FIXED-MOBILE SUBSTITUTION

SECOND REPORT FOR BT

MARCH 2000

TABLE OF CONTENTS

TABLE OF CONTENTS

TABLES AND FIGURES

TABLES AND FIGURES

EXECUTIVE SUMMARY

This report on fixed-mobile substitution, based on a survey in February 2000 …

This report considers whether there is evidence of substitution between fixed and mobile phones. Two forms of substitution are analysed: substitution in calls and substitution in lines. In order to estimate the scale of these effects, we designed, commissioned and analysed market research to investigate the actual behaviour of consumers. The survey was conducted during February 2000 and consists of 3,003 telephone interviews – 2,030 obtained through fixed lines and 973 through mobile phones.

… finds strong evidence that both call and line substitution are taking place.

A previous report produced by •econ for BT, based on a similar survey concluded in September 1999, found strong evidence that both forms of substitution were taking place. The new survey provides further evidence of substitution and suggests a number of likely trends.

Respondent categories and their characteristics

Respondents receiving different combinations of fixed and mobile services exhibit different characteristics:

Throughout the report, survey respondents are classified according to the combination of fixed and mobile services that they subscribe to. Increasing mobile penetration is reflected in a increasing number of respondents with both a single fixed phone and a mobile since the last survey and a falling number of respondents with a single fixed phone only. There are significant differences in the characteristics of respondents using different combinations of services:

secondary lines are associated with fax and Internet access;

- the survey data suggests there is a relatively low probability of second fixed lines being answered when called. This suggests that most secondary lines are being used for fax and the Internet rather than voice calls;

mobile users are less likely than non-mobile users to answer a fixed line;

- furthermore, within a household, mobile users are less likely to answer a fixed line than those without a mobile. This suggests there are some individuals who use their own mobile as their main point of contact instead of their household's fixed line;

fixed lines are associated with home ownership;

- fixed lines are associated with home ownership. However, this link is less strong than in the last survey, suggesting that traditional deterrents to getting a second fixed line – such as lower income levels and uncertain housing tenures – may be losing importance;

fixed mobile substitution appears increasingly common amongst single-person households;

- the proportion of mobile only respondents living in a single person households has increased, and is now very similar to that amongst single fixed line respondents. In single person households, the inconvenience of sharing fixed lines with other household members is absent as a reason for a getting a mobile. Nevertheless, there is increasing fixed mobile substitution occurring amongst this group;

take-up of additional access is most prevalent amongst younger age groups;

- respondents without mobiles, especially single fixed line users, are disproportionately elderly or retired. Take-up of additional access – both fixed and mobile – is much more prevalent amongst younger age groups;

pre-paid phones may be driving rapid growth in mobile use amongst the poorest social groups; and

- the proportion of mobile only and single fixed and mobile users in the lowest social class band E has increased, suggesting that mobiles are becoming increasingly attractive to lower income groups. This is consistent with the rapid growth of pre-paid mobile phone packages; and

personal Internet usage is driving demand for second lines…

… and encouraging migration of voice onto mobile.

- Internet and fax usage is associated with the presence of second lines. The association is strongest for households with multiple fixed lines, but also occurs in households with a single fixed line and mobile. This is consistent with the use of fixed lines for data traffic and migration of voice traffic onto mobiles. Moreover, second lines are increasingly being used for personal rather than work purposes. This is likely to be due to increased personal use of the Internet.

Call substitution

Call substitution is common, may be increasing …

Call substitution between fixed and mobile phones is common and may be increasing. One-third of respondents said that they make mobile calls sometimes or often even though their home fixed line is easily available, slightly up from September 1999. The main reason given was that mobile calls are cheaper at certain times.

… and takes place at work as well as at home.

In the workplace, about one-third of those who pay their own mobile bills and have access to a fixed line at work make mobile calls sometimes or often. Where the employer pays for the mobile bill, this proportion increases to a half. The main reason given is the convenience of not having to return to a fixed phone.

Call substitution is in part being driven by line substitution …

Around one-fifth of respondents with one or more fixed lines and a mobile use their mobile as their main voice line.

… and is sensitive to variations in the call price differential between mobiles and fixed lines.

There is also evidence of significant price sensitivity between mobile and fixed phone calls. Asked about the effects of a hypothetical reduction in the price of mobile calls, more than one third of respondents said that their usage of fixed lines would fall if mobile call prices fell by one-half.

Line substitution

Substitution of mobiles for fixed lines is significant, but one-way.

The survey also provides evidence of line substitution in the form of respondents getting mobile phones instead of additional fixed lines. In particular, mobiles can substitute for additional fixed lines required for Internet, data and fax. However, fixed lines appear not to be able to provide services that substitute for the convenience of a mobile.

Going mobile only is typically an unconstrained long-term choice.

Most mobile only respondents do without a fixed line by choice. Moreover, doing without a fixed line is usually a medium-to-long-term arrangement, not a transitory one. Almost one-half of mobile only respondents have been without a fixed line for over one year.

Although mobile and secondary fixed line ownership are positively associated …

… the incremental effect of Internet access and fax ownership on demand for second fixed lines is smaller when a respondent has a mobile.

There is a positive correlation between ownership of mobile phones and having more than one fixed line, which suggests an underlying taste for telephony services driving demand for both fixed and mobile access. However, we provide strong econometric evidence that the *incremental* effect of drivers for access demand, such as Internet access and fax ownership, on demand for second fixed lines is smaller when a respondent has a mobile. This strongly supports the thesis that fixed-mobile substitution is occurring through Internet, data and fax users migrating voice services onto mobiles and using an existing single fixed line for non-voice services.

Mobiles are viewed as potential substitutes for second fixed lines…

Potential adopters of second fixed lines are much more likely to consider a mobile phone as an alternative than potential mobile adopters are to consider a second fixed line.

…with line choice being sensitive to perceived price differences between the two services.

Among single fixed users considering getting a mobile, the option of getting a second fixed line instead held little attraction, even if mobile services cost up to twice as much. However, in the case of single fixed respondents considering getting a second fixed line, roughly one quarter of the respondents said that they might prefer a mobile if the cost of the two services was equal.

1. INTRODUCTION

This report considers whether there is substitution between fixed and mobile phones, based on a bespoke market survey undertaken by FDS International during February 2000[1]. This is the second report produced by •econ for BT on this subject; the first drawing on data from a previous survey in September 1999. Both reports analyse two forms of substitution:

- ***substitution in calls***, that is individuals with access to both fixed and mobile phones switching individual calls from fixed phones to mobiles; and
- ***substitution in lines***, that is individuals deciding to get a mobile phone instead of getting a fixed line (or an additional fixed line).

The extent to which either form of substitution is currently occurring is an empirical matter. Therefore, we have designed, commissioned and analysed market research to investigate the actual behaviour of consumers. The February 2000 survey consisted of 3,003 telephone interviews – 2,030 obtained through fixed lines and 973 through mobile phones. It followed a similar methodology and format to the September 1999 survey, in order to allow comparisons between the two.[2] Although this report focuses on the results of the new survey – and can be read independently of the previous report – comparisons with the results of the previous survey are highlighted throughout.

Overall, we find strong evidence that both forms of substitution are taking place:

- There are significant numbers of people who make mobile calls when having access to fixed lines, and the predominant reason given for this is that mobile calls are cheaper at certain times.
- The growth of Internet and data usage appears to play an important role in triggering additional demand for access. We find that rather than getting an additional fixed line, some consumers appear to be migrating voice telephony onto mobile phones, thereby freeing existing fixed lines for Internet, data and fax use.

These results are consistent with those of the September 1999 survey. Furthermore, evidence points towards an increase in call and line substitution between the two surveys. Notably, the proportions of respondents who said that they make mobile calls from home sometimes or often even though their fixed line is easily available has risen.

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1 The full questionnaire can be found in Appendix D.

2 An explanation of the sample methodology for the February 2000 and September 1999 reports can be found in Appendix A.

NOTE ON TABLES AND FIGURES

In the tables and figures reported below, we show the number of observations used to calculate a proportion by "**N=…**". This provides a guide to the likely reliability of the proportion quoted.

2. RESPONDENT CATEGORIES

2.1. KEY FINDINGS

Within the report, respondents are divided into five categories, according to the combination of telephony services that they subscribe to:

- single fixed line users;
- multiple fixed line users;
- single fixed and mobile users;
- multiple fixed and mobile users; and
- mobile only users.

Together these categories account for all UK individuals over sixteen subscribing to at least one type of telephony service.

In the rest of this section, we analyse the proportions of the total population of UK individuals over sixteen subscribing to at least one telephony service lying within each of these five categories. The key findings are as follows:

- although single fixed users remain the largest overall category, as share of all telephony users they have declined markedly between the two surveys. This reflects increasing mobile penetration, which has led to a sharp increase in the number of single fixed and mobile users;
- our calculations on the relative sizes of the five user categories indicates that the overrepresentation of households with multiple fixed lines that occurs when surveying by making random calls to UK fixed lines is quite low. This suggests that most secondary lines are being used for non-voice applications, such as fax and the Internet; and
- our calculations also suggest that, in general, for households with one or more fixed lines, mobile users are slightly less likely to answer a household fixed line than are non-mobile users. This suggests there are some individuals who use their personal mobile phone as their main point of contact instead of their household fixed line. This is consistent with the findings below of some respondents using their mobile phone as their main line for receiving and making voice calls.

2.2. CATEGORY SAMPLE SIZES

The survey sample contains 3,003 observations. In Table 1, we show a breakdown of the sample by category of respondent for the September 1999 and February 2000 surveys. Where we report results for particular categories of respondents, it should be noted that sample errors vary according to the number of respondents in that category. Hence, for example, it is reasonable to assume that results for single fixed, and single fixed and mobile respondents should be more reliable than results for multiple fixed and mobile only respondents.

Table 1: Sample sizes for respondent categories

	Single fixed	*Multiple fixed*	*Single fixed and mobile*	*Multiple fixed and mobile*	*Mobile only*	*Total*
September 1999	983	99	990	346	*182*	***2,600***
February 2000	1,000	160	999	581	263	***3,003***

2.3. CATEGORY SIZES

Estimating the relative share of the telephony market population (i.e. all UK individuals over sixteen subscribing to at least one telephony service) accounted for by each category is complex. The sample proportions observed in the survey cannot be considered as a reliable proxy for the overall population proportions. This is because the surveyed proportions are subject to systematic sampling bias owing to the call-based methodology used in contacting them. There are three sources of potential bias:

- oversampling of respondents who have both a fixed line and a mobile, as they can be contacted via both modes of telephony;
- oversampling of multiple fixed lines respondents, as there is a greater likelihood of contacted them by random digit dialing than single fixed users; and
- undersampling of the most common categories (i.e. single fixed, and single fixed and mobile), as interviews of respondents in these categories did not take place once a quota of 1,000 was reached.

We obtained estimates of sizes of the five user categories, correcting for these sources of error. A detailed discussion of the method used is provided in Appendix C. Briefly, this involved estimating the relative probabilities of reaching each category of respondent via fixed line and via mobile, then computing the expected sample proportions, and comparing these with the sample proportions obtained. Throughout the process, we assumed that the average number of individuals over sixteen and the average number of individuals owning a mobile in a household (considering separately single fixed line households and multiple fixed line households) was given accurately by questions asked specifically on these topics. This is a reasonable assumption given the large sample sizes used.

In order to overcome the potential sampling biases identified above, the following adjustments were made:

- data taken before and after sampling quotas were completed were treated separately;
- fixed line and mobile samples were treated separately since they target different (though overlapping) subsets of the population;

- an oversampling parameter *d* was estimated to account for the increased likelihood of reaching a multiple fixed home rather than a single fixed home when making a random fixed line call. Put simply, if a single fixed household can be reached via 1 telephone number, we assume that a multiple fixed line household can be reached via 1+*d* "effective" telephone numbers. The expected value of *d* is between 0 and 1. The reason why *d* is likely to be less than 1 is because many secondary lines are connected only (or much of the time) to a fax machine or a modem and not to a voice telephone; and

- a further sampling parameter *m* was estimated to allow for possible differences between the likelihood of individuals with and without mobiles answering a household fixed line phone. This parameter could take values between –1 and 1. For example, in a two member household with one mobile, it may be that the non-mobile user is more likely to answer, because the mobile user is less often at home or perhaps expects the call to be for the non-mobile user (in this case, m would be negative). Alternatively, it may be that the mobile user is the chief user of all forms of telephony in the household (in this case, m would be positive).

Table 2 summarises the estimated proportions for both the September 1999 and the February 2000 surveys. The proportions were jointly estimated, with d constant for both surveys but m calculated separately.

Table 2: Estimated population proportions for respondent categories

	Sep-99	***Feb-00***
Single fixed	54.90%	47.90%
Multiple fixed	3.80%	4.20%
Single fixed and mobile	29.00%	35.10%
Multiple fixed and mobile	6.10%	6.80%
Mobile only	6.20%	6.00%
All categories	100%	100%
d	0.14	
m	-0.07	-0.22

We can observe the following:

- increasing mobile penetration is reflected in the large rise in the number of single fixed and mobile users at the expense of single fixed users;

- the multiple fixed line oversampling parameter *d* was found to be fairly small (0.14). This suggests that most secondary lines are being used for non-voice applications, such as fax and the Internet; and

- the parameter *m* reflecting the difference in probability of those with and without mobiles answering the household fixed phone was also found to be small but negative and increasing between the two surveys (-0.07 rising to -0.22). This indicates that mobile users are less likely to answer the household's fixed line. Having a mobile phone would be thus similar to having a 'private direct line' with the user not expecting to receive calls and not bothering in answering the fixed line. This is consistent, as it is shown below, with fixed and mobile users reporting that their mobile is their main means of making and receiving voice calls.

3. CHARACTERISTICS OF RESPONDENTS

3.1. KEY FINDINGS

This section discusses the characteristics of respondents using different combinations of services. The key findings are largely consistent with those of the September 1999 survey, although some trends are also apparent:

- ownership of multiple fixed lines is still positively associated with household size;
- multiple fixed lines are also associated with higher social class, suggesting that there are strong income effects;
- fixed lines, in general, are associated with home ownership. However, this association is less strong that in the last survey, suggesting that traditional deterrents to getting a second fixed line – such as lower income levels and uncertain housing tenures – may be losing importance;
- mobile-only individuals are disproportionately likely to be young and living in rented accommodation. The proportion of students amongst mobile-only individuals, though slightly higher than for other types, is small;
- the proportion of mobile only respondents living in a single person household has increased, and is now very similar to that amongst single fixed line respondents. This could be an indicator that where lines are not to be shared, there is an increasing substitution of fixed lines by mobiles;
- the proportion of retired and elder people amongst non-mobile respondents is higher than for the other user groups. This is particularly acute amongst single fixed line users, who are disproportionately elder or retired. This shows that take-up of additional access – fixed or mobile – is much more prevalent amongst younger age groups;
- an increase was found in the proportion of mobile only and single fixed and mobile users in the lowest social class band E, suggesting that mobiles are becoming more affordable. This is consistent with the rapid growth of pre-paid mobile phone packages;
- Internet and fax usage is associated with the presence of second lines. The association is strongest for households with multiple fixed lines, but it is also true for households with single fixed and mobile. This is consistent with the migration of data traffic onto fixed lines and voice to mobiles; and
- working at home is positively associated with having a second fixed line, either with or without a mobile. However, second lines are increasingly being used for personal rather than work purposes. This is likely to be due to increased personal use of the Internet.

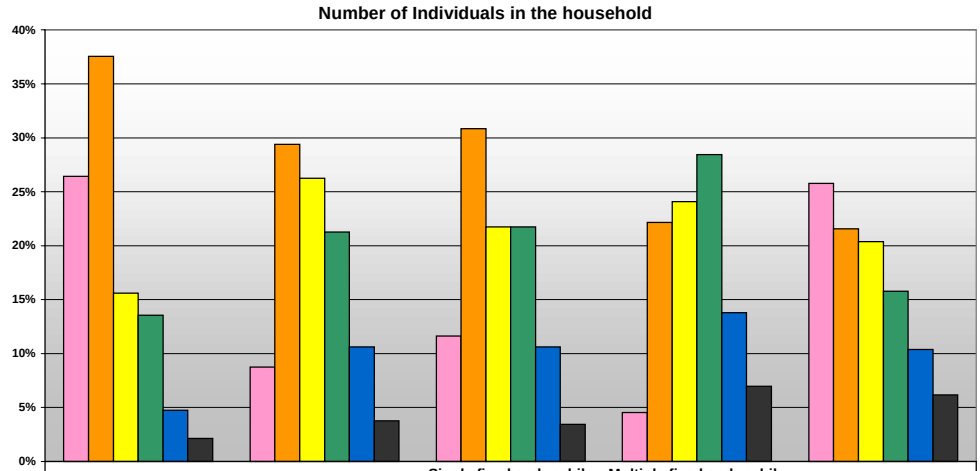
3.2. SOCIO-ECONOMIC CHARACTERISTICS OF RESPONDENT TYPES

The socio-economic characteristics of respondents using different combinations of fixed lines and mobiles are shown in Figure 1 to Figure 13.

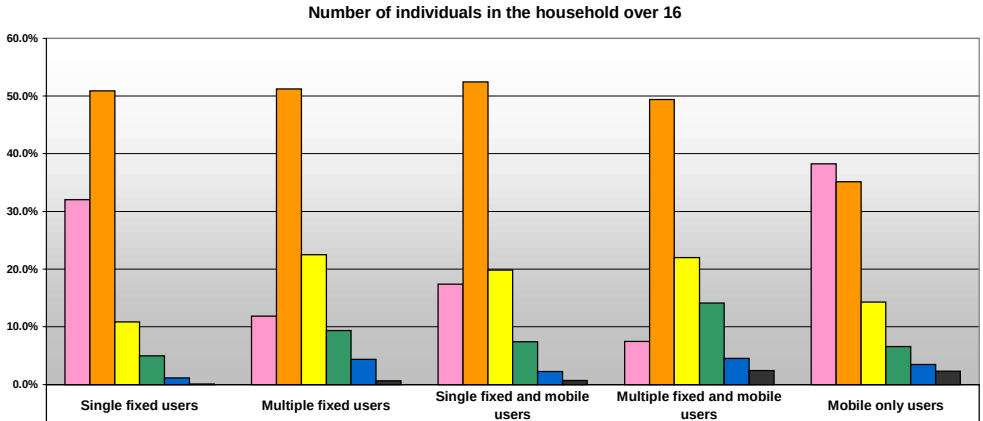
3.2.1. HOUSEHOLD SIZE AND COMPOSITION

Unsurprisingly, single fixed and mobile only respondents have a higher proportion of single member households (Figure 1). Multiple lines are positively related to household size. Nevertheless, the proportions of the largest households (five individuals or more) amongst mobile only respondents is similar to that amongst multiple line households. This reflects the fact that many large households represent shared residencies rather than integrated family units.

Figure 1: Household size



	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
1	26.4%	8.8%	11.6%	4.5%	25.8%
2	37.6%	29.4%	30.8%	22.2%	21.5%
3	15.6%	26.3%	21.7%	24.1%	20.4%
4	13.6%	21.3%	21.7%	28.5%	15.8%
5	4.8%	10.6%	10.6%	13.8%	10.4%
>5	2.1%	3.8%	3.4%	7.0%	6.2%
N =	988	160	989	573	260

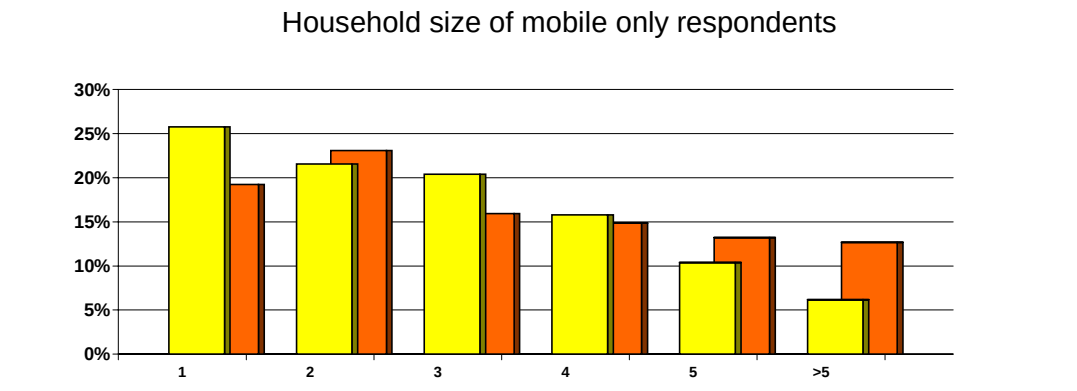


	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
1	32.1%	11.9%	17.4%	7.5%	38.2%
2	50.9%	51.3%	52.4%	49.4%	35.1%
3	10.9%	22.5%	19.8%	22.0%	14.3%
4	5.0%	9.4%	7.4%	14.1%	6.6%
5	1.1%	4.4%	2.2%	4.5%	3.5%
>5	0.1%	0.6%	0.7%	2.4%	2.3%
N =	986	160	988	573	259

In general, the proportions observed are similar to those found in the September 1999 survey. However, it is notable that the number of single person households amongst mobile-only users has increased significantly (see Figure 2). Single person households are of particular interest since for these individuals there is no incentive to get a mobile either because a fixed line is being used by other family members or because they wish to separate out some calls on a separate bill. Rather, the choice between fixed and mobile telephony should be influenced primarily by straightforward value-for-money concerns. Therefore, a greater proportion of single person

households choosing to go mobile-only provides some evidence of increasing fixed-mobile substitution at the access level.

