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MOBILE OPPORTUNITIES:

Poverty and Telephony Access in Latin America and the Caribbean

The case of Brazil

Antonio José Junqueira Botelho, PhD

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Mobile Opportunities:
Poverty and Telephony Access in Latin America and the Caribbean

Country Report: Brazil

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Table of Contents

EXECUTIVE SUMMARY

This country research report is part of a larger comparative multinational research project carried out by the Inter-American Dialogue of the Information Society (DIRSI) on "Mobile Opportunities – Poverty and Access to Telephony in Latin America and the Caribbean." which involved the design, implementation and analysis of a unique survey on the mobile telephony (hereafter MT) usage patterns of urban, low-income populations in seven countries: Argentina, Brazil, Colombia, Jamaica, Mexico, Peru and Trinidad & Tobago. The project's main goal is to collect original data and analyze it in order to understand how the, urban, bottom of the pyramid segments of the population make use o MT. A guiding hypothesis is that MT is a useful tool for wealth generation and social network development. A user is defined as a person who made use of MT in the previous three months.

Mobile Users

A first major finding is that among bottom of the pyramid urban respondents in Brazil, 53% have used a mobile phone to make or receive phone calls in the three months preceding the interview. The figure is lower than overall MT teledensity (61%) but higher than that for the lower socio-economic groups (43%) found in other studies. However, when mobile use is looked across geographic regions one finds a mixed picture. Those showing the highest rates of mobile use are not necessarily those in cities with the highest per capita income in Brazil. The metropolitan region of São Paulo, the richest city in the country, has the lowest usage rate (46%) whereas the Recife metropolitan area, one of the poorest areas in relative terms, has the third largest.

Most users (78%) owned a mobile and the near totality of user owners owns a prepaid mobile, while only a tiny minority owns a postpaid. Moreover, the vast majority of owners within each income group have a prepaid (above 90%). A closer look, nevertheless, reveals that the option for prepaid increases with decreasing income. Surprisingly, there is little difference in user ownership across the low income groups. The vast majority of users which do not own a MT borrow it from family and friends. Among owners, two-thirds purchased, the majority brand new, and one third received it as a gift. There are significant differences according to income. Thus, among those

who acquired a mobile, only 7% are in the lowest income group and the middle income groups –with earnings on the range US$ 32.81 to 185.83– concentrate 77% of the ownership share of buyers. Surprisingly, these same groups also have the highest share between those who have received a mobile as a gift (79%). Finally, the majority of buyers (above 76%) prefer to acquire a brand new mobile rather than a used one.

Amongst owners of a mobile phone, the average price paid for a mobile was US$146.13, the minimum price paid was US$ 52 cents and the maximum was US$ 518.00. Looking at the price paid across income groups, the maximum price follows the income gradient: the higher the income the higher the maximum price paid for a mobile. One of the main reasons (38%) for choosing a prepaid over postpaid is cost, but 52% find it more adequate for controlling expenditures. Curiously, in the lowest income group 78% chose a pre-paid because it is perceived as a better way to control expenditures, followed by far by cost concerns.

MT service adoption is relatively new as about one third of users respondents have been a user for less than 1 year, but the vast majority has had it for over 1 year. This seems to indicate that this segment has a large share of early adopters who have already incorporated new social practices.

The average number of outgoing calls made by users during the week preceding the interview was approximately 14 calls, with median equal to 10 calls. For receiving calls, the average was 20 calls, with median equal to 12 calls. This pattern seems to support the accepted knowledge that low income users make strategic use of MT by making few calls and receiving many. However, the lowest income group (up to US$ 32.81) had the highest average number of outgoing calls 22 on average; followed by the 3rd highest income group (US$ 78.09 -185.83), with 15 calls. And in terms of incoming calls, the lowest income group also has the highest average, with 42 calls, followed by the 3rd income group having on average 13 calls. The fact that the lowest income group users make and receives more calls relative to the three other low income groups can be, in part, due to the fact that one-third of users in this user group have a fixed telephone at home, compared with 41% in the next group and the majority (~52%) in the two higher income groups.

The main reason for making calls was to contact friends, then relatives, with average of 4.3 and 3.6 calls per user, respectively, corroborating the strong ties thesis. 'Friends' followed by family were also the preponderant reason for received calls. Work was a secondary reason in both types, revealing and untapped use of MT to bootstrap personal economic advancement and social mobility.

Increase in use follows income, with the low income group exhibiting lowest use and the highest income group about over half. A somewhat similar pattern is observed in age, the age range 19-30 years having the highest rate (66%). Given the generally low level of, a high share of users (37%) employs mobile to send or receive messages[2]. Another major finding is that the income group that presents the highest rate of message use is the lowest income group. Older (51 or higher) users tend to send and receive more messages than others, although adolescents receive an average higher number of messages. An interesting finding is that whereas males send more, females receive more. Almost the totality of users (~98%) had never used their mobile to make bank transactions or to communicate with government agencies. Nevertheless a minority had used it to download a ring tone/a paper wall (18%) or to participate in contests (6.5%).

In terms of service cost, the near majority of users of prepaid mobile find it expensive and too expensive and just 14% find it cheap. One finds a split in the lowest income group (~32%) among the options: 'cheap', 'neither cheap nor expensive' and 'expensive'. By contrast, in the others higher income groups, the majority finds the prepaid service neither expensive nor cheap or expensive.

Most mobile owner users recharge their prepaid between 0 and 30 days. Recharge lasting time is evenly split with one third each lasting 0 to 7 days, from 8 to 15 days and 16 to 30 days. Users in the lowest income group usually (~60%) make their recharge every 16 to 30 days, while in the other income groups the recharge is made, mostly between 0 to 15 days. It is interesting to note that, on the one hand, the near majority of recharges are made between 3 and 4 weeks but that, on the other, the near

[2] This rate, however, is lower than that found in the project results in other countries. Please see the project's comparative Regional Report.

majority of recharges last about 12 days, evidencing a clear use gap. In addition, MT owner users keep a mobile without credit double the time with credit. For example, if a user has a recharge credit of 1 month, he or she will remain for 2 month with a mobile without credit. There are indications that for the lower income groups MT is used mainly to receive calls. Next, the average value of the mobile phone bill is US$ 50.92, while the (estimated) average cost of a monthly recharge is US$ 10.14 (for comparison, the price paid for the last recharge is US$ 8.80), putting in evidence the stark income contrast between postpaid and prepaid users.

When one looks at the average price paid for the last recharge across income groups, one observes that the first three have practically the same average spending (ranging from US$ 8.37 to US$ 8.64), but that the highest income group has the highest average spending of US$ 10.51. Further, the value of the average amount spent (monthly) with MT recharge (US$ 10.14) represents just 20% of the amount paid for a (average) MT bill (US$ 50.92), raising some question about the potential for substitution between postpaid and prepaid MT in low income groups.

Findings seem to confirm that low income segments direct a disproportionate amount of income towards MT expenditures and that this share of expenditure drops rapidly as the income of the respondent increases. Yet, from a monthly expenditure perspective, we observe that income groups 3 and 4 had a monthly recharge expenditure of US$ 7.77, whereas income group 1 value was almost one-third of that and group 2 about two-thirds. Comparing these values with the average value of a monthly postpaid bill, a large gap emerges with recharge accounting for 18.7% of the bill in income group 4 and going up to 30% in group 2. It is also interesting to observe that the majority of recharges are under US$ 10.00, signaling a limited expenditure in this form of communication by low income MT users.

The top strategy employed by MT users in Brazil to cut cost is to use the mobile only to receive calls, followed by not answering calls, making calls only when fees are cheaper and using the mobile only for messages. This result is convergent with previous ones pointing out that users spend a large time without service credit.

There is a high degree of satisfaction of users with their MT service and therefore the near majority of users are not willing to switch to a different MT service provider. Further, even when offered the advantage of a lower phone bill, about one third of users said it is important for them to keep their actual phone number, putting in evidence the barrier to service migration and thus cost savings for low income users created by the lack of portability in Brazil, which will become mandatory by late 2008. A clear majority of user is satisfied with service quality.

Reaction of users in terms of probable consumption changes, when their bill costs and income are altered, was quite diverse. In the end, results show greater negative price sensitivity than positive one, as a vast majority would change the consumption pattern if cost doubled. Other results also reveal low income elasticity towards MT consumption, confirming their limited MT expenditure expansion capacity and reflecting the low number of outgoing calls. However, revealing a clear cost-based repressed demand, if the monthly cost of the phone service could be halved, more than one-third of the lowest income group would double consumption, whereas just 15% of the highest income group would have done the same. On the other hand, doubling user's monthly income would result, for the vast majority of lowest income group keeping the same spending pattern.

For the vast majority of users, the general life aspects most positively affected by the adoption of mobiles were improvements in relationships with family, emergency situations, and relationship with friends. The next cluster of perceived benefits by less than half of users includes work, security and better life quality as a whole. Work employment status does not seem to affect the ranking of user perception, although the importance (much improvement) assigned to impact on work increases with length of use, going from 44% for less than six months of use to 50% for over 5 years of use. This seems to indicate the importance of learning as users become more comfortable with the technology and aware of its work-related possibilities.

Much of the public policy debate around access to ICTs in developing countries centers around issues of substitution among different technologies, with some more recently recognizing that there may be a certain degree of complementarity involved as bottom of pyramid users develop strategies based on their interpretation of price

signals, income and needs. As expected, the rate of fixed telephony ownership amongst MT users is low, 37%. The rate is a bit lower than that of the overall sample. However, the vast majority of fixed telephony owners are also users of MT, indicating a strong complementarity component. Income is a determinant of this ownership rate, with less than 30% of users in income group 1 owing a fixed telephone, against over half in income group 4.

The majority of fixed phone owners chose not to disclose the reasons for not making use of it, but one third state they prefer to use MT and a few claimed it is too expensive. Across income groups, the majority of groups 1 and 3 again cited undisclosed reasons, but curiously almost half of the highest income group stated they did not need to use. Half of FT users make at most 8 calls per week. Amongst those that call friends, 50% make at most 2 calls, while for those calling relatives, make 3 calls. By contrast, half of FT owners have received at most 10 calls with half of those receiving 2 calls from friends and 5 from relatives in the country. A tiny minority of FT owners finds it cheap, while one–fourth find it neither cheap nor expensive, and the vast majority expensive or too expensive. In regard to service quality, the vast majority find it at least good.

As expected, internet use is quite low and income determines this pattern. One third of Internet users access it from cyber café and home, and very few used all other types of access (relative or friend home, work, school and free terminal).

Half of MT user state that low cost is the main motive for using public telephony. However, almost half of users found it was neither cheap nor expensive. Nevertheless, among users in the lowest income group 1, the main public telephony users, the near majority of MT found the service above good.

The main barrier to the adoption of MT is price, followed far by lack of need. The price factor decreases as income rises. By contrast, need runs in the opposite direction. Price is also main factor against MT adoption for adolescent and the single most significant for elders. Mobile high price is the preponderant factor for all work status, but particularly for commissioned workers or employer. The second most important reason for not buying a mobile phone across genders is the perception of

not recognizing it as a real need. Mobile high price is also the preponderant factor for non users belonging to the lowest education levels, but not for those in the two highest education levels. Still, one third of non users, and of income groups 2, 3 and 4, are willing to buy a mobile phone in the next twelve months and, surprisingly, almost half in the lowest income group are willing to do so. Almost two-thirds of would be prepaid buyers think it is cheaper than the postpaid mobile and just one-third think it is better to control spending. For the two lowest income groups, being cheaper than postpaid is the preponderant choice. Indeed, willingness to pay for a post paid standard plan costing up to US$ 21.00/month increases with income[3]. Willingness to pay for a post paid standard plan costing up to US$ 21.00/month varies with age and, as expected, willingness to pay for a post-paid standard plan costing up to US$ 21.00/month practically grows with education. Yet, over one third of non users have no willingness to acquire a plan whatever the cost and a similar number are prepared to acquire a plan costing up to US$ 10.40/month.

Mobile Non Users

The rate of fixed telephony ownership amongst mobile non users is 43%, but amongst mobile non users of the lowest income group, only 24% have a fixed phone at home. Half of the fixed phone owners that are also mobile non users, have had a phone for at most 3 years. When time of ownership of fixed phone is cut across income groups, it is observed that the average time of ownership grows with income size. The main reasons for fixed phone owners not using their phone were: too expensive (17%), 'it is not needed, since potential contacts live close' (35%) and 'undisclosed reasons' (44%). The vast majority of owners of the lowest income group see it as either expensive or too expensive.

As expected, the number of Internet users among non users was quite small, putting in doubt the digital inclusion policy efforts based on computer and Internet access. The vast majority of Internet users in the lowest income and in the second highest income groups access it at cyber cafés. They perceive as the major improvements caused by Internet: relationship with friends, school, access to educational information, access to

[3] This is the converted average monthly expenditure for a standard post-paid mobile service plan in Brazil.

health information and status and social recognition. The vast majority finds Internet expensive, particularly the lowest income group, an assessment that holds across income groups. Similarly, the vast majority says that the Internet improves the communication with their colleagues at work and about one third that it improves their business and employment opportunities and that saves time either at work or in business transactions. This appears to indicate there is considerable room for learning, creating an opportunity for MT use capacity-building programs.

About one third of respondents find public phones cheaper and of easier access, and claim they lack options. However, the main reason for using public phones for about one third of those in each of the three lowest income groups (1, 2 and 3) is lack of options and for the highest income, easy of access. The vast majority of respondents find the price of the public phone services neither cheap nor expensive or expensive. As expected there's an income relation in cost perception.

Conclusions and Policy Implications

In a recent interview on the occasion of the Internet Governance Forum in Rio de Janeiro, Vint Cerf, one of the so-called fathers of the Internet, suggested that mobile telephony is the fastest way to give Internet access to the estimated 3 billion users by 2010 (out of the 5.5 billion people without access today), including in Brazil. In his view the mobile is the entry door to the internet coupled to other devices like the computer and the TV[4]. The results presented above give weight to his considerations, particularly in regard to the bottom of the pyramid urban population, which make up the vast majority of the poor in Brazil. They seem to confirm for this population segment that the rate of diffusion of mobiles is much faster than other types of telephony, particularly public telephony which appears to play the critical role of mobile service complement, given the high costs of tariffs and ICT services, as found in other recent research.

Right now a small majority of this segment uses mobiles, but one third of non users plan to acquire one. Moreover two-thirds of users own a prepaid mobile, the majority

[4] André Machado, "A economia do mundo virtual é diferente – entrevista Vint Cerf," O Globo, 19 de dezembro de 2007, caderno INFO ETC pp. 1 and 3.

having purchased it. This seems to indicate there is still considerable room for policy measures and regulator incentives to both increase the number of users in this segment and to fulfill the potential of the mobile telephony service among current users. For the results of this study clearly show that although mobile users are willing to spend more on the service they generally do not yet recognize it as a tool for the consolidation of social capital and to bootstrap their own economic advancement. The results also show there is an immense opportunity for government to take a quantum leap in the provision of services for increasing citizenship by promoting the expansion of mobile services, accompanied by the right incentives and appropriate education of mobile users.

As tariffs are still very high (Appendix 1)[5], including for SMS, reform in the tariff structure would also increase the use of MT by his segment users and would probably add a substantial number of new users to the market. According to a Merrill Lynch survey (2007), Brazil has the next to last lowest use of mobiles with 79 minutes/month, behind Peru and just ahead of Marocco. So far MT service provider business model has been focused on high-end services for the richer segments of the population. Unfortunately, this picture is unlikely to change in the near future as government delayed until the end of last year the auctioning of 3G spectrum. The spectrum costs coupled to the required investments to deploy it will most certainly make them leave their current business model untouched in the near term. On a positive note, however, portability will become mandatory by August 2008 and may service provider change may increase from the current 25% rate.

Government digital inclusion policy continues to be trapped in a tunnel vision, focused on lowering the cost on computers, even though the public telecenter model has revealed its inherent limitations. The computer-centric policy is plagued by multiple mission policy syndrome as it is partly justified as needed to spur local hardware industry and, more importantly in the eyes of policymakers, indirectly the semiconductor industry, one of the four industrial policy priorities. The relative success of the policy can be assessed by the decline in computer prices and the boom

[5] A recent survey by Merrill Lynch in 50 countries showed that Brazil has the fourth most expensive tariff (US$ 0.26/per minute with PPP), together with Japan.

in the market, helped by credit expansion, but hits a diffusion limit at the bottom of the lower middle class. Internet access is yet another main barrier to the fulfillment of digital inclusion in Brazil, one which is said to be approached through a state-centric broadband solution. In fact, just recently in April 2008, the government indicated that digital inclusion would become an objective of the country's second phase industrial policy (PITCE). In this context it announced the Broadband for All Program with the goal of having 25% of households and 100% of public schools with broadband access by 2010, increasing access and reducing regional disparities.

This sketchy policy context seems to be adverse to the expansion of volume and use of MT among at the bottom of the pyramid. Yet, emerging local and regional developments in the promotion of mobile government services could rapidly force a change in this picture from the bottom up. Since local and federal taxes account for between 46 and 76% of tariffs, a level similar only to that of Uganda and Turkey according to the mobile industry executives, and since as this research has shown there's a strong correspondence between cost of service and use expansion in scope and scale among the urban low income segments of the Brazilian population, tax reduction could be a more efficient mechanism for increasing overall MT use. And particularly among the neediest, as it was shown above that if the monthly cost of the phone service could be cut in half, over one-third of the lowest income group would double consumption. It could be argued by some that rising incomes among the lower socio-economic classes due to the renewed growth sustainability of the Brazilian economy over the last couple of years could play the same role in promoting use expansion at the bottom of the pyramid. However, an important finding presented above is that doubling user's monthly income would result, for the vast majority of lowest income group keeping the same spending pattern, an income gradient that declines to 40% for the highest income group.

This coupled to a concerted effort to increase the scope of government m-services and adequate industrial policy mechanisms to drastically lower the cost of internet access-enabled new generation 3G devices and to promote its rapid diffusion as an accelerator of device price and service cost reduction, could be a part of a more significant policy agenda. In the end, as many others in the past, technological revolutions that significantly alter the lives of the poor, empowering them as citizens

and bootstrapping them into a sustainable income generation, usually come from the periphery of the system. The results of this study will help frame this emerging agenda and the terms of the debate, so that mobile telephony in Brazil will sooner than later become yet another example.

1. INTRODUCTION

Mobile telephony has experienced an explosive growth in Brazil to the point that already from 2004 more users had mobile phones than fixed ones. This trend appears to be part of a broader trend of diffusion of ICTs in Brazil.

Results of a recent survey on access and use of ICT[6] showed significant improvements, even though there remain major regional and social class differences, particularly in the use of services like e-government. Both computer and Internet access rates increased as well as the rate of people who already have used a computer and the number of people who used a computer over the last three months which reached, respectively, 45.7% and 33.1% in 2006. On the one hand, the rate of those who already have accessed the Internet and of those who used the Internet in the last three months continued to grow vigorously. On the other hand, the percentage of individuals who never have used a computer and the Internet posted very small reductions. Residences continued to be the main access site, but surprisingly school accesses declined strongly in contrast with sharp increases in paid public centers. Usage of electronic government stagnated mainly among low income segments of the population. Residential ownership of computer and Internet access remained low at 20% and 15%, with educational levels and social status being the main factors behind their increase.

However, 61% of interviewees had made use of mobile phone in the preceding three months, with striking differences among regions –50% in the North and 75% in the Center-West (where the Federal District which has the highest rate of use an ownership)– and social classes –87% of A class and 43% in classes DE–. As expected, age and income level are strong predictors of mobile phone use. Mobile phone ownership is significantly lower, 46% of the population, the majority of which are pre-paid (89%), and almost 40% have Internet access. The pattern of use reveals that most mobile users make and receive calls, 46% send and receive text messages and just 5% effectively use it to access the Internet.

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[6] *Pesquisa sobre o uso das Tecnologias da Informação e da Comunicação no Brasil* (CGI. BR, 2007). The survey was done between July and November 2006.

The much faster rate of diffusion of mobiles in relation to other types of telephony and ICT services is confirmed by the 2006 National Household Sampling Survey (PNAD) showing that in 2006, 64% of households had a mobile against 31% in 2001[7]. A more significant indicator of the pervasiveness of mobiles is that whereas in 2001 28% of households had only a fixed telephone against 8% with mobiles, these numbers reversed by 2006 when 28% had only a mobile and just 11% had a fixed phone.

