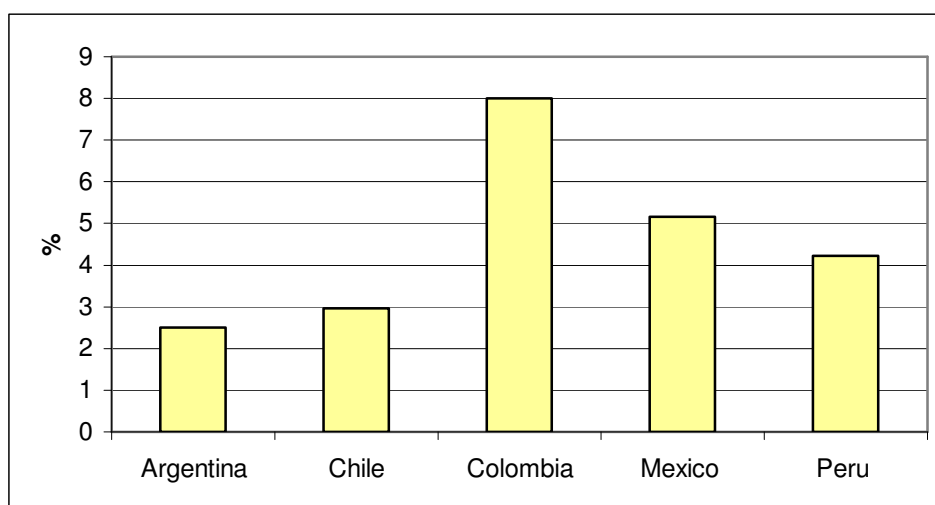


Source: Own calculations.

4.2 Average wage level

As for the average wage level (in the formal economy), we again observe that Argentina and Chile have a higher affordability level, as the low volume basket represents less than 3% of their average wages (Figures 4.2 and B.2). In this regard, however, Mexico belongs to the low affordability group, together with Colombia and Peru. The comparison does not include Brazil due to a lack of detailed wage data. Further, it is important to point out that using the wage level in the formal sector we might be overestimating service affordability. This is particularly relevant in those countries where informal employment exceeds employment in the formal economy, as is, for example, the case of Peru.

Figure 4.2: **Share of monthly per capita wages represented by the pre-paid, low volume basket (current US dollars)**

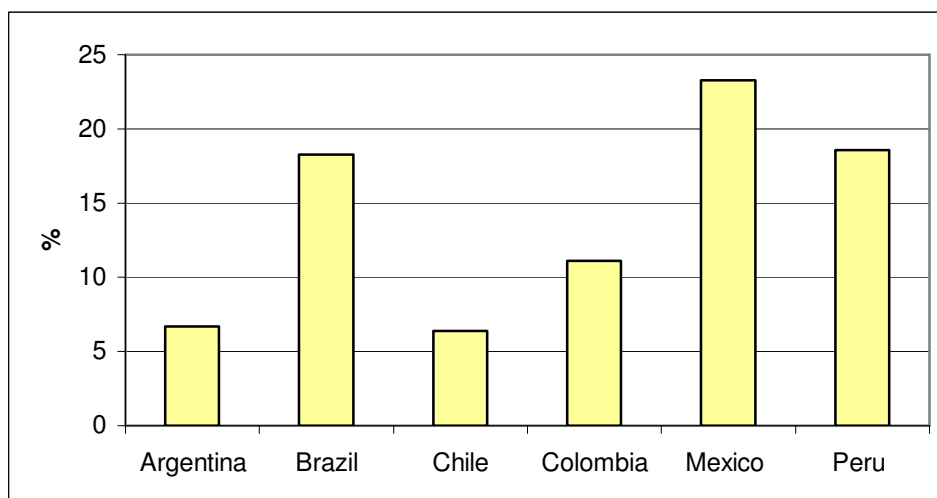


Source: Own calculations.

4.3 Minimum wages

The value of the low volume basket as a ratio of the minimum wage represents a more reliable indicator of service affordability for the poor (Figures 4.3 and B.3). In this case, it is interesting to note that Colombia is now a little closer to the group of countries with higher affordability levels, while Mexico has the least affordable services for those who earn the minimum wage, followed by Peru and Brazil. In absolute terms, it should be emphasised that only Argentina and Chile have acceptable affordability levels, while the rest are far above 5% the minimum wage.

Figure 4.3: **Share of the minimum wage represented by the pre-paid, low volume basket (current US dollars)**

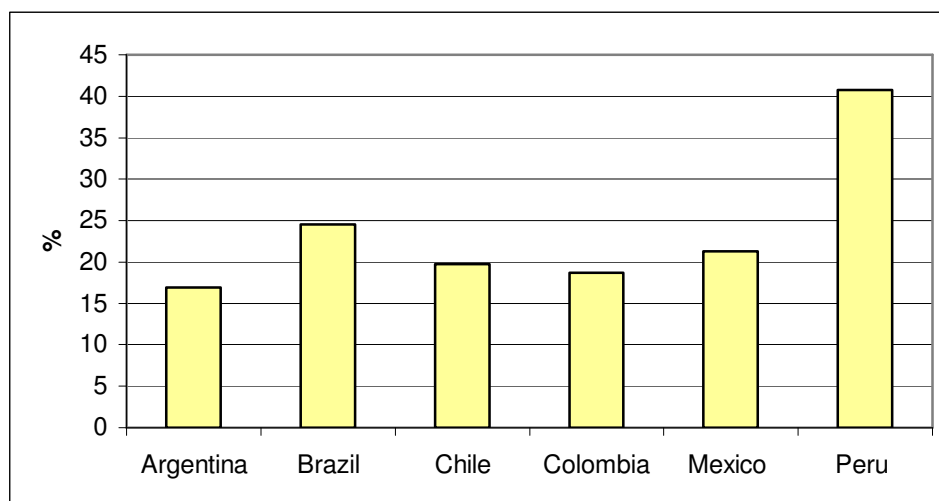


Source: Own calculations.