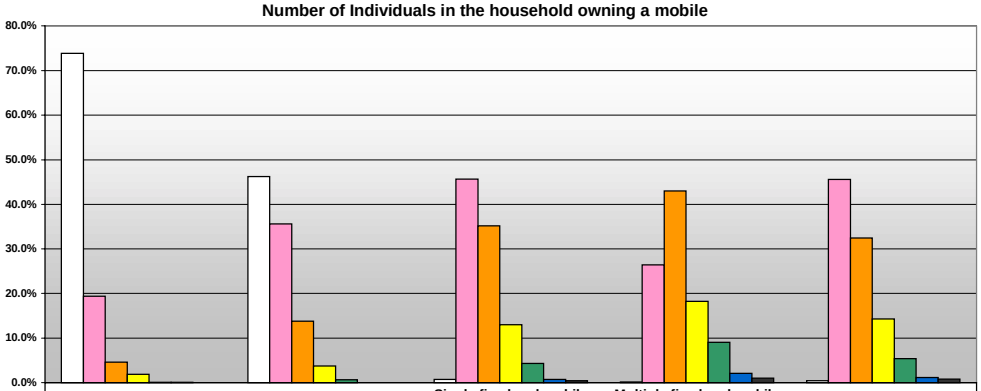
Figure 2: Mobile only respondents by household size, September 1999 and February 2000



	1	2	3	4	5	>5	N =
Feb-00	25.8%	21.5%	20.4%	15.8%	10.4%	6.2%	263
Sep-99	19.2%	23.1%	15.9%	14.8%	13.2%	12.6%	182

Figure 3 shows the number of mobiles in a household by type of services received. Notice that where the respondent has a mobile, it is typical (in more than half the cases) to find more than one mobile phone in the household.

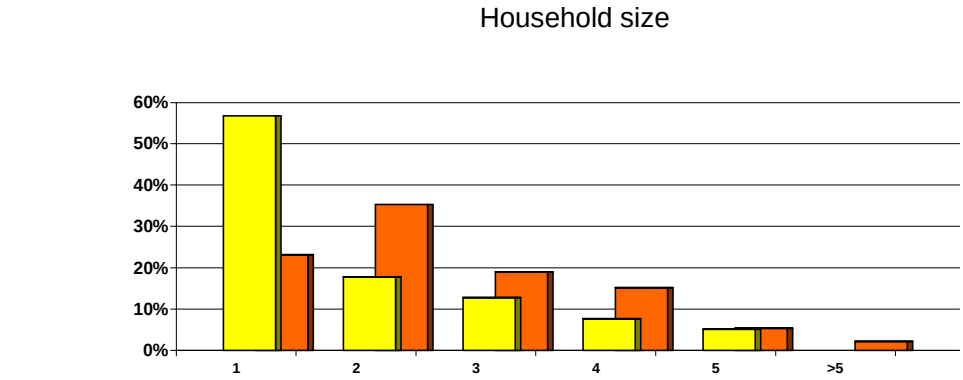
Figure 3: Mobiles in the household



	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
0	73.9%	46.3%	0.7%	0.2%	0.4%
1	19.4%	35.6%	45.7%	26.4%	45.6%
2	4.6%	13.8%	35.2%	43.0%	32.4%
3	1.9%	3.8%	13.0%	18.3%	14.3%
4	0.1%	0.6%	4.3%	9.0%	5.4%
5	0.1%	0.0%	0.7%	2.1%	1.2%
>5	0.0%	0.0%	0.4%	1.0%	0.8%
N =	995	160	992	575	259

The large proportion of households with just one mobile amongst mobile only respondents reflects the large number of single person households within this category. To illustrate this, Figure 4 shows the distribution by household size of mobile only users with just one mobile in the household, and contrasts this with the distribution by household size of the rest of respondents who own the only mobile in their household (i.e. with a fixed line). More than half of the mobile only respondents live in a single person household, compared with less than a quarter of single mobile owners having a fixed line.

Figure 4: Distribution of single mobile households by household size

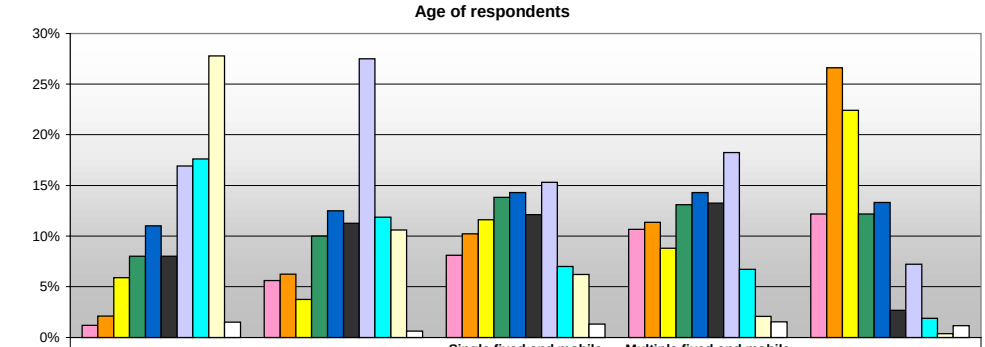


	1	2	3	4	5	>5	N =
Mobile only respondents	56.8%	17.8%	12.7%	7.6%	5.1%		118
Rest of respondents owning the only mobile in the household	23.1%	35.3%	19.0%	15.1%	5.3%	2.2%	719

3.2.2. AGE AND SOCIO-ECONOMIC STATUS

Figure 5 shows the age distribution of respondents by type. In general, the age distributions of 'single fixed and mobile' and 'multiple fixed and mobile' respondents are fairly representative of the working age population. On the other hand, respondents with 'single fixed' or 'multiple fixed' – i.e. respondents not having a mobile – are disproportionately older, while mobile only respondents are disproportionately younger. It is apparent that mobile take-up is negatively correlated with age.

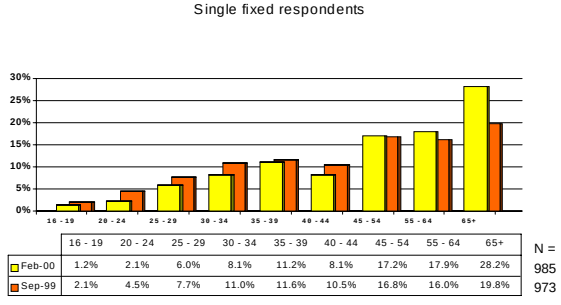
Figure 5: Age of respondents



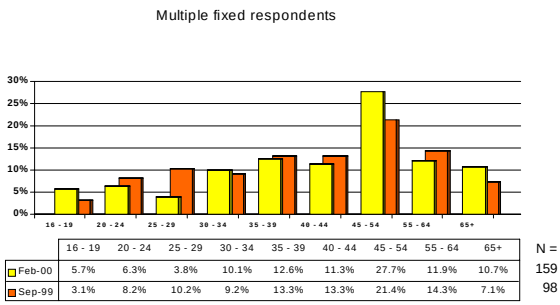
	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
16 - 19	1.2%	5.6%	8.1%	10.7%	12.2%
20 - 24	2.1%	6.3%	10.2%	11.4%	26.6%
25 - 29	5.9%	3.8%	11.6%	8.8%	22.4%
30 - 34	8.0%	10.0%	13.8%	13.1%	12.2%
35 - 39	11.0%	12.5%	14.3%	14.3%	13.3%
40 - 44	8.0%	11.3%	12.1%	13.3%	2.7%
45 - 54	16.9%	27.5%	15.3%	18.2%	7.2%
55 - 64	17.6%	11.9%	7.0%	6.7%	1.9%
65 +	27.8%	10.6%	6.2%	2.1%	0.4%
REF	1.5%	0.6%	1.3%	1.6%	1.1%
N =	1,000	160	999	581	263

Furthermore, in Figure 6 we can observe an increase in the share of over-65s amongst non-mobile respondents (especially amongst single fixed) between February 2000 and September 1999. This appears to confirm that elder generations have a much lower response rate to new technologies and that adoption of mobiles continues to be disproportionately by the young.

Figure 6: Age of non-mobile users, September 1999 and February 2000



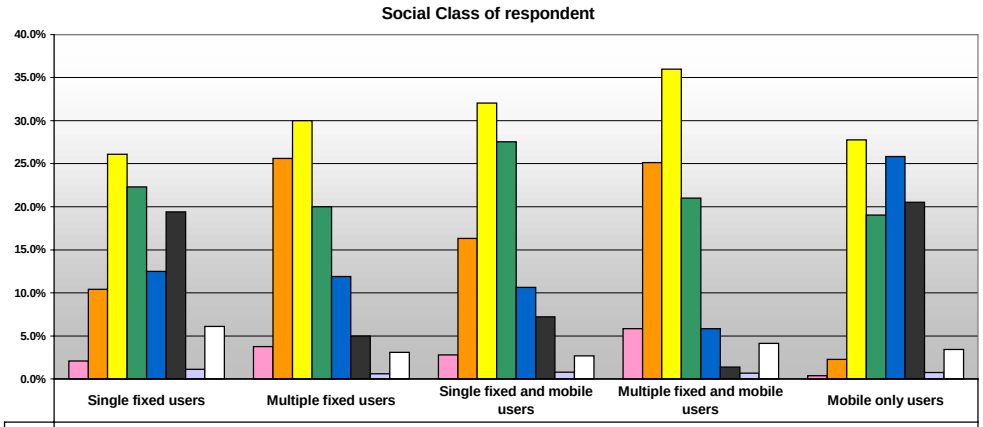
	16 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 54	55 - 64	65+	N =
Feb-00	1.2%	2.1%	6.0%	8.1%	11.2%	8.1%	17.2%	17.9%	28.2%	985
Sep-99	2.1%	4.5%	7.7%	11.0%	11.6%	10.5%	16.8%	16.0%	19.8%	973



	16 - 19	20 - 24	25 - 29	30 - 34	35 - 39	40 - 44	45 - 54	55 - 64	65+	N =
Feb-00	5.7%	6.3%	3.8%	10.1%	12.6%	11.3%	27.7%	11.9%	10.7%	159
Sep-99	3.1%	8.2%	10.2%	9.2%	13.3%	13.3%	21.4%	14.3%	7.1%	98

Figure 7 highlights the positive correlation between social class[3] (which can be taken as a broad proxy for income) and take-up of second lines and mobiles.

Figure 7: Social class

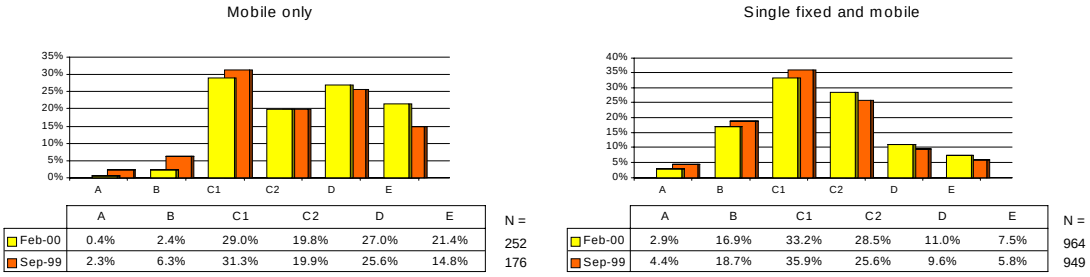


	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
A	2.1%	3.8%	2.8%	5.9%	0.4%
B	10.4%	25.6%	16.3%	25.1%	2.3%
C1	26.1%	30.0%	32.0%	36.0%	27.8%
C2	22.3%	20.0%	27.5%	21.0%	19.0%
D	12.5%	11.9%	10.6%	5.9%	25.9%
E	19.4%	5.0%	7.2%	1.4%	20.5%
DK	1.1%	0.6%	0.8%	0.7%	0.8%
REF	6.1%	3.1%	2.7%	4.1%	3.4%
N =	1,000	160	999	581	263

Figure 8 reveals an increase in the proportion of the lowest social classes D and E amongst 'mobile only' and 'single fixed and mobile' respondents since the previous survey in September. This suggests that mobiles are becoming more affordable, which is consistent with the rapid growth in sales of pre-paid packages. Other things being equal, this apparent trend implies increased scope for both call and line fixed mobile substitution, in general and especially within social band E.

[3] Respondents were asked a series of questions in order to assess their social class based on standard definitions of six social classes, namely (in descending order) A, B, C1, C2, D and E. A minority of respondents gave inconsistent responses to these questions and are denoted as don't knows (DK) or refused to answer (REF).

Figure 8: Social class of mobile only respondents, September 1999 and February 2000



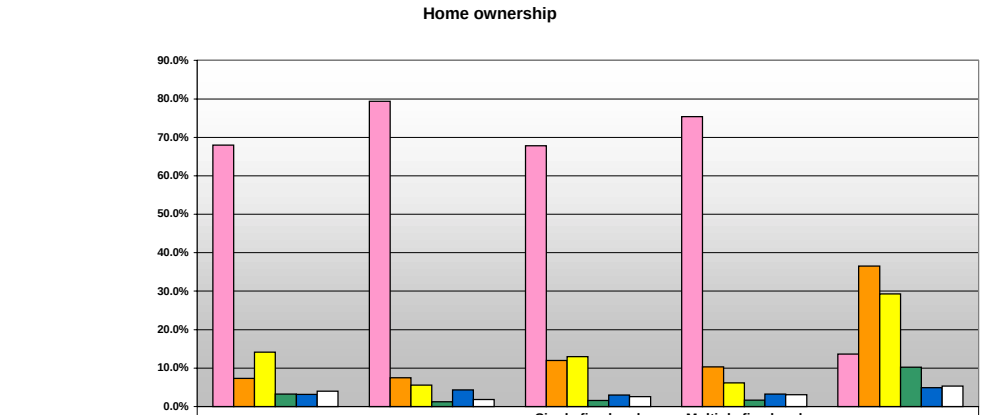
	A	B	C1	C2	D	E	N =
Feb-00	0.4%	2.4%	29.0%	19.8%	27.0%	21.4%	252
Sep-99	2.3%	6.3%	31.3%	19.9%	25.6%	14.8%	176

	A	B	C1	C2	D	E	N =
Feb-00	2.9%	16.9%	33.2%	28.5%	11.0%	7.5%	964
Sep-99	4.4%	18.7%	35.9%	25.6%	9.6%	5.8%	949

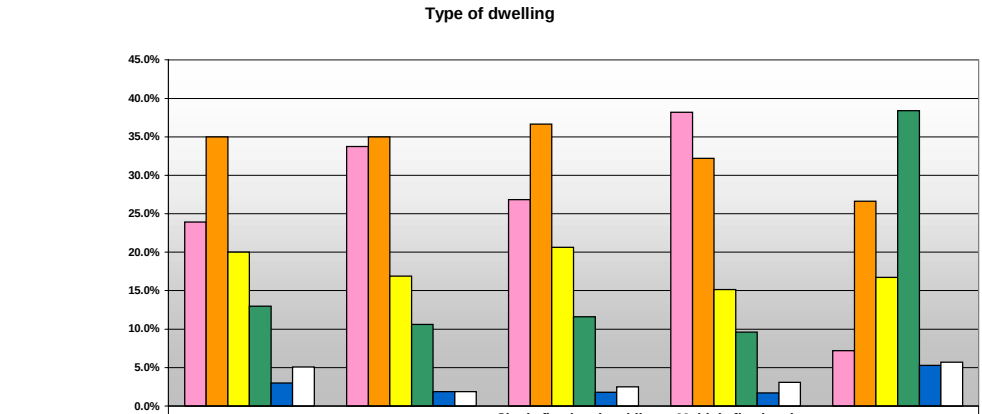
Figure 9 highlights the close relationship between second fixed lines and home ownership. This finding is unsurprising, being related to greater security of housing tenure and, typically, higher income levels. The proportions of detached and semi-detached houses are also comparatively large for respondents with multiple fixed lines – regardless of whether they have a mobile; this can be linked to higher home ownership ratios, higher income levels and larger household sizes typical for such properties.

Mobile only respondents are typically renting, and living in a flat/maisonette. This is to be expected in a relatively young group, but also points to less secure housing tenure as a main driver for mobile only choice. In particular, installation charges and minimum contract periods for fixed lines may reduce the relative attractiveness of fixed lines against mobile for those with short housing tenures.

Figure 9: Home ownership and type of dwelling



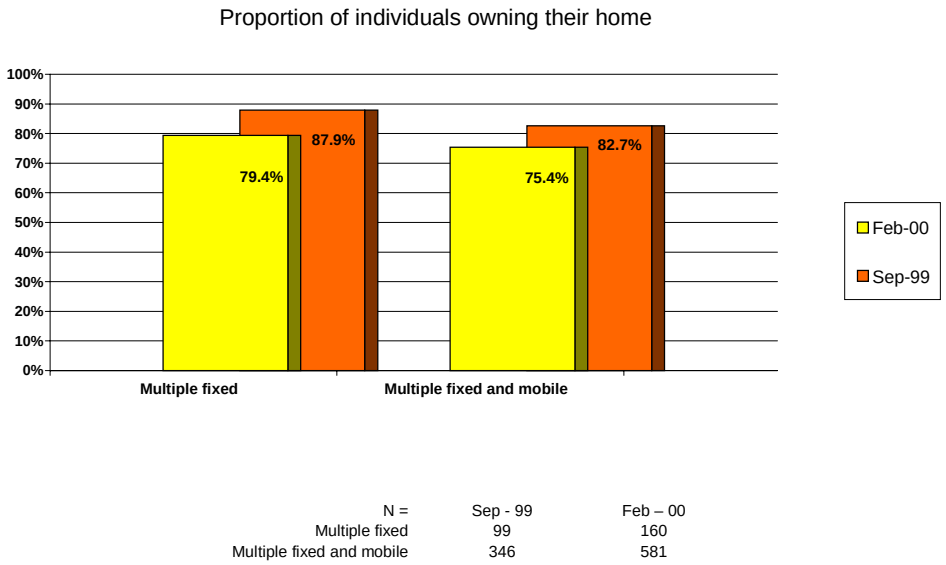
	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
Own	68.0%	79.4%	67.8%	75.4%	13.7%
Rent - private	7.3%	7.5%	12.0%	10.3%	36.5%
Rent - from local authority	14.2%	5.6%	13.0%	6.2%	29.3%
Housing association	3.3%	1.3%	1.6%	1.7%	10.3%
Other	3.2%	4.4%	3.0%	3.3%	4.9%
REF	4.0%	1.9%	2.6%	3.1%	5.3%
N =	1,000	160	999	581	263



	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
Detached house	23.9%	33.8%	26.8%	38.2%	7.2%
Semi-detached house	35.0%	35.0%	36.6%	32.2%	26.6%
Terraced house	20.0%	16.9%	20.6%	15.2%	16.7%
Flat / maisonette	13.0%	10.6%	11.6%	9.6%	38.4%
Other	3.0%	1.9%	1.8%	1.7%	5.3%
REF	5.1%	1.9%	2.5%	3.1%	5.7%
N =	1,000	160	999	581	263

However, Figure 10 suggests that the importance of owner-occupied housing an a factor associated with take-up of second lines is gradually declining. This suggests that second line take-up is gradually becoming more universal rather than strongly conditioned by housing type and income. It is reasonable to conjecture that this is due to increasing personal use of the Internet.