In this context, this paper goal is to explore the access strategies, usage patterns and perceived impacts of mobile telephony in urban, low-income segments of the Brazilian population. This country research report is part of a larger comparative multinational research project carried out by the Inter-American Dialogue of the Information Society (DIRSI) on "Mobile Opportunities - Poverty and Access to Telephony in Latin America and the Caribbean." which involved the design, implementation and analysis of a unique survey on the mobile telephony (hereafter MT) usage patterns of urban, low-income populations in seven countries: Argentina, Brazil, Colombia, Jamaica, Mexico, Peru and Trinidad & Tobago. The project's main goal is to collect original data and analyze it in order to understand how the urban 'bottom of the pyramid' segments of the population make use of MT. A guiding hypothesis is that MT is a useful tool for wealth generation and social network development.

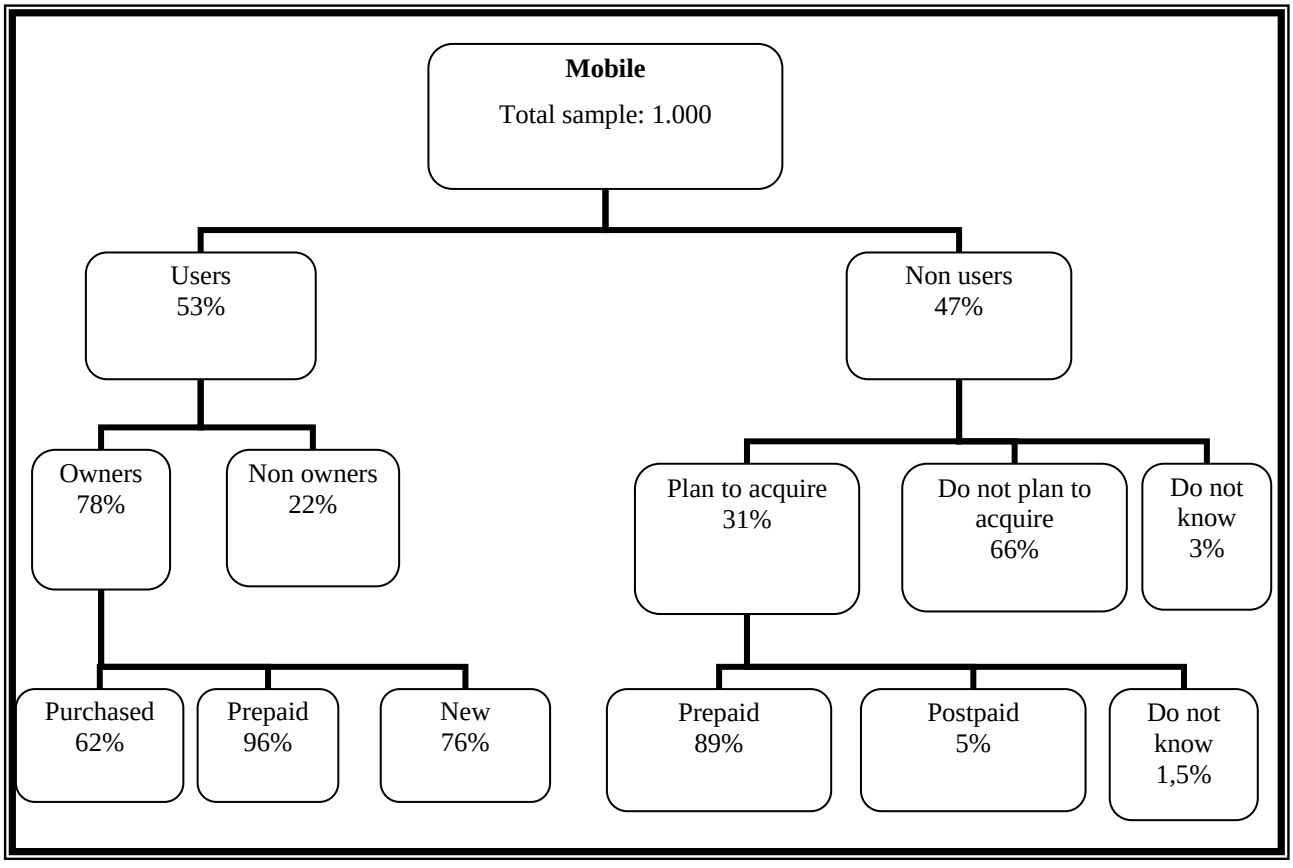
The topics discussed below are part of the results of fieldwork carried out in Brazil in the first semester of 2007. The survey work comprised 1.000 direct interviews in probabilistic samples in 6 metropolitan regions with the most significant shares of low-income people in their population. On the one hand, given the rapid increase in the diffusion of mobile telephony in Brazil over the past decade and the concomitant stagnation of both fixed and public telephony one would expect that diffusion to reach the bottom of the pyramid. On the other, the low penetration and rate of diffusion among this segment of other ICT devices and services critical to a wide reaching and sustainable digital inclusion, calls forth the need to create bottom-up knowledge on

[7] National Institute of Geography and Statistics IBGE 2007.

MT use and perceptions in order to start building exploratory alternative strategies of digital inclusion, this report ultimate goal.

The report is organized in 6 sections. The next briefly discusses relevant issues in the country's social context, with a focus on poverty, and telephony market conditions, capped by a presentation of the methodology employed in the field research. The third section highlights patterns of use, ownership, expenditure, substitution, motivation and perceived benefits by MT users, defined as someone who made or received a mobile phone call in the previous three months. The following section explores the themes of MT access barriers and potential incentives among MT non-users. The fifth section looks into substitution issues and complementarily functions between MT and other types of ICT services such as fixed and public telephony and the Internet. A final section draws some conclusions and presents a few policy recommendations aimed at putting in relief new roles and promoting the exploration of missed opportunities observed in the analysis of the use of MT by low income segments of Brazil's urban population. Chart 1 synthesizes the main macro findings.

Chart 1. Synthesis of results.



2. CONTEXT AND METHODOLOGY

2.1. Poverty

In August 2000 (IBGE, Censo Nacional 2000), Brazil had a population of 169.8 million people, 81% living in urban areas. The heavily urban Southeast region (90%) had about 40 percent of the population, followed by the regions Northeast (75% urban), with about 25 percent of the population, and South (80% urban), with about 15 percent. The projected population for 2005 was about 184.2 million people. In 2004, according to the national household survey (IBGE, PNAD 2004) there were 51.8 million dwellings, 84.5 percent in urban areas, of which almost 50 percent in the Southeast region. The average number of people per dwelling was 3.5 people and per room were 1.8 people. Over 90% of urban dwellings had drinking water (North region just about 60%) and about two-thirds sewage services.

A recent government monitoring report of the Millennium Goals shows that between 1992 and 2006 the population living in conditions of extreme poverty (under the US$ PPC criteria) fell from 8.8% (13.4 million people) to 4.2% (7.5 million people) and using the minimum wage criteria ('extreme poverty' refers to households with a monthly per capita income of less that one-fourth of the minimum wage, R$ 89.60, 'poverty' as half of the minimum wage, R$ 179.21) fell from 28% to 16%, whereas poverty was reduced from 52% to 38%. Inequality also fell between 2001 and 2005 with the Gini coefficient reaching 0.566 at the end of the period, after hovering around 0.595 in the preceding years. Income of the poorest 10% grew at a 9.2% annual arte and of the 1% richest fell 0.4% per year[8]. Despite these advancements in term of digital inequality the situation remains adverse according to the report. In 2005, the number of people with Internet access reached 32.1 million, of which 55% were in the Southeast region and 8% and 4% in the Center-West and North region respectively.

[8] Yet another government study released by IBGE (Pesqusia de Orçamentos Familiares - POF, 2002 e 2003 which surveyed 48.5 million families) at the same time shows that the expenditures of 10% richest families, five million families with an income equal or above R$ 3,875.78, were ten times higher than those of 40% of the poorer families with an income up to R$ 758,25.

Between 1992 and 2004 Brazilian population went from 139.7 million to 173.5 million, a growth rate of 1.92% per year. The North and Center West regions had the highest rates, but accounted for only 13.5% of the country's total population in 2004, whereas the Northeast had 28.4% and the state of São Paulo alone 22.1%. The population growth in the period is due to growth in urban population, especially in non-metropolitan areas; as rural areas experienced negative average rate of population growth. The distribution of poverty, however, differs significantly both in terms of urban-rural and regional dimensions: the Northeast and the rural areas continue to be the main reservoirs of poverty.

The distribution of poverty, however, differs significantly both in terms of urban-rural and regional dimensions: the Northeast and the rural areas continue to be the main reservoirs of poverty. In 2004, there were 62 million poor, a number smaller than in 1992 and 1993, indicating a reduction. The total number declined until 1998, inverted its trend until 2003, to decrease again in 2004. Extreme poverty declined at a rate of 10.5% per year, whereas type I poverty increased 1.6%. Given that this type represents 93.1% of the poor in 2004, the overall evolution of poverty over this period is manly influenced by it.

Table 1. Regional distribution of population by poor and non-poor, 1992-2004.

Tabela 5
Distribuição regional da população segundo categorias de pobres e não pobres, 1992 a 2004

Áreas	1992	1993	1995	1996	1997	1998	1999	2001	2002	2003	2004
Não pobres											
Norte	3,69	3,81	4,23	4,17	4,12	4,20	4,41	4,98	4,91	4,92	5,38
Nordeste	14,32	14,07	15,38	15,41	15,61	16,35	16,08	16,52	16,49	16,36	16,86
Sudeste – SP	24,31	23,11	23,67	23,71	23,94	23,38	23,91	23,36	23,78	23,42	23,19
São Paulo	32,18	32,37	31,22	31,21	30,76	30,13	30,01	29,11	28,63	28,69	27,84
Sul	18,68	19,53	18,40	18,32	18,07	18,29	18,08	18,42	18,49	18,88	18,71
Centro-Oeste	6,83	7,10	7,10	7,18	7,50	7,66	7,51	7,61	7,70	7,73	8,02
Brasil	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00
Pobre I											
Norte	6,06	6,12	6,24	6,35	6,67	6,97	6,93	7,46	7,90	7,92	7,81
Nordeste	38,74	39,35	44,27	44,97	45,26	45,33	44,47	44,90	46,04	45,14	46,96
Sudeste – SP	21,25	22,17	20,04	19,36	18,95	19,25	18,45	18,55	17,50	17,96	17,27
São Paulo	13,45	13,56	10,19	10,11	10,23	10,11	11,30	11,74	12,08	12,71	12,71
Sul	13,51	12,36	12,61	12,30	12,60	12,05	12,23	10,74	10,05	9,73	9,18
Centro-Oeste	7,00	6,44	6,64	6,90	6,28	6,30	6,62	6,61	6,43	6,55	6,07
Brasil	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00
Pobre II											
Norte	6,28	7,66	5,28	5,29	4,80	4,84	4,35	7,57	8,08	7,50	8,52
Nordeste	53,24	53,48	63,04	65,24	65,62	67,68	71,23	70,19	72,10	74,51	70,22
Sudeste – SP	14,62	13,14	13,06	12,22	13,03	12,42	11,28	9,99	7,57	6,72	9,81
São Paulo	3,89	2,61	3,08	1,50	1,37	1,81	2,22	1,09	1,04	1,47	0,72
Sul	12,55	11,52	6,81	8,12	6,34	6,21	3,66	4,36	3,78	4,82	4,07
Centro-Oeste	9,42	11,59	8,74	7,64	8,85	7,04	7,25	6,81	7,44	4,97	6,66
Brasil	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00
Extrema pobreza											
Norte	3,78	2,55	2,46	2,77	3,09	2,64	2,85	4,05	4,45	4,55	4,97
Nordeste	75,38	77,44	78,06	80,44	80,35	82,85	83,65	83,10	85,42	85,36	84,99
Sudeste – SP	11,50	11,34	11,24	9,58	9,50	8,65	8,21	5,80	6,36	6,16	5,64
São Paulo	0,24	0,82	0,35	0,49	0,31	0,00	0,06	0,58	0,12	0,05	0,07
Sul	4,70	3,80	3,32	3,03	2,48	2,21	1,66	3,66	1,84	1,16	1,73
Centro-Oeste	4,40	4,06	4,58	3,68	4,28	3,66	3,57	2,81	1,82	2,71	2,61
Brasil	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00	100,00

Fonte: PNAD-IBGE.

Similarly, Brazil1's gross domestic product per capita increased from R$ 6,896 in 2001 to R$ 8,694.47 in 2003 to R$ 10,519.89 reais in 2005. This growth in per capita income coupled to falling interest rates and consequent increase in credit availability has increased significantly the consumption of the poorer classes. Thus, the socio-economic criteria (NSE) on which the sampling for the field research was based, which in turn was based on the 2000 census, has not kept up with this change. Therefore, although the research survey sampling target were D and E classes in urban metropolitan regions, the results reveal a migration of D and E classes to the C class as their possession of durable consumer goods has changed in recent years[9]. In light of this and in order to afford comparability with the other six countries in the project, the final surveyed sample was divided in four household income groups in US$ per capita / per month, according to a methodology proposed by the Steering Committee.

Table 2. Survey income groups.

Income groups (in US$ per capita / month)	Number of households
Group 1 - up to 32.81	76
Group 2 - higher than 32.81 and up to 78.08	301
Group 3 - higher than 78.08 and up to 185.83	369
Group 4 - higher than 185.83	174
TOTAL	**980**
Missing	20

The recent national household survey PNAD 2006 (IBGE 2007) showed a continuation in the decline of the Gini coefficient to 0.541 in 2006, versus 0.544 in 2005 and 0.566 in 2001. However, the rate of decline slowed down in the most recent period. The results also confirmed the continuation of the two-year growth (2005-2006) in workers' average income, a rate of 12.2% in 2006 over 2005 although the income level remains lower than in 1996. A FGV study based on PNAD data also showed that misery was reduced by 15% in 2006, the highest drop in ten years,

[9] A recent study by Latin Panel and target Marketing based on PNAD data confirmed this trend. It shows that between 2002 and 2007 the share of each class in households, particularly C, D and E, shifted in the following direction, respectively: 30.56% to 41.94%; 34,40% to 23.84% and 12.72% to 2.31%. Cássia Almeida, Fabiana Ribeiro e Aguinaldo Novo, "Consumidor emergente – Acesso a bens faz crescer segmentos B e C, mas idéia de nova classe média é questionada." O Globo, Quarta-feira, 26 de setembro de 2007 (Economia): 25. Appendix 1 below, Actual Sample Distribution section, provides the original weighted distribution by class.

accompanied by a growth in average household income of 9%. The 50% poorest increased their wealth by 12% and the 10% richest by 8%. The number of people below the poverty line which was 23% in 2005 fell to 19% in 2006.

2.2. Telephony Market

The expansion of cellular phones in Brazil has been spectacular, going from 35 million in 2002 to over 86 million in 2005 (IBGE, 2006). Already at the end of 2004 the number of mobile lines (65.6 million) exceeded largely that of fixed lines (39.6 million) and in by early 2007 had surpassed the 100 million mark. As predicted, the South and Southeast regions with the highest income per capita concentrate about two-thirds of all fixed phones and 80 percent of all cellular phones. According to Brazil's telecommunications regulatory agency ANATEL (*Agência Nacional de Telecomunicações*[10]), at the end of the first semester of 2007 the installed base of mobile phones reached 106,663,068, a growth of 7% in relation to the end of 2006 and of 16% in relation to June 2006, signaling a slowing down of expansion as the similar rate for June 2006-June 2005 was 22%.

Table 3. Evolution of Telephony in Brazil.

Fixed Telephony	**1997**	**2005**	**2006**	**2007 (Sept)**
Number of access in use (million)	14.8	39.8	38.8	42.1
Teledensity (access / 100,000 inhabitants)	n.a.	21.5	20.7	22.2
Public Telephony				
Number of public phone access in use (million)	n.a.	1.3	1.1	1.1
Teledensity (per 1,000 inhabitants)	n.a.	6.9	6.6	6.0
Mobile Telephony				
Number of access in use (million)	4.5	65.6	99.9	120.9
Teledensity (MTs / 100 inhabitants)	2.8	n.a.	53.2	63.6
Prepaid MT (million)	n.a.	n.a.	n.a.	81.15

Source: Anatel.

[10] http://www.anatel.gov.br/Portal/exibirPortalInternet.do

The Millennium Goals monitoring report shows that in 2006 the number of mobile phones exceeded 100 million units giving a teledensity of 53 mobiles per 100 inhabitants, what places Brazil as one of the five largest mobile phone markets in the world. An annual 2006 survey of use ICT in households carried out by the Internet Governance Committee (CGI) on 10.5 thousand households showed that 97% use open TV; 90% radio and 68% mobile telephony, percentage higher than fixed telephony, 50%. Moreover, in every geographic region, mobile telephony use was higher than fixed telephony and in the poorer regions of the Northeast and North was almost double. In the poorest households segment (income up to R$ 300.00) the share of households use of mobiles was almost three times larger than that of fixed, and for the next poorer is twice as large. This latter pattern is repeated for classed D/E. Households in informal low income communities (*favelas*) have a higher use of mobiles, as well as those nearby and distant and in formal low income areas.

Table 4. Mobile telephony in Brazil at glance - July 2007.

	jul/06	dec/06	jun/07	jul/07
Mobiles	93,046,782	99,918,621	106,663,068	108,519,664
Prepaid	80.53%	80.62%	80.44%	80.28%
Teledensity	49.87	53.24	56.45	57.36
	1,286,611	2,586,842	1,572,533	1,856,596
Monthly growth	1.40%	2.66%	1.50%	1.74%
	6,836,446	13,708,285	6,744,447	8,601,043
Annual growth	7.93%	15.90%	6.75%	8.61%
	16,467,812	13,708,285	14,902,897	15,472,882
Growth in 1 year	21.50%	15.90%	16.24%	16.63%
Note: Mobiles in service at provider. Teledensity based on projected population for the month by IBGE.				

Source: Anatel.

2.3. Methodology

This study is part of a broader international study carried out in seven countries in Latin America and the Caribbean (Argentina, Brazil, Colombia, Jamaica, Mexico, Peru and Trinidad and Tobago) under the coordination of the Regional Dialogue for the Information Society (DIRSI), with funding from the International Development Research Centre, Canada.

Sample and sampling scheme - the target population was dwellers of cities with population higher than 100,000 inhabitants belonging to the main metropolitan areas of Brazil plus the satellite cities surrounding Brasília, the country capital. More

specifically, our sample had included cities from the following metropolitan areas: Porto Alegre, Rio de Janeiro, São Paulo, Belo Horizonte and Recife. The total sample size was of 1000 dwellers distributed across the aforementioned areas. The sample scheme used was a stratified multistage sample, with sample size proportional to the size of the population in these areas belonging to the economic groups D and E. The economic grouping methodology used in our sampling scheme was the "Criteria for Economic Classification Brazil", developed by the pool institutes IBOPE and ABEP (Brazilian Association for Survey Companies) based on data raised by a national socio-economic survey conducted by IBOPE in the year 2000. This is an economic classification that estimates the purchasing power of urban families, based on a scoring that captures, for a house, the numbers of household appliances, the number of water closets, the number of automobiles, the number of maids and the education level of the head of the household inhabitants[11].

Description of the sampling scheme - On the 1st stage municipalities within each area are randomly selected, according to the numbers of dwellers with inhabitants earning up to 3 minimum wages / month. On the 2nd stage smaller areas within each municipality, named census sectors are sampled with average monthly income not higher than 3 minimum wages /month. On the 3rd stage dwellings are selected and on each selected dwelling the respondent selected will be that dweller with birthday closest to the interview day.

The following table presents the resulting sample size obtained by using this sampling scheme. More details can be found in a technical report issued by Vox Populi, the pooling institute responsible for obtaining the Brazilian sample.

[11] For details please see http://www.abep.org/codigosguias/ABEP_CCEB.pdf.

Table 5. Sampling Scheme.

Areas	Population	% Classes D and E (*)	Population of classes D and E	Sample size
Metropolitan region of Belo Horizonte	4,879,213	36	1,756,517	115
Metropolitan region of Recife	3,602,867	56	2,017,606	130
Metropolitan region of Porto Alegre	4,036,126	33	1,331,922	90
Metropolitan region of São Paulo	19,424,923	28	5,438,978	360
Metropolitan region of Rio de Janeiro	11,580,041	34	3,937,214	255
Metropolitan region of the Federal District	2,337,078	32	747,865	50
TOTAL	**45,860,248**		**15,230,102**	**1.000**

(*) Data obtained by a survey on socioeconomic profile of the population of Brazil in 2000 by a pool of market survey firm IBOPE and ABEP.

Statistical analysis - since the sampling scheme used to draw respondents from the population of classes D and E was not of the random type, it was necessary to obtain weights for each of the sampled respondents, which is given by the estimated probability of a respondent belonging to the sample. These weights/probabilities are estimated by the pool agencies and have been incorporated in all statistical estimates presented in this report - totals, means, proportions etc - so that unbiased point estimates for such measures could be obtained. Nevertheless, given the limited sample size of our survey (1000 respondents), which has mainly be dictated by costs reasons, care should be exercised when obtaining results of cross tables involving variables with too many levels, since in this situation one may end up with cells with no cases or too few cases, and as a result in this situation estimates of totals, means etc will be too imprecise and should not be trusted.