4.4 Poverty line

We finally examine the share that the low volume basket cost represents to someone with an income equal to the poverty line in each country (Figures 4.4 and B.4). The results in this case are conclusive: the cost of the basket exceeds by far the ability to pay of the Latin American poor, being over 15% of the poverty line income in every country. Moreover, Peru is confirmed as the country with the least affordable services, with an expenditure level over 40% of the poverty line income, followed by Brazil and Mexico, with 25% and 21% respectively. Even in Argentina and Colombia, where the service is shown as more affordable for the poor, the expenditure levels widely exceed 10% of the poverty line, hence having a strong inhibiting effect on service consumption.

Figure 4.4: **Share of the poverty line income represented by the pre-paid, low volume basket (current US dollars)**



Source: Own calculations.

5. Comparison with traditional alternatives: fixed and public telephony

Finally, in this section we analyse the cost of mobile phone service vis-à-vis the two traditional telephone alternatives (fixed line and public payphone services) using the same methodology (i.e. OECD baskets). It is well known that the poor have had little access to fixed line telephone service. In addition, prior to the spread of mobile service, the only alternative for the low income population was to use public payphones. This analysis enables us to estimate the cost associated with the process of substituting public payphones (and fixed line phones to a certain extent) by mobile phones in poor households.

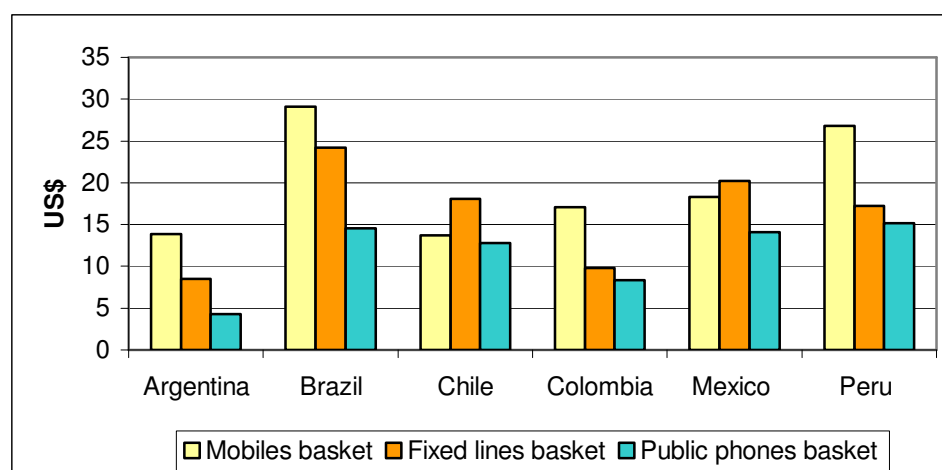
It is usual to think that, when opting for mobile telephony, the poor are acting in an irrational way given the overpriced rates of this service's unit costs vis-à-vis those for fixed and public telephony services. Nevertheless, the comparison per unit price (i.e. per minute of voice conversation) overestimates the existing price differential due to both the service marketing modalities and the CPP system prevailing in the region.

We carried out the analysis using the basket methodology applied throughout the study (Figures 5.2 and B.5 in Appendix B). This led us to conclude that the

gap between mobile versus fixed line costs is less significant than might be expected. Moreover, we even found the inverse relation, with higher costs for the mobile basket than for the fixed line basket in Chile and Mexico.

In fact, our results show that the most significant differences are found in Argentina and Colombia. In these countries, due to the effect of different sectoral policies (i.e., the freezing of tariffs and a special price system for fixed lines in poor households, respectively), fixed telephone tariffs are at artificially low levels. In sum, low income users' preference for mobile telephony is not only due to factors of convenience (e.g. mobility) and spending patterns (e.g. spending control under the pre-paid system), but also because of the tariff structure for each of these alternatives.

Figure 5.1: **Cost for the low volume, pre-paid basket depending on the type of service (current US dollars)**¹³



Source: Own calculations.