Figure 10: Home ownership amongst multiple fixed line respondents, September 1999 and February 2000



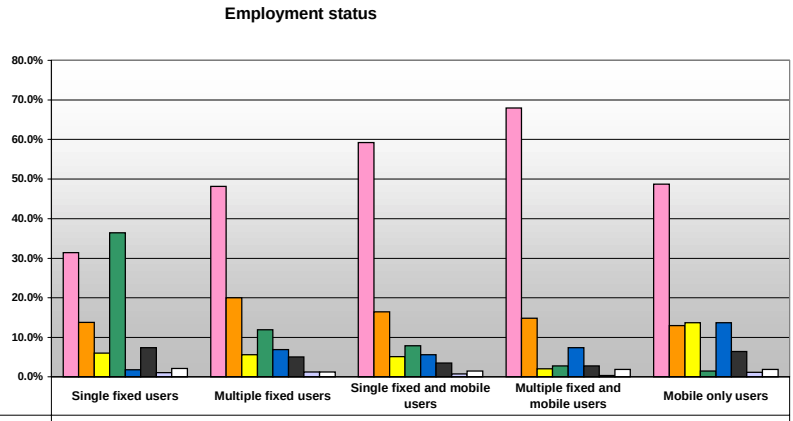
N =	Sep - 99	Feb – 00
Multiple fixed	99	160
Multiple fixed and mobile	346	581

Figure 11 shows the employment status of respondents by type of services received. Two observations stand out:

- there is a disproportionately large percentage of retired people amongst non-mobile respondents. This is especially noticeable for single fixed respondents, where retired people are by far the largest group. This proportion has increased significantly since the last survey (see Figure 12), consistent with the findings above in relation to over-65s; and

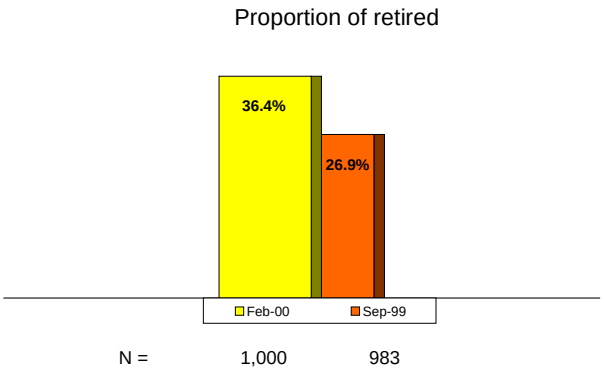
- students and the unemployed are comparatively larger amongst mobile only users. However, full-time workers remain by far the largest group, as for all types but single fixed.

Figure 11: Employment status



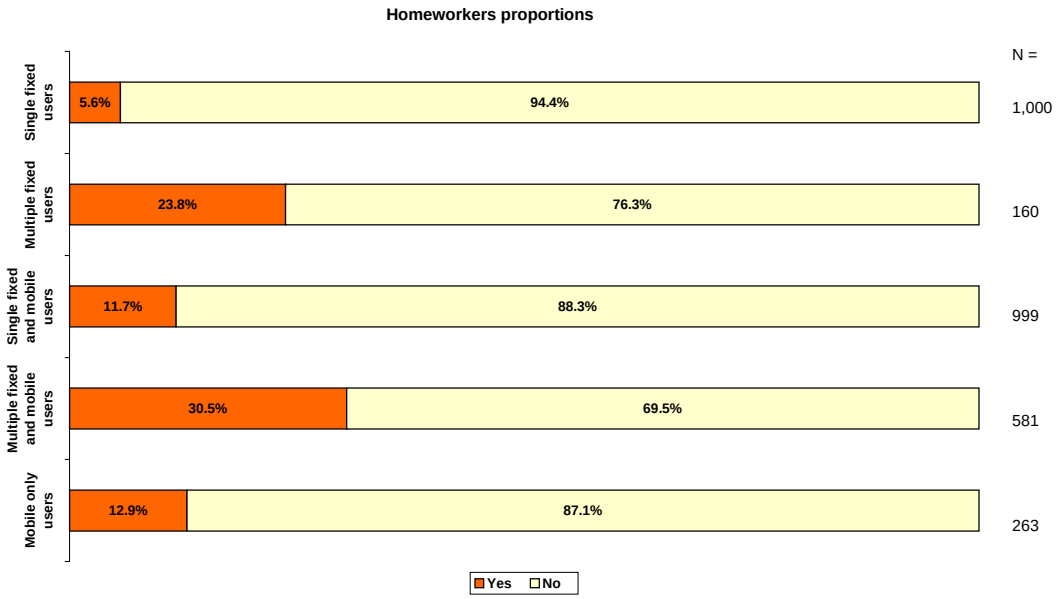
	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
Full time (30+ h.p.w.)	31.4%	48.1%	59.3%	68.0%	48.7%
Part time (8 - 29 h.p.w.)	13.8%	20.0%	16.4%	14.8%	12.9%
Temp. not working	6.0%	5.6%	5.1%	2.1%	13.7%
Retired	36.4%	11.9%	7.9%	2.8%	1.5%
Student	1.8%	6.9%	5.6%	7.4%	13.7%
Shoping and looking after the house	7.4%	5.0%	3.5%	2.8%	6.5%
Other	1.1%	1.3%	0.7%	0.3%	1.1%
REF	2.1%	1.3%	1.5%	1.9%	1.9%
N =	1,000	160	999	581	263

Figure 12: Proportion of retired amongst single fixed users, September 1999 and September 2000



Although the proportion of homeworkers in the whole sample is lower than in the previous survey, the strong association between having a second fixed line and being a homeworker is reconfirmed by Figure 13.

Figure 13: Proportions of homeworkers



3.3. USAGE OF TELEPHONY AND NEW TECHNOLOGIES

3.3.1. MAIN USE OF LINES

Figure 14 shows the relative usage levels of different lines for work and personal purposes. The main findings are as follows:

- the proportion of individuals using their line mainly for work amongst single line respondents (fixed or mobile) is very small. Amongst multiple line users, lines used mainly for work are usually secondary lines (either fixed or mobile, but especially the former). Some 20-30% of respondents with more than one fixed line use the secondary line mainly for work purposes; where the individual has both a fixed line (or lines) and mobile, the mobile is used mainly for work by 16-26%; and

- mobile phones are much more likely than fixed lines to be used for mixed work and personal purposes, which probably reflects the convenience of portability and having telephone access available all through the day.

Figure 14: Main use of lines

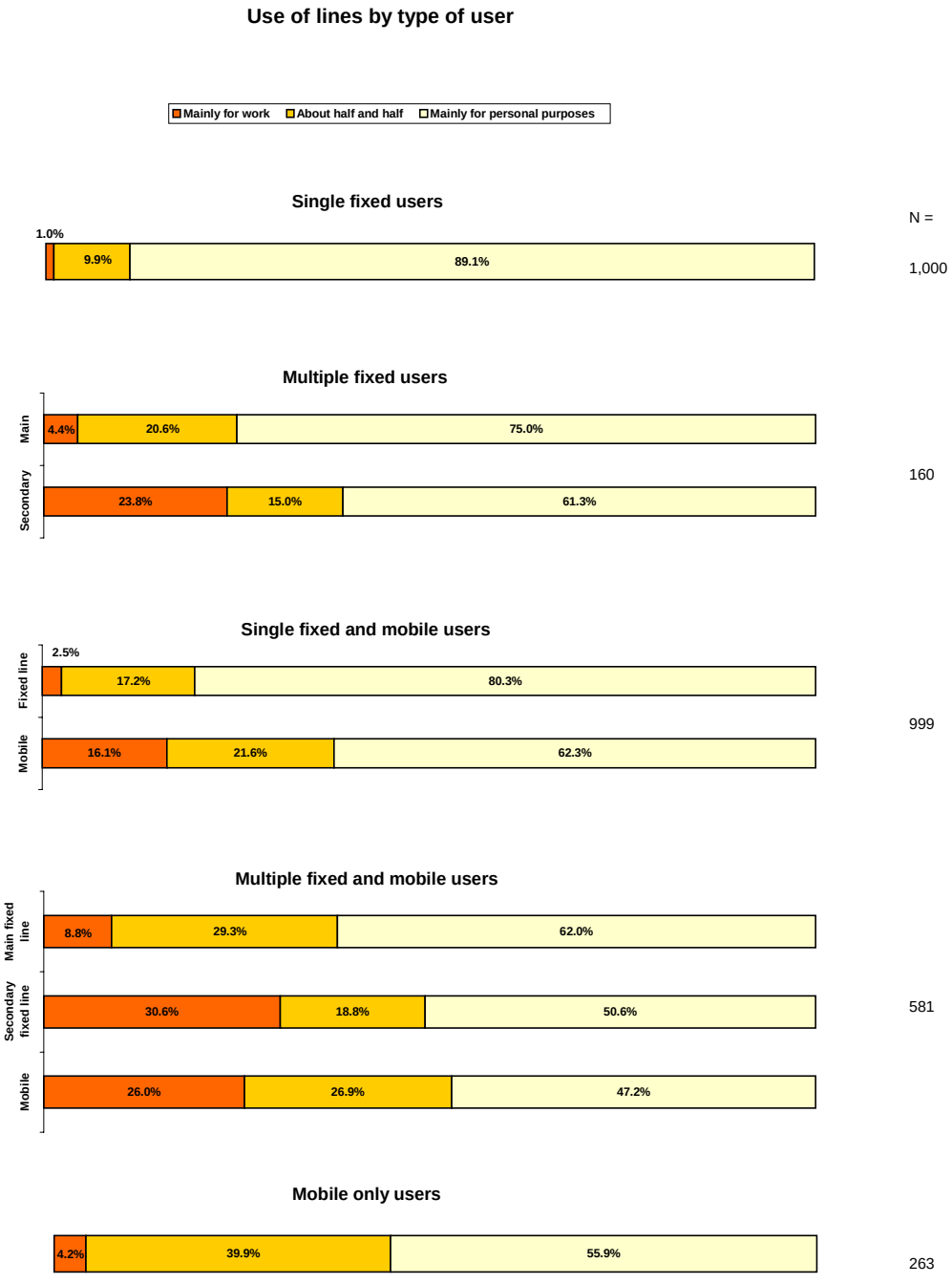
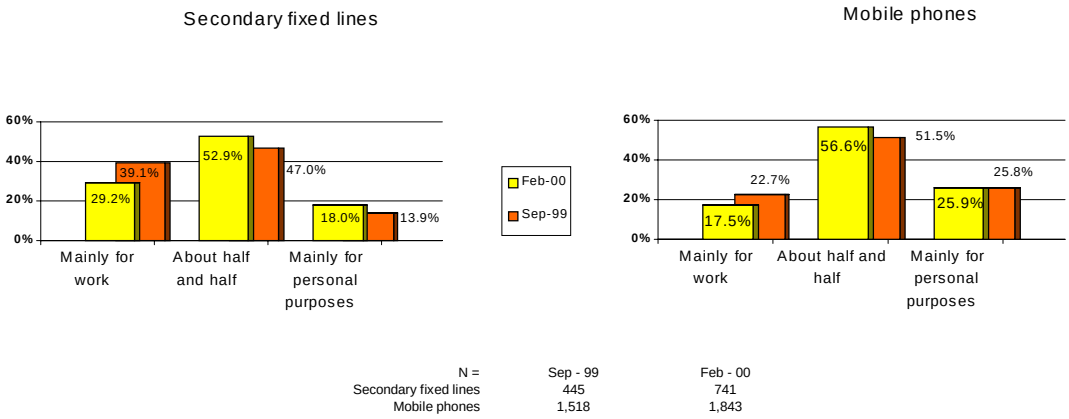


Figure 15 provides evidence that the use of secondary lines and mobiles for personal rather than work purposes has grown since the previous survey. However, it is unlikely that the use of such lines for work purposes has actually stopped increasing. Rather, use for personal purposes is growing at a much faster rate, as use of the Internet and mobile phones become an increasingly common part of everyday life.

Figure 15: Main use of secondary fixed lines and mobiles September 1999 and February 2000

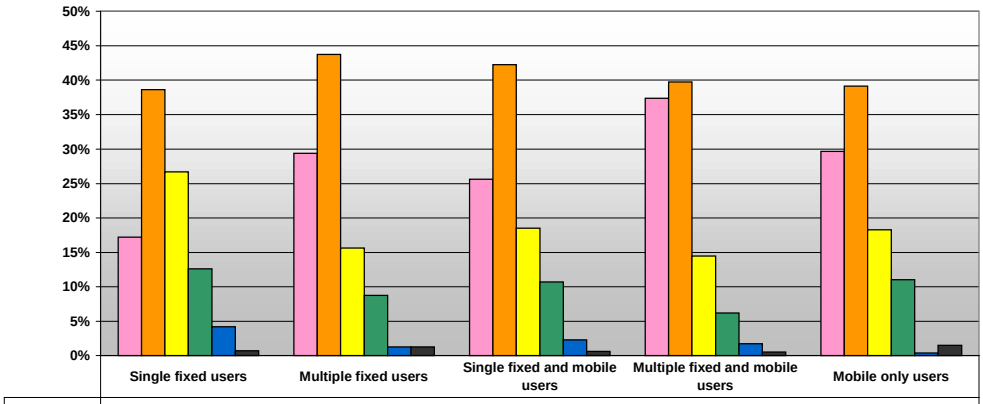


3.3.2. USAGE OF VOICE, FAX AND INTERNET

Figure 16 and Figure 17 show relative usage of voice, fax and Internet/data calls by different type of services received. There is little variation in voice usage across the categories. However, fax and Internet/data usage reveal some important observations. Unsurprisingly, fax and Internet usage is closely associated with having multiple fixed lines, with or without mobiles. However, 'single fixed and mobile' respondents show fax and Internet usage patterns much more similar to 'multiple fixed' and 'multiple fixed and mobile' than to 'single fixed' or 'mobile only'. This evidence suggests that such users are migrating voice to mobile and data to fixed.

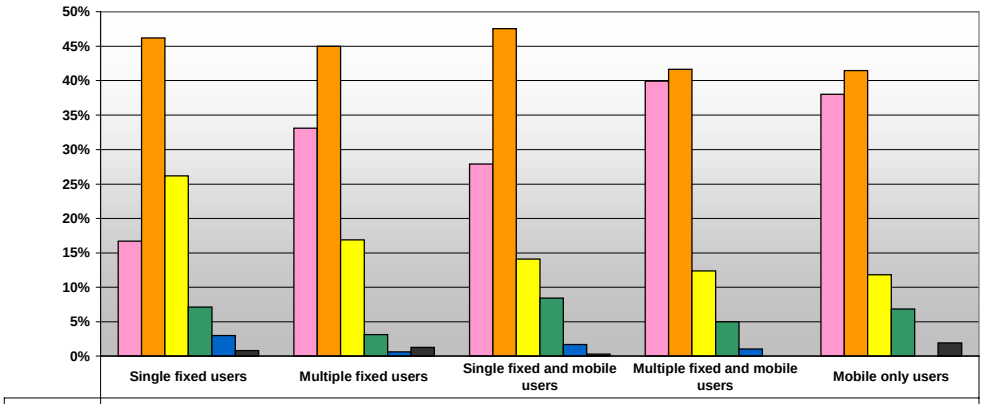
Figure 16: Phone usage - voice

How often do you make outgoing voice calls?



	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
Very often	17.2%	29.4%	25.6%	37.4%	29.7%
Quite often	38.6%	43.8%	42.2%	39.8%	39.2%
Sometimes	26.7%	15.6%	18.5%	14.5%	18.3%
Rarely	12.6%	8.8%	10.7%	6.2%	11.0%
Never	4.2%	1.3%	2.3%	1.7%	0.4%
Don't know	0.7%	1.3%	0.6%	0.5%	1.5%
N =	1,000	160	999	581	263

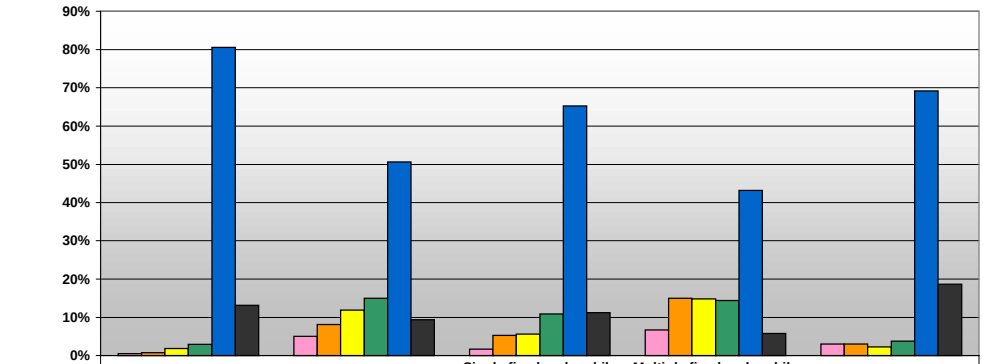
How often do you receive voice calls?



	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
Very often	16.7%	33.1%	27.9%	39.9%	38.0%
Quite often	46.2%	45.0%	47.6%	41.7%	41.4%
Sometimes	26.2%	16.9%	14.1%	12.4%	11.8%
Rarely	7.1%	3.1%	8.4%	5.0%	6.8%
Never	3.0%	0.6%	1.7%	1.0%	0.0%
Don't know	0.8%	1.3%	0.3%	0.0%	1.9%
N =	1,000	160	999	581	263

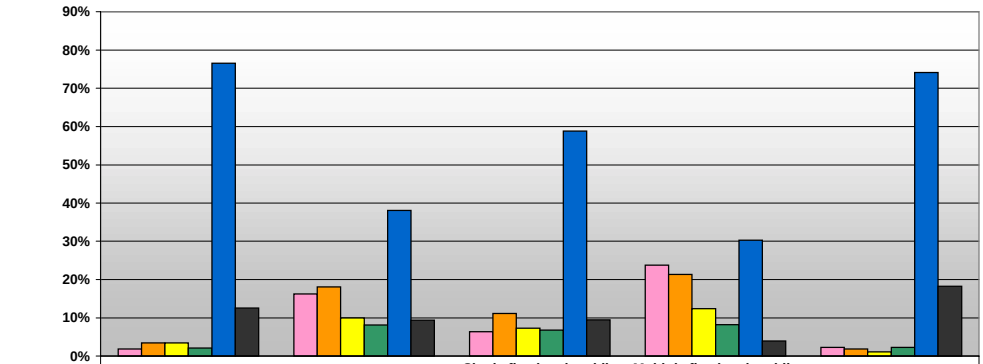
Figure 17: Phone usage – fax and Internet/data

How often do you send and receive faxes?



	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
Very often	0.5%	5.0%	1.7%	6.7%	3.0%
Quite often	0.8%	8.1%	5.3%	15.0%	3.0%
Sometimes	1.9%	11.9%	5.6%	14.8%	2.3%
Rarely	3.0%	15.0%	10.9%	14.5%	3.8%
Never	80.6%	50.6%	65.3%	43.2%	69.2%
Don't know	13.2%	9.4%	11.2%	5.9%	18.6%
N =	1,000	160	999	581	263

How often do you make internet and data calls?



	Single fixed users	Multiple fixed users	Single fixed and mobile users	Multiple fixed and mobile users	Mobile only users
Very often	1.9%	16.3%	6.4%	23.8%	2.3%
Quite often	3.4%	18.1%	11.1%	21.3%	1.9%
Sometimes	3.4%	10.0%	7.3%	12.4%	1.1%
Rarely	2.1%	8.1%	6.8%	8.3%	2.3%
Never	76.6%	38.1%	58.9%	30.3%	74.1%
Don't know	12.6%	9.4%	9.5%	4.0%	18.3%
N =	1,000	160	999	581	263

3.3.3. PC AND FAX OWNERSHIP AND USE OF THE INTERNET

Figure 18 highlights the positive association between multiple lines and both PC ownership and Internet access. This relationship, which is strongest for multiple fixed and mobile, and weaker for single fixed and mobile, is consistent with the data above. To a lesser extent – probably due to limited personal usage possibilities – the same holds for fax ownership (Figure 19).