3. MOBILE USERS

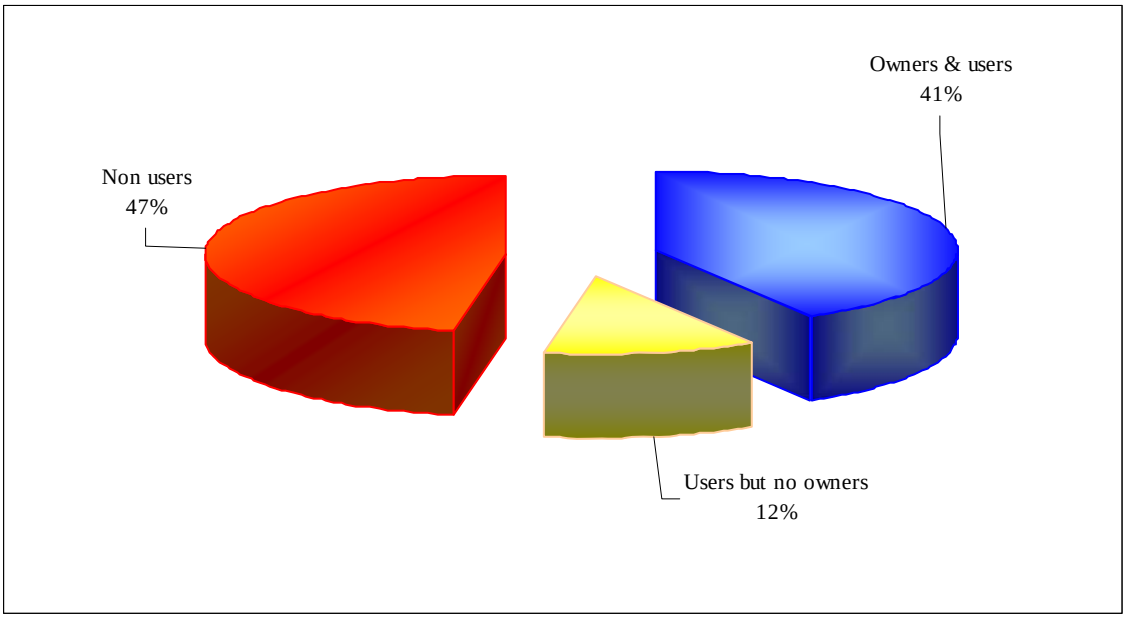
This section identifies and characterizes MT users in the sampled population. A user is someone who made or received a call with a MT in the previous three months, independently of ownership.

3.1. Mobile Telephony: Users and Service Characteristics

3.1.1. MT users at the bottom of the pyramid

A first major finding is that among bottom of the pyramid urban respondents in Brazil, 53% have used a mobile phone to make or receive phone calls in the three months preceding the interview. The figure is lower than overall MT teledensity (61%) but higher than that for the lower socio-economic groups (43%) found in recent study (CGI.BR 2007).

Graph 1. Users, owners and non users.

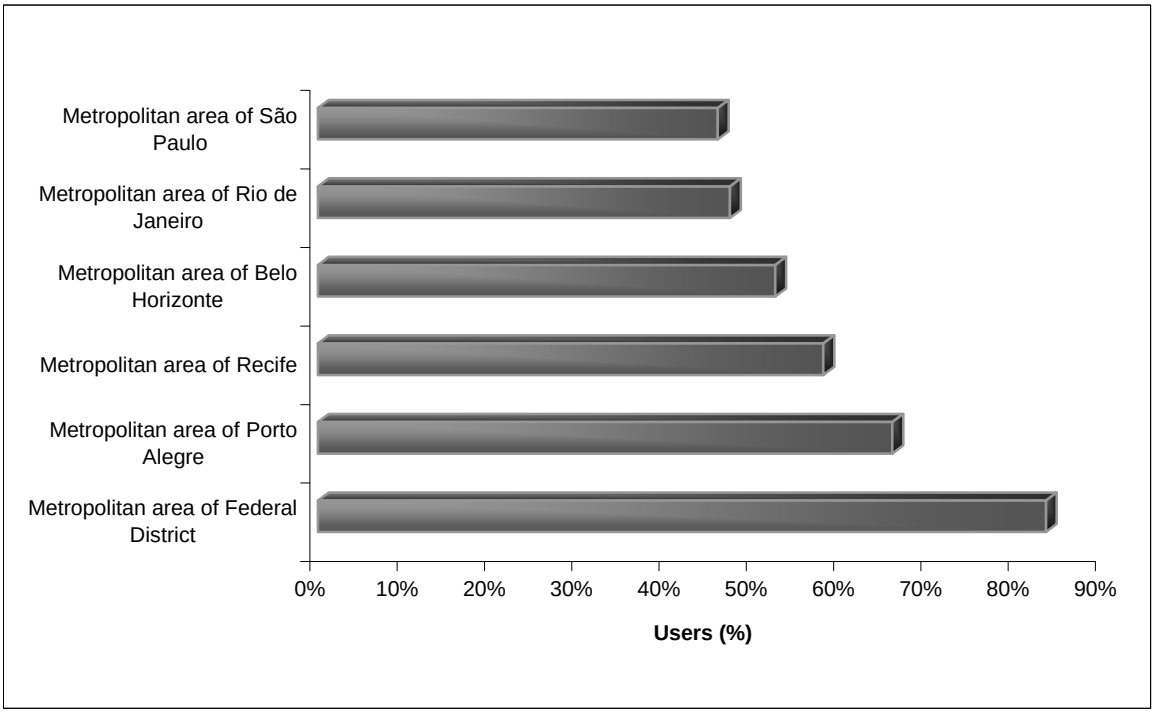


Base: Total sample.

However, when mobile use is looked across geographic regions one finds a mixed picture. Those showing the highest rates of mobile use are not necessarily those with the highest per capita income in Brazil. Thus the highest usage rate are observed in the metropolitan region of Brasília (83% of use), the Brazilian capital (DF) which

leads the country in MT teledensity among units of the federation (112) and in the metropolitan area of Porto Alegre (66%), the capital of the country's southernmost Rio Grande do Sul state (which has the country's second highest MT teledensity, 69). These are both areas of relative high per capita income in Brazil, yet in the metropolitan region of São Paulo, the richest city in the country, the usage rate is the lowest (46%) whereas the Recife metropolitan area, one of the poorest areas in relative terms, has the third usage rate. The percentage of users and households with fixed telephony is about the same in São Paulo and Belo Horizonte. However, MT user as share of total respondents is 60-80% higher than households with fixed telephony in Rio de Janeiro, Recife and Brasilia and 3.6 times higher in Porto Alegre.

Graph 2. Mobile Telephony Users**.**



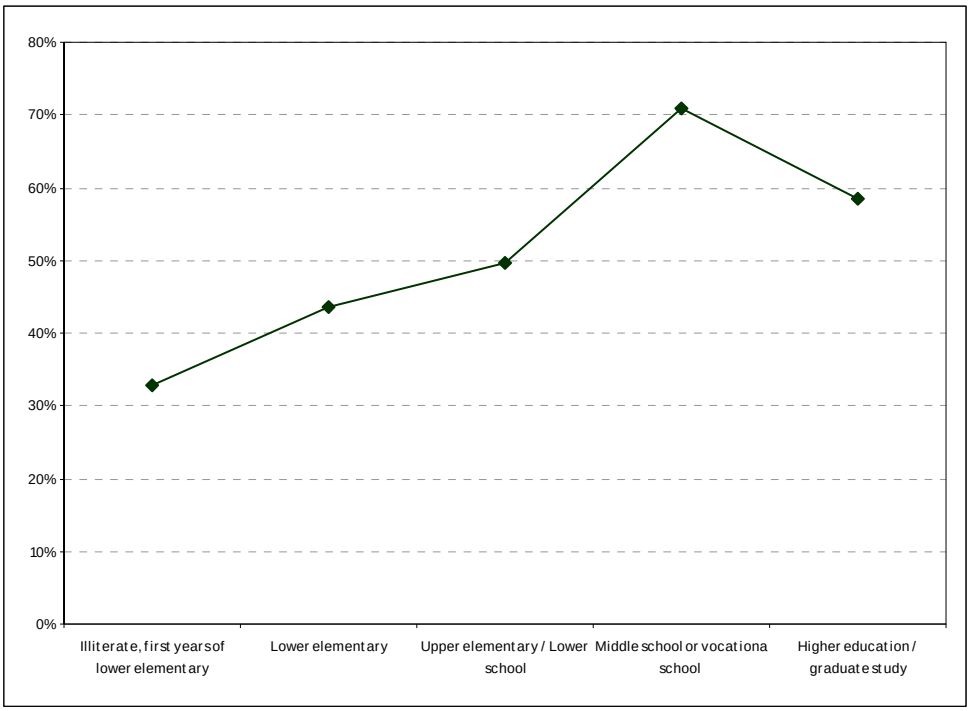
Base: Total sample.

Increase in use follows income, with the low income group exhibiting lowest use (43%)[12] and the highest income group with about 58%. A somewhat similar pattern is observed in age, the age range 19-30 years having the highest rate (66%), followed by the age bracket 13-18 years. The lowest usage rate is for the oldest age group, in the

[12] The exchange rate used between Reais (Brazilian currency) and the US dollar was 1US$= 1.93 Reais. This was obtained by averaging out the buying price of the US dollar in the Brazilian market during the period of the interview, which took place between 1st of June 2007 to 23rd of June 2007.

range 51 years old plus. The usage rate across gender is practically the same, 53%. Similarly, there is no difference in use among employers and commissioned workers, employed and autonomous workers. High education levels are associated with higher use, except for middle school or vocational training.

Graph 3. Use and educational level.

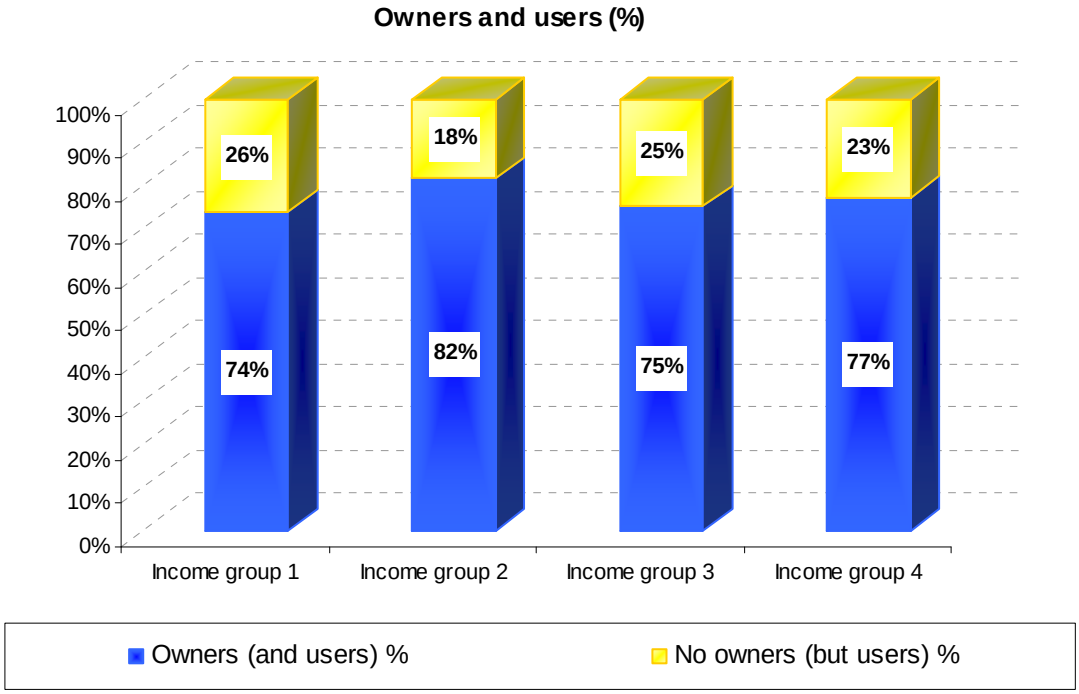


Base: MT users.

3.1.2. User characterization

Most of users (78%) owned a mobile. Surprisingly, as shown in Graph 4 there is little difference in user ownership across the low income groups. The lowest income group has a 74 % rate and the next group has the highest of 82%.

Graph 4. User MT ownership across income levels.

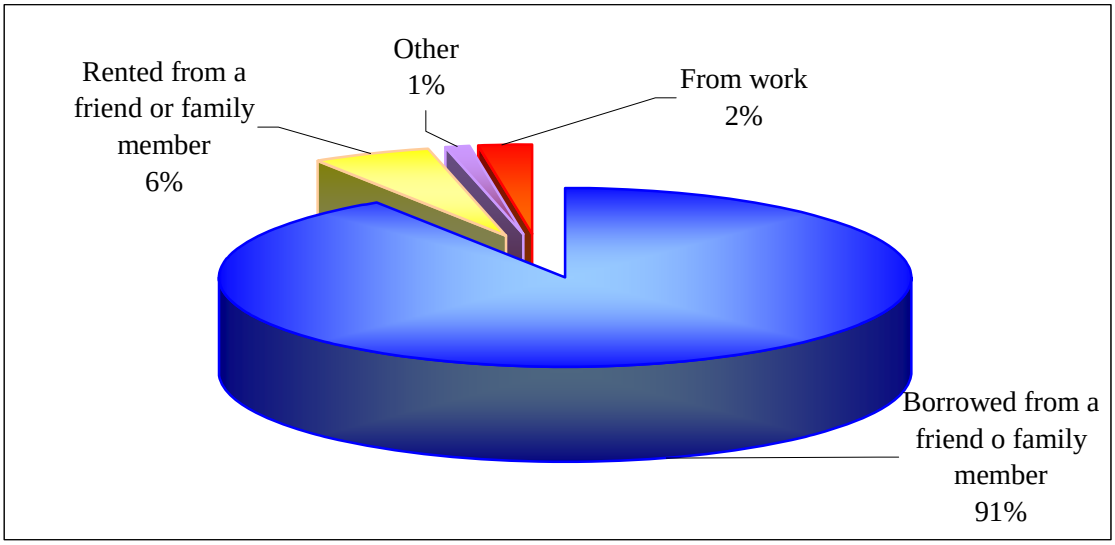


Base: MT users.

From a different perspective, amongst respondents who owned a mobile 100% have used it to make or receive calls in the last three months preceding the interview. While among non-owner users, only 19% have made or received calls using a borrowed MT. Therefore, in mobile users, mobile owners use 5 times more mobiles to make/receive phone calls, as compared to non-owners.

The vast majority of users which do not own a MT borrow it from family and friends. Thus MT use is lowest, around 47%, for dwellings with at most two persons per dwelling, rising to 58% for dwellings with three persons per unit, but falling for dwellings with 4 or 5 persons per unit to then return to the previous level for dwellings with 6 or more persons per unit.

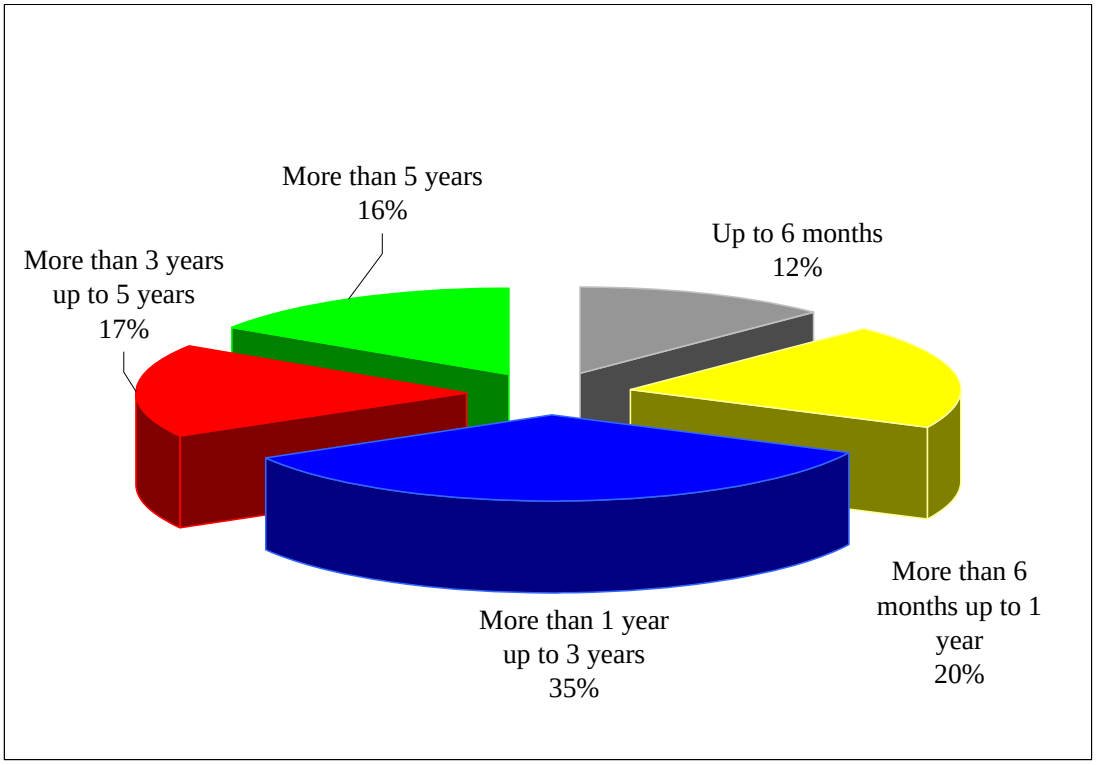
Graph 5. MT sources for non owner user.



Among those that borrow mobiles from a friend or a relative, 10% belong to lowest income group, 31% to the 2nd and 45% to the 3rd income groups and 14% to the highest income group. By contrast, among those that rent a mobile from a relative or a friend, the totality comes from the two highest income groups.

Finally, MT service adoption is relatively new as about one third of user respondents have been a user for less than 1 year (Graph 6), but the vast majority for over 1 year. This seems to indicate that this segment has a large share of early adopters who have already incorporated new social practices.

Graph 6. Length of use of MT**.**

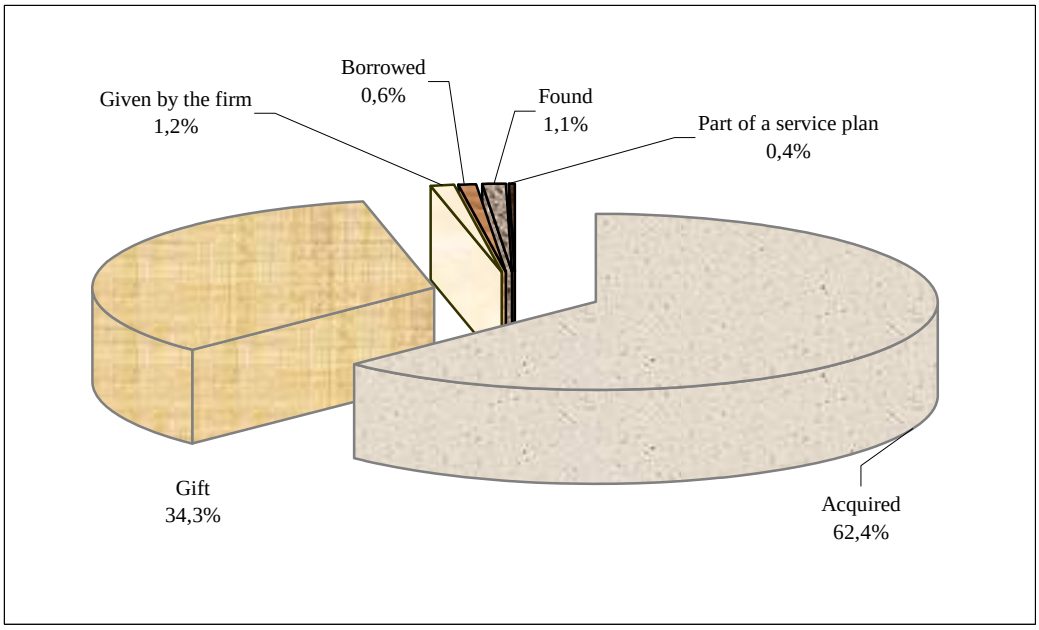


Base: mobile users.

3.1.3. Acquisition Patterns

Among owners, as shown in Graph 7, two-thirds purchased, the majority brand new, and one third received it as a gift.