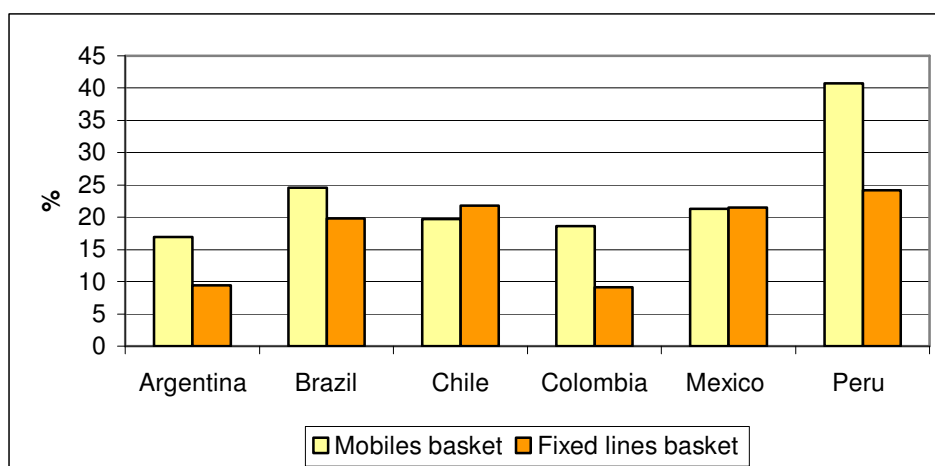
Nevertheless, the tariff differential between mobile and public payphone services seems to be much more significant (see Figure 5.1). This explains the continued high usage levels of these services by the poor. In particular, the CPP system promotes the complementarity pattern of use, in which mobile

¹³ Telephone prices for Colombia correspond to the card of the biggest telephone operator in Bogotá in March 2007. Since the CRT regulates access charges and updates them annually, since October 2006 the increase would only have been marginal, i.e. below 5%.

service is mainly used for incoming calls, while low income users make outgoing calls through public telephony.

On the other hand, if we compare the cost of low volume, pre-paid baskets vis-à-vis the poverty line (Figure 5.2), we can see that, again, Peru is the least affordable country in the region. Due to the policies mentioned above, Colombia and Argentina come out as the countries where the fixed line basket is most affordable, even though in both cases the cost of the basket is over 5% of the poverty line. This in turn explains the preference of the poor for mobile services that allow them to have better control of their expenditure.

Figure 5.2: **Share of the poverty line income represented by low volume pre-paid and fixed line baskets (current US dollars)**



Source: Own calculations.

6. Conclusions and issues for future research

From the literature review and our own analysis, we can draw several conclusions and pose many questions for further study. These involve numerous aspects of the mobile service affordability problem and the purchasing power of the poor.

The main conclusion of this study is that current tariffs and operators' marketing practices result in mobile telephony services not being generally affordable for most of the Latin American population. This conclusion has an important inhibiting effect, not only in terms of penetration but also usage. This in turn fosters expenditure control practices that are tolerated by the operators, albeit

outside the formal sector. Although competition has stimulated tariff reduction, there is still a wide price differential with respect to alternative services, such as fixed and public telephony. That said, in the case of the mobile-fixed comparison, the differential is lower than expected. In addition, we highlight the important price differential between the pre-paid and post-paid systems. This, together with the mobile-fixed issue, implies that most of the poor's access to phone service represents a significantly higher cost than for the rest of the population.

Our analysis also shows that the implementation of changes in the operators' marketing practices, such as per second pricing or micro-prepay, would result in a significant reduction in the costs faced by low volume users of pre-paid mobile phone service. Most interestingly, these changes, by reducing the cost of the service basket, could stimulate demand in such a way that there would be an essentially neutral impact on operators' revenues.

Our results, however, give rise to issues that require further research on the many aspects of the mobile services demand of the poor. Since the basket has been built following theoretical assumptions, the first task is to collect information on the ground to determine the effectively consumed telecommunications basket of the poor. Moreover, although a basket constructed using empirical data on current consumption patterns would not be directly comparable across regions, it still has the advantage of reflecting what was consumed and thus what was actually spent by the poor in each country.

Similarly, in addition to calculating the actual consumption basket, it is also necessary to explore the sensitivity of demand to changes in tariffs and business models, as well as to study users' perceptions of the affordability of service and other dimensions such as the quality of service. This type of research would in turn enable a better understanding of the combination of factors affecting poor people's purchasing decisions vis-à-vis current phone service alternatives.

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- Brazil: www.ibge.gov.br
- Chile: www.ine.cl
- Colombia: www.dane.gov.co
- Mexico: www.inegi.gob.mx
- Peru: www.inei.gob.pe

Appendix A: Methodology to define the baskets

In order to measure the affordability of mobile phones for the poor in different countries in Latin America, we used a service basket methodology. This enables the standardisation of every plan and tariff found, as well as comparison at an international level. The main purpose of the baskets is to define the benchmark for different types of users (low volume, medium volume and high volume).

The basket we used is based on the mobile service basket proposed by the OECD, with minor adaptations reflecting Latin America's service marketing models. In this first stage we collected tariffs for the six major markets of the region: Argentina, Brazil, Chile, Colombia, Mexico and Peru. Below is a description of the characteristics of the various baskets and the data collection methodology (carried out in October 2006), as well as the other indicators included in the analysis.

1. Characteristics of the mobile service basket

Currency: Tariffs were converted into US dollars for a better comparison, using the current exchange rate. Likewise, in view of the difference between the price ranges in each country, tariffs are also shown (in Appendix B) in purchasing power parity (PPP) dollars, calculated with IMF's conversion factor.

Taxes: Tariffs reflect the final prices, and hence include the value added tax (VAT) and any other special tax applied to the service.