Figure 18: PC ownership and Internet access

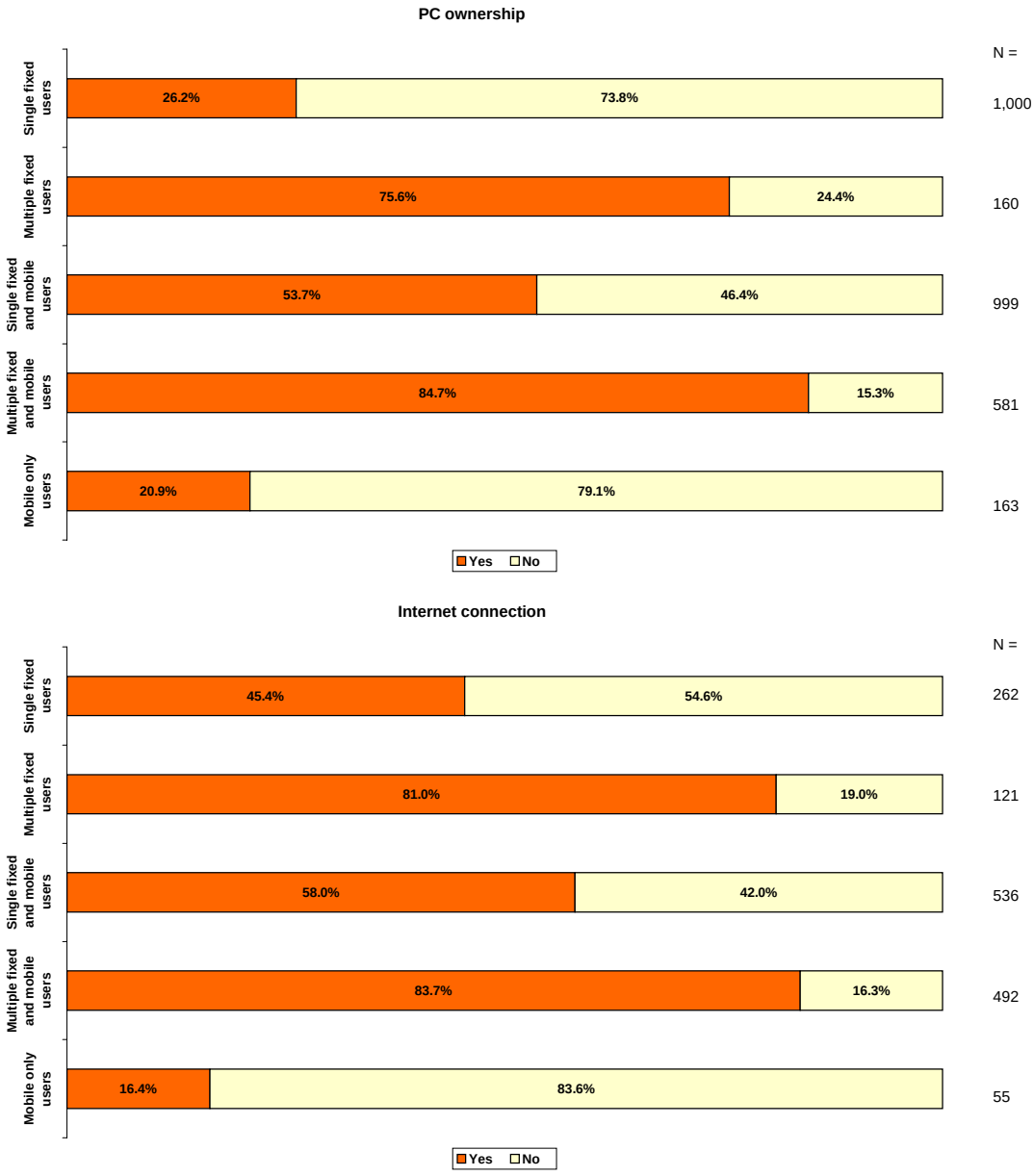
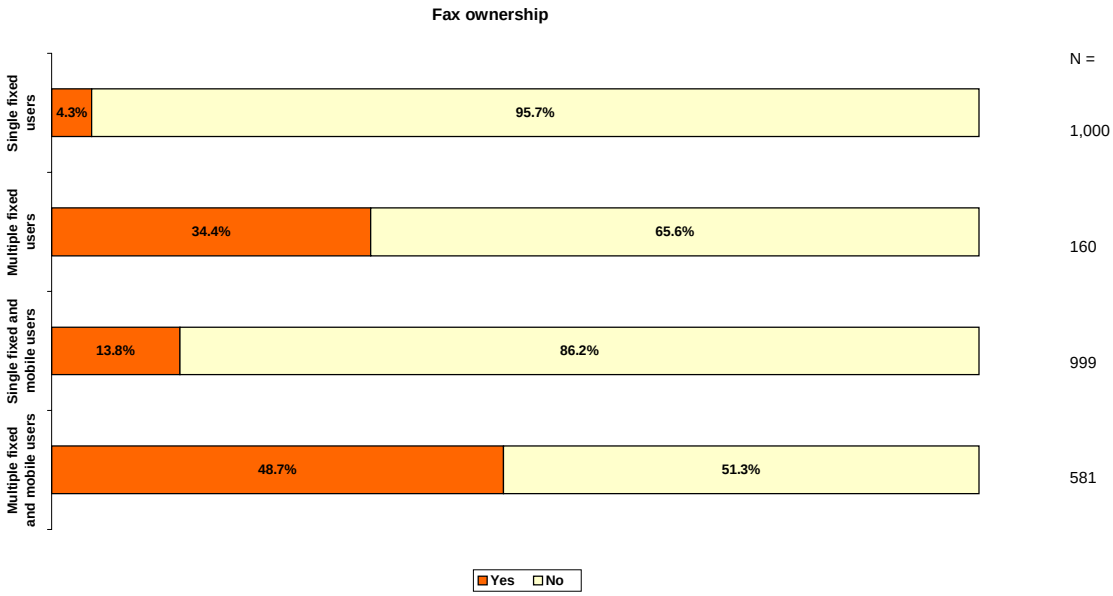


Figure 19: Fax ownership



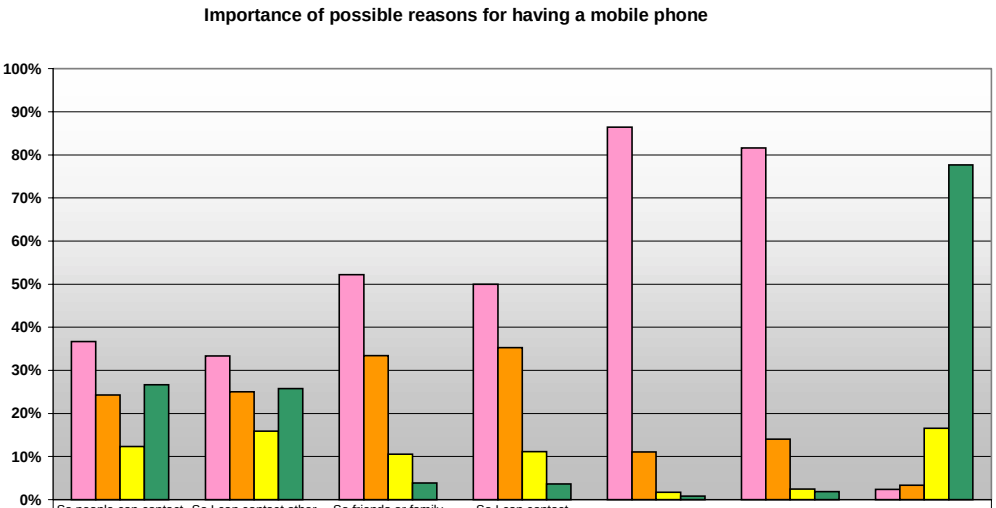
3.4. ADDITIONAL CHARACTERISTICS OF MOBILE USERS

3.4.1. REASONS FOR HAVING A MOBILE

Figure 20 describes the relative importance of possible reasons for having a mobile phone. The results were similar to those of the September 1999 survey. The most important reason for owning a mobile is being both contactable and being able to make contact in case of emergency; to facilitate personal contacts is the second.

Being contactable and being able to contact others appear to be equally important.

Figure 20: Reasons for mobile ownership



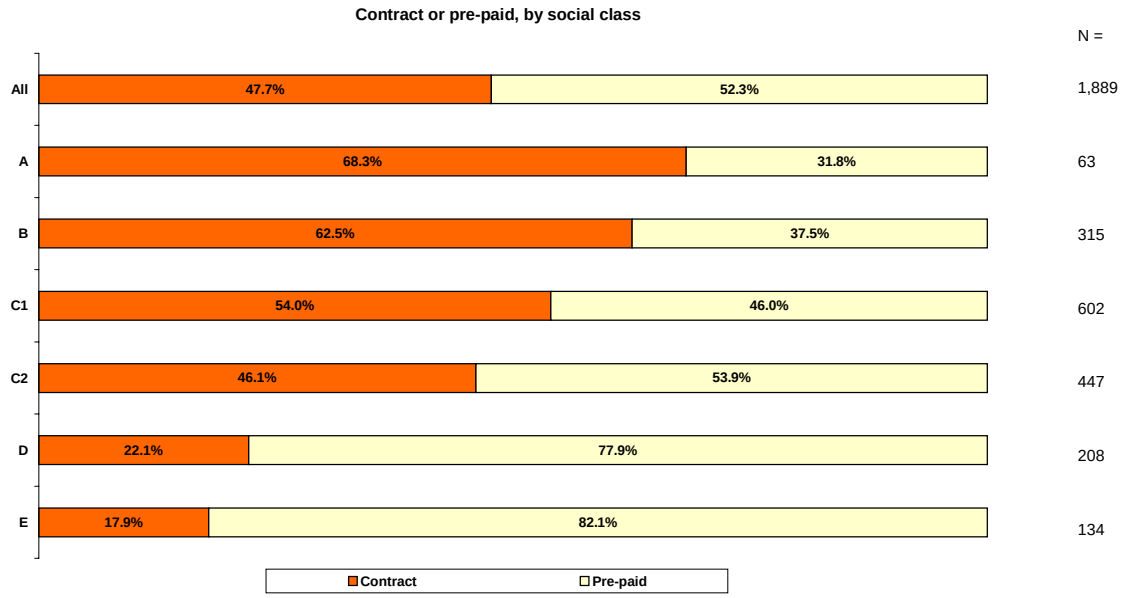
	So people can contact me to do with work or business	So I can contact other people to do with work or business	So friends or family can contact me more easily	So I can contact friends or family more easily	So I can make calls in an emergency	So people can call me in an emergency	Because it matters for my image
Very important	36.7%	33.3%	52.2%	50.0%	86.4%	81.6%	2.4%
Quite important	24.3%	25.0%	33.4%	35.3%	11.1%	14.1%	3.4%
Not very important	12.3%	15.9%	10.5%	11.1%	1.7%	2.4%	16.6%
Not at all important	26.7%	25.8%	3.9%	3.6%	0.8%	1.9%	77.7%

N = 1,843

3.4.2. CONTRACT VS. PRE-PAID

Figure 21 shows the relative take-up levels of contract and pre-paid mobile phone packages for different social classes. Whereas the higher social classes reveal a clear preference for contract packages, this is reversed for the lower social classes. The very high level of take-up of pre-paid packages amongst the lowest class E is consistent with the observation that the emergence of this product segment may be driving rapid growth in mobile phone usage amongst lower income groups.

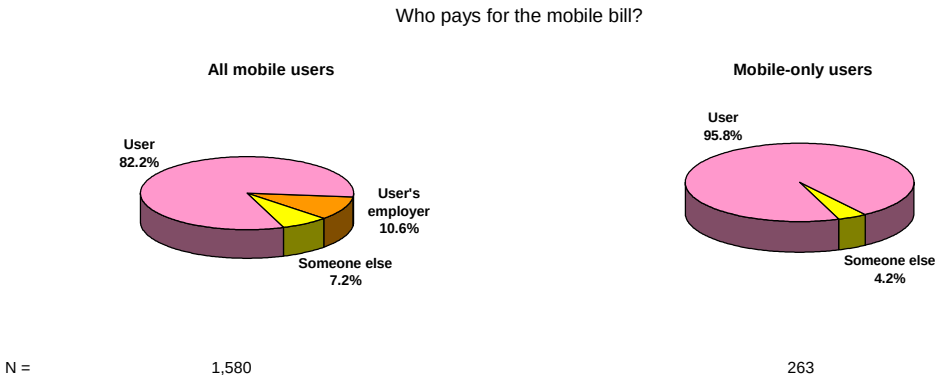
Figure 21: Relationship between type of mobile contract and social class



3.4.3. WHO IS PAYING FOR THE MOBILE BILL AND WHO BOUGHT THE MOBILE PHONE

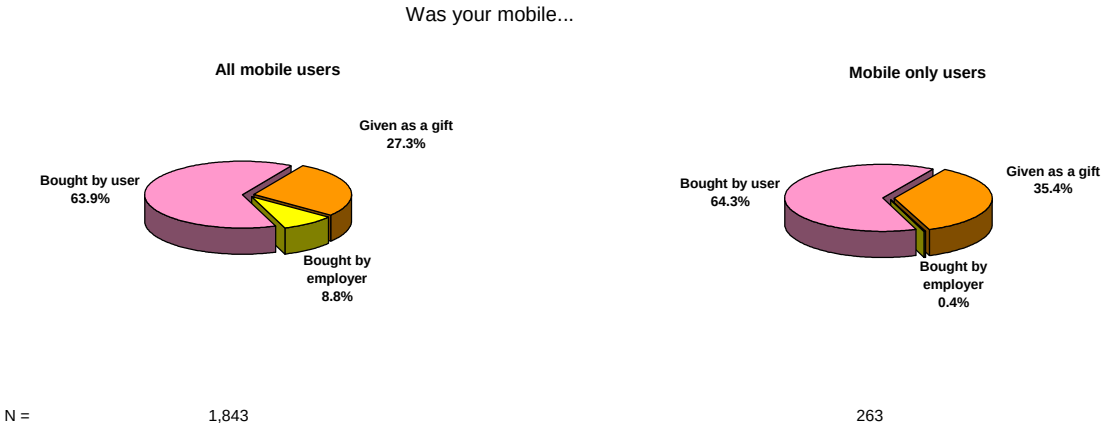
The very large majority of respondents pay for their own bills; especially mobile only users, as is shown in Figure 22.

Figure 22: Who pays for the mobile bill, all mobile users and mobile only.



Nevertheless, about one-third of mobile users did not buy the mobile themselves, as shown in Figure 23. A substantial minority of mobile users was bought a mobile as a gift. The number of mobile only users who were bought a mobile by their employer is negligible.

Figure 23: Who bought the mobile phone



4. CALL SUBSTITUTION

In this section we consider whether there is evidence of call substitution. By call substitution, we mean that when users have a choice of access to both fixed and mobile phones, the two services would be competing for traffic depending on cost and convenience. Users may have a choice making a call of a fixed or a mobile phone if they are in the workplace or home where both are available. Of particular interest are situations where the same party would pay for a call whether it is made on an available fixed or mobile phone. In this case, it is reasonable to suppose that the relative cost of a call on fixed and mobile will be taken into account.

4.1. KEY FINDINGS

Our key findings are broadly consistent with those of the September 1999 study:

- the latest data confirms the finding in the September survey that a significant proportion of respondents are making mobile calls from home, even though a fixed line is easily available (33.7% of respondents make mobile calls sometimes or often, up from 31% in September). As before, the main reason given for doing so is that mobile calls are cheaper at certain times. Respondents reporting that they sometimes use their mobiles at home because mobile calls are cheaper than fixed calls are spread evenly across the four main mobile networks;

- most respondents (71.3%) believe that acquiring a mobile phone has not affected the use of their fixed line. However, amongst those who have perceived a change, most (90% of those who perceived a change, which is 25.8% of all fixed and mobile users) experienced a decrease in fixed line usage. This suggests that call substitution between fixed and mobile is significant for a substantial minority of users. In particular, this strongly rejects any notion that fixed and mobile phones are *complements*, in the sense that household members getting mobiles increases the household fixed bill;

- in the workplace, about one third of those who pay for their own bills and have access to a fixed line at work make mobile calls sometimes or often; where the employer pays for the bill, this proportion increases to a half. As in the previous survey, the main reason given is the convenience of not having to return to a fixed phone;

- with regard to mobile usage, homeworkers display similar trends to non-homeworkers;

- primary fixed lines and mobiles are largely used for voice traffic, while Internet and fax calls are typically made on secondary fixed lines;

- about one-fifth of respondents with at least one fixed line and a mobile use their mobile as their primary means of making and receiving voice calls;

- the majority of users consider mobile phones to offer good value for money. Although there is price sensitivity, few users think of the cost every time they use their phone, and very few wait to get to a fixed line to make their calls. Call quality, the potential difficulty of getting a connection and battery life do not appear to be significant impediments to the usage of mobiles; and

- asked about the effects of a hypothetical reduction in the price of mobile calls, over 36% of respondents said that their usage of fixed lines would fall if mobile call prices fell by 50%. 23.2% of respondents reported that their usage of fixed lines would be "much less".

4.2. USE OF MOBILE PHONE FROM HOME

4.2.1. FREQUENCY OF CALLS FROM HOME

Here we consider the extent to which respondents are using their mobile phones to make calls from home when they also have a fixed line. Figure 24 illustrates the use of mobiles at home in households which also have fixed lines and the reasons for use. Roughly one-third of respondents use the mobile to call from home sometimes or often. The main reason stated is that calls are cheaper at certain times.

Figure 24: Mobile calls from home

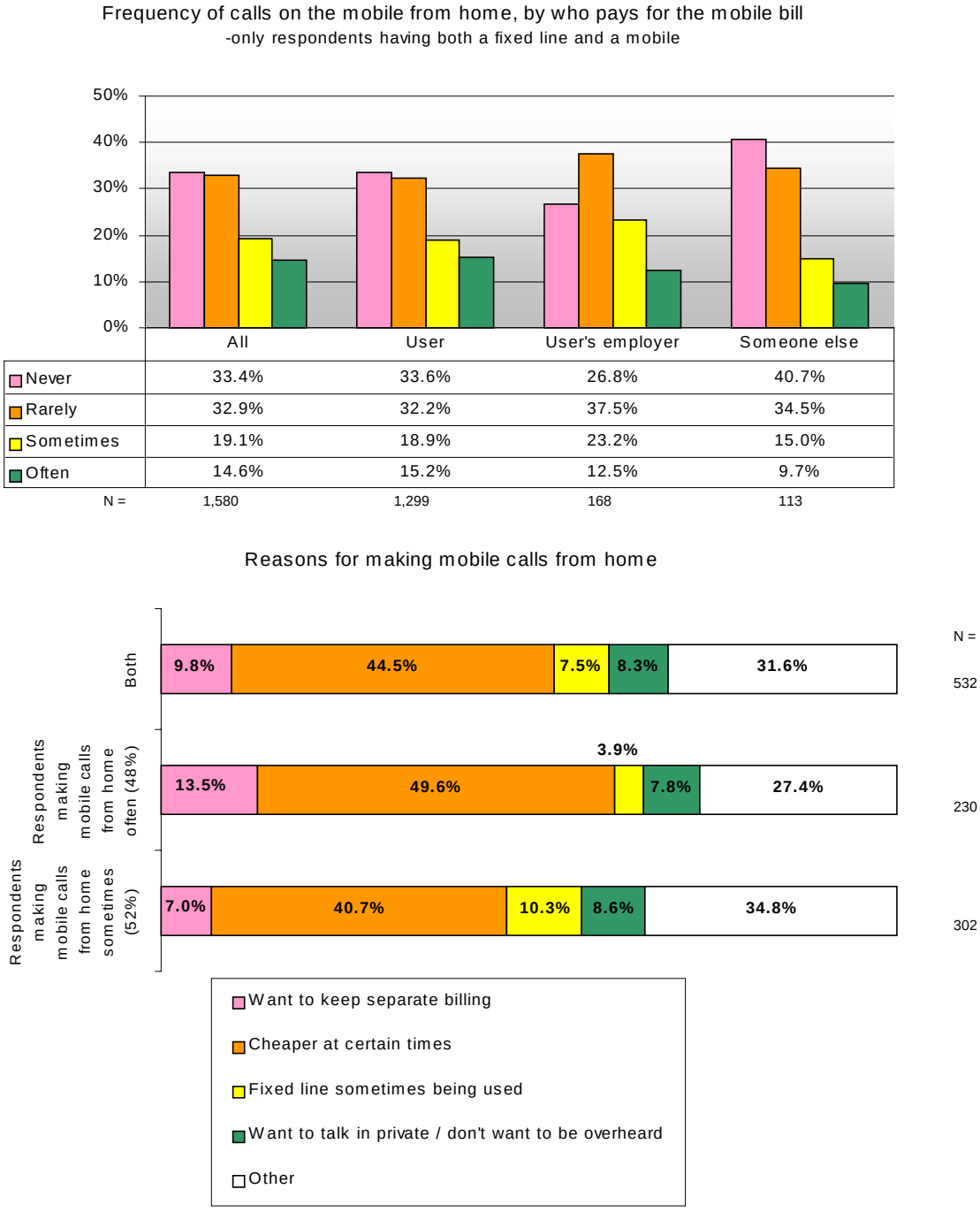


Figure 25 shows how people who make mobile calls from home because they are cheaper than fixed line rates at certain times are distributed across operators. The four main networks have roughly equal shares of such respondents. When compared with the subscriber market shares of the networks, this suggests that Orange and One-to-One have a disproportionately high share.

This may in part be explained by the fact that Vodafone and BTCellnet have larger shares of the business market.