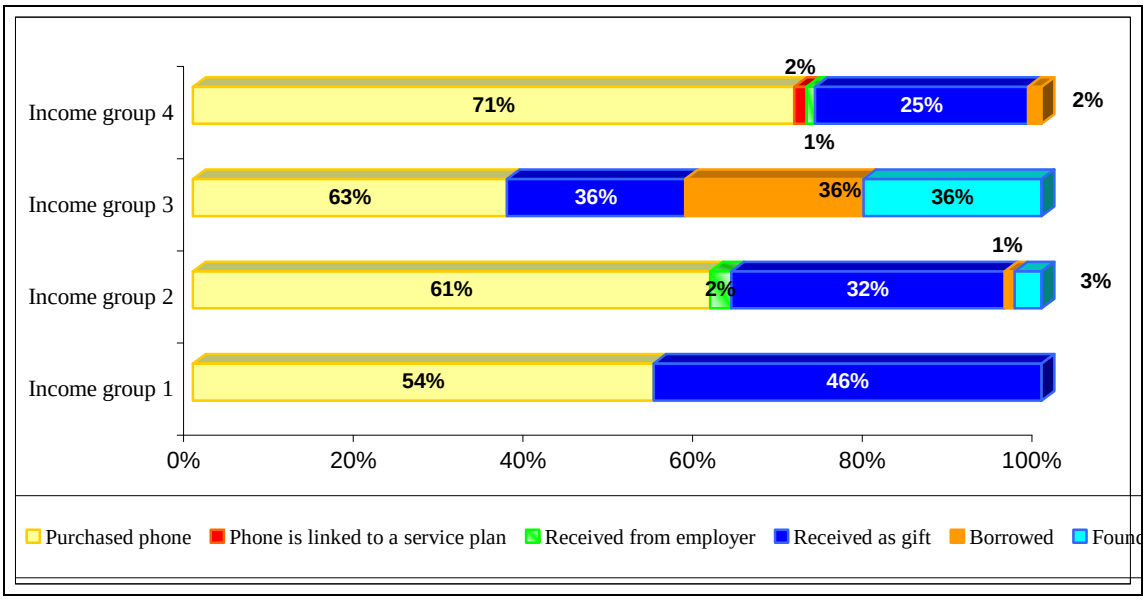
Graph 7. Ownership sources.



However, there are significant differences according to different income levels, as shown in Graph 8. Thus, among those who acquired a mobile, only 7% are in the lowest income group and the middle income groups, with earnings on the range US$ 32.81 to 185.83 concentrate 77% of the ownership share of buyers. Surprisingly, these same groups also have the highest share between those who have received a mobile as a gift (79%). Curiously, among the minority with a work mobile 73% belong to the 2nd income group.

Examining the pattern of mobile buyers across income groups, irrespective of income, one finds that the majority of buyers (above 76%) prefer to acquire a brand new mobile rather than a used one. Interesting enough, the rate of new phone buyer's for the lowest income group (73%) is higher than that for the 2nd income group (67%).

Graph 8. Ownership sources according to income.



Amongst owners of a mobile phone, the average price paid for a mobile was US$ 153.43, the median price was US$ 129.53, while the minimum price paid was US$ 52 cents and the maximum was US$ 518.00. Looking at price paid across income groups, Table 6, the maximum price follows the income gradient: the higher the income the higher the maximum price paid for a mobile. The median price paid for a mobile runs

in the same direction, with the two lowest income classes paying US$ 103.63, the 3rd class paying US$ 129.00 and the highest class paying US$155.44.

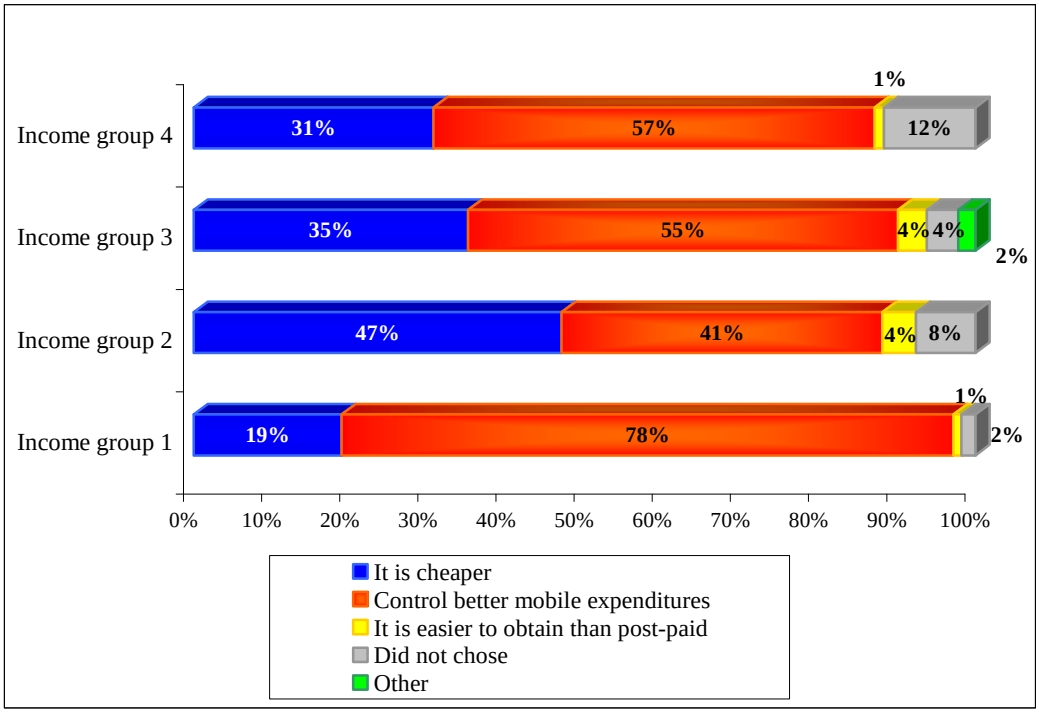
Table 6. Cost of acquisition according to income.

Value paid for mobile in US dollars	Overall	Income group 1	Income group 2	Income group 3	Income group 4
Mean	146.13	136.65	135.46	142.93	183.52
Median	103.63	103.63	103.63	129.02	155.44
Maximum	518.13	310.88	420.73	440.41	518.13

3.1.4. Prepaid Vs. Postpaid

The vast majority of user owners 96% own a prepaid mobile, while only 3% own a postpaid mobile. Moreover, the vast majority of owners within each income group have a prepaid (above 90%). A closer look, nevertheless, reveals that the option for prepaid increases with decreasing income: in the lowest income group the totality (100%) of owners opt for prepaid, while for the highest income group this rate drops to 91%. One of the main reasons (38%) for choosing a prepaid over postpaid is cost, but 52% find it more adequate for controlling expenditures. In the lowest income group 78% chose a pre-paid because it is perceived as a better way to control expenditures, followed by far by cost concerns (Graph 9). Expenditure control is the main reason for all income groups except for the 2nd income group. The second main reason is cost over postpaid. For the tiny minority postpaid owners, cost is the main motivation followed by expenditure control. The majority of postpaid owners are in the two highest income groups.

Graph 9. Prepaid acquisition motivation according to income.



Base: mobile prepaid owners.

3.2. Mobile Telephony: Usage Patterns

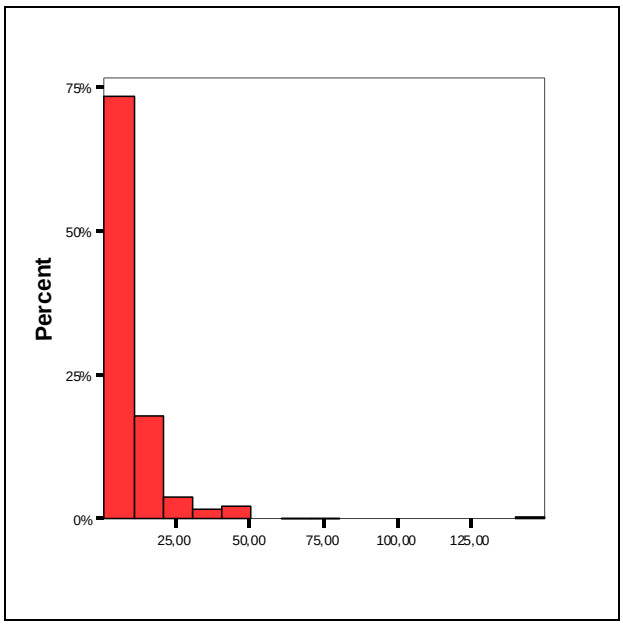
3.2.1. Call Volume

The average number of outgoing calls made by users during the week preceding the interview was approximately 14 calls, with median equal to 10 calls (Graph 10). For receiving calls, the average was 20 calls, with median equal to 12 calls. This pattern seems to support the received wisdom that overall low income users make strategic use of MT by making few calls and receiving many. However, the lowest income group (up to US$ 32.81) had the highest average number of outgoing calls 22 on average; followed by the 3rd highest income group (US$ 78.09 -185.83), with 15 calls. And in terms of incoming calls, the lowest income group also has the highest average, with 42 calls, followed by the 3rd income group having on average 13 calls. The fact that the lowest income group users make and receives more calls relative to the three other low income groups can be, in part, due to the fact that one-third of users in this user group have a fixed telephone at home, compared with 41% in the next group and the majority (~52%) in the two higher income groups. Indeed, the most frequent form of communication employed by users is fixed telephony at home followed by prepaid

MT (a mean of 14 calls made during the previous week versus 10 calls, respectively). This pattern holds across all income groups (1: 20 / 15 calls; 2: 11 / 7 calls and 4: 20 / 14), except for group 3 (11 / 10 calls)[13].

In terms of sending messages, for outgoing the average was 10 and median 7, while for incoming the average was approximately 9 and median 5. The lowest income group maintained its high consumption score with an average of 13 messages, against 9 messages on average for the second income group, the second following.

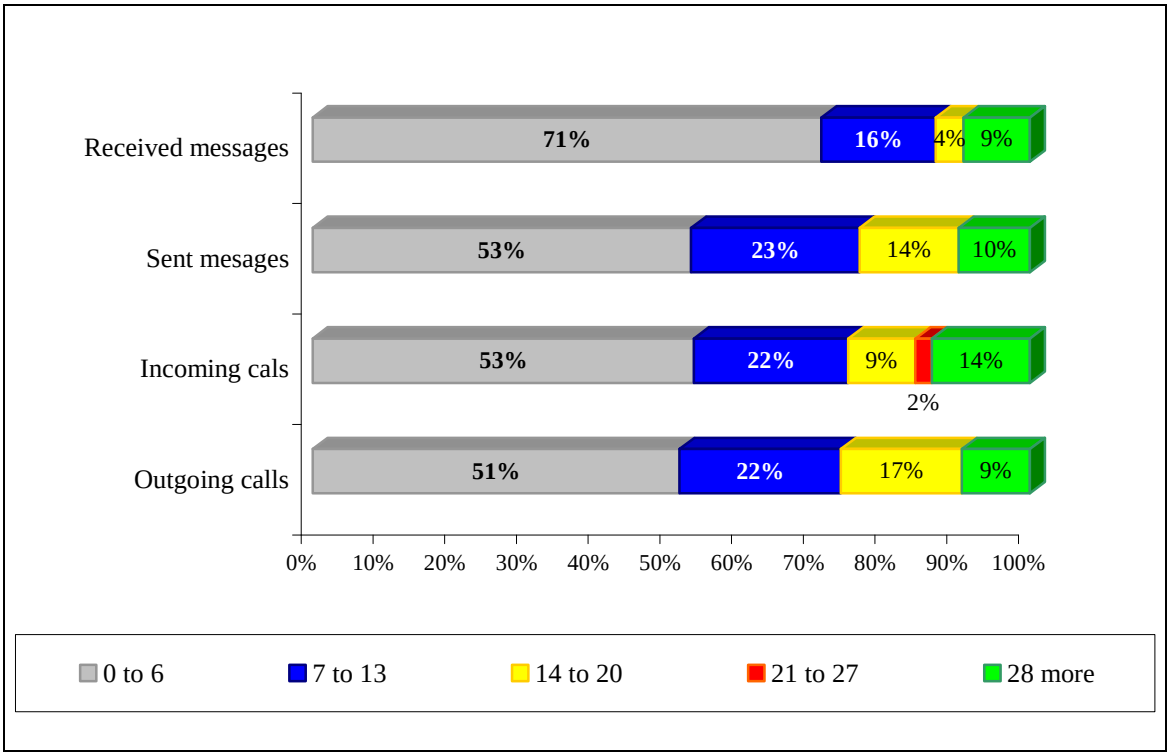
Graph 10. MT Outgoing calls per week.



Approximately 53% of mobile phone users, on the week preceding the interview, made at most 6 phone calls, 22% made between 7 and 13 calls and 10% made at least 21 calls (Graph 11). On the receiving side, 52% had received at most 6 calls, 22% received between 7 and 13 calls, and 16% received at least 21 calls. With respect to sent messages, 53% had sent at most 6 messages and 24% between 7 and 13 messages. On the receiving side, 71% had received at most 6 messages and 16% between 7 and 13 messages.

[13] However, these comparisons should be interpreted with caution since the absolute and relative number of income group 1 users with fixed telephone at home is very small.

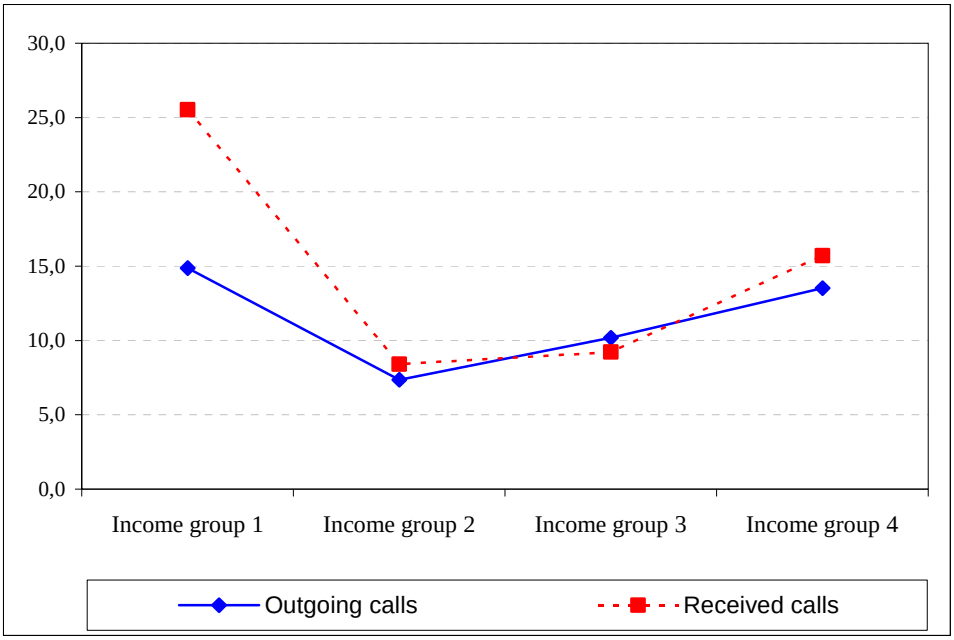
Graph 11. Use pattern statistics.



Base: mobile users.

Yet, the majority of users in the lowest income group (~52%) make between 14 to 20 calls, in sharp contrast with the finding that 0 to13 calls is the most likely range for users in the other income groups: 86% of users in the 2nd income group, 73% of users in the 3rd income group and 72% of users in the 4th income group (Graph 12). Again, in regard to incoming calls, the near majority of users in the lowest income group (~46%) receive 28 or more calls while the most likely number of calls received by users of the other income groups, was 0 to 6 calls. On the one hand, the heaviest users of outgoing messages are also in the lowest income range with 65% sending 7 to 13 sent messages, whereas other income groups cluster in 0 to 6. On the other, for incoming messages the vast majority of users are in the range of 0 to 6 received messages, irrespective of the income group they belong to.

Graph 12. Received and outgoing calls according to income.



There are also interesting variations in call volumes across gender and age (Tables 7 and 8). Males and adolescents (13-18) make most outgoing calls and those above 30 and women the least. The gender gap closes in terms of receiving calls and those between 13 and 13 receive the most calls.

Table 7. Outgoing calls per week by age and gender.

	TOTAL	**Age**				**Gender**	
		13-18	*19-30*	*31-50*	*51 plus*	*Male*	*Female*
Mean	**10.6**	14.6	11.7	9.2	7.0	13.4	9.0
Median	**6**	15	10	5	5	8	5
Minimum	**1**	1	1	1	1	1	1
Maximum	**150**	40	70	150	32	150	70

Table 8. Receiving calls per week by age and gender.

	TOTAL	**Age**				**Gender**	
		13-18	*19-30*	*31-50*	*51 plus*	*Male*	*Female*
Mean	**10.9**	10.6	13.5	9.4	6.6	11.8	10.5
Median	**6**	7	7	5	4	6	5
Minimum	**1**	1	1	1	1	1	1
Maximum	**150**	40	110	150	50	150	110

3.2.2. Call Patterns and Motivation

The main reason for making outgoing calls was to contact friends, then relatives, with average of 4.3 and 3.6 calls per user, respectively, corroborating the strong ties thesis. 'Friends' followed by family were also the preponderant reason for received calls. Work was a secondary reason in both types of calls. This pattern was replicated in sending and receiving messages. Similarly, in the lowest income communication with friends led (13 calls on average), but here followed far by family. This pattern of motivations was repeated for other income groups, but showing some reversals in average number of outgoing calls: 3 for family and 2.5 for friends for the 2nd group; equal at 4.3 for both family and friends at group 3; and 4.5 for friends and 2.6 for family in income group 4. Moreover, in the latter, business comes in second with 2.2 but in the second income groups is below 2 calls, and is negligible in income group 1.

Again for the lowest income group the prevailing reason for receiving calls is communicating with friends (17.4 calls) or relatives (6.1 calls). The average number of calls to friends drops to about 4.4 in the second income group, a figure slightly larger of received calls from family (3). In income group 3 the figures of received calls is about the same for friends and family at 4. Only in the highest income group 4, business is the top reason (6.3), followed by friends (4.5) and family (3.5), suggesting that income increase leads to learning in use of MT for instrumental purposes

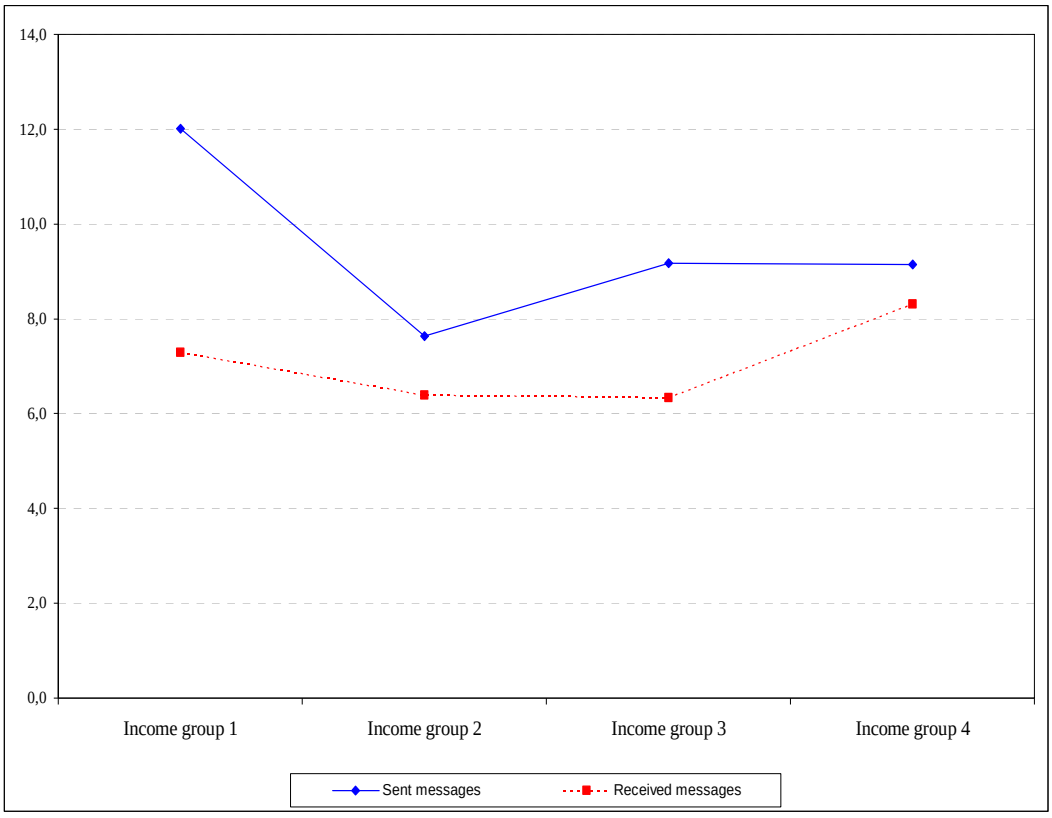
For the lowest income group the prevailing reason for sending messages is communication with friends, with a total average of 7 messages per user. This reason is also preponderant for users belonging to the other income groups, but showing a lower average number of messages: 5.7 messages for both the 2nd and 3rd groups and 2.6 messages for the 4th group. Sending messages associated with work or business reasons should also be stressed for the lowest income group, with an average of 2 messages per user.