Composition of the basket: Neither the price of the equipment (and possible related subsidies) nor the connection charges were considered (although the only country where these charges were found was Colombia). Hence, the basket exclusively reflects the (monthly) cost of the service. We distinguished between the prices of the baskets for pre-paid and post-paid plans. The baskets include monthly rental charges and any other applicable charge to the corresponding tariff plan. Following OECD, three types of baskets are defined according to the service usage intensity:

- i. Low user: with a volume of calls below half that of the medium user;
- ii. Medium user: 75 calls per month; and
- iii. High user: making twice as many calls as the medium user.

Since the calling party pays (CPP) system dominates in the region, only the outgoing calls are estimated. The basket corresponds to the following volume of calls and text messages (SMS) per month:

Table A.1: **Baskets according to the user profile**

<i>Basket</i>	<i>Outgoing calls</i>	<i>SMS</i>
Low volume	25	30
Medium volume	75	35
High volume	150	42

Source: OECD (2002).

Call Destination: four types of destinations are differentiated:

- a. Local calls to fixed phones.
- b. National calls to fixed phones: if there were different tariffs according to the distance, we used the OECD's weights for the telecommunication baskets:

Table A.2: **Weights used according to distance by OECD**

Km	3	7	12	17	22	27	40	75	110	135	175	250	350	490
Wt.	60	14	5	3	1.5	2.5	2.5	2.5	1.5	1.3	1	1	0.8	3.5

Source: OECD (2002).

When the distances specified by the OECD do not coincide with those specified in the operator's tariff plans, the OECD weights that coincided with every range defined by the operator were considered. On the other hand, it is possible for the operator to charge as a local call what OECD would consider a national call. In this case, we added the weight(s) corresponding to these distance(s) to the cost per minute for local calls.

- c. Calls to on-net mobile phones.
- d. Calls to off-net mobile phones. In the case that tariffs differed across operators, we considered their weighted average using the corresponding market shares as weights.

The distributions by destination of each basket are (in percentages of the call total):

Table A.3: **Distribution by destination of each basket**

<i>Basket</i>	<i>Local calls to fixed lines</i>	<i>National calls</i>	<i>On-net mobiles</i>	<i>Off-net mobiles</i>
Low volume	28%	14%	40%	18%
Medium volume	24%	12%	43%	21%
High volume	26%	14%	42%	18%

Source: OECD (2002).

In those cases where there were differences between the tariffs charged for calls to local and national mobile phones, we took the ratio of the price for a local fixed call to a national fixed call as a basis. For example, in Argentina, where mobile tariffs do not depend on the operators but on where the telephone was acquired, we used the following weights:

Table A.4: **Weights used for differences in the rates charged for calls to local and national mobile lines**

<i>Basket</i>	<i>Local calls to fixed lines</i>	<i>National calls</i>	<i>Local calls to mobile lines</i>	<i>National calls to mobile lines</i>
Low volume	28%	14%	39%	19%
Medium volume	24%	12%	43%	21%
High volume	26%	14%	33%	27%

Source: Own calculations.

Time and day when calls are made: We distinguished between three different categories as regards the time and day when calls are made:

- a. Peak time calls: on weekdays, normal rate. If there were several tariffs, we took the most expensive weekday one.

- b. Non-peak time calls: on weekdays, reduced rate. If there were several tariffs, the cheapest weekday one was considered.
- c. Weekend calls: during daytime Sundays. If there were different tariffs, the cheapest Sunday rate was considered.

The distribution of time and day for each of the three baskets are as follows (in percentages of total calls):

Table A.5: **Shares for time and day of each basket**

<i>Basket</i>	<i>Peak time</i>	<i>Non-peak time</i>	<i>Weekend</i>
Low volume	38%	35%	27%
Medium volume	47%	30%	23%
High volume	63%	22%	15%

Source: OECD (2002)

Call duration: we considered three different lengths, according to:

- a. Local and domestic calls to fixed lines.
- b. On-net calls to a mobile phone.
- c. Off-net calls to a mobile phone.

The lengths defined for each basket are (in minutes per call):

Table A.6: **Duration of each call defined for each basket (minutes per call)**

<i>Basket</i>	<i>Local and national calls</i>	<i>On-net mobiles</i>	<i>Off-net mobiles</i>
Low volume	1.6	1.4	1.4
Medium volume	2.1	1.9	1.9
High volume	2.2	2	2.1

Source: OECD (2002).

In countries where calls are charged by the minute (and not per second), the duration was rounded up to the next highest unit.

Allowed calls: The cost of calls included in the post-paid contracts were deducted from the cost of usage after calculating the basket. The former was always below the actual usage cost (as no negative usage is allowed), and we did not consider leftover minutes transferred to the following month.

Included minutes and SMS: When the (post-paid) tariff plan included minutes, these were deducted from the basket before estimating the cost incurred. When the plan considered had SMS included, these were deducted from the basket before calculating the cost of the text messages, taking as maximum the number of messages considered in each basket.