Figure 25: Network of respondents using their mobile from home because of cheaper calls

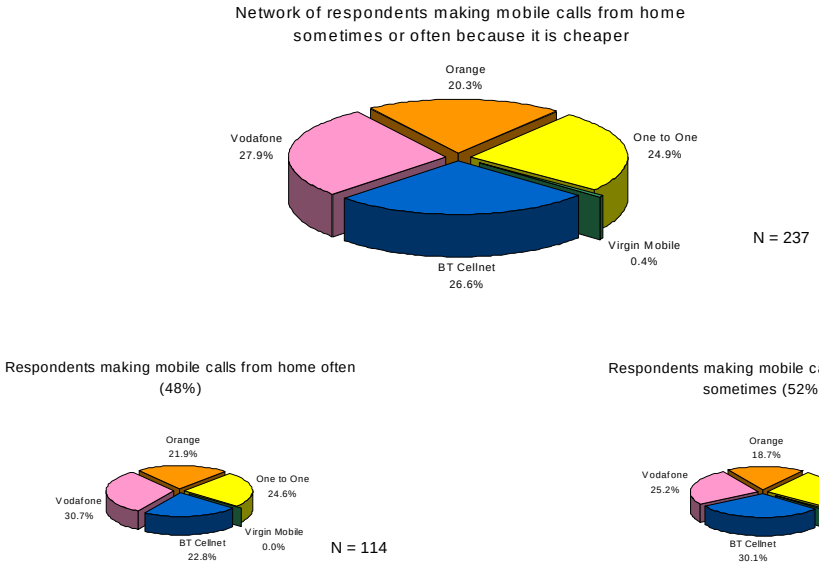
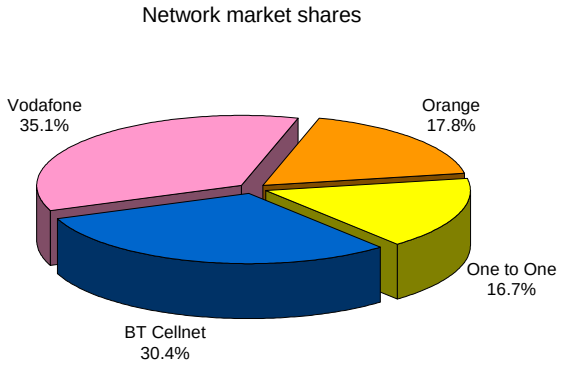


Figure 26: Subscriber market shares of different mobile networks (September 1999)

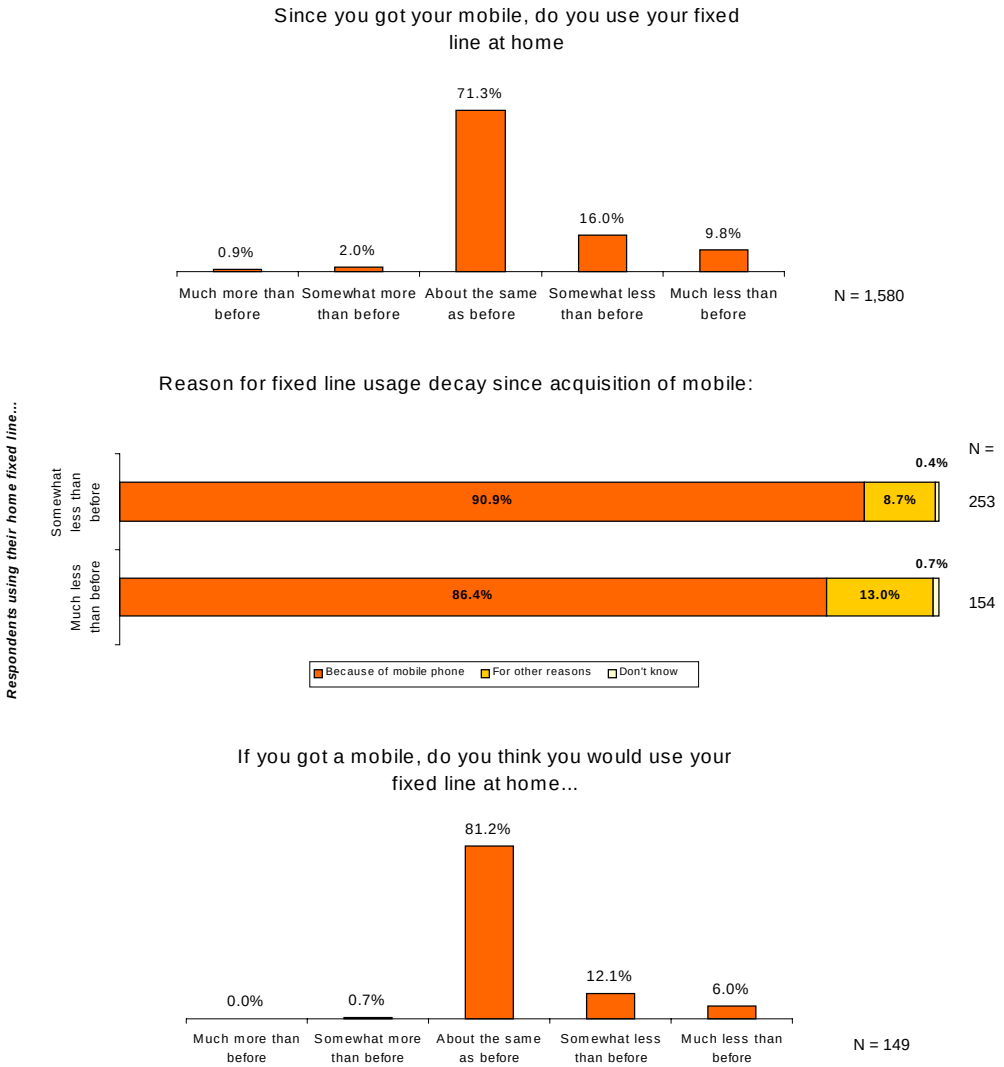


Source: DKBR Research

4.2.2. IMPACT OF MOBILE ACQUISITION ON HOME FIXED LINE USAGE

Respondents were asked whether usage of their fixed phone had changed on acquiring a mobile and, if so, for what reason. As shown in Figure 27, the majority of respondents (71.3%) reported no change. However, amongst those who have perceived a change, over 90% (25.8% of the relevant sample) decreased their usage of the fixed line. This is consistent with the observation above that some users regularly use their mobiles at home, despite having a fixed line available.

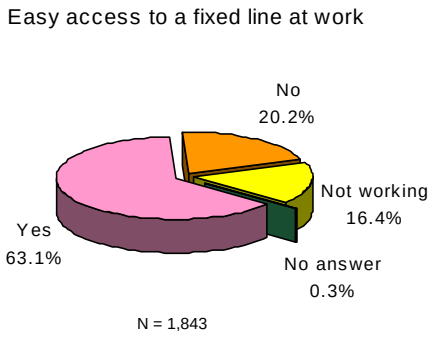
Figure 27: Impact of mobile phone on home fixed line, as perceived by users



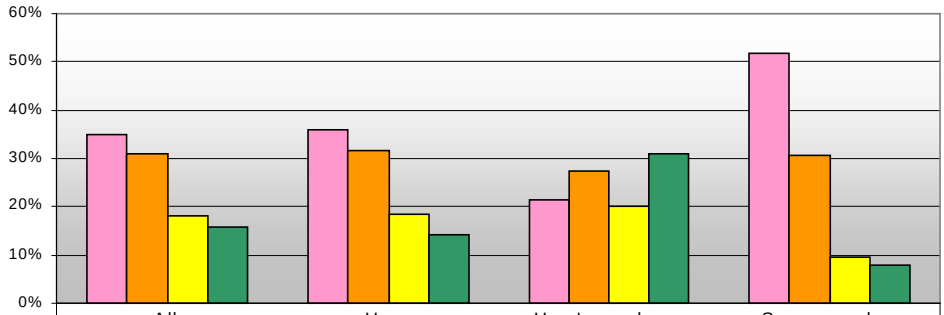
4.3. USE OF MOBILE PHONE FROM WORK

The proportions of users frequently calling on their mobile from work are similar to those using mobile calls from home (although they are generally lower when someone else is paying the mobile bill). The main reason given is the unavailability or inconvenience of getting to a fixed line (Figure 28).

Figure 28: Mobile calls from work

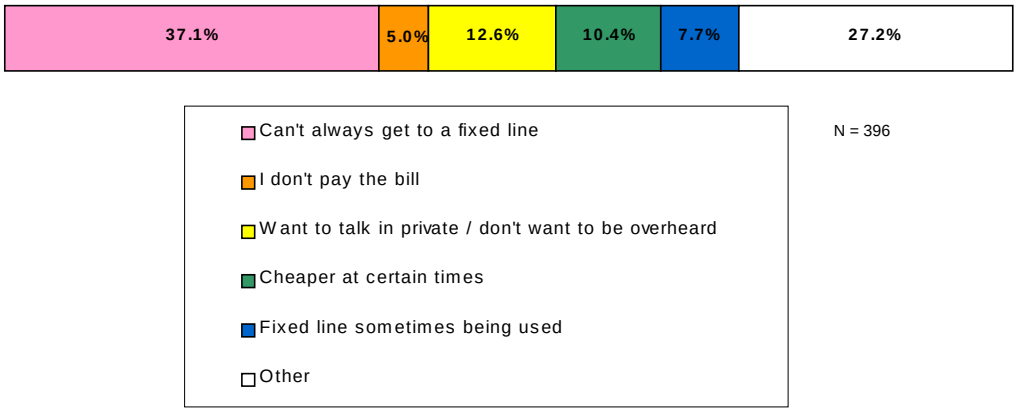


Frequency of calls on the mobile from work, by who pays for the mobile bill
-only respondents having both a fixed line and a mobile



	All	User	User's employer	Someone else
Never	34.9%	35.9%	21.5%	51.6%
Rarely	31.1%	31.7%	27.5%	30.7%
Sometimes	18.2%	18.4%	20.1%	9.7%
Often	15.9%	14.1%	30.9%	8.1%
N =	1,162	951	149	62

Reasons for making mobile calls from work



4.4. HOMEWORKERS

We consider homeworkers separately from the main sample above as they may have different (work-related) motives for making mobile calls from home.

Figure 29 contrasts how homeworkers use their mobile phones with the usage patterns of non-homeworkers and to all mobile users. Unsurprisingly, homeworkers are much more likely to use their mobile for work that both other groups. However, the proportion of homeworkers using their mobiles for work only has decreased since the September survey (Figure 30). Instead, mobiles are increasingly being used for both work and leisure. This contrasts with the observation for all users in Section 3, where it is the use of mobiles for personal purposes only that has risen at the expense of work only.

Figure 29: Mobile phone usage by homeworkers compared to non-homeworkers and all mobile users

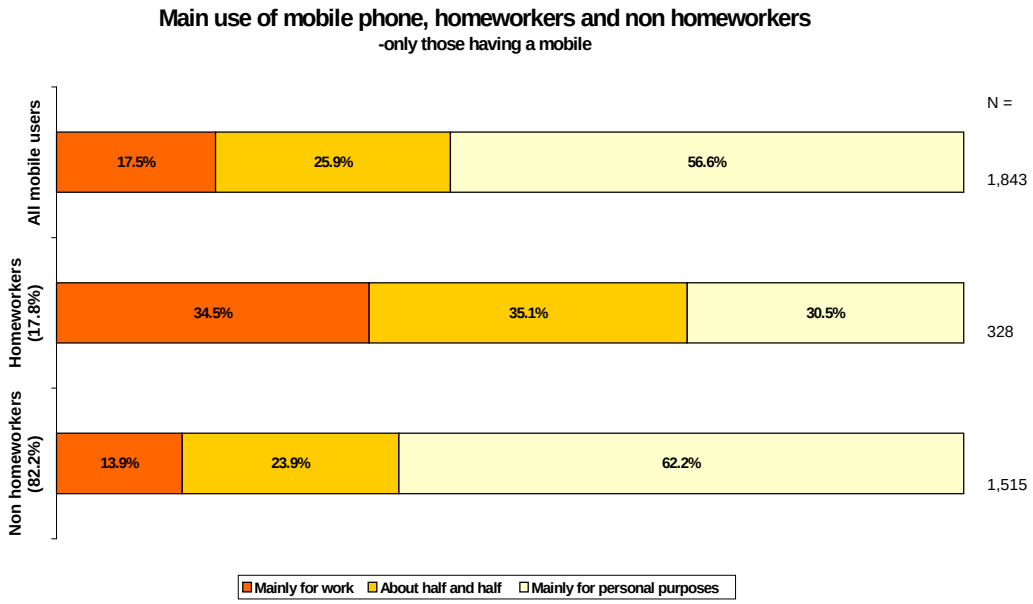
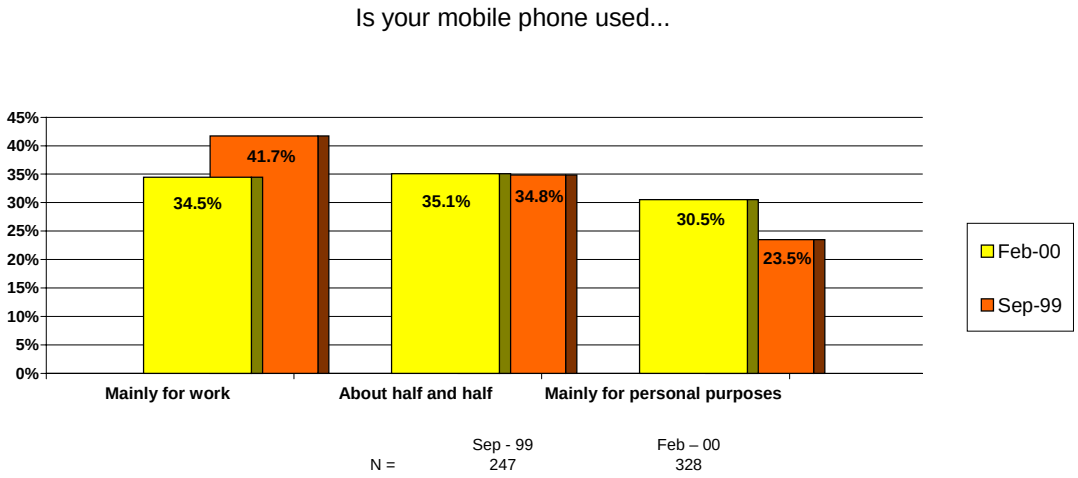
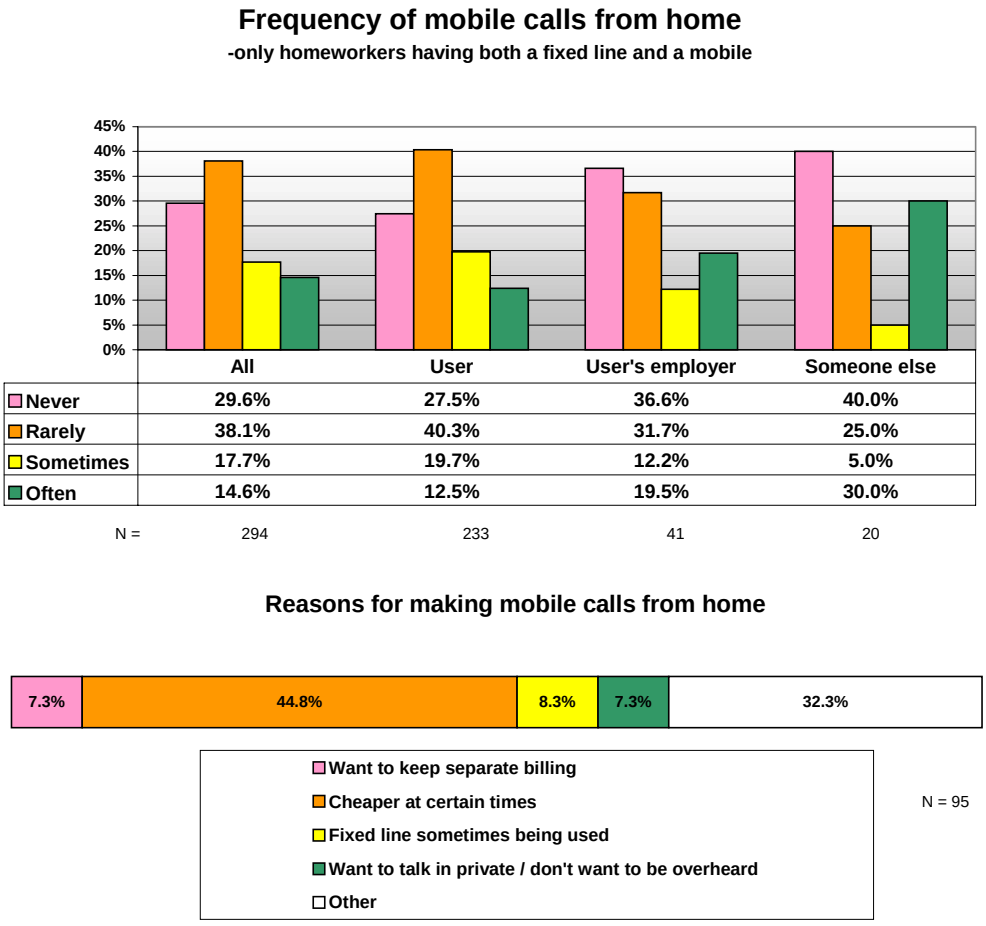


Figure 30: Mobile phone usage by homeworkers, September 1999 and February 2000



In terms of the frequency of and reasons for making mobile calls from home, the patterns for homeworkers are generally similar to that for non-homeworkers. The notable exception to this is where someone else pays the bill, when (unsurprisingly) homeworkers are much more likely to use a mobile from home than non-homeworkers.

Figure 31: Homeworkers mobile calls from home



4.5. LINE CHOICE FOR DIFFERENT USES

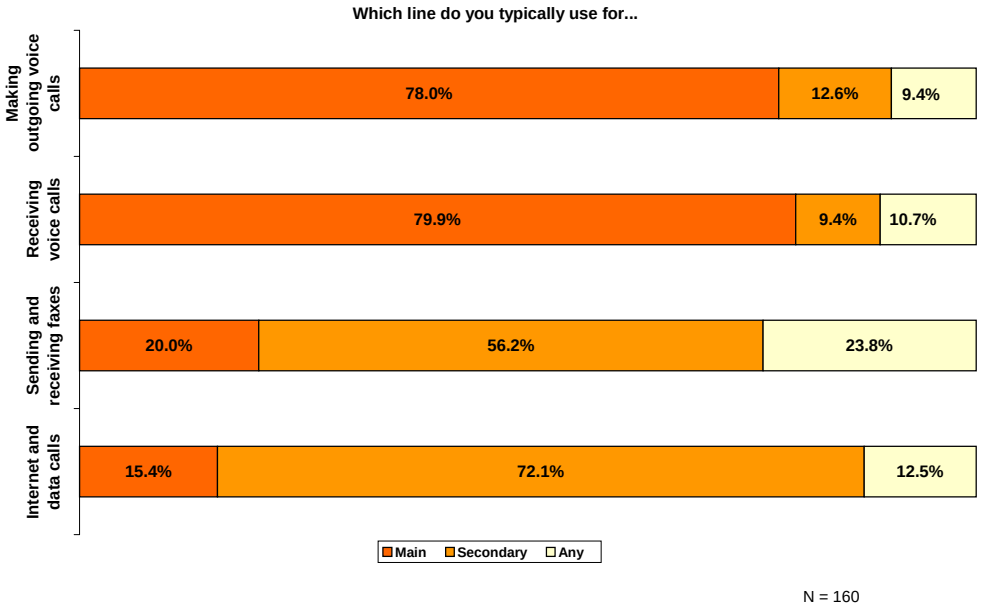
Different telephony lines may be reserved for different types of use. To investigate this, respondents with more than one line were asked which line they typically use for different types of calls. Multiple fixed users without mobiles were also asked to provide further information comparing their uses of main and secondary lines.[4]

[4] Throughout this subsection, when reporting responses regarding fax and Internet / data usage, respondents reporting "don't know" have been dropped, since it is likely that they never use this type of service.

4.5.1. MULTIPLE FIXED USERS

Among multiple fixed users, there is a clear trend towards using the main fixed line for voice. If fax or Internet/data traffic is to be carried, it is typically through the secondary line.