Finally, communication with friends was the main motivation for the lowest income group receiving messages (5), sharing with other income groups, which show a slight lower average number of messages: 4 messages for the 2nd and 4th group, and 3.5 messages for the 3rd group.

3.2.3. SMS Patterns

A high share of users (37%) employs MT to send or receive messages[14]. This is somewhat surprising given that illiteracy rate is also high (34%) amongst respondents. It remains practically unchanged when looked across the different income groups (32~37%). Furthermore, when SMS usage is looked across literacy status, those classified as illiterate, surprisingly enough, make use of SMS, but half of the share within the group (21%) than those in the literate group (43%). Thus, a surprising finding in this Brazilian context is that the income group that presents the highest rate of message use is the lowest income group, with 53% of its mobile users, whereas the lowest, was income group 3 with 35.2% (Graph 13).

Graph 13. Received and sent messages according to income.



[14] This is lower than the rate found in other countries in the project.

Older (51 or higher) users tend to send and receive more messages than others, although adolescents receive an average higher number of messages. An interesting finding is that whereas males send more, females receive more.

Table 9. Sent messages per week by age and gender.

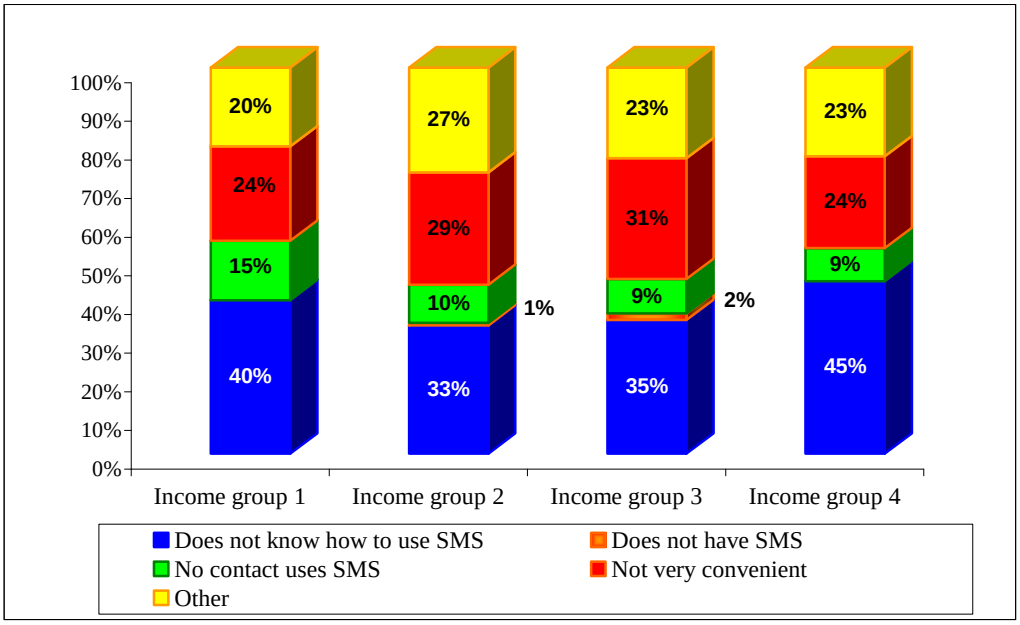
	TOTAL	**Age**				**Gender**	
		13-18	*19-30*	*31-50*	*51 or higher*	*Male*	*Female*
Mean	**8.9**	7.4	9.8	6.3	32.0	9.5	8.4
Median	**6**	3	8	4	32	6	5
Minimum	**1**	1	1	1	32	1	1
Maximum	**40**	30	40	40	32	40	40

Table 10. Received messages per week by age and gender.

	TOTAL	**Age**				**Gender**	
		13-18	*19-30*	*31-50*	*51 or higher*	*Male*	*Female*
Mean	**6.7**	7.3	6.9	6.2	6.5	4.9	7.9
Median	**4**	4	5	3	9	4	5
Minimum	**1**	1	1	1	1	1	1
Maximum	**50**	20	30	50	9	30	50

The main reasons for mobiles owners not using the SMS service are: not knowing how to use it (36%), lack of convenience (29%) and other (23%). However the lower income group places know how as its main reason (40%) followed by lack of convenience (24%) (Graph 14).

Graph 14. SMS use motivation according to income.



A vast majority of SMS users (85%) found it advantageous to standard mobile calls due to cost, followed by relative convenience (58%). Cost is also the main advantage perceived by the low income user groups, ranging from 95% for the lowest to 68% to the highest. When the assertion that sending messages is less inconvenient than making calls is subjected to scrutiny, the highest agreement rates are observed within the second income group (67%) and the lowest agreement rates within the third income groups (52%).

3.2.4. Remittances

There is no use of mobile to arrange sending or receiving remittances within or outside the country.

3.2.5. M-Services

Almost the totality of users (~98%) had never used their mobile to make bank transactions or to communicate with government agencies. Nevertheless a minority had used it to download a ring tone/a paper wall (18%) or to participate in contests (6.5%). When the minority of mobile users that had used their mobile to download a ring tone /paper wall or to participate in contests is examined across income groups, we observe that amongst those of the lowest income range only 5% had download a ring tone/paper wall. These figure raises with increasing income range, reaching the

rate of 18% for both the 2nd and 3rd income groups and 25% for 4th income group. The use of mobiles for participating in contests varies between 8%, for the 3rd income group, rising to up to 16% for the highest income range.

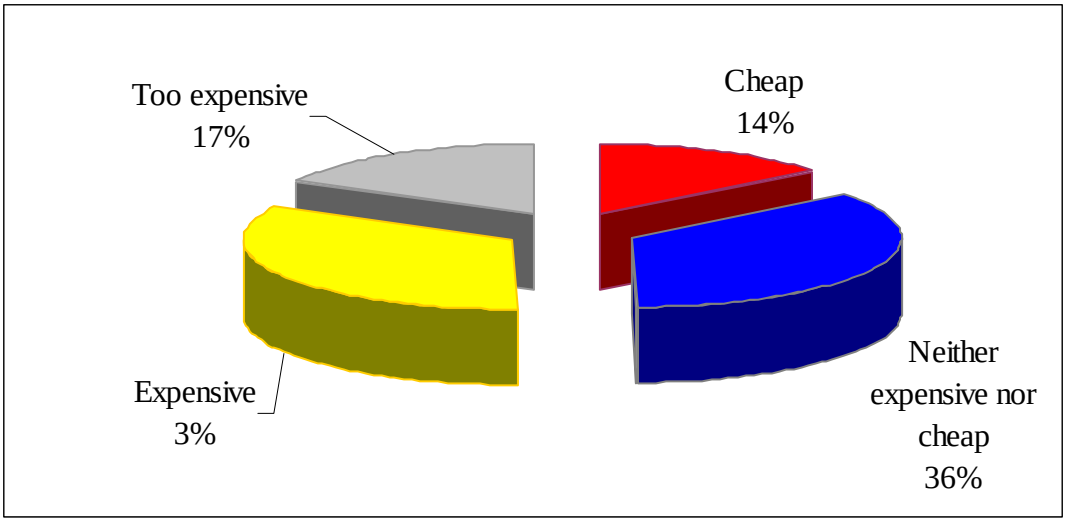
3.3. Mobile Telephony: Cost and Expenditure Patterns

3.3.1. Cost Perception

The majority of users of postpaid MT mobile find it expensive or too expensive and one-third neither cheap nor expensive. When the cost perception of postpaid mobile is examined across income groups[15], 90% of those in the 2nd income group find it cheap, while for the higher income groups there is no registry in this category. This unexpected result is explained by the fact that that there are only 20 respondents with postpaid mobiles in the whole sample.

Similarly, the near majority (50%) of users of prepaid mobile find it expensive and too expensive and just 14% find it cheap (Graph 15).

Graph 15. Prepaid MT cost perception.

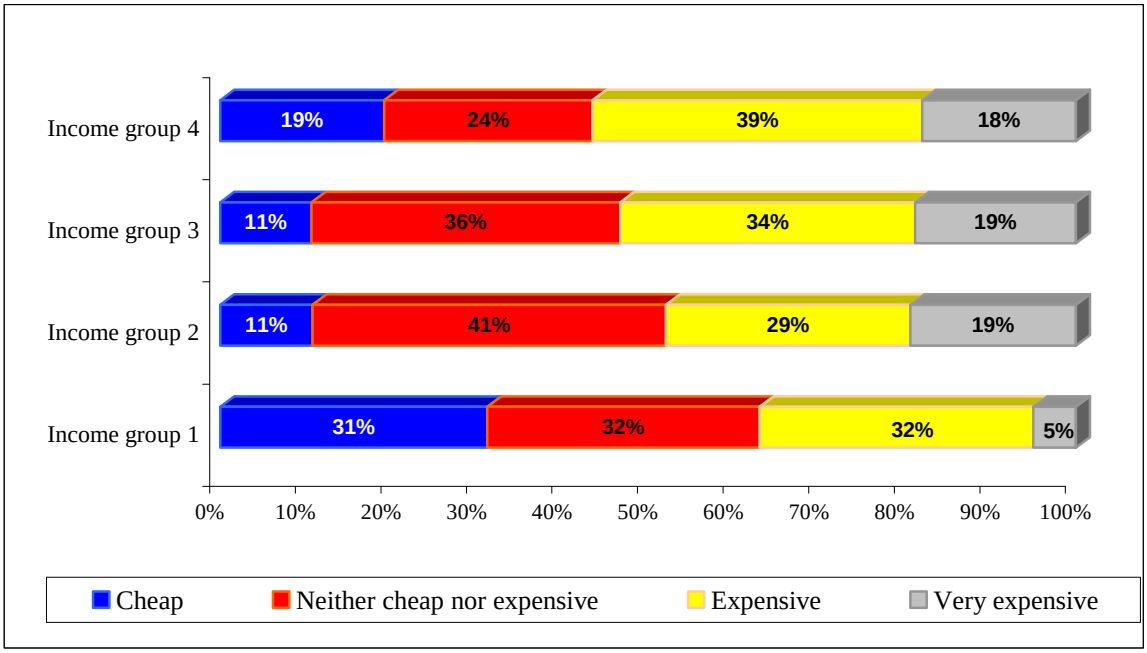


Base: mobile prepaid users.

[15] There are no users of postpaid mobiles belonging to the lowest income group.

Examining it across income groups, one finds a split in the lowest income group (~32%) among the options: 'cheap', 'neither cheap nor expensive' and 'expensive' (Graph 16). By contrast, in the others higher income groups, the majority finds the prepaid service neither expensive nor cheap or expensive.

Graph 16. Prepaid MT cost perception according to income.

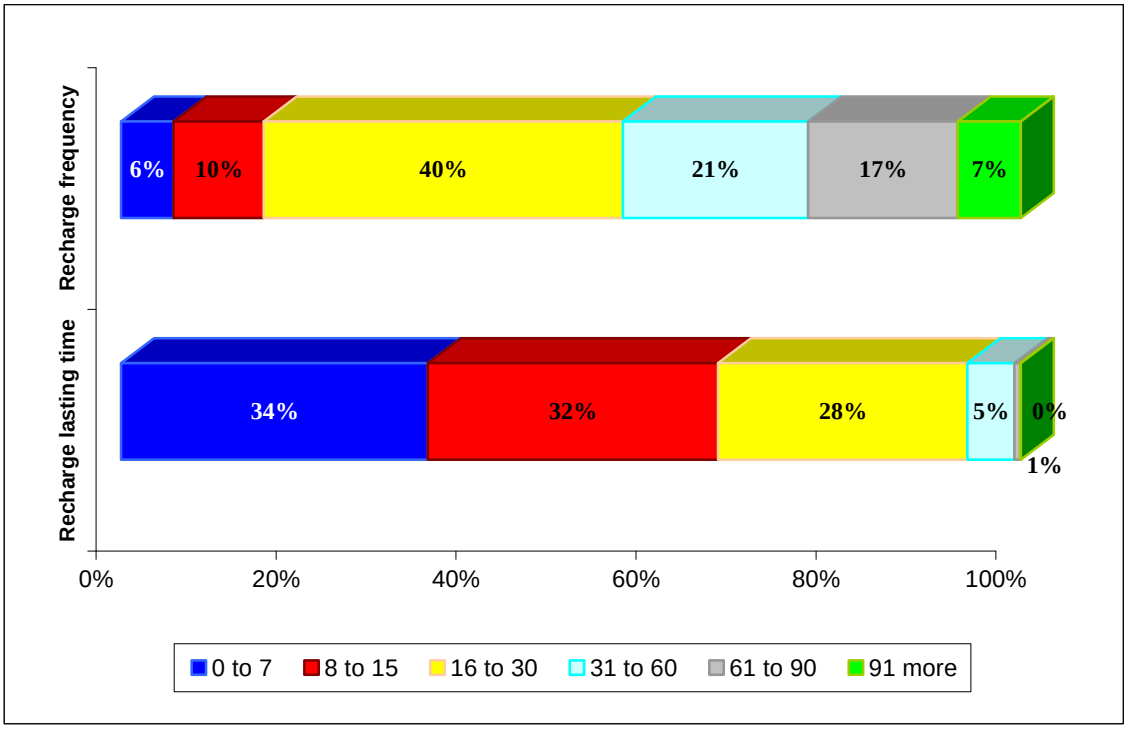


Base: mobile prepaid users.

3.3.2. Expenditure Patterns

Most mobile owner users (66%) recharge their prepaid between 0 and 30 days (Graph 17). The recharge lasts an estimated 0 to 7 days for 34% of users, from 8 to 15 days for 32% and 16 to 30 days for 28%. The average time of recharge was 42.1 days, while the median time was 30 days.

Graph 17. Prepaid recharge.



Base: mobile prepaid owners.

When the estimated time of the last recharge is looked across income groups we observe with surprise that users in the lowest income group usually (~60%) make their recharge every 16 to 30 days, while in the other income groups the recharge is made, mostly between 0 to 15 days. A very small number across income groups make a recharge after 61 days. Moreover, for the majority (70%) of prepaid owners of the lowest income group a recharge lasts between 16 to 30 days, while for the other groups between 0 to 15 days.

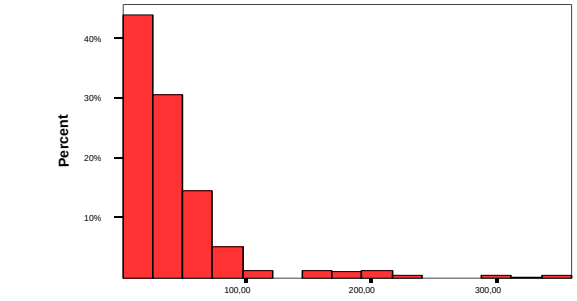
Almost half of the users of the lowest income group made their recharge between 61 to 90 days preceding the interview. For the other income groups the majority of users had made their recharge between 16 to 60 days preceding the interview.

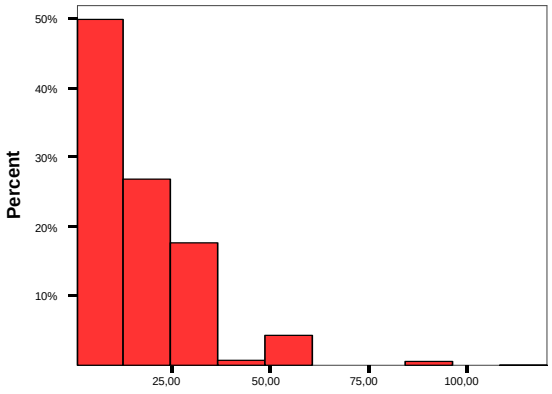
Table 11. Recharge frequency.

Income group	0 a 7	8 a 15	16 a 30	31 a 60	61 a 90	91 or more
1	0.0%	5.5%	28.3%	11.9%	40.3%	14.0%
2	5.3%	8.8%	35.0%	27.4%	18.2%	5.2%
3	3.5%	10.8%	49.8%	16.8%	13.7%	5.4%
4	15.8%	12.7%	37.9%	12.7%	11.0%	9.9%

It is interesting to note that, on the one hand, the near majority of recharges is made between 3 and 4 weeks (Graph 18) but that, on the other, the near majority of recharges lasts about 12 days (Graph 19), evidencing a clear use gap.

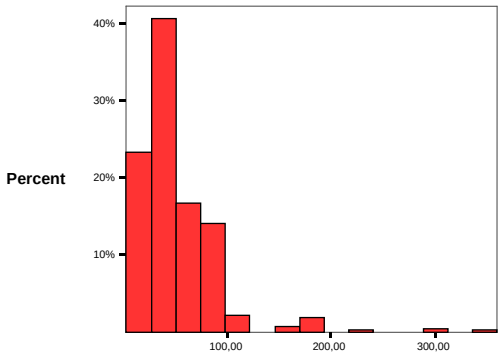
Graphs 18 and 19. Prepaid last recharge and lasting time.





Looking into the amount of time MT owner users keep a mobile without credit in relation to the amount of time with credit (using the median since the standard deviation is high), one concludes that they keep a mobile without credit double the time with credit (Graph 20). For example, if a user has a recharge credit of 1 month, he or she will remain for 2 month with a mobile without credit.

Graph 20. MT prepaid recharge frequency (days).



Furthermore, income groups 1 and 2 keep a mobile without credit double and triple of the time, respectively, in relation to the time they have credit. By contrast, income groups 3 and 4 keep a mobile without credit the same amount of time as with credit. This seems to indicate that for the lower income groups the mobile is used mainly to receive calls. For the lower income group the mobile goes without credit for 60 days (median), whereas for groups 2 and 3 the figure falls to 23 days and for the highest one further to 15 days.

The average value of the mobile phone bill is US$ 50.92, while the (estimated) average cost of a monthly recharge is US$ 10.14 (for comparison, the price paid for the last recharge is US$ 8.80), putting in evidence the stark income contrast between postpaid and prepaid users.

Table 12. Prepaid and postpaid costs.

(US$)	**Mean**	**Median**	**Minimum**	**Maximum**	**Standard Deviation**
Value of last recharge	8.80	7.77	0.52	31.09	3.66
Value of last bill	50.92	35.23	18.08	270.83	60.22

Base: mobile owners.

When we look at the average price paid for the last recharge across income groups (Table 13) we observe that the first three income groups have, practically the same average spending (ranging from US$ 8.37 to US$ 8.64), but that the highest income group has the highest average spending of US$ 10.51. For phone bills, there is a clear

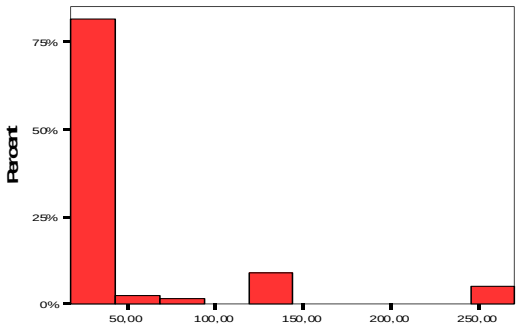
gradient with lowest income groups paying the lowest bills ranging from US$ 22.85 for the 2nd income group to US$ 64.40 to the highest income group.

Table 13. Prepaid and postpaid costs according to income.

Income group	US$	Mean	Median	Minimum	Maximum	Standard Deviation
1	*Value of last bill*					
	Value of last recharge	8.58	7.77	5.18	15.54	2.89
	Value of last bill	22.85	18.13	18.13	66.84	14.41
2	*Value of last recharge*	8.37	7.77	0.52	13.99	2.47
	Value of last bill	53.27	36.27	18.08	270.83	70.28
	Value of last recharge	8.64	7.77	2.59	25.91	3.48
3	*Value of last bill*	65.40	41.45	18.13	129.53	48.90
	Value of last recharge	10.51	8.29	2.59	31.09	5.41
4						

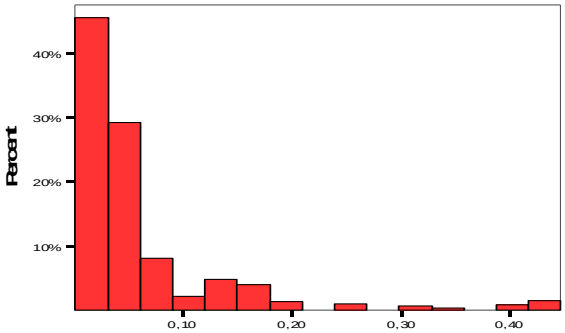
Analyzing the average amount spent, monthly, with MT recharge, we observe that this value (US$ 10.14) represents just 20% of the amount paid with (average) MT bill (US$ 50,92) (Graph 21), raising doubts about the potential for substitution between postpaid and prepaid MT in low income groups.