Selection of the plan and operator: If the operator(s) offered more than one pre-paid plan, we selected the cheapest plan, taking as reference the low volume user basket. For each country, we considered the operators with the largest market share, up to a maximum of three operators per country, based on the following table:

Table A.7: **Operators' market share in countries studied**

<i>Country</i>	<i>Name</i>	<i>Share</i>
Argentina	CTI	33%
	Movistar	39%
	Personal	28%
Brazil	Claro	23%
	Vivo	30%
	Tim	25%
Chile	Movistar	45%
	Entel PCS	37%
Colombia	Comcel	64%
	Movistar	27%
Mexico	Telcel	79%
	Movistar	14%
Peru	Claro	36%
	Movistar	59%

Source: Own calculations based on most recent data at the time of research (October 2006), provided by Teleco (<http://www.teleco.com.br/>). Data for Argentina and Brazil (Anatel) correspond to the third quarter of 2006; data for Colombia (CRT) and Mexico (Cofetel) correspond to the second quarter of 2006; data for Chile and Peru (OSIPTEL) correspond to the first quarter of 2006.

Each operator has a wide range of plans and options. We considered every price and then picked the resulting lowest price for the low volume user basket. In the case of pre-paid plans, if prices differed with the amount of each recharge card, we considered the basket with the cheapest card, which we believe would best reflect actual practice by low income users, even if per minute prices were higher. For post-paid plans, we selected those with the lowest monthly charge.

In both cases, the information presented comprises the plan that resulted in the cheapest basket for the low user.

Currency and exchange rates: There are theoretical arguments for and against considering a call from a mobile phone as a tradable good. We decided to report the results in current US dollars (using the exchange rate at the time of data gathering) as well as in PPP dollars.¹⁴

¹⁴ Source for exchange rates: <http://www.bloomberg.org/invest/calculators/currency.html>; for PPP conversion factors: International Monetary Fund, World Economic Outlook Database.

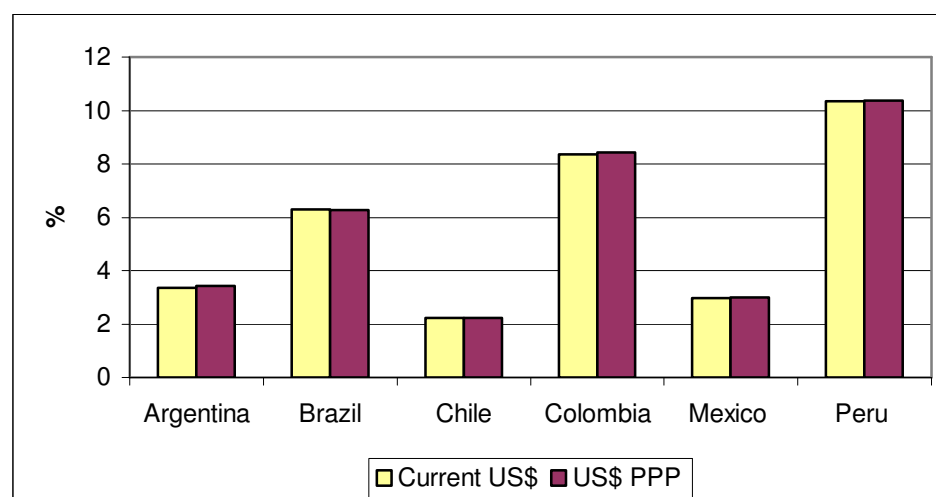
Appendix B: Dollar and purchasing power parity (PPP) calculations

Table B.1: Monthly cost of the pre-paid, low volume mobile basket

<i>Country</i>	<i>U\$</i>	<i>U\$ PPP</i>	<i>Concentration (HHI)</i>	<i>Penetration</i>
Argentina	\$15.28	\$45.53	3232	57.27%
Brazil	\$29.99	\$47.60	2388	46.25%
Chile	\$16.42	\$23.98	3801	67.79%
Colombia	\$20.12	\$56.82	4752	47.92%
Mexico	\$20.02	\$27,97	6148	44.34%
Peru	\$29.07	\$58,02	4891	19.96%

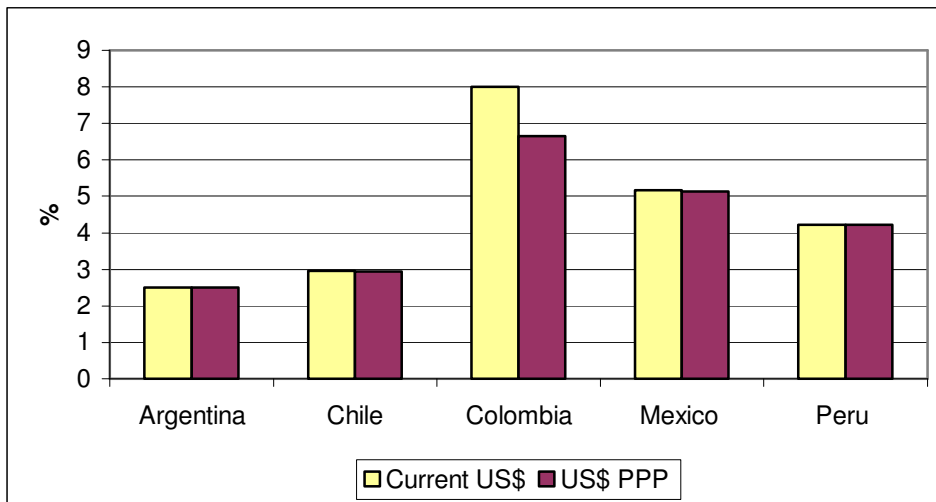
Source: Own calculations.