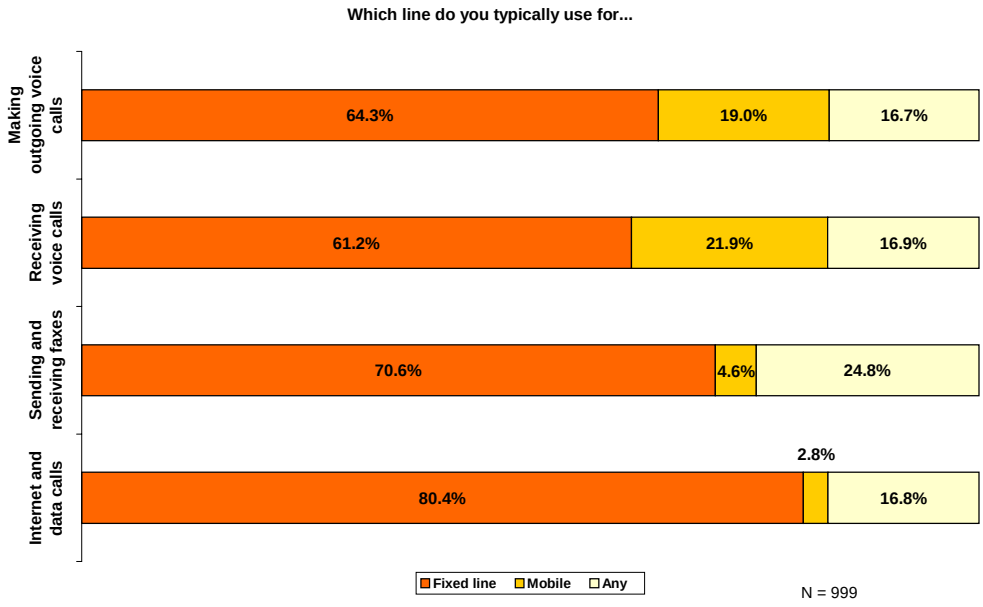
Figure 32: Line choice for different uses - multiple fixed non-mobile users



4.5.2. SINGLE FIXED AND MOBILE

Unsurprisingly, in the case of respondents with a single fixed line and mobile, the fixed line accounts for the majority of all types of calls. In particular, mobile phones are not well suited at present for receiving fax or Internet calls and this is reflected in the data.

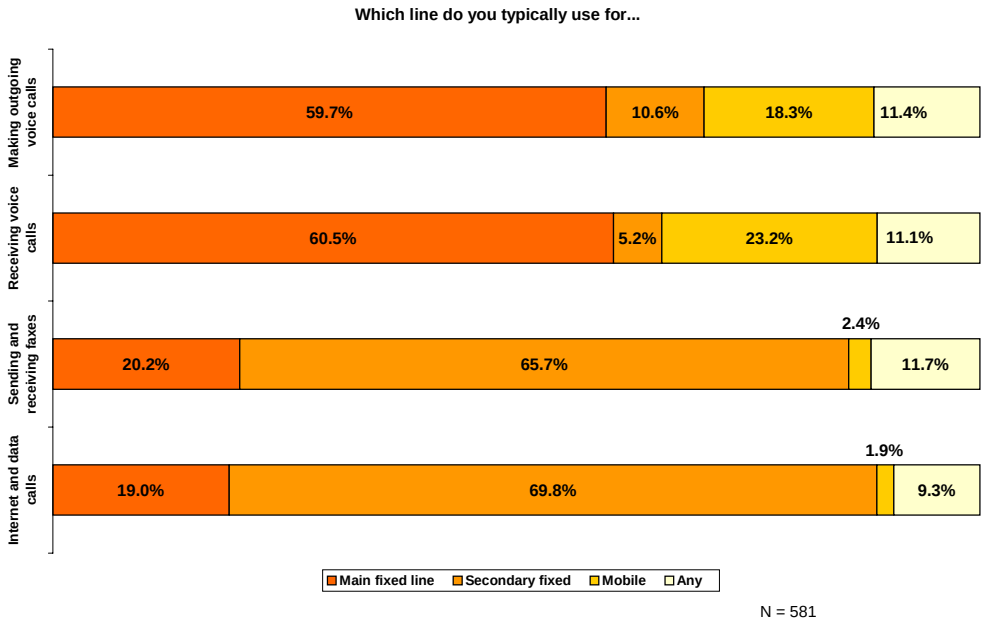
Figure 33: Line choice for different uses - single fixed and mobile users



4.5.3. MULTIPLE FIXED AND MOBILE

In the case of respondents with multiple fixed lines and a mobile, the proportion of individuals using their mobile as their main means of making and receiving voice calls is slightly higher than for those having a single fixed and a mobile. Furthermore, this proportion is much higher than that of individuals using a second fixed line for voice. Meanwhile, the majority of fax and Internet/data calls are made on secondary fixed line.

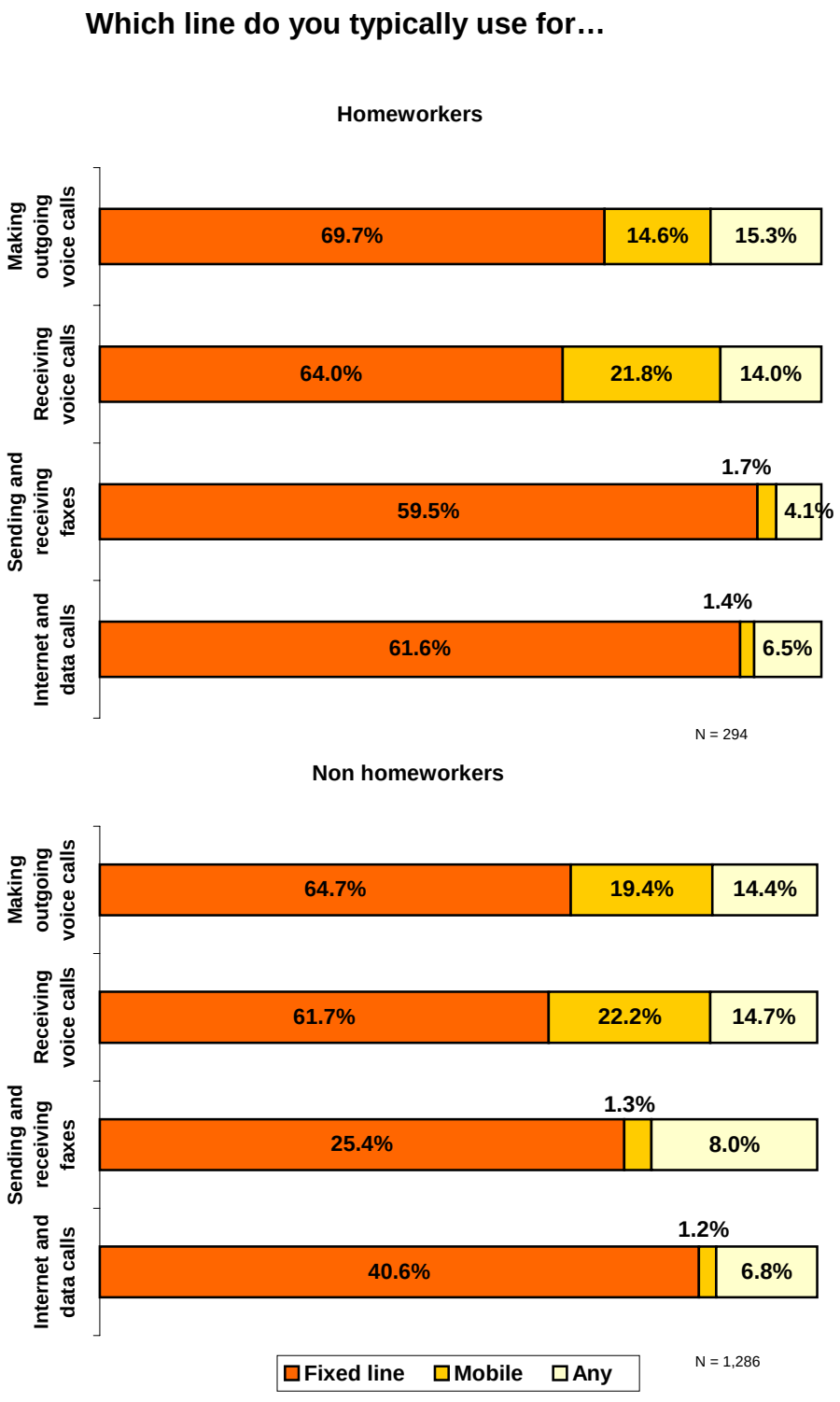
Figure 34: Line choice for different uses - multiple fixed and mobile users



4.5.4. HOMEWORKERS

With respect to line choice, the preferences of homeworkers are similar to those of the sample as a whole. This can be seen in Figure 35 below. These proportions relate to respondents having both fixed and mobile phones (regardless of the number of fixed lines).

Figure 35: Line choice for different uses - homeworkers

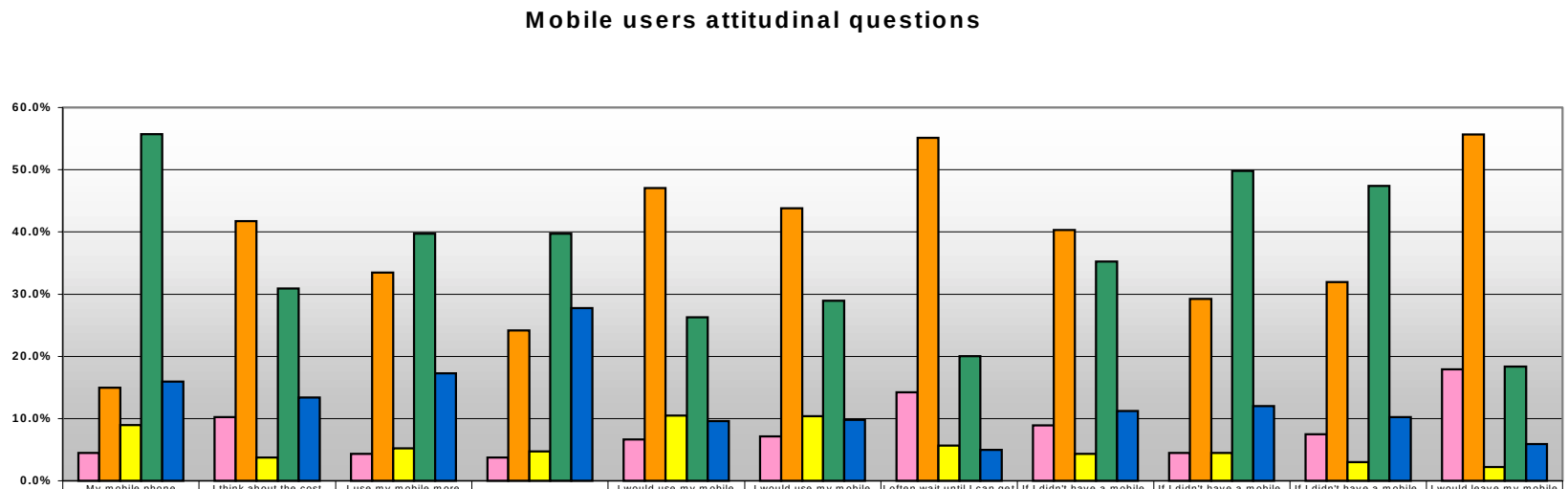


4.6. ATTITUDES TOWARDS MOBILE USAGE

Respondents were asked whether they agreed/disagreed with a series of statements, including whether mobile phones represented value for money. Figure 36 shows the results. The main findings are as follows:

- the majority of users considered mobile telephones to offer good value for money;
- although there is price sensitivity (respondents would use more if calls were cheaper, and would use other lines more if no mobile) few users think of the cost every time they use their phone, and very few wait to get to a fixed line to make their calls;
- difficulties in obtaining a connection and reduced call quality did not emerge as significant hurdles to mobile usage; and
- few respondents were concerned about short battery life when leaving phones turned on.

Figure 36: Attitudes towards the mobile phone



	My mobile phone represents good value for money	I think about the cost every time I use my mobile	I use my mobile more than I thought I would when I got it	I would use my mobile more if the calls cost less	I would use my mobile more if the call quality was better	I would use my mobile more if I could always get a connection	I often wait until I can get to a fixed line rather than use my mobile	If I didn't have a mobile, I would use my fixed line more	If I didn't have a mobile, I would use other fixed lines more	If I didn't have a mobile, I would use payphones more	I would leave my mobile on for longer but I worry about the batteries
Strongly disagree	4.5%	10.2%	4.3%	3.7%	6.6%	7.2%	14.2%	8.9%	4.5%	7.4%	17.9%
Disagree	14.9%	41.7%	33.5%	24.2%	47.0%	43.8%	55.1%	40.3%	29.3%	32.0%	55.7%
Nether agree nor disagree	9.0%	3.7%	5.2%	4.7%	10.5%	10.4%	5.6%	4.3%	4.5%	3.0%	2.2%
Agree	55.7%	30.9%	39.7%	39.7%	26.3%	28.9%	20.0%	35.3%	49.8%	47.4%	18.3%
Strongly agree	16.0%	13.4%	17.3%	27.7%	9.6%	9.8%	5.0%	11.2%	12.0%	10.2%	5.9%

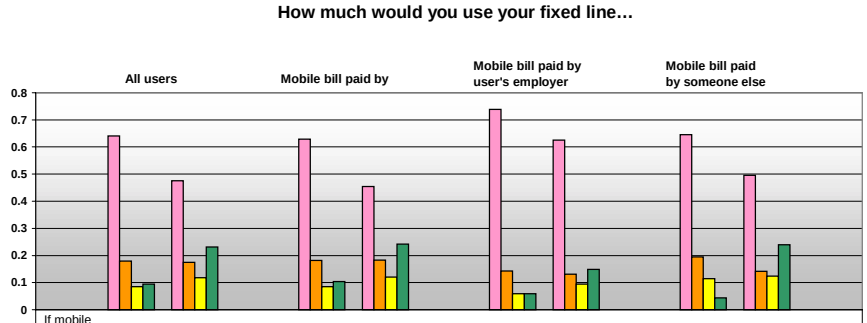
N = 1,843

4.7. PRICE SENSITIVITY

Respondents were asked about the impact of fixed and mobile call prices on their usage patterns. More specifically, we asked how a hypothetical fall in *mobile* call charges would impact on their usage of *fixed* lines. Figure 37 illustrates the answers to these questions, broken down by who pays for the respondent's mobile bill.

In terms of assessing the substitutability of fixed and mobile calls, it is appropriate to consider only respondents paying their own mobile bill, since in this case both fixed and mobile bills are being paid by the same economic unit. For this group, Figure 37 shows a significant cross-elasticity, with 19% of respondents reporting that they would expect their fixed usage to be "much less" or "somewhat less" if mobile call prices fell by 25%. For hypothetical mobile price cuts of 50%, this proportion rises to 36.3%. These results are essentially unchanged from the September 1999 survey.

Figure 37: Impact of changes in mobile call pricing on fixed line usage



If mobile calls fell by...	All users: a quarter	All users: a half	Mobile bill paid by: a quarter	Mobile bill paid by: a half	Mobile bill paid by user's employer: a quarter	Mobile bill paid by user's employer: a half	Mobile bill paid by someone else: a quarter	Mobile bill paid by someone else: a half
Same as now	64.1%	47.5%	62.8%	45.4%	73.8%	62.5%	64.6%	49.6%
A little less	17.9%	17.5%	18.2%	18.3%	14.3%	13.1%	19.5%	14.2%
Somewhat less	8.5%	11.8%	8.6%	12.1%	6.0%	9.5%	11.5%	12.4%
Much less	9.5%	23.2%	10.4%	24.2%	6.0%	14.9%	4.4%	23.9%
N =	1,580		1,299		168		113	

5. LINE SUBSTITUTION

In this section we consider substitution at the line level, that is getting a mobile phone instead of a fixed line and vice-versa. Substitution can take place between a mobile and single fixed line (i.e. mobile only or single fixed) or between a mobile and an additional fixed line (i.e. single fixed and mobile or multiple fixed) Specifically, we examine:

- line substitution on single lines: the characteristics and behaviour of mobile-only users;
- line substitution on additional lines: an econometric analysis is presented that assesses how fax, Internet and additional mobile phone or fixed line ownership affect take-up of additional fixed lines and mobile phones;
- the perceptions of respondents intending to get a mobile or an additional fixex line, on second lines and mobiles as potential substitutes and the factors that drive choice between them; and
- the impact of hypothetical scenarios about the changes in the *total cost* of fixed and mobile telephony on choices between fixed lines and mobiles.

5.1. KEY FINDINGS

The key findings are as follows:

- an overwhelming majority of mobile only respondents do without a fixed line by choice. Most of them *choose* to have one line only and *choose* it to be a mobile. Furthermore, doing without a fixed line is usually a medium-to-long-term arrangement, not a transitory one. Some 46% of mobile only respondents have been without a fixed line for over one year;
- there is a positive correlation between ownership of mobile phones and having more than one fixed line, which suggests an underlying taste for telephony services that drives demand for *both* fixed and mobile access;
- the occurrence of fixed-mobile line substitution can be tested by looking at the impact of known drivers of access demand, such as Internet access and fax ownership, on demand for mobiles and second fixed lines. If a driver of access demand has a *smaller* incremental effect on demand for second fixed lines when a respondent has a mobile, and a *smaller* incremental effect of demand for mobiles when a respondent has a second fixed line, this can be interpreted as evidence for fixed-mobile substitution;
- pooling the data from the September 1999 and February 2000 surveys provides *very strong evidence* of such fixed-mobile substitution at the access level. Both ownership of a PC with Internet access and usage of

the Internet are associated with greater demand for both second fixed lines and mobiles. However, the *incremental effect* of Internet access and fax ownership on demand for second fixed lines is smaller when a respondent has a mobile. Similarly, the *incremental effect* of Internet access on demand for mobiles is smaller when a respondent has a second fixed line;

- this finding is consistent with substitution between fixed and mobile at the level of *lines*. In particular, it supports the thesis that such substitution is occurring through Internet, data and fax users migrating voice services onto mobiles and using an existing single fixed line for non-voice services. Further evidence for this conclusion is provided by a comparison of usage patterns for single fixed mobile respondents with both single fixed and multiple fixed respondents;

- potential adopters of second fixed lines are much more likely to consider a mobile phone as an alternative than potential mobile phone adopters are to consider a second fixed line as an alternative. This is consistent with Internet access being a key driver of demand for second fixed lines and the alternative strategy being that of migrating voice onto a mobile and using an existing fixed line for data;

- both 'mobile only' and 'single fixed and mobile' users display a strong preference for mobiles. However, mobile only users are much more price sensitive; and

- among 'single fixed' respondents considering getting a mobile, the option of getting a second fixed line instead held little attraction, even if mobile services cost up to twice as much. However, in the case of 'single fixed' respondents considering getting a second fixed line, roughly one fourth of the respondents said they might prefer a mobile if the cost of the two services was equal.

5.2. SUBSTITUTION OF SINGLE LINES

Here we examine the usage patterns of mobile only respondents and their reasons for going mobile only. In general, evidence that mobile only usage patterns are similar to those of single fixed users would support the thesis that line substitution is taking place.

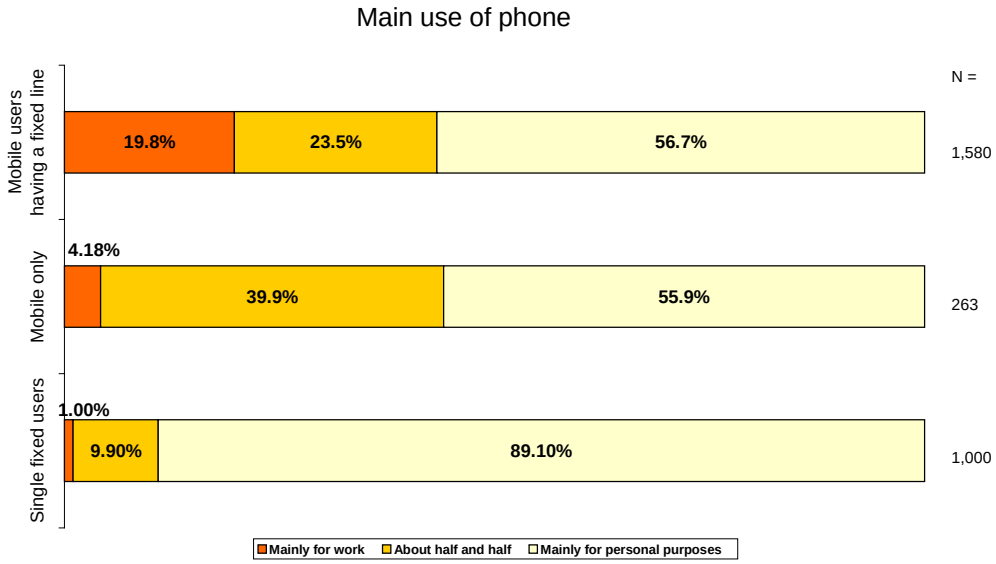
5.2.1. USE OF LINE

Figure 38 compares the use of mobile phones by mobile only users with that of other mobile users and with single fixed line users. As in the September 1999 survey, the usage pattern of mobile only users is more similar to that of single fixed line users than to that of other mobile users. The main findings are that:

- the proportion of mobile only respondents using their mobiles mainly for work purposes is very low (4.2%), and is much closer to the position for single fixed respondents (1%) than to that of other mobile users (19.8%); and

- the proportion of mobile only users who use their mobiles roughly equally for work and personal purposes is much higher (39.9%) than the corresponding proportion of single fixed individuals (9.9%). However, this is unsurprising, as mobiles are portable and thus can be used at any time, including office hours, whereas fixed lines can only be used for work from home.