Graph 21. MT postpaid bill value distribution.



The findings confirm that low income segments direct a disproportionate amount of income towards MT expenditures (Graph 22). On average, respondents spend over 7% of their income on MT, although the near majority spends no more than 3%. This share of expenditure drops rapidly as the income of the respondent increases.

Graph 22. MT monthly recharge expenditure / user per capita income.



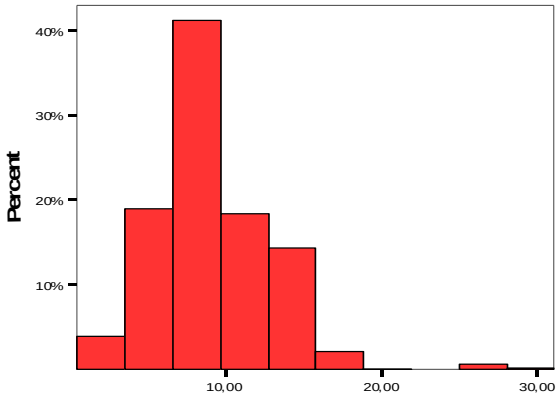
From a monthly expenditure perspective, we observe that income groups 3 and 4 had a monthly recharge expenditure of US$ 7.77, whereas income group 1 value was almost one third of that (US$ 2,59) and group 2 about two-thirds (US$5.53) (Table 14). Comparing these values with the average value of a monthly postpaid bill, a large gap emerges with recharge accounting for 18.7% of the bill in income group 4 and going up to 30% in group 2.

Table 14. Recharge monthly expenditure according to income.

Income group		Value of last recharge X monthly recharge frequency (US$)
1	*Mean*	5.35
	Median	2.59
	Minimum	0.43
	Maximum	15.54
	Standard Deviation	4.48
2	*Mean*	8.55
	Median	5.53
	Minimum	1.04
	Maximum	103.63
	Standard Deviation	12.20
3	*Mean*	10.44
	Median	7.77
	Minimum	0.65
	Maximum	103.63
	Standard Deviation	16.45
4	*Mean*	17.90
	Median	7.77
	Minimum	0.52
	Maximum	111.03
	Standard Deviation	23.82

It is also interesting to observe that the majority of recharges are under US$ 10.00, signaling a limited expenditure in this form of communication by low income MT users (Graph 23).

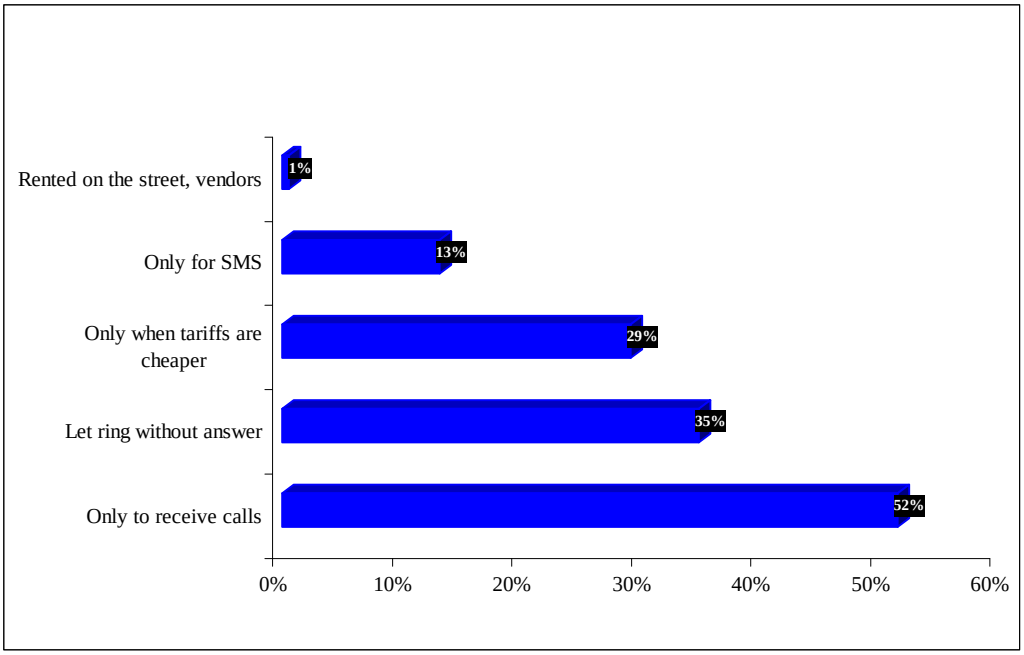
Graph 23. Last recharge value distribution.



3.3.3. Cost Control Strategies and Sharing

The top strategy employed by MT users in Brazil to cut cost is to use the mobile only to receive calls, followed by not answering calls, making calls only when fees are cheaper and using the mobile only for messages (Graph 24). This result is convergent with previous ones pointing out that users spend a large time without service credit. The very small role of messages in the strategy portfolio is probably due in part to their relative high cost and in part to the know-how difficulties faced by users. Surprisingly, the strategy 'just to receive calls' is the most common just among users in the 3rd lowest income group (60%) and, as expected, less so in the highest income.

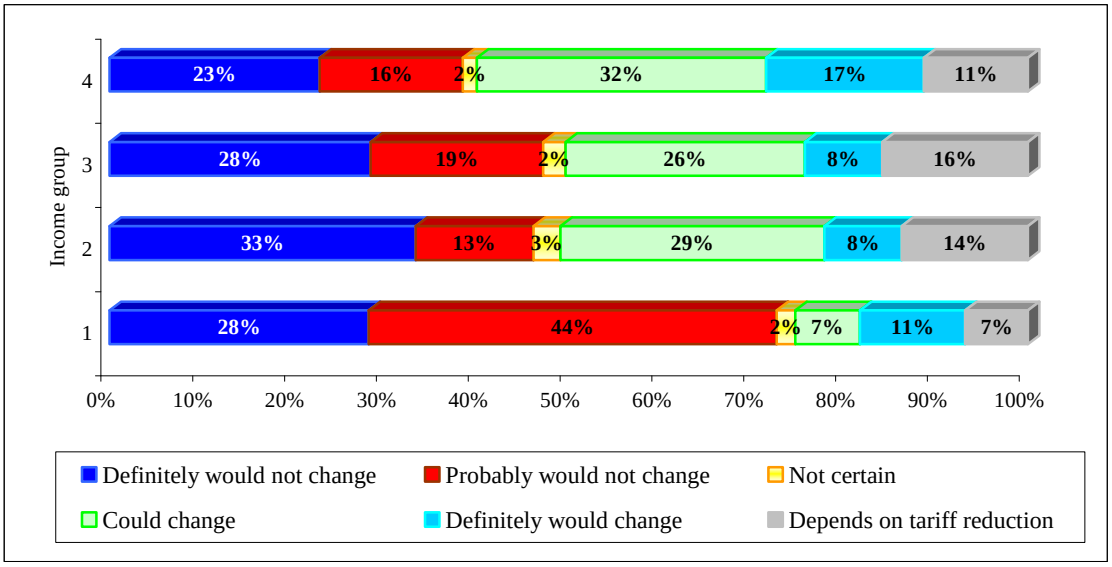
Graph 24. Cost control strategies.



3.3.4. Switching Incentives

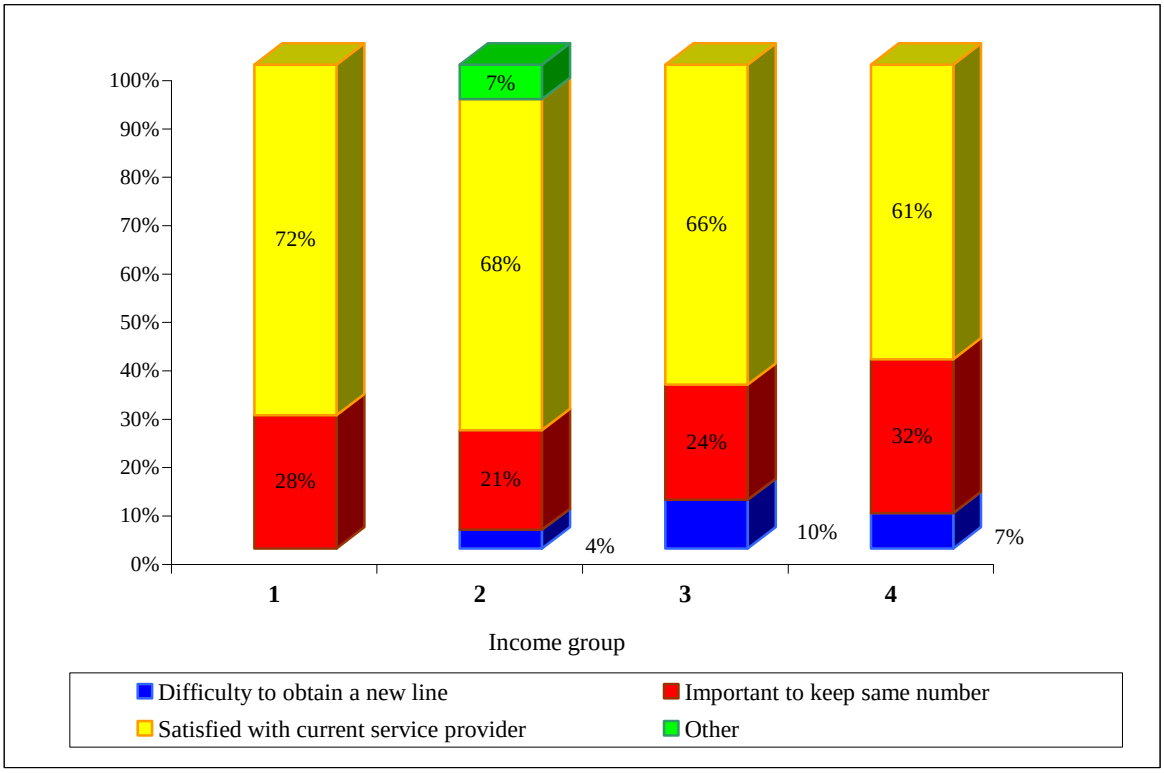
There is a high degree of satisfaction of users with their MT service. The near majority of users are not willing to switch to a different MT service provider, whereas one-fourth said they would, and 14% said they could switch depending on the amount of fee reduction. Even more so in the lowest income group, where 73% either probably would not change or would not definitely change provider, while for the other income groups this figure ranges from 38% to 47% (Graph 25). By contrast, income group 4 is the most likely to change, with a vast majority indicating such willingness. Thus, education seems to play a role in shaping MT consumption decision. Surprisingly, no income group appears to be sensitive to price, as all fall well below one-third.

Graph 25. Cost control strategy according to income.



Even when offered the advantage of a lower phone bill, about one third of users (25%) said it is important for them to keep their actual phone number, putting in evidence the barrier to service migration and thus cost savings for low income users created by the non-adoption of portability by the regulation authority in Brazil. Yet, a clear majority users are satisfied with the quality of the service provided. There are clear differences, however, among user income groups (Graph 26). In the lowest income group, the majority is satisfied with their actual mobile operator, a figure that falls continuously to 61% for the higher income groups. However, keeping the actual mobile number is the second most important reason claimed for not switching service provider, being the highest in the highest income group, one-third.

Graph 26. Switching motivations according to income.



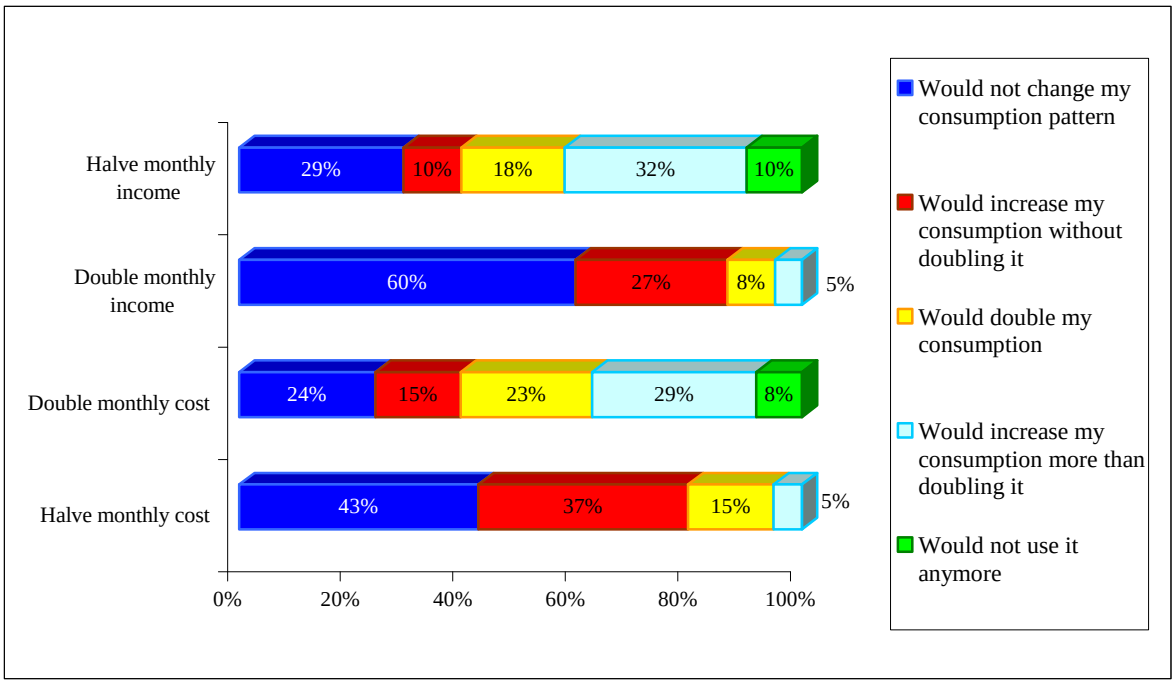
3.3.5. Price and income elasticity

Reaction of users in terms of probable consumption changes, when their bill costs and income are altered, was quite diverse (Graph 26). On the one hand, if the monthly cost of the phone service could be halved, 43% would not change their consumption and 37% would change it, but would not double it. If, on the other hand, the telephony costs would double, 24% would maintain their consumption level unchanged, 15% would decrease the consumption, but not by half, 23% would have halved it and 29% would decrease their consumption more than half of it. These results show greater negative price sensitivity than positive one, as a vast majority would change the consumption pattern if cost doubled.

Next, doubling the consumers' income would have the following effect: 60% of users would not change their consumption and 27% would increase, but not double it. When users have their income halved: 29% would keep their consumption level unchanged, 10% would decrease the consumption, but not to half of it, 18% would have halved it and 32% would decrease their consumption more than half of it. This suggests a rather

low income elasticity towards MT consumption, confirming their limited MT expenditure increase capacity and reflecting the low number of outgoing calls.

Graph 27. Income and price elasticity proxies.

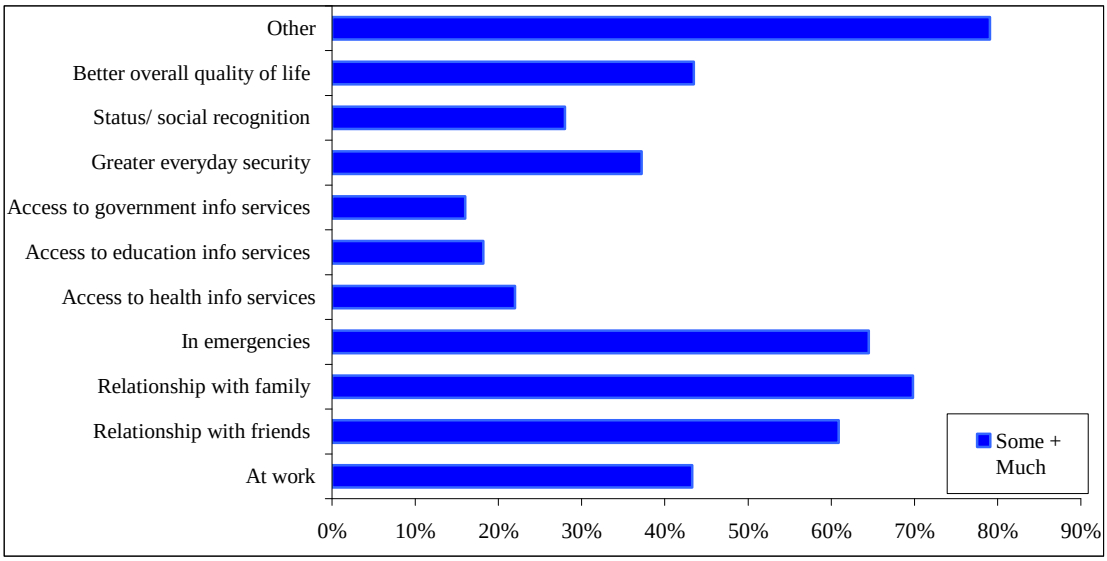


However, revealing a clear cost-based repressed demand, if the monthly cost of the phone service could be halved, more than one-third of the lowest income group would double consumption, whereas just 15% of the highest income group would have done the same. On the other hand, doubling user's monthly income would result, for the vast majority of lowest income group keeping the same spending pattern, with a clear income gradient delineated to just 40% for the highest income group.

3.4. Mobile Telephony: Perceived Benefits

For the vast majority of mobile users, the general life aspects most positively affected by the adoption of mobiles were improvements in relationships with family, emergency situations, relationship with friends. The next cluster of perceived benefits by less than half of users includes work, security and better life quality as a whole.

Graph 28. To what extent did access to MT improved the following aspects of your life? (sum of 'some' and 'much').



Base: mobile users.

When improvements brought by mobile telephony are analyzed across the populations of the different geographic sampling areas across Brazil, there is not much difference between the overall patterns observed: most of the MT benefits have been noticed in improving relationships with family and friends, followed by access to emergency information and improvement in work. Similarly when improvements brought by MT are analyzed across the different income groups: improving relationships with family and friends, followed by access to emergency information and improvement in work practice.

There is not much difference between the patterns observed across gender, yet women cite at a higher rate MT use in emergency situations. The perception of benefits is more intensively felt in the groups with the highest education levels (at least 8 years of formal education) in the areas of relationships with family and friends, followed by emergency situations. Age groups do not show much difference in areas of impact, yet use in emergency situations is stressed by the oldest age group.

Work employment status also does not seem to affect the ranking of user perception, although importance (much improvement) assigned to impact on work increases with length of use, going from 44% for less than six months of use to 50% for over 5 years

of use. This seems to indicate the importance of learning as users become more comfortable with the technology and aware of its possibilities.

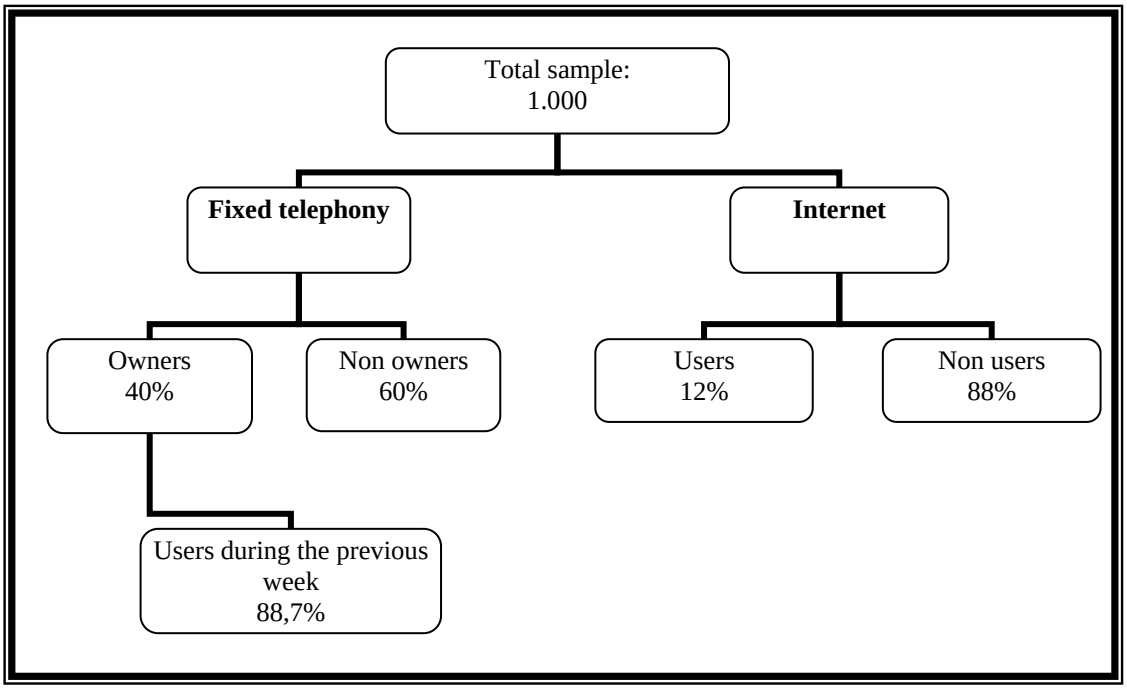
Furthermore, there is not much difference in impact of MT on work practices across employment status groups (employee, self-employed and commissioned worker or bosses). The areas most cited are once again improving relationships with family and friends, followed by emergency situations. However, access to health information services and work come up in third most important impact for commissioned workers or boss group, ahead of emergencies.