Figure B.1: Share of monthly GDP per capita represented by the low volume, pre-paid basket (current US and PPP dollars)



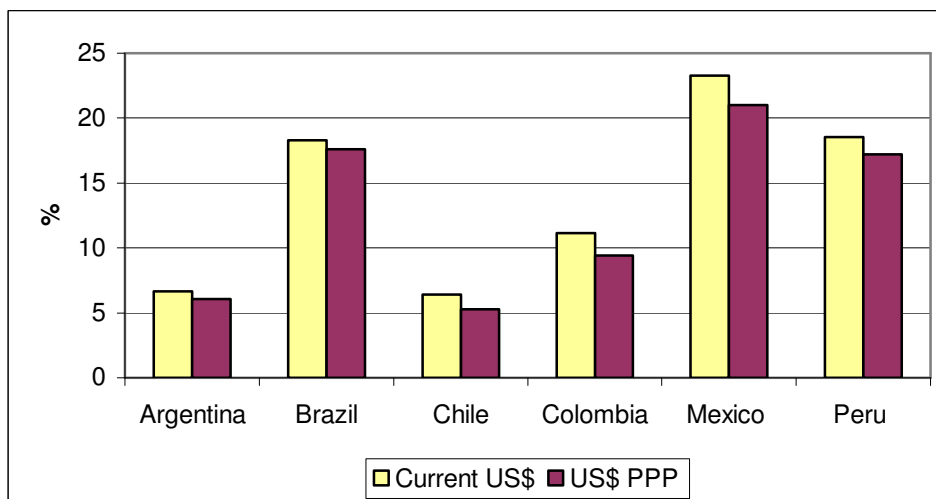
Source: Own calculations.

Figure B.2: **Share of average monthly wages represented by the low volume, pre-paid basket (US current US and PPP dollars)**



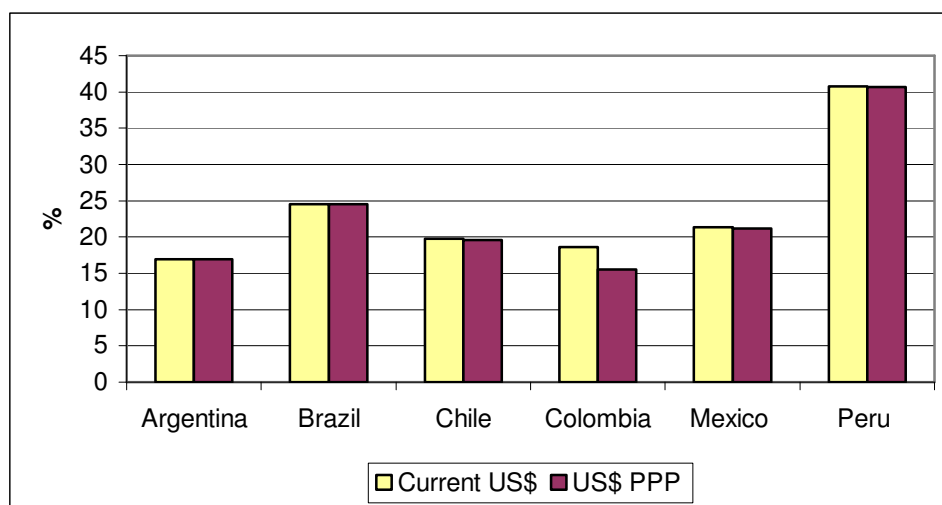
Source: Own calculations.

Figure B.3: **Share of minimum wage represented by the low volume, pre-paid basket (US current US and PPP dollars)**



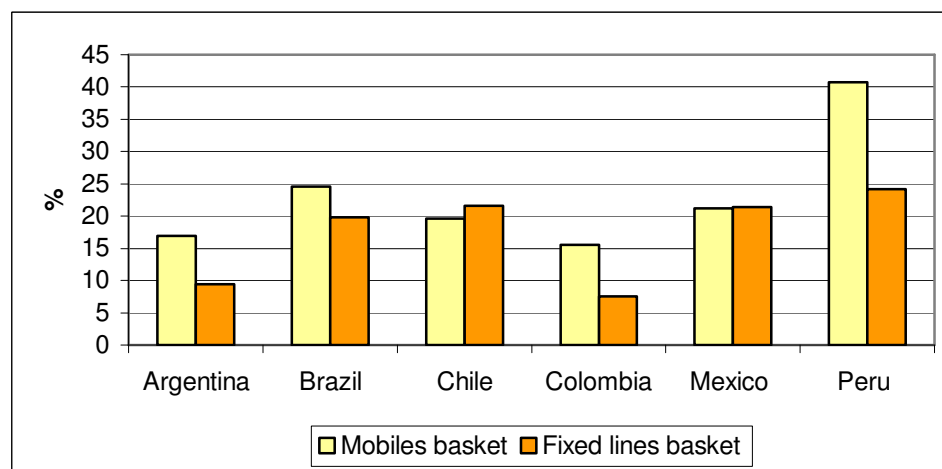
Source: Own calculations.