Figure 38: Main use of phone – mobile only, other mobile users and single fixed users



5.2.2. REASONS FOR GOING MOBILE ONLY

Mobile-only respondents were asked how long they have been living without a fixed line, their reasons for not having a fixed line and whether or not they were considering having a fixed line installed. The key objective of these questions is to assess whether or not respondents who are mobile only view this as more than a transitory arrangement, and whether their decision to go mobile only is a free choice. The results are reported in Figure 39, Figure 40 and Figure 41. The key findings are as follows:

- for most mobile only respondents, doing without a fixed line is a medium-to-long-term arrangement rather than a transitory one. Over 70% of mobile only respondents have been without a fixed line for more than 6 months and some 46% had been without for over one year;

- an overwhelming majority of mobile only respondents do without a fixed line by choice. Only 17.1% of respondents could not have a fixed line installed where they live. Of these, 55.6% would not have a fixed line installed even if they could;

- some 64.6% were not likely to get a fixed line installed in the next 12 months or would not do so if they could. This reinforces the conclusion that most mobile-only users to not consider this to be a transient state;

- among respondents who had previously had a fixed line but no longer have one, some 46% had cancelled the line, while the remainder had changed accommodation; out of these, only 11% could not have a fixed line installed where they live; and

- among respondents who had cancelled their fixed line, the most common reason was that they did not use the line enough to make it worthwhile (30.4%). A further 10.9% said that they preferred to have only one contact number.

Figure 39: Length of time without a fixed line

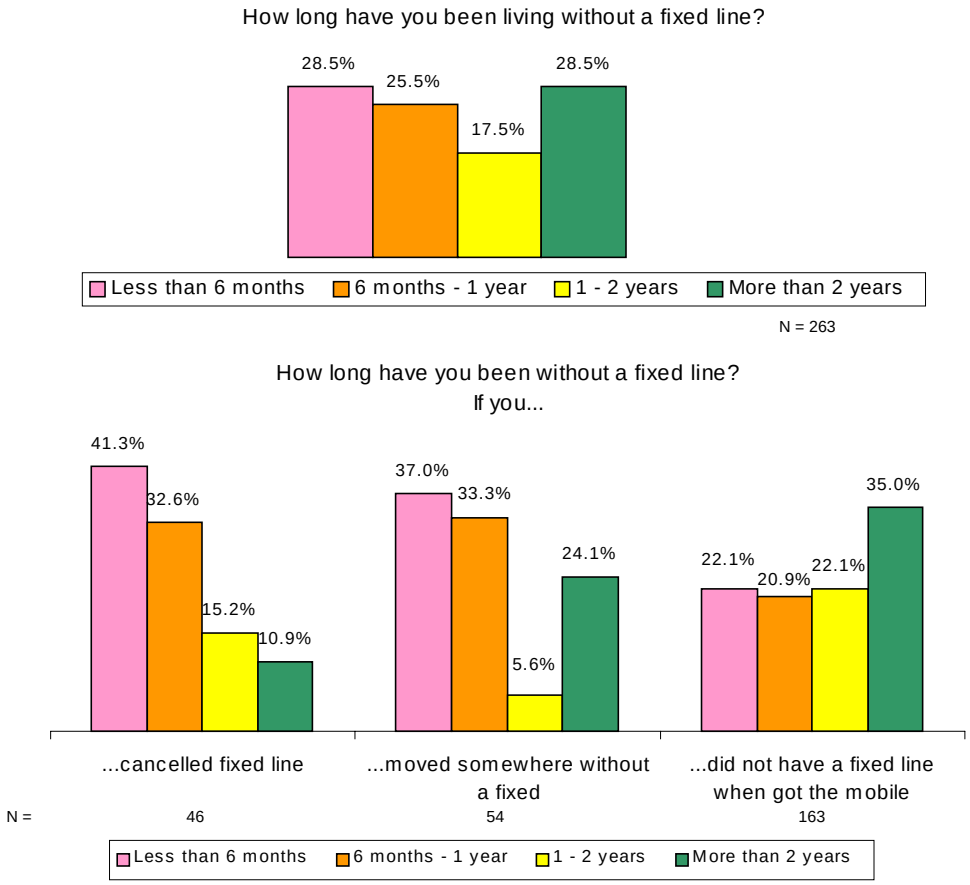


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Figure 40: Reasons for not having a fixed line

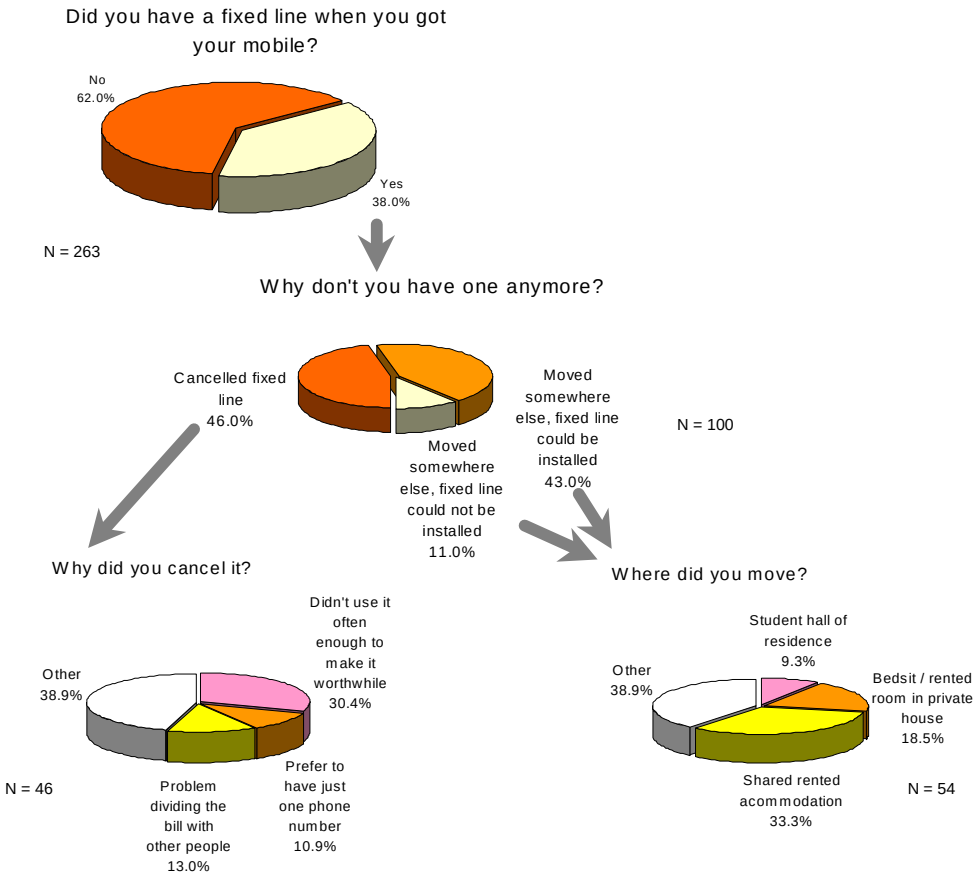
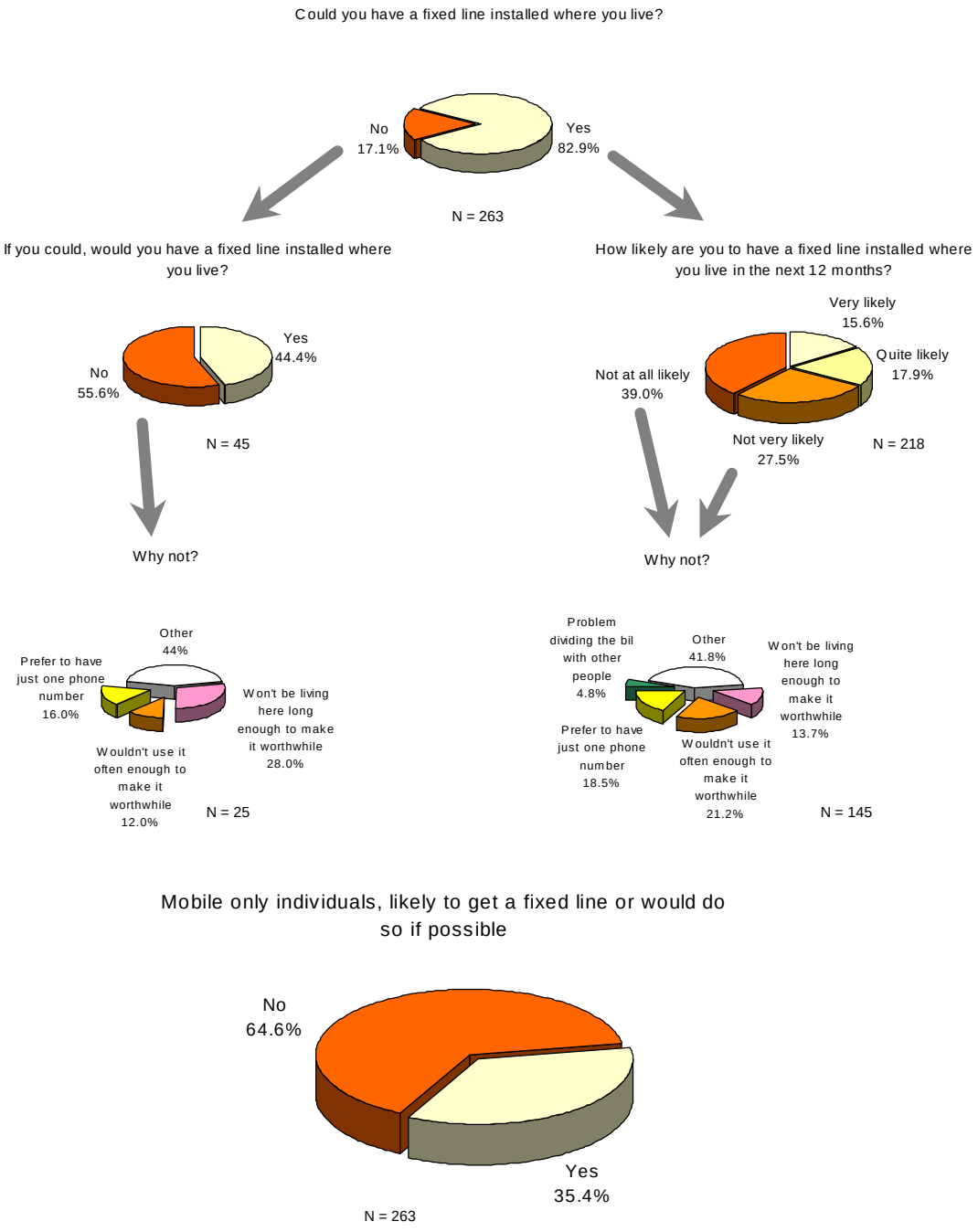


Figure 41: Willingness to install a fixed line



5.3. SUBSTITUTION OF ADDITIONAL LINES

Here we present the results of statistical tests for fixed-mobile substitution at the level of lines. In order to increase the size of our data (and thereby increase the power of the test), we have pooled the data from the September 1999 and February 2000 surveys. The results provide very strong evidence of fixed-mobile substitution at the line level, which are consistent with the results of econometric tests run on the September 1999 survey data only. Moreover, these results are backed up by observations from two further exercises, reported below:

- a comparison of the usage pattern of single fixed and mobile respondents with those of single fixed and multiple fixed respondents; and
- an analysis of the preferences of potential secondary fixed line and mobile phone adopters.

5.3.1. THE PROBLEM OF UNOBSERVED TASTES

The most obvious way to test for the presence of fixed mobile substitution is to consider whether owning a mobile phone reduces the propensity of an individual to have a second fixed line (and vice versa), *all other things equal*. Unfortunately, creating conditions where *all other things are equal* (i.e. where comparisons can be made between *similar* individuals) is very difficult.

A superficial examination of the data reveals that ownership and usage of fixed and mobile phones are positively associated. However, such association does not *by itself* reject the thesis of fixed-mobile substitution at the level of individuals, because decisions to get fixed lines and/or mobile phones are driven by many factors, some observable and others not. In particular, it is likely that the positive association is driven by an overall *taste* for telephony, which varies significantly across individuals. For example, suppose that we compare second fixed line ownership across mobile owners and non-mobile owners. These two groups of individuals are *not* similar, as those with a mobile phone are likely to have a greater overall taste for telephony in general and are thus more likely to be fax and/or Internet users. This taste effect will partially or wholly mask any impact of fixed-mobile substitution.

Unfortunately, an individual's taste for telephony cannot be directly observed. Although we do have data on factors associated with taste, such as respondent usage patterns and socio-economic characteristics, these proved insufficient to capture differing tastes fully. In summary, the presence of a positive association between numbers of fixed lines and ownership of mobile is not surprising, and it does not provide any insight into whether there is fixed-mobile substitution. Consequently, we must devise different tests to investigate this question.

5.3.2. FRAMING HYPOTHESES TO INVESTIGATE FIXED-MOBILE SUBSTITUTION

One way of overcoming the problem of unobserved tastes is to consider whether mobile phone or second fixed line ownership influences the impact that drivers of access demand, such as fax and Internet PC ownership, have on take-up decisions. If the fixed-

mobile substitution thesis is correct, we should observe that the impact of Internet or fax ownership on take-up of second fixed lines is less strong where a respondent owns a mobile phone. This would imply that instead of getting a second fixed line, some mobile phone owners are migrating voice onto mobile and using the single fixed line for Internet and/or fax. In other words, if the incremental impact of Internet and fax is *smaller* where a respondent has a mobile, this is consistent with fixed-mobile substitution at the level of lines.

Similar considerations apply to the demand for mobiles. Internet and fax usage are likely to be associated with ownership of mobiles, since tastes for each are likely to be correlated. However, if there is fixed-mobile substitution taking place, the strength of this association should be lower where a respondent has a secondary fixed line.

5.3.3. MODELLING SECOND FIXED LINE TAKE-UP

We estimated a simple logit model of second fixed line ownership. The results are reported in Table 3.

The explanatory factors considered were:

- ownership of a PC with Internet access;
- usage of the Internet;
- ownership of a fax machine;
- usage of fax;
- age;
- social class;
- employment status;
- household size
- home ownership;
- type of dwelling; and
- whether the respondent conducted business activities from home.

We also introduced dummy variables to take account of the different origins of the sample data, i.e. whether data was from the September 1999 or February 2000 surveys and whether it was sampled using calls to mobile or fixed line numbers.

Respondents were classified as heavy Internet (or fax) users if they had said that they use the Internet (or fax) "very much". As in the first report, we estimated three alternative models using both Internet and fax *usage* and Internet/PC and fax *ownership*:

- Model 1 considered only whether a respondent *had* Internet access or a fax machine. These factors were strongly positively related with take-up of a second fixed line. The association between Internet access and secondary line ownership was significantly (at a 10% level) smaller where the respondent had a mobile. However, in the case of fax ownership, the decrease in the association was not significant;

- Model 2 includes variables for whether a respondent has Internet access or a fax machine and how much the respondent *uses* Internet and fax. Take-up of second fixed lines is strongly related to both *having* and *using* a fax machine or Internet access. In this model, we found evidence that the effect of heavy use of fax and/or Internet in driving take-up of second fixed lines is diminished by mobile ownership. This is significant at the 5% level (and at the 2% level in the case of Internet); and

- Model 3 includes only variables for *usage* of Internet and fax. We find similar conclusions to Model 2, but the decrease in the Internet driver effect becomes highly significant (i.e. significant even at the 1% level).

In addition, household size was found to be a very important explanatory factor in take-up of second fixed lines.

Table 3: Logit models of second fixed line take-up

	Model 1				Model 2				Model 3			
	Coefficient	Std. Error	z	p-value	Coefficient	Std. Error	z	p-value	Coefficient	Std. Error	z	p-value
Household size 2 or more	0.654	0.173	3.784	0.000	0.677	0.288	2.348	0.019	0.6583285	0.281257	2.341	0.019
Household size 3 or more	0.433	0.119	3.624	0.000	0.590	0.194	3.043	0.002	0.6336908	0.18606	3.406	0.001
Household size 4 or more	0.026	0.117	0.219	0.827	0.028	0.187	0.151	0.880	0.1460674	0.177331	0.824	0.41
Household size 5 or more	0.324	0.127	2.544	0.011	0.469	0.200	2.341	0.019	0.3776587	0.18818	2.007	0.045
Has PC with Internet	1.447	0.164	8.835	0.000	1.003	0.281	3.566	0.000	0.8413736	0.165829	5.074	0
Has fax	1.317	0.199	6.607	0.000	1.348	0.327	4.119	0.000				
Respondent has mobile	0.535	0.141	3.796	0.000	0.706	0.222	3.178	0.001				
Mobile * has Internet	-0.336	0.189	-1.773	0.076	-0.099	0.326	-0.304	0.761				
Mobile * has fax	-0.059	0.223	-0.267	0.790	-0.089	0.365	-0.243	0.808				
Heavy Internet user					1.830	0.544	3.365	0.001	2.463679	0.496299	4.964	0
Heavy fax user					2.485	0.924	2.689	0.007	2.783098	0.942777	2.952	0.003
Mobile * heavy Internet user					-1.407	0.589	-2.391	0.017	-1.502029	0.535273	-2.806	0.005
Mobile * heavy fax user					-1.927	0.958	-2.011	0.044	-1.689566	0.969323	-1.743	0.081
Number of observations	5092				2400				2400			
Log likelihood	-1968.5				-797.5				-864.6			
Pseudo R-squared	0.284				0.321				0.264			

Note: Dummies not reported for: age; social class; employment status; home ownership; housing type; home business activities. Constant not reported

5.3.4. MODELLING MOBILE TAKE-UP

Similar logit models were estimated for take-up of mobile phones. Here, the sample was limited to respondents contacted on a fixed phone, as including those contacted on a mobile number would have introduced a gross sample selection bias.

In this model, mobile ownership is the dependent variable and multiple line ownership is a regressor. Gender was introduced as an explanatory variable and household size was dropped. A plausible interpretation of the lack of significance of household size is that mobile usage and take-up decisions depend on the individual, rather than the household.

Table 4 shows the results of four alternative models. In these models, we include interactive terms between having multiple fixed lines and ownership/usage of Internet/fax. The models correspond to the three used for secondary line take-up (the fourth model is a variant of Model 3):

- Model 1 considers only whether a respondent *owns* a fax machine or a PC with Internet access. Both Internet and fax ownership are observed to be strong drivers on mobile take-up. As before, the effect of Internet on mobile take-up is significantly lessened (at the 10% significance level);

- Model 2 is a composite model including both *ownership* and *usage* of Internet. In this model, the parameters are less significant than in Model 1 (primarily as a result of correlation among the owership and usage variables);

- Model 3 considers only *usage* of fax and Internet. The findings are consistent with those of Model 1, and similarly significant, but with usage in the place of ownership for both fax and Internet; and

- Model 4 considers only *usage* of fax and Internet, but leaves out the variable for assessing the declining impact of fax usage as a driver for mobile take-up if the respondent already has multiple fixed lines. This parameter was found not to be significant in Model 3, and by suppressing it, the other parameters in consideration become more significant.

The findings on fax usage are unclear. Fax usage and ownership is strongly positively related to take-up of mobile. This is likely to be due to taste effects. However, we were unable to find any significant effect of multiple fixed line ownership on the relationship between mobile take-up and fax usage or ownership.

It is not surprising that it is somewhat more difficult to identify an impact of second fixed lines on mobile take-up than vice-versa. Given our hypothesis that there is migration of voice onto mobile to free fixed lines for Internet and fax usage, this is exactly what would be expected. Where an individual already has a mobile, this makes migration of voice to the mobile possible immediately. On the other hand, the impact of multiple fixed line ownership on mobile take-up is likely to be less strong, as there may

be many factors driving mobile take-up (in particular the need for mobility), not just the desire to free fixed lines for data.