Finally, there is not much difference among these same employment groups in relation to areas of impact brought by MT use in their work or business: contact with suppliers is referred as the most important impact by all groups, particularly employees. The next major areas for self-employed and commissioned workers or bosses are, respectively, saving time at work or business and increase in business or employment opportunities. Increase in time of MT use positively affects the perception of impact areas on work or business. There's an almost linear growth in importance of increase of business and work opportunities, increase of communication with co-workers and increase in contact with clients.

3.5. Substitution and Complementarity

Much of the public policy debate around access to ICTs in developing countries centers around issues of substitution among different technologies, with some more recently recognizing that there may be a certain degree of complementarity involved as bottom of pyramid users develop strategies based on their interpretation of price signals, income and needs. Chart 2 summarizes the pattern of MT complementary technologies of fixed telephony and internet among its users.

Chart 2.



3.5.1. Fixed Telephony

As expected, the rate of fixed telephony ownership amongst MT users is low, 37%. The rate is a bit lower than that of the overall sample. However, the vast majority of fixed telephony owners are also users of MT, indicating a strong complementarity component. Income is a determinant of this ownership rate: in the lowest income group 1 only 13% rising to 55% for the highest income group 4. Half of fixed phone owners that are also MT users, have had it for a median of 5 years. But, confirming the income thesis, the highest income group 4 deviates from this figure with a median of 9 years and the lowest income group with 3 years. Indeed, fixed phone average time of ownership grows with income. It ranges from an average of 2.4 years for the lowest income group to 8.7 years to the highest income group.

The near totality (92%) of fixed telephony owners, use it to make or receive calls: 92% to only make calls and 96% to only receive them. Almost one third have allowed others, besides family members, to make use the fixed phone, without charges. As

expected usage of fixed telephony increases with income levels[16] : from 80% for income group 2 to 97% for the highest income group 4.

The majority of fixed phone owners chose not to disclose the reasons for not making use of it, but one third state they prefer to use MT and a few claimed it is too expensive. Across income groups, the majority of groups 1 and 3 again cited undisclosed reasons, but curiously almost half (40%) of the highest income group stated they did not need to use. Half of FT users make at most 8 calls per week. Amongst those that call friends, 50% make at most 2 calls, while for those calling relatives, make 3 calls. By contrast, half of FT owners have received at most 10 calls with half of those receiving 2 calls from friends and 5 from relatives in the country.

Just 9% of FT owners find it cheap, while one–fourth find it neither cheap nor expensive, and the vast majority expensive or too expensive. Surprisingly, close to one third FT owners in income group 3 find it neither cheap nor expensive, whereas the vast majority of owners in the lowest income group 1 find it expensive and one-third in highest income group 4 find it very expensive.

In regard to service quality, the vast majority (62%) find it at least good. Yet 100% in income group 1 rate it as good, whereas the vast majority in income groups 2, 3 and 4 rate it regular or above. Finally, half FT owners have an average bill at most US$ 38.86. As expected, income again determines FT expenditure with lowest income group spending less (US$ 34.64) and highest more (US$ 47.72).

3.5.2. Internet

As expected, internet use is quite low in this low income MT user population. Just 18% of MT users had used the internet in the month preceding the interview. However, this figure is 50% higher than that of the overall sample of MT users and non-users indicating a relation between MT and Internet use. As expected, incomes determines the pattern, with the highest internet usage rate in the highest income group (45%) more than twice as large of all others. One third of Internet users access

[16] The rates obtained for the lowest income group 1 are not statistically reliable since they were obtained with too few cases.

it from cyber café and home, and very few used all other types of access (relative or friend home, work, school and free terminal). An interesting finding is that the majority of the small number of internet users in the lowest income group, access the internet at cyber cafes, the main access site also for one third of those in the next income group 2. Family and friend's home are somewhat popular places of access (8% to 20%) for the intermediate income level groups 3 and 2. These results coupled to the very low use of schools and free public terminals by the two lowest income groups (1 and 2) raises some interesting questions for digital inclusion public policy. Also surprising is the fact that the vast majority of Internet users in highest income group 4 access it from home.

The vast majority of Internet users perceive as main benefit (some plus much) relationship with friends. Around one third see as benefits the impact at school, access of information on educational matters, life quality as a whole and relationship with family. Still relevant, but less so, was the impact in the access of information on health and status /social recognition. About a quarter the price paid to have access to internet service cheap and over one third expensive or too expensive. Almost half users in income group 3 find it expensive, followed by one-third third in highest income group 4. The near majority of those users in the two lowest income groups generally found the service neither cheap nor expensive.

The main areas of perceived impact of Internet in work practice were: co-workers communication, work and business opportunities, client contact and time saving. The median for monthly use is at most 7 days, a figure that climbs to 20 for the highest income group 4 (Table 15). As expected, as income increase so does the time spent on the internet.

Table 15. Approximate days of internet use over previous month.

Income group	Mean	Median	Minimum	Maximum	Standard Deviation
Overall	11.36	7.00	1.00	30.00	10.42
1	3.00	1.00	1.00	5.00	2.00
2	7.44	5.00	1.00	30.00	8.02
3	8.27	5.00	1.00	30.00	7.73
4	18.64	20.00	2.00	30.00	11.35

Almost half of Internet users communicate with people living in other states or countries, and all in the highest income group 4 do versus less than half in income group 2 [17].

3.5.3. Public Phones

The share of users in each income group that makes use of fixed telephony to make and receive calls, amongst all forms of communication, grows with income (12 to 54%). One must also bear in mind that both prepaid MT and public phones alike were used by clear majorities (63~66%) of overall users to make calls in the previous month. Furthermore, similar leading (among all forms of communication employed by users) majorities of users in each income group use pre-paid and public phones to make calls (respectively for group 1, 57 and 55; for group 2, 73 and 73%, and for group 3, 61 and 63%). The exception here is found in income group 4 for were the corresponding majority to prepaid MT (66%) is fixed telephony (54%), yet followed closely by public telephone (50%). In other words public phones are still a major form of communication for MT users. Together these findings seem to confirm results obtained elsewhere that MT users are also intensive users of public phones for making calls.

Half of MT user state that low cost is the main motive for using public telephony. However, almost half of users found it was neither cheap nor expensive. Curiously, one-third of the highest income group 4 found it expensive, the highest percentage of all groups. Next, access is a relevant factor for one quarter and just a few claim a lack of other options. About two-thirds of users across income groups state these same two motives, although the vast majority of income group 2 state low cost and over one-third of groups 1 and 3 state easy access (Table 16). Lack of option is a motive cited by less than one fifth of each income group.

[17] The rate for the lowest income group should not be considered, since it has very few respondents.

Table 16. Motive for using public telephony service.

Income group	Low cost	Easy access	Privacy	Lack of options	Other	TOTAL
Overall	50.3%	26.4%	1.6%	18.0%	3.7%	**100.00%**
1	48.4%	38.5%		10.0%	3.0%	**100.00%**
2	60.1%	17.9%		19.2%	2.8%	**100.00%**
3	38.5%	34.1%	30.0%	19.8%	4.7%	**100.00%**
4	56.0%	21.4%	4.1%	15.9%	2.6%	**100.00%**

Almost half of users find it good but one third finds it bad or very bad. Nevertheless, as expected given that they are the main public telephony users, the near majority of MT users in the lowest income group 1 users found the service above good, in contrast with about two-thirds in groups 2 and 3 found it acceptable to good.

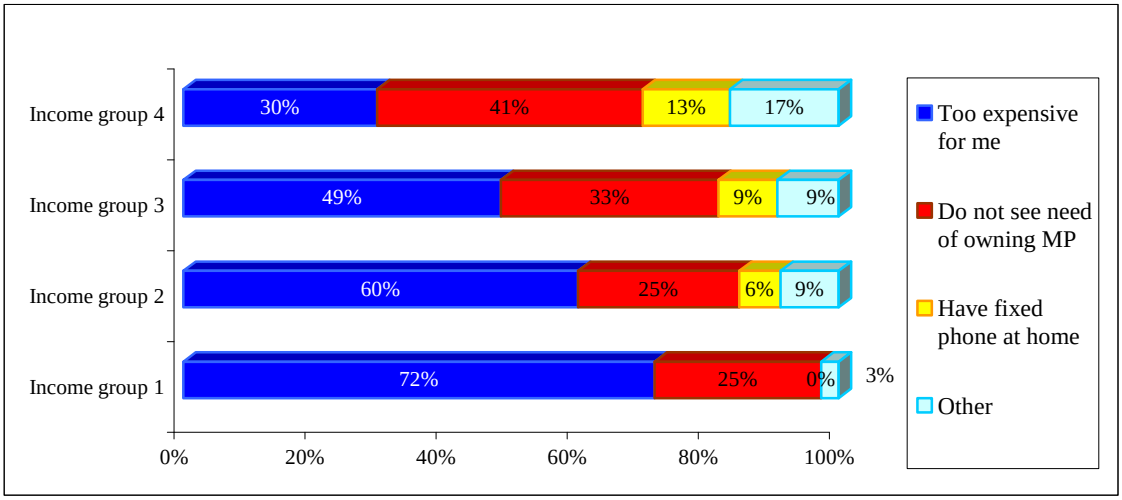
4. MOBILE NON USERS

4.1. Perspectives

4.1.1. Reasons for Not Using: Geographic Area and Social Groups

The main barrier to the adoption of MT is price, followed far by lack of need (Graph 29). The price factor decreases as income rises. By contrast, need runs in the opposite direction.

Graph 29. Motives for having a MT according to income.



Base: non mobile users.

Price is also main factor against MT adoption for adolescent and the single most significant for elders. The rate of respondents that have justified not buying a MP because they 'do not recognize it as a real need' is lowest for the lowest income range (11%), then it increases to 45% for the 2nd income range, 22% for the 3rd income range and 38% for the highest income range. When reasons for not buying a mobile are looked across genders, mobile's high price is the preponderant factor for both genders: 54.6% for males and females. The second most important reason for not buying a mobile phone, amongst genders, is the perception of not recognizing it as a real need, 27% for males and 30% for females.

Mobile high price is the preponderant factor for all work status: 57% for employed, 51% for autonomous and 98% for commissioned workers or employer. The second most important reason for not buying a mobile phone across genders is the perception of not recognizing it as a real need. Mobile high price is also the preponderant factor for non users belonging to the lowest education levels, but not for those in the two highest education levels. As before, the second most important reason for not buying a mobile phone, amongst users of different education levels, is the perception of not recognizing it as a real need. This is highest for users of the highest education level (75%).

4.1.2. Future Adoption

One third on non users, and of income groups 2, 3 and 4, are willing to buy a mobile phone in the next twelve months and, surprisingly almost half in the lowest income group are willing to do so. The near majority of mobile's non users willing to buy a MP in the next twelve months will buy the prepaid type (89%). Crossing would-be buyers according to type of plan and income, we observe that, irrespective of income group, the vast majority will opt for a prepaid service. Surprisingly, almost one-third in the lowest income group 1 plans to buy a post-paid type of MP. Amongst those very few non-owners that are willing to acquire a postpaid mobile in the next twelve months, 58% had justified their choice because they think it is cheaper than the prepaid mobile and 26% think it is better to control spending. Due to the very sparse sample, it is impossible to make valid inferences across income groups.

Almost two-thirds of would be prepaid buyers think it is cheaper than the postpaid mobile and just one-third think it is better to control spending. For the two lowest income groups, being cheaper than postpaid is the preponderant choice, with practically the same rate, around 65%.

The top reasons for buying a mobile are: to be in contact with friends and relatives (27%), to be easily found in emergency situations (21%), to be convenience to make and receive calls (19%) and need a mobile for work reasons (11%). For the lowest income group are: helpful for contacting relatives and friends (54%), convenient for making and receiving calls (23%) and helpful in emergency situations (12%); for the 2nd income group the top reasons are convenient for making and receiving calls (24%)

and helpful for contacting relatives and friends (18%). For the 3rd income group the top choice is it being helpful in emergency situations (38%), followed by being helpful for contacting relatives and friends (27%).

4.1.3. Willingness to Pay

When non owners are asked if they would be prepared to pay up to US$ 21.00 /month for a post-paid standard plan, 84% answered no. Willingness to pay for a post paid standard plan costing up to US$ 21.00/month[18] increases with income, being around 10% for the first income group, 13% for the 2nd, 17% for the 3rd income group and 33% for the 4th income group.

Willingness to pay for a post paid standard plan costing up to US$ 21.00/month varies with age, being 11.4% for the youngest age group, raising to around 18% for the next age group, and then decreasing to 16% for the third group, and then raising again to 18% for the eldest age group. It is higher for males (20%) than for females (14%) and highest for employed workers (20%), dropping to 8% for autonomous workers and then to 2% for commissioned workers or employer. As expected, willingness to pay for a post-paid standard plan costing up to US$ 21.00/month practically grows with educational level, being lowest, around 17%, for those with up to 8 years of formal education and then raising to 23% and 67% for those with completed high school and higher educations, respectively.

Over one third of non users are have no willingness to acquire a plan whatever the cost and a similar number are prepared to acquire a plan costing up to US$ 10.40/month.

[18] This is the average monthly cost, converted to US dollars, for a basic, post paid, mobile plan in Brazil.

Table 17. Affordability - Monthly maximum price that could pay.

US$	%
Up 10.40	44.5%
From 10.41 to 20.72	13.9%
From 20.73 to 41.45	0.7%
41.46 or above	0.3%
None	40.6%
TOTAL	**100.0%**

When looking at the choice pattern for several cost ranges of a prepaid mobile plan, across income groups, the majority of non-users, for the three first income groups, would either be prepared to acquire a plan costing up to US$ 10.40/month (not less than 40%) or not acquiring a plan at all (around 37%).

There is no clear pattern on the choice for several cost ranges of a prepaid mobile plan, across non user's age groups. Nevertheless, the majority of respondents, irrespective of age, would either be prepared to acquire a plan costing up to US$ 10.40/month or not acquiring a plan at all. When examining results across gender, the choice pattern for several cost ranges of a prepaid mobile plan, half of male non users (49%), would be prepared to acquire a plan costing up to US$ 10.40/month and around 35% will not be prepared to acquire a plan at all. Finally, when looking at the choice pattern for several cost ranges of a prepaid mobile plan, across worker's status, 49% of employed and 52% of autonomous workers would be prepared to acquire a plan costing up to US$ 10.40/month. For plans costing in the range from US$ 10.41/month to US$ 20.72/month, only 7% of autonomous workers and 16% of employed workers would be willing to acquire such a plan. The rate of workers not willing to acquire plan whatever the price paid is 33% for employed workers and 41% for autonomous workers.

4.2. Substitution and Complementarity

4.2.1. Fixed Telephony

The rate of fixed telephony ownership amongst mobile non users is 43%. Amongst mobile non users of the lowest income group, only 24% have a fixed phone at home.

This percentage rises to 35% for the next income group, being 69% for the highest income group.

Half of the fixed phone owners that are also mobile non users, have had a phone for at most 3 years. The average time of fixed phone ownership is 4.2 years. When time of ownership of fixed phone is cut across income groups, it is observed that the average time of ownership grows with income size. It ranges from an average of 2.2 years for the lowest income group to 5.6 years to the highest income group.

In the week preceding the interview 85% of the fixed phone owners, that are also mobile non users, had used the phone to make or receive calls, 83% just to make calls and 92% only to receive calls. In the month preceding the interview 17% of the owners had allowed persons, other than relatives, to use their fixed phone, and amongst this group, only 1% had charged for phone use. The rate of fixed phone owners that have used the phone both to make and receive calls, according to income groups, was: 95% for the lowest income group, 76% for the 2nd income group, 86% for the 3rd income group and 93% for the highest income group.

The main reasons for fixed phone owners not using their phone were: too expensive (17%), 'it is not needed, since potential contacts live close' (35%) and 'undisclosed reasons' (44%). For both the lowest and highest income groups the totality of users (100%) claim that 'it is not needed, since potential contacts live close'. For owners of the 2nd income group they are classified under 'undisclosed reasons' (72%) and for owners of the 3rd income group it is mainly claimed that "it is too expensive" (46%).

The average number of phone calls made in the week preceding the interview was 5 calls, from which 2 were made to relatives. The average number of phone calls received in the week preceding the interview was 6 calls, from which 2 were made by friends and 4 by relatives.

With regard to fixed telephony cost, 6% of fixed phone owners find the service cheap, 31% neither expensive nor cheap, 42% expensive, and 21% too expensive. When cost perception of fixed telephony is looked across income groups, around 82% of owners of the lowest income group see it as either expensive or too expensive. This figure

decreases to 59% for those of the 2nd income group, 68% for the 3rd income group and 49% for the highest income group. The fixed telephony service is evaluated as being bad or too bad by 13% of users and good or excellent by 58% of users (Table 18). When the evaluation of fixed telephony service is looked across income groups the worse evaluation is given by the highest income groups and the best by the lowest income groups.

Table 18. Evaluation of price and quality of fixed telephony.

Income group	Cheap	Neither cheap nor expensive	Expensive	Very expensive	Very bad + bad	Acceptable	Good + Excellent
Overall	5.8%	31.4%	42.0%	20.7%	13.2%	28.4%	58.4%
1		18.1%	60.0%	21.9%	0.0%	28.7%	71.3%
2	10.1%	31.1%	40.4%	18.3%	14.3%	14.6%	71.1%
3	6.5%	25.6%	45.4%	22.6%	15.8%	29.4%	54.7%
4	1.1%	50.1%	30.1%	18.7%	17.3%	34.7%	47.9%

The average cost of the last phone bill, of the month before the interview, was US$ 36.58. Across income groups we observe that the average cost does not always increases with income, being US$ 35.67 for the lowest income group, US$ 27.28 for the second group and US$ 41.93 for the highest income group.

4.2.2. Internet

As expected, the number of Internet users among non users was quite small, putting in doubt the digital inclusion policy efforts based on computer and Internet access. Only 5% of the respondents used the internet in the month preceding the interview. Surprisingly, across income groups, the lowest income and the second highest groups show higher internet usage (7%) and the highest income group has no Internet users. About one third Internet users make their Internet access using terminals mainly from own home, undisclosed place and cyber café. The vast majority of Internet users in the lowest income and in the second highest income groups access it at cyber cafés. One third of those in income group 2 prefer to access internet at undisclosed places and at school. And the majority of non users in income group 3 access it at home.

They perceive as the major improvements caused by Internet: relationship with

friends, school, access to educational information, access to health information and status and social recognition. The vast majority finds Internet expensive, particularly the lowest income group, an assessment that holds across income groups. Similarly, the vast majority says that the Internet improves the communication with their colleagues at work and about one third that it improves their business and employment opportunities and that saves time either at work or in business transactions. This appears to indicate there is considerable room for learning, creating an opportunity for MT use capacity-building programs.

The average number of days of internet access is 9.7 days and as expected it rises with increasing income, going from 2 at the very bottom of the pyramid to 16 at the second highest income group.

Between one third and half of Internet users among respondents use it to communicate with people in other states or countries, a figure that drops sharply only for the lowest income group.

4.2.3. Public Phones

About one third of respondents find public phones cheaper and of easier access, and claim they lack options. However, the main reason for using public phones for about one third of those in each of the three lowest income groups (1, 2 and 3) is lack of options and for the highest income easy of access.

Perceptions about the quality of the public phone services are roughly evenly split among either bad or too bad, regular and good, with the latter being the choice of close to half. Curiously, the lowest income group has both the most negative and positive perceptions of this service as one quarter it too bad and another find it excellent. In addition, the latter figure drops to negligible in the next income group. In the end, irrespective of their income group affiliation, the service is most of the time classified as either regular or good (at least 48%, at most 76%).