Figure B.4: **Share of poverty line income represented by the low volume, pre-paid basket (current US and PPP dollars)**



Source: Own calculations.

Figure B.5: **Share of poverty line income represented by pre-paid mobile and fixed line, low volume baskets (PPP dollars)**



Source: Own calculations.

Appendix C: Measures used in the affordability analysis

1. GDP per capita

The gross domestic product (GDP) is the most widely used proxy for a country's economic activity. It measures the value of every good and service produced in a year within a given country, including net flows from abroad which result from property sources. It is the measure most commonly used to make comparisons of well-being across countries. GDP per capita is calculated as the ratio of GDP over total population.

The limitations of this indicator to measure the real affordability of telephony services are clear. First, there is a discrepancy between the GDP per capita and what is really earned by a person. This can be explained by: payments for factors abroad, capital depreciation, taxes paid, and payments made for social security and social provision. Thus, depending on these amounts, the discrepancy may be significant, resulting in a GDP per capita higher than the income that each person actually earns. Secondly, this average does not take into account internal disparities among a country's inhabitants. Hence, two countries may have the same GDP per capita but the disparity between the richest and the poorest can be very different. In other words, the value of the GDP per capita does not reflect the income of every inhabitant, and it can overestimate people's real ability to pay.

Considering these limitations, GDP per capita data are shown in Table C.1. These figures are measured both in current US dollars and in PPP dollars in the year 2005. The differences across the countries in our sample are quite significant regardless of the exchange rate used. When measured in PPP dollars, Argentina has the highest GDP per capita and Peru the lowest, with a GDP per capita less than half of Argentina's. In terms of current US dollar values, Mexico has the highest GDP and Colombia the lowest. These discrepancies clearly illustrate the difficulty of making international comparisons if we only use one type of exchange rate.

Table C.1: **GDP per capita 2005**

Country	GDP (PPP) per capita	GDP per capita (current US\$)
Argentina	15,937	5,458
Brazil	9,108	5,717
Chile	12,983	8,864
Colombia	8,091	2,888
Mexico	11,249	8,066
Peru	6,715	3,374

Source: Estimated, International Monetary Fund (IMF), World Economic Outlook Database.

2. Average wage level

It can be argued that wage level data is a better proxy to reflect the gap between the GDP per capita and the income actually earned by the population. However, it is important to be aware that, due to the high levels of informal work in Latin America, wage data only indicate the amount earned by groups that are increasingly less representative of the general population, i.e. those employed in the formal sector. The only country which provides informal sector average income data is Argentina. Moreover, given that this international comparison makes it preferable to use data from the same source, the average figure does not account for the labour market segmentation. This is because such data is expressed in different average wages for the various employment categories.

Table C.2 shows the figures of the monthly average wages in 2005, again presented both in current US and PPP dollars. In current US dollars, urban wages in Peru show a high average level, while Colombia's average level is the lowest of the six countries. In PPP terms, the average wage in Mexico is the lowest if one does not consider informal income in Argentina, and formal wages in Argentina are the highest. Further, it is interesting to note the similarity in average wages in PPP terms between Chile and Colombia.

Table C.2: **Average monthly wages**

Country	Value in National Currency (2006)*	Value in US Dollars (2006)	PPP Conversion Factor (local currency units at international \$ - 2006)**	PPP Wages
Argentina				
Formal/1	1882.21	609.13	1.04	1,816.81
Informal/2	357.28	115.63	1.04	344.86
Brazil			1.34	
Chile/3	292091.18	555.36	357.72	816.53
Colombia/4	706003.99	251.56	827.76	852.91
Mexico/5	4191.24	388.08	7.68	545.52
Peru				
Urban/6	2221.36	687.73	1.62	1,373.75
Central Government /7	981.45	303.86	1.62	606.96

* These values were adjusted using the corresponding Consumer Price Index (CPI) on the date the data were collected and the CPI in September 2006.

** Source: International Financial Statistics, IMF.

1. Average wages for the formal private sector. Original data correspond to the end of 2005.
2. Average informal income earned by workers living in poverty. The original figure corresponds to the end of 2005.
3. Employment and Remuneration Survey, monthly frequency, April 2005. Applied to all economic activities except for agriculture, hunting, fishing and forestry.
4. Labour Force Survey. Original figures as of the fourth quarter of 2005. Monthly frequency.
5. National Urban Employment Survey, year 2005, monthly. Corresponds to people older than 14. Provisional data. It covers 48 cities representing 95% of the places with 100,000 or more inhabitants: 28 state capitals, 6 cities on the US border and 15 cities of economic importance.
6. Nominal average wage at a national urban level. Figure taken from Perú en Números, 2006, published by the Ministry of Labour and Employment Promotion, National Department of Labour and Professional Training.
7. Nominal Remuneration in the Central Government nationwide. The original figure is the average for the year 2005. Source: INEI.

3. Minimum Wages

Average wage data includes wages earned by the entire employed labour force. This implies the aggregation of the labour market segmentation effect and each worker's various productivity and human capital levels. For a more accurate picture, albeit still an aggregated measure of the available income data of the poor, we also report the minimum wage level in each of the countries. Again, these data are presented both in current US and PPP dollars. The information is provided in Table C.3.