Table 4: Logit models of mobile ownership

	Model 1				Model 2				Model 3				Model 4			
	Coefficient	Std. Error	z	p-value	Coefficient	Std. Error	z	p-value	Coefficient	Std. Error	z	p-value	Coefficient	Std. Error	z	p-value
Multiple fixed lines	0.561	0.108	5.214	0.000	0.323	0.164	1.970	0.049	0.722	0.181	3.979	0.000	0.706	0.181	3.904	0.000
Has PC with Internet	0.656	0.160	4.092	0.000	0.489	0.241	2.034	0.042								
Has fax	0.538	0.162	3.322	0.001	0.742	0.259	2.862	0.004								
Multiline * has Internet	-0.462	0.214	-2.158	0.031	-0.636	0.370	-1.716	0.086								
Multiline * has fax	0.073	0.239	0.307	0.759	0.224	0.396	0.565	0.572								
Heavy Internet user					1.365	0.510	2.677	0.007	1.644	0.491	3.350	0.001	1.794	0.473	3.793	0.000
Heavy fax user					-0.786	0.648	-1.213	0.225	-1.229	0.613	-2.005	0.045	-1.458	0.573	-2.542	0.011
Multiline * Heavy Internet					1.762	1.146	1.537	0.124	1.912	1.115	1.716	0.086	0.947	0.483	1.963	0.050
Multiline * Heavy fax					-1.424	1.211	-1.175	0.240	-1.220	1.181	-1.032	0.302				
No of observations	3717				1694				1694				1694			
Log-likelihood	-2121.4				-931.8				-938.8				-939.5			
Pseudo R-squared	0.161				0.186				0.180				0.179			

Notes: Dummies not reported for: age; social class; employment status; home ownership; housing type; home business activities; gender.

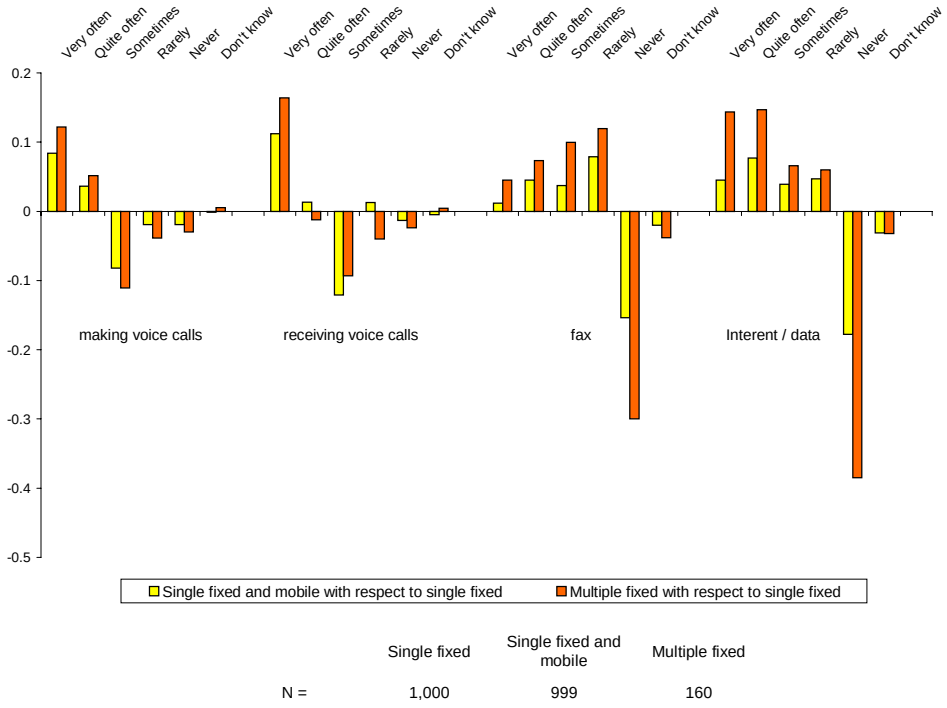
Constant not reported

Coefficients are significant at the 5% level where the p-value is less than 0.05. Similarly, they ate significant at the 10% level if the p-value is less than 0.1.

5.3.5. USAGE COMPARISONS

In Section 3.3.2, we have seen that the usage patterns of 'single fixed and mobile' respondents was more similar to that of 'multiple fixed' and 'multiple fixed and mobile' than to those of 'single fixed' and 'mobile only'. Figure 42 takes this analysis one step further, comparing relative use of voice calls, fax and Internet/data by 'single fixed and mobile' and 'multiple fixed' respondents with usage by single fixed respondents. The pattern for both is very similar, indicating that single fixed and mobile respondents should be considered as multiple line users. For such users, the mobile appears to be a partial substitute to a second fixed line, which is consistent with the thesis of migration of voice to mobile and data to the fixed line.

Figure 42: Frequency of calls: 'single fixed and mobile' and 'multiple fixed' compared with 'single fixed' respondents



5.3.6. POTENTIAL TAKE-UP OF SECOND FIXED LINES AND MOBILES

Line substitution can be expected to be most clearly visible when customers decide about getting additional lines. Here, we look at potential take-up of additional fixed lines and mobiles and examine whether customers view them as potential substitutes.

Figure 43 and Figure 44. report the results. The main findings are as follows:

- among respondents quite likely or very likely to get a secondary line in the next 12 months, some 16.2% had considered a mobile instead. In contrast, only 5.2% of potential mobile buyers had considered an additional fixed line instead; and

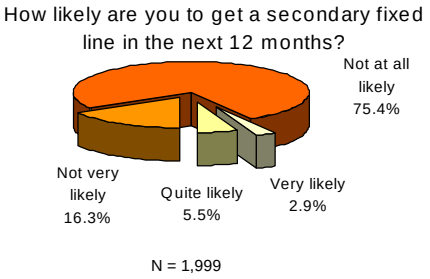
- the main driver of demand for additional fixed lines is Internet usage; for mobile phones, it is the possibility to make or receive calls when away from home.

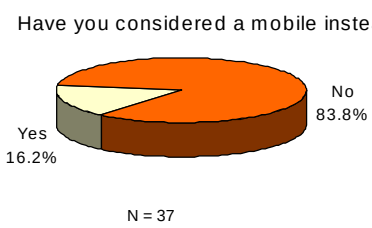
Overall, it would appear that potential adopters of second fixed lines are much more likely to consider a mobile phone as an alternative than potential mobile phone adopters are to consider a second fixed line as an alternative. This is consistent with Internet being a key driver of demand for second fixed lines. An alternative strategy to getting a second fixed line is migrating voice onto mobiles and using an existing single fixed line for data. Therefore, use of mobiles can provide an alternative to a second fixed line for some households. By contrast, an additional fixed line is unlikely to provide sufficient functionality for the majority of users to substitute for a mobile.

It should be noted that the observations on secondary line take-up below are based on data from all respondents with only one fixed line, including those who already have mobiles. Similarly, observations for mobile phone take-up are based on data from all respondents without mobiles, including those who already have second fixed lines. Clearly, respondents who already have a mobile are less likely to consider another mobile as a substitute for a secondary line than those who do not have a mobile. Likewise, respondents who already have a second line are less likely to view a third line as a substitute for a mobile than those who have neither. Hence, data below almost certainly understates the extent to which second line and mobiles are potential substitutes for people with only one single fixed line. Based on the findings above, it is likely that the importance of a mobile as a substitute for a fixed line is understated the most.

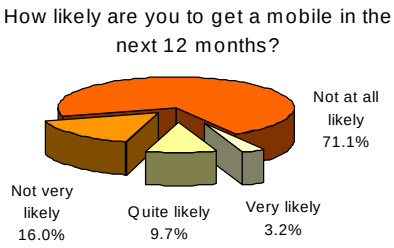
Figure 43: Likelihood to adopt a secondary line / mobile phone

Secondary line





Mobile phone



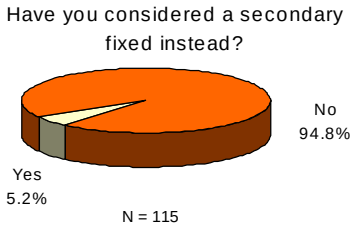
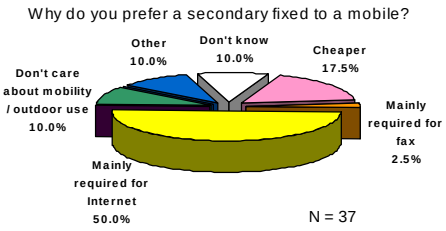
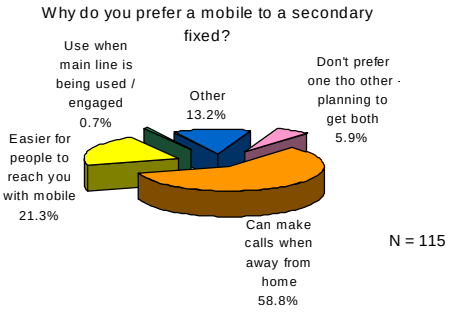
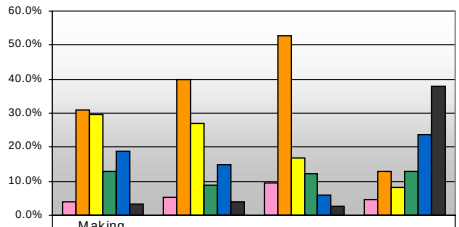


Figure 44: Reasons for preferring one to another and intended usage





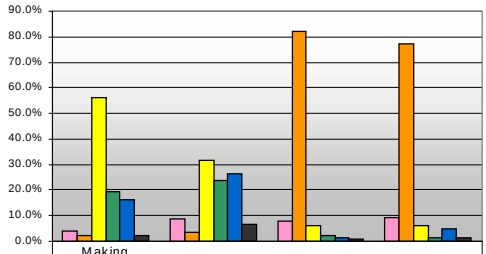
How much do you expect to use the secondary line for...



	Making outgoing voice calls	Receiving voice calls	Sending and receiving faxes	Internet and data calls
Don't know	4.1%	5.4%	9.5%	4.7%
Not at all	31.1%	39.9%	52.7%	12.8%
Not very much	29.7%	27.0%	16.9%	8.1%
Somewhat	12.8%	8.8%	12.2%	12.8%
Quite a lot	18.9%	14.9%	6.1%	23.7%
Very much	3.4%	4.1%	2.7%	37.8%

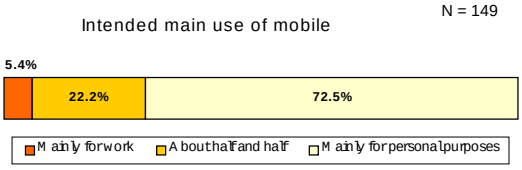
N = 148

How much do you expect to use your mobile for...



	Making outgoing voice calls	Receiving voice calls	Sending and receiving faxes	Internet and data calls
Don't know	4.0%	8.7%	8.1%	9.4%
Not at all	2.0%	3.4%	81.9%	77.2%
Not very much	56.4%	31.5%	6.0%	6.0%
Somewhat	19.5%	23.5%	2.0%	1.3%
Quite a lot	16.1%	26.2%	1.3%	4.7%
Very much	2.0%	6.7%	0.7%	1.3%

N = 149



N = 149

5.4. IMPACT OF PRICES ON FIXED AND MOBILE SUBSCRIPTION DECISIONS

Respondents were asked about the choice between a fixed line and a mobile phone under various hypothetical scenarios about the total bill. Both 'mobile only' and 'single fixed and mobile' users displayed a strong preference for mobiles. However, mobile only users appeared to be much more price sensitive. Among 'single fixed' respondents considering getting a mobile, there was little interest in getting a second fixed line instead, even if mobiles were much more costly. However, in the case of 'single fixed' respondents considering getting a second fixed line, a substantial minority said they might prefer a mobile if the cost of the two services was equal.

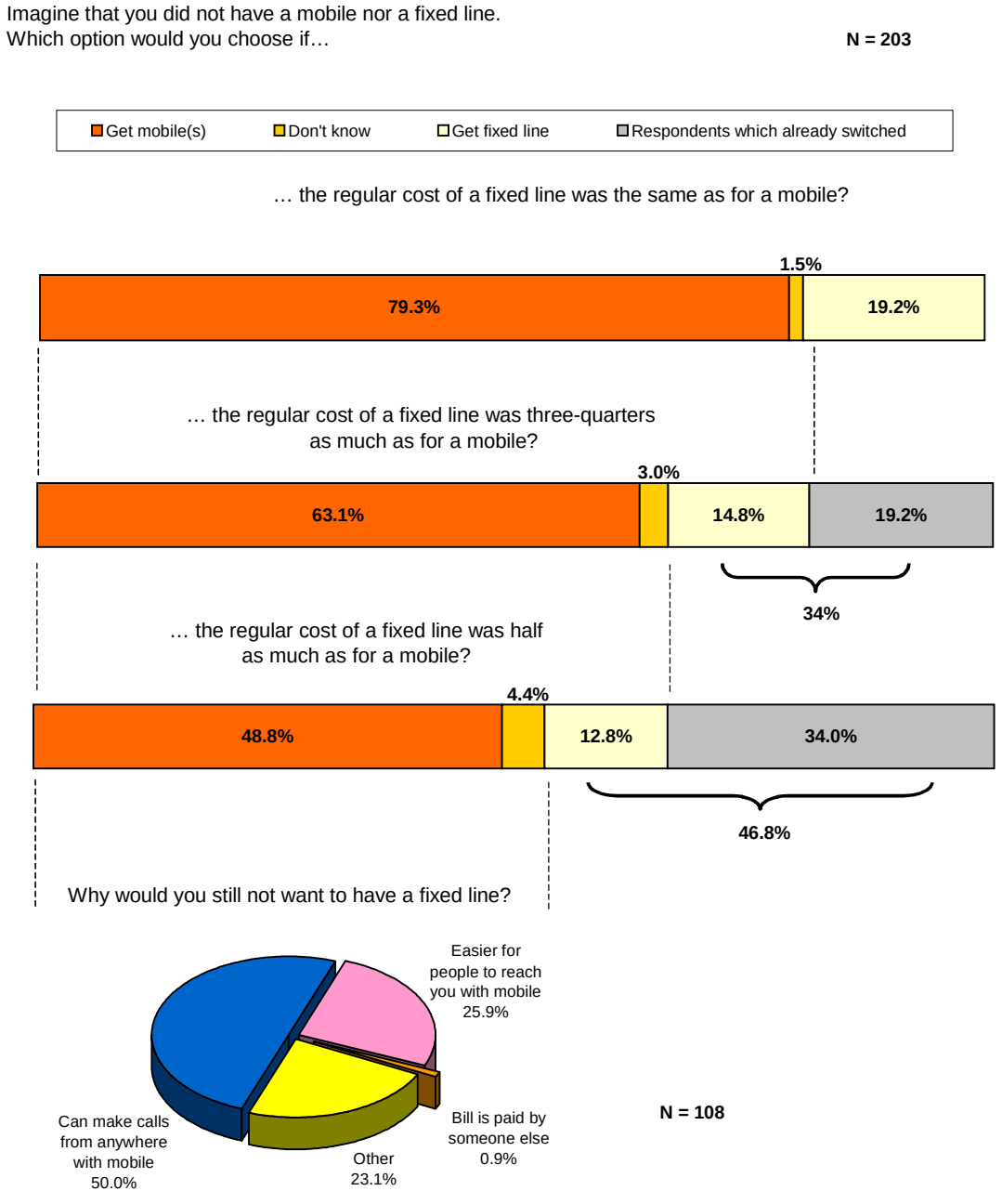
5.4.1. MOBILE ONLY USERS

Mobile only users were asked to imagine that they did not have a mobile and, on this basis, to choose between either a mobile or a fixed line at different relative prices. The results are reported in Figure 45. The main findings are as follows:

- although respondents displayed a clear preference for mobiles, there was a significant degree of price sensitivity. At equal cost, some 79.3% of respondents preferred a mobile. This figure dropped to 63.1% in the event that fixed lines were three-quarters the cost of a mobile and to just 48.8% in the event that the cost of a fixed line was only half that of a mobile; and

- among respondents who said they would chose the mobile even if it was twice the cost of a fixed line, the key reasons cited were the ability to call from anywhere (50%) and the ability to receive calls anywhere (25.9%).

Figure 45: Line choice under different prices – mobile only



5.4.2. FIXED AND MOBILE USERS

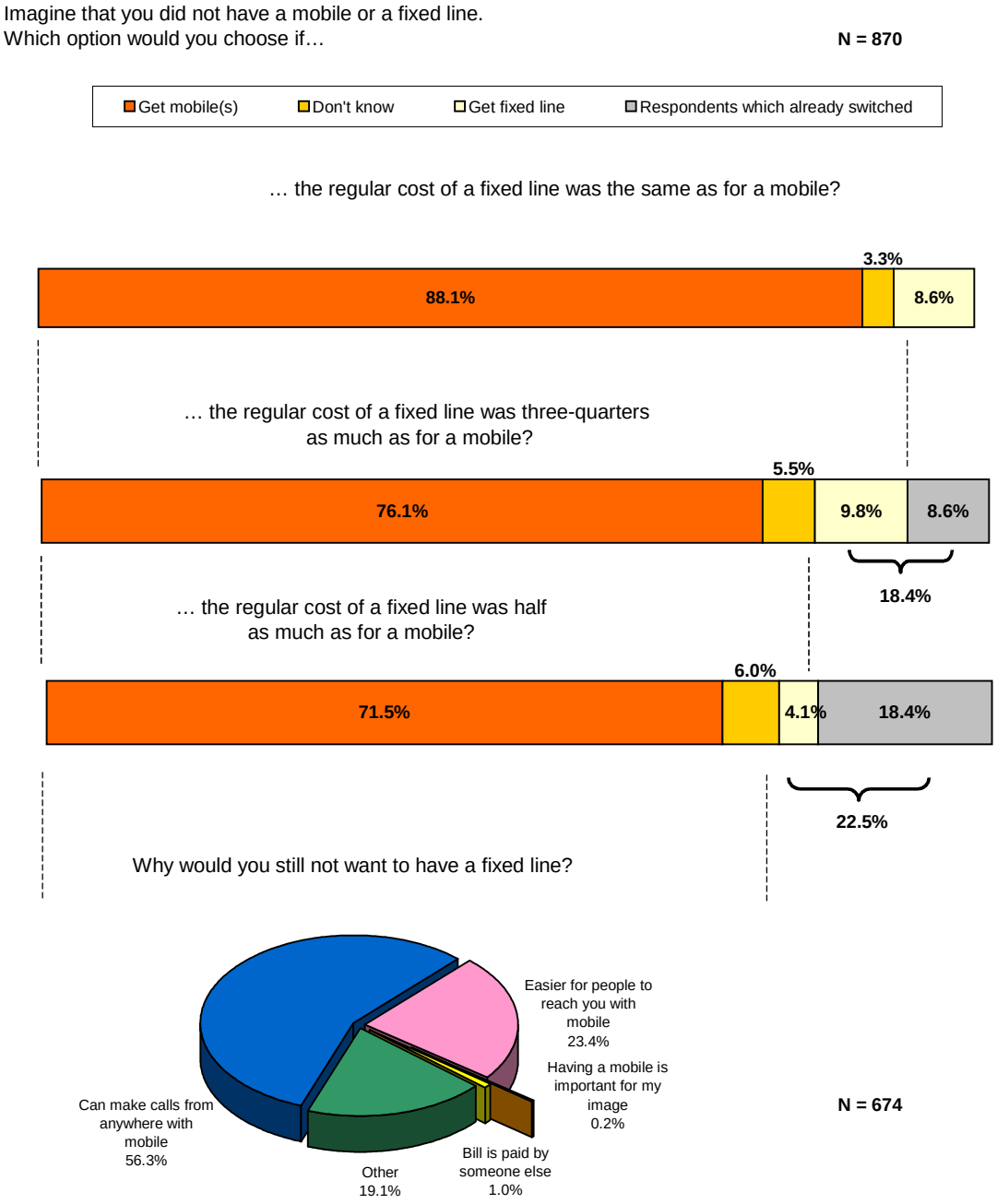
Respondents with single fixed and mobile lines were asked to imagine that they did not have any lines and, on this basis, to choose between either a mobile or a fixed line at different relative prices. The results are reported in Figure 46. The main findings are as follows:

- respondents displayed a very strong preference for mobiles. At equal costs, some 88.1% said they would prefer the mobile;
- price sensitivity was lower than for mobile-only users. Even if the cost of a fixed line was half that of a mobile, over 70% of respondents said that they would prefer the mobile; and
- as with mobile only users, the preference for the mobile even at high cost differentials was driven by a desire to be able to make (56.3%) or receive (23.4%) calls from anywhere.

The finding that respondents with both fixed and mobile lines place greater relative value on their mobile than mobile only users is particularly interesting. One might have expected the opposite result, given that a majority of mobile only users have made deliberate decisions not to have fixed lines installed (Figure 40). It is likely that this difference reflects a combination of two factors:

- respondents who have both fixed and mobile are in a better position to compare the relative value of mobile and fixed line services, and most apparently value the former more greatly; and
- it is likely that mobile-only users are more cost-sensitive in general than respondents with multiple lines.

Figure 46: Line choice under different prices – single fixed and mobile users



5.4.3. MULTIPLE FIXED LINE USERS