The vast majority of respondents find the price of the public phone services neither cheap nor expensive or expensive (Table 19). As expected there's an income relation in cost perception. The higher the income group, less likely is the chance of the

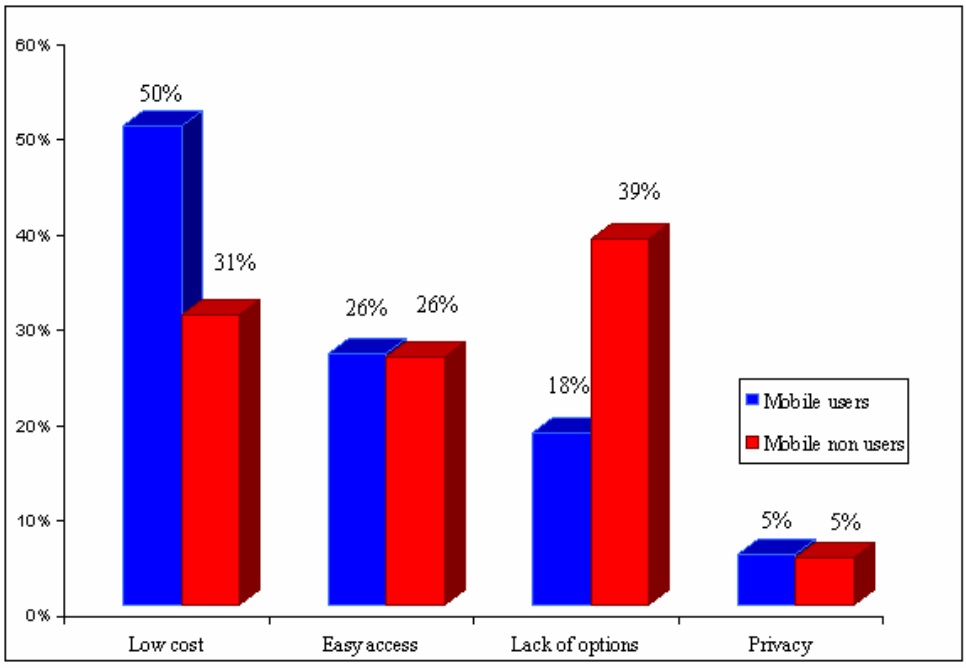
respondent finding it cheap. On the one hand, the perception of it being neither cheap nor expensive is shared with approximately half of the respondents belonging to the lowest and second lowest income groups. On the other, the service is also perceived as expensive by one quarter to about one third of the three lowest income groups.

Table 19. Evaluation of price and quality of public telephony.

Income group	Cheap	Neither cheap nor expensive	Expensive	Very expensive	Very bad + bad	Acceptable	Good + Excellent
Overall	15.60%	43.30%	30.00%	11.10%	29.70%	24.90%	45.40%
1	7.00%	42.10%	44.20%	6.80%	30.40%	18.00%	51.60%
2	11.70%	52.00%	29.80%	6.50%	23.60%	28.70%	47.80%
3	19.80%	44.70%	24.80%	10.70%	29.00%	25.30%	45.70%
4	34.00%	28.80%	32.50%	4.80%	23.80%	24.00%	52.20%

Finally, for non users of MT at the very bottom of the pyramid public phones remain a necessity, in sharp contrast with the cost consideration it plays for MT users – to make calls after receiving one in the mobile (Graph 30).

Graph 30. MT motivations: users and non users.



Base: Public phone users.

5. CONCLUSIONS AND POLICY IMPLICATIONS

At the end of 2007, Brazil had 121 million mobiles with a teledensity of 63.59 mobiles per 100 inhabitants, having added 21 million mobiles in that year. It has the world's fifth largest mobile market. By contrast, there were about 7 million households with broadband internet (2008)[19]. Although the volume of mobile internet access grew 167% over the six month from September 2007, according to the consulting firm Predicta, it reached just 212 thousand in February. The third largest mobile service provider in the country estimates that its revenues from internet access will surpass those from SMS this year (2008). Industry observers concur that mobile internet access will be the first service focus of mobile companies following the 3G spectrum auction at the end of 2007. In a recent interview on the occasion of the Internet Governance Forum in Rio de Janeiro, Vint Cerf, one of the so-called fathers of the Internet, suggested that mobile telephony is the fastest way to give Internet access to the estimated 3 billion users by 2010 (out of the 5.5 billion people without access today), including in Brazil. In his view the mobile is the entry door to the internet coupled to other devices like the computer and the TV[20]. The results presented above give weight to his considerations, particularly in regard to the bottom of the pyramid urban population, which make up the vast majority of the poor in Brazil. They seem to confirm for this population segment that the rate of diffusion of mobiles is much faster than other types of telephony, particularly public telephony which appears to play the critical role of mobile service complement, given the high costs of tariffs and ICT services, as found in other recent research.

Right now a small majority of this segment uses mobiles, but one third of non users plan to acquire one. Moreover two-thirds of users own a prepaid mobile, the majority having purchased it. This seems to indicate there is still considerable room for policy measures and regulator incentives to both increase the number of users in this segment and to fulfill the potential of the mobile telephony service among current users. For the results of this study clearly show that although mobile users are willing to spend

[19] This represents 13% of households, although 17% have internet access, whereas 22% of households have a computer.
[20] André Machado, "A economia do mundo virtual é diferente – entrevista Vint Cerf," O Globo, 19 de dezembro de 2007, caderno INFO ETC pp. 1 and 3.

more on the service they generally do not yet recognize it as a tool for the consolidation of social capital and to bootstrap their own economic advancement. The results also show there is an immense opportunity for government to take a quantum leap in the provision of services for increasing citizenship by promoting the expansion of mobile services, accompanied by the right incentives and appropriate education of mobile users.

As tariffs are still very high (Appendix 1)[21], including for SMS, reform in the tariff structure would also increase the use of MT by his segment users and would probably add a substantial number of new users to the market. According to a Merrill Lynch survey (2007), Brazil has the next to last lowest use of mobiles with 79 minutes/month, behind Peru and just ahead of Marocco. So far MT service provider business model has been focused on high-end services for the richer segments of the population. Unfortunately, this picture is unlikely to change in the near future as government delayed until the end of last year the auctioning of 3G spectrum. The spectrum costs coupled to the required investments to deploy it will most certainly make them leave their current business model untouched in the near term. On a positive note, however, portability will become mandatory by August 2008 and may service provider change may increase from the current 25% rate.

Government digital inclusion policy continues to be trapped in a tunnel vision, focused on lowering the cost on computers, even though the public telecenter model has revealed its inherent limitations. The computer-centric policy is plagued by multiple mission policy syndrome as it is partly justified as needed to spur local hardware industry and, more importantly in the eyes of policymakers, indirectly the semiconductor industry, one of the four industrial policy priorities. The relative success of the policy can be assessed by the decline in computer prices and the boom in the market, helped by credit expansion, but hits a diffusion limit at the bottom of the lower middle class. Internet access is yet another main barrier to the fulfillment of digital inclusion in Brazil, one which is said to be approached through a state-centric broadband solution. In fact, just recently in April 2008, the government indicated that

[21] A recent survey by Merrill Lynch in 50 countries showed that Brazil has the fourth most expensive tariff (US$ 0.26/per minute with PPP), together with Japan.

digital inclusion would become an objective of the country's second phase industrial policy (PITCE). In this context it announced the Broadband for All Program with the goal of having 25% of households and 100% of public schools with broadband access by 2010, increasing access and reducing regional disparities.

This sketchy policy context seems to be adverse to the expansion of volume and use of MT among at the bottom of the pyramid. Yet, emerging local and regional developments in the promotion of mobile government services could rapidly force a change in this picture from the bottom up. Since local and federal taxes account for between 46 and 76% of tariffs, a level similar only to that of Uganda and Turkey according to the mobile industry executives, and since as this research has shown there's a strong correspondence between cost of service and use expansion in scope and scale among the urban low income segments of the Brazilian population, tax reduction could be a more efficient mechanism for increasing overall MT use. And particularly among the neediest, as it was shown above that if the monthly cost of the phone service could be cut in half, over one-third of the lowest income group would double consumption. It could be argued by some that rising incomes among the lower socio-economic classes due to the renewed growth sustainability of the Brazilian economy over the last couple of years could play the same role in promoting use expansion at the bottom of the pyramid. However, an important finding presented above is that doubling user's monthly income would result, for the vast majority of lowest income group keeping the same spending pattern, an income gradient that declines to 40% for the highest income group.

This coupled to a concerted effort to increase the scope of government m-services and adequate industrial policy mechanisms to drastically lower the cost of internet access-enabled new generation 3G devices and to promote its rapid diffusion as an accelerator of device price and service cost reduction, could be a part of a more significant policy agenda. In the end, as many others in the past, technological revolutions that significantly alter the lives of the poor, empowering them as citizens and bootstrapping them into a sustainable income generation, usually come from the periphery of the system. The results of this study will help frame this emerging agenda and the terms of the debate, so that mobile telephony in Brazil will sooner than later become yet another example.

APPENDICES

Appendix 1: Country tariffs

	Pre-paid		Post-paid	
	Effective	*Real*	*Effective*	*Real*
Argentina	$13.68	$15.19	$9.50	$13.83
Brazil	**$31.11**	**$32.26**	**$27.10**	**$41.09**
Colombia	$17.10	$18.60	$14.58	$23.07
Jamaica	$7.58	$8.86	$6.20	$13.49
México	$24.92	$26.52	$15.20	$20.92
Perú	$20.55	$22.25	$17.22	$21.15

Appendix 2: Methodology

Actual Sample Distribution (weighted)

Table 20. Income groups.

Income group	%
Income group 1	10.1%
Income group 2	39.1%
Income group 3	37.9%
Income group 4	12.9%
TOTAL	**100.0%**

Table 21. Urban agglomerations.

	%
Metropolitan area of Recife	13.1%
Metropolitan area of Belo Horizonte	12.1%
Metropolitan area of Rio de Janeiro	20.9%
Metropolitan area of São Paulo	37.2%
Metropolitan area of Porto Alegre	10.4%
Metropolitan region of Federal District	6.2%
TOTAL	**100.0%**

Table 22. Sampled urban agglomeration / Income group.

Metropolitan area / Income group		Recife	Belo Horizonte	Rio de Janeiro	São Paulo	Porto Alegre	Federal District	TOTAL
1	**%**	23.6%	7.0%	11.4%	47.9%	6.0%	4.1%	**100.0%**
2	**%**	16.8%	14.5%	19.5%	31.4%	13.3%	4.5%	**100.0%**
3	**%**	8.5%	14.3%	24.4%	35.4%	10.8%	6.6%	**100.0%**
4	**%**	8.6%	9.2%	23.3%	37.1%	8.2%	13.6%	**100.0%**

Technical aspects of sampling procedures

This section details the sampling methodology employed in the research. The target population was urban dwellers of socio-economic classes D and E, aged between 13 and 70 years and living in five state capital cities with 100,000 or more inhabitants and their related metropolitan areas of Brazil, and in the satellite towns surrounding the national capital city of Brasília (Federal District). Specifically, the sample covers urban population living in the following areas:

- Metropolitan Region of Porto Alegre (Capital of Rio Grande do Sul State)
- Metropolitan Region of Rio de Janeiro (Capital of Rio de Janeiro State)
- Metropolitan Region of São Paulo (Capital of São Paulo State)
- Metropolitan Region of Belo Horizonte (Capital of Minas Gerais State)
- Metropolitan Region of Recife (Capital of Pernambuco State)
- Satellite towns around Brasília (National Capital located in the Federal District)

The selection of these urban areas was mainly dictated by the fact that all are among the most populated metropolitan regions in the country with the highest proportion of inhabitants in socio-economic classes D and E in relation to their general population, according to data based on the 2000 national census, as shown below.

Table 23. Urban areas with largest shares of D/E socio-economic classes.

Urban areas	Population	Proportion of classes D/E	Population of classes D/E
Metropolitan Region of Belo Horizonte	4,879,213	36%	1,756,517
Metropolitan Region of Recife	3,602,867	56%	2,017,606
Metropolitan Region of Porto Alegre	4,036,126	33%	1,331,922
Metropolitan Region of São Paulo	19,424,923	28%	5,438,978
Metropolitan Region of Rio de Janeiro	11,580,041	34%	3,937,214
Satellite Towns of Brasilia	2,337,078	32%	747,865
TOTAL	**45,860,248**		**15,230,102**

Source: Socio-economic surveys undertaken by IBOPE and ABEP in the year 2000.

Building upon this representativeness, a sample of 1,000 dwellers from socio-economic classes D and E was probabilistically selected from these urban areas, producing the following sample composition:

Table 24. Sample composition by urban areas.

Urban areas	Sample size	% of total sample
Metropolitan Region of Belo Horizonte	115	11,5
Metropolitan Region of Recife	130	13,0
Metropolitan Region of Porto Alegre	90	9,0
Metropolitan Region of São Paulo	360	36,0
Metropolitan Region of Rio de Janeiro	255	25,5
Satellite Towns of Brasilia	50	5,0
TOTAL	**1.000**	**100%**

Specifically, the sample was obtained from respondents drawn from the following municipalities belonging to the aforementioned urban areas:

Table 24. Sample composition by select municipalities.

Unit of Federation	Municipality	Sample size	Urban population (*)
DF	Samambaia	15	174.583
DF	Ceilândia	20	348.688
DF	Planaltina	15	185.873
MG	Santa Luzia	15	407.003
MG	Contagem	15	603.376
MG	Ribeirão das Neves	15	322.969
MG	**Belo Horizonte**	**70**	**2.399.920**
PE	Camaragibe	15	150.354
PE	Jaboatão dos Guararapes	30	651.355
PE	Olinda	15	387.494
PE	Paulista	15	299.744
PE	**Recife**	**55**	**1.515.052**
RJ	Belford Roxo	15	489.002
RJ	Duque de Caxias	15	855.010
RJ	Nilópolis	15	150.475
RJ	Queimados	15	139.118
RJ	São Gonçalo	30	973.372
RJ	São João de Meriti	15	466.996
RJ	Nova Iguaçu	30	844.583
RJ	**Rio de Janeiro**	**120**	**6.136.652**
RS	Alvorada	15	214.953
RS	Canoas	15	333.322
RS	Novo Hamburgo	15	258.754
RS	Viamão	15	261.971
RS	**Porto Alegre**	**30**	**1.440.939**
SP	Diadema	15	395.333
SP	Ferraz de Vasconcelos	15	176.532
SP	Francisco Morato	15	170.585
SP	**Guarulhos**	**15**	**1.283.253**
SP	Itaquaquecetuba	15	352.755
SP	Mogi das Cruzes	15	372.419
SP	Osasco	15	714.950
SP	Santo André	15	673.234
SP	São Bernardo do Campo	15	803.906
SP	**São Paulo**	**225**	**11.016.703**

(*) Populations estimates from a survey undertaken in 2006 by IBGE.

The final sample was of the stratified type, with size proportional to the size of the target population, where each of the six urban areas is considered a stratum. The selection of households from socio-economic classes D and E was made in four stages, namely:

- **First stage** – random selection of municipalities from those with highest number of householders with income up to three minimum wages, that is, with a monthly income up to US$ 592.00.[22]
- **Second stage** – selection of urban census sectors[23] within each municipality, where the average monthly income of a householder is up to three minimum wages.
- **Third stage** – selection of dwellings – using systematic jump, where on average, five interviews are undertaken on each census sector. Each interviewer receives the description of the census sector he/she is going to work with, with an indication on which block he/she should start. Once a household is selected, he/she should jump the next five dwellings, irrespective of a hit or not, and interview the next dwelling, until he/she reaches the pre-determined number of households.
- **Fourth stage** – selection of respondents – within each dwelling a respondent is selected, by choosing that with birthday date closest to the interview day, as long that he/she is aged between 13 and 70 years old. If a selected respondent refuses to answer the interview or the dwelling is found empty, this should be substituted according to the rule of systematic jump.

Sample characterization

In this section we present, in the form of tables, some socio-economic characteristics of the respondents and householders in the sample. The information is presented according to the urban areas, gender, income group, age group, type of work and education level.

[22] At the time of the interviews, in the month of June 2007, the minimum wage in Brazil was R$ 380.00 *reais*, and the exchange rate dollar used was US$ 1 dollar = R$ 1.926 *reais* (June 29, 2007).
[23] A census sector is the unity of division of a municipality in areas comprising of several blocks, used by the Brazilian census bureau (IBGE). The census sectors used in our sample scheme were those of the year 2000.

Houselholders

Table 25. Income groups.

Income group	%
Income group 1	10.1%
Income group 2	39.1%
Income group 3	37.9%
Income group 4	12.9%
TOTAL	**100.0%**

Base: total sample.

Table 26. Urban areas.

Urban area	%
Recife	13.1%
Belo Horizonte	12.1%
Rio de Janeiro	20.9%
São Paulo	37.2%
Porto Alegre	10.4%
Brasilia satellite towns	6.2%
TOTAL	**100.0%**

Base: total sample.

Table 27. Urban areas and income groups.

Metropolitan area / Income group		Recife	Belo Horizonte	Rio de Janeiro	São Paulo	Porto	Brasilia
1	**%**	23.6%	7.0%	11.4%	47.9%	6.0%	4.1%
2	**%**	16.8%	14.5%	19.5%	31.4%	13.3%	4.5%
3	**%**	8.5%	14.3%	24.4%	35.4%	10.8%	6.6%
4	**%**	8.6%	9.2%	23.3%	37.1%	8.2%	13.6%

Base: total sample.

Table 28. Gender.

Gender	%
Male	58.2%
Female	41.8%
TOTAL	**100.0%**

Base: total sample.

Table 29. Education level.

Education level for householders	%
None / Illiterate / Pre-school / Kidengarten	8.6%
First primary school years	38.1%
Last primary school years / complete	35.9%
High school / technical school	14.9%
University	1.1%
Does not know / no answer	1.3%
TOTAL	**100.0%**

Base: total sample.

Table 30. Main activity in the week preceding the interview.

Main activity	%
Worked	57.6%
Has not worked, but has a job	6.6%
Searched for a job	7.5%
Student	0.2%
House work	3.6%
Retired or on social security	14.5%
Permanently handicaped	1.1%
Does not work	9.0%
TOTAL	**100.0%**

Base: total sample.

Table 31. Position in the workforce in the week preceding the interview.

Position in the working force	%
Employed	48.9%
Self employed	50.0%
Commissioned worker	1.1%
Employee	0.0%
TOTAL	**100.0%**

Base: total sample.

Table 32. Contribution to the social security system.

Do you contribute to the social security system?	%
Yes	49.2%
No	50.8%
TOTAL	**100.0%**

Base: total sample.

Table 33. Age groups (in years).

Age group	%
13-18	0.4%
19-30	19.5%
31-50	52.7%
51 and older	27.5%
TOTAL	**100.0%**

Base: total sample.

Table 34. Monthly income group (detailed).

Income group	%
No income	20.5%
$1 to $150	14.4%
$151 to $225	18.7%
$226 to $300	9.4%
$301 to $450	11.9%
$451 to $900	3.8%
$901 to $1350	0.5%
$1351 to $1800	2.3%
Does not know/ no answer	18.4%
TOTAL	**100.0%**

Base: total sample.

Respondents

Table 35. Gender.

Gender	%
Male	34%
Female	66%
TOTAL	**100%**

Table 36. Main activity in the week preceding the interview.

Main activity in the week preceding the interview	%
Worked	43.1%
Has not worked, but has a job	3.6%
Searched for a job	7.7%
Student	3.3%
House work	12.9%
Retired or on social security	7.0%
Permanently handicaped	0.5%
Does not work	21.8%
TOTAL	**100.0%**

Table 37. Position in the workforce in the week preceding the interview.

Position in the workforce	%
Employed	45%
Self employed	53%
Commissioned worker	1%
Employee	1%
TOTAL	**100.0%**

Table 38. Contribution to the social security system.

Do you contribute to the social security system?	%
Yes	43%
No	57%
TOTAL	**100%**

Table 39. Education level.

Level of education	%
None / Illiterate / Pre-school / Kindengarten	5.2%
First primary school years	28.6%
Last primary school years / complete	39.0%
High school / technical school	26.2%
Graduated / Post-graduate	0.9%
TOTAL	**100.0%**

Table 40. Age group (in years).

Age group	%
13-18	8.7%
19-30	31.2%
31-50	45.8%
51 and older	14.4%
TOTAL	**100.0%**

Table 41. Monthly income group (detailed).

Income group	%
No income	50.3%
$1 to $150	11.6%
$151 to $225	14.5%
$226 to $300	5.0%
$301 to $450	6.5%
$451 to $900	2.6%
$901 to $1350	0.5%
$1351 to $1800	0.8%
Does not know / no answer	8.2%
TOTAL	**100.0%**