Table C.3: **Minimum wages per capita**

Country	Monthly level (LC)	Date of introduction	Current monthly level (LC)*	Current ER (2006)	Current Monthly Level US\$	PPP Conversion Factor (local currency units at international \$ - 2006)**	PPP minimum wages
Argentina	630	01-Jul-05	706.99	3.09	228.76	1.04	682.42
Brazil	350	01-Abr-06	351.19	2.14	164.11	1.34	261.69
Chile	135,000	01-Jul-06	135380.16	526.85	256.96	357.72	378.45
Colombia	408,000	01-Ene-06	422629.90	2,339.60	180.64	827.76	510.57
Mexico1/	916	01-Ene-06	933.33	10.86	85.94	7.68	121.48
Peru	500	01-Ene-06	504.28	3.22	156.61	1.62	311.86

*Adjusted by the corresponding CPI.

** Source: International Financial Statistics. IMF.

1. Corresponds to the geographical area C, which is the lowest value; the highest is 973.40 Mexican pesos.

Clearly, minimum wage levels are much lower than average wages. In PPP terms, once again the high level estimated for Argentinean minimum wages and the low figures in Mexico stand out. The gap between the minimum and the average wage is also important, being as much as five times in Peru. Further, it is noteworthy that the average wage in the informal sector in Argentina is practically one half the minimum wage.

4. Poverty line

The three previous measures account for labour market dynamics, constituting an aggregate measure of a country's revenues. Conversely, the poverty line indicates the expenditure needed to purchase a basic consumption basket that includes food and other minimum goods and services. Thus, a person is qualified as "poor" if he/she does not earn the necessary income to buy such a basket. In addition, a person who cannot earn enough to buy a minimum food basket (i.e. is below the extreme poverty line) is qualified as 'extremely poor'.

The use of the poverty and extreme poverty lines is best known as a measurement of poverty on a national level. The World Bank has recently introduced a concept now called the International Poverty Line, in an effort to unify the indicator as much as possible to allow cross-country comparisons. Thus, we defined two thresholds: the number of people living on no more than

one dollar per day and the number of people living on two dollars per day at the most.

Table C.4 shows the respective poverty lines for the countries analysed. Figures are presented in local currency, and then converted (using the exchange rate and the conversion factor) into current US and PPP dollars. Notice that in the case of Mexico we use the extreme poverty line level for the analysis.

Table C.4: **Poverty line per capita**

Country	In local currency units as of 2006	Exchange rate	In US dollars	PPP Conversion Factor (Local currency units at international \$ - 2006)*	PPP Poverty line
Argentina/1	278.92	3.09	90.28	1.04	269.23
Brazil/2	260.03	2.13	122.08	1.34	193.76
Chile/3	43720	525.95	83.13	357.72	122.22
Colombia/4	302,655.42	2806.55	107.84	827.76	365.63
Mexico/5	1013.55	10.80	93.85	7.68	131.92
Peru/6	230.53	3.23	71.37	1.62	142.57

* Source: International Financial Statistics. IMF.

1. The amount for the year 2006 corresponding to the monthly value of the Total Basic Basket (TBB) is used as the poverty line. The monthly value of the Basic Food Basket (BFB) is 126.78 Argentine pesos and equal to the extreme poverty line. Source: INDEC, Permanent Household Survey. The currency is not specified, but it is assumed that it is Argentine pesos.

2. The difficulty in this country is that there is no official poverty line. Different authors use their own definitions. The information obtained corresponds to the year 1996 and measures the poverty line. Source: Ferreira, Lanjou, and Neri (2000), "A New Poverty Profile For Brazil Using PPV". This was adjusted by the corresponding CPIs to obtain the value for the year 2006.

3. Covers the minimum basic needs. Source: Ministry of Planning, MIDEPLAN, 2006. <http://www.casen.cl/>.

4. The original figure is 257,945 Colombian pesos for the year 2003. This was adjusted by the corresponding CPI to obtain the value for the year 2006. It measures the cost of goods to meet the minimum basic needs for food, housing, clothes, etc. Source: <http://www.presidencia.gov.co/sne/2004/agosto/03/05032004.htm>.

5. Capacity poverty at an urban level. Capacity poor are those who do not have access to the minimum requirements of food, health and education. The original datum is 969.84 Mexican pesos in August 2005. This was adjusted by the corresponding CPI to obtain the value for the year 2006. Source: Consejo Nacional de Evaluación de la Política de Desarrollo Social (CONEVAL). Num 001/2006. México, D.F., 01 October 2006.

6. Monetary value of the poverty line, total value. The original figure is 214.40 nuevos soles in 2003. This was adjusted by the corresponding CPI to obtain the value for the year 2006. The figure for the extreme poverty line is 115.90 nuevos soles in 2003 and 124.56 nuevos soles in 2006. Source: Perú en Números, 2005.

Again, the high values for Argentina stand out. At the same time, it is important to point to the similarity among the figures for Chile, Peru and Mexico, even in connection with the extreme poverty line, with Colombia's being the highest value of the sample. Compared with the minimum wage figures in Table C.3, Mexico shows a poverty line quite similar to its minimum wage. This, on the other hand, contrasts with the rest of the countries, which show significant

discrepancies between both values, with the poverty line being far below the minimum salary defined for each country.

Source of data for Annex B

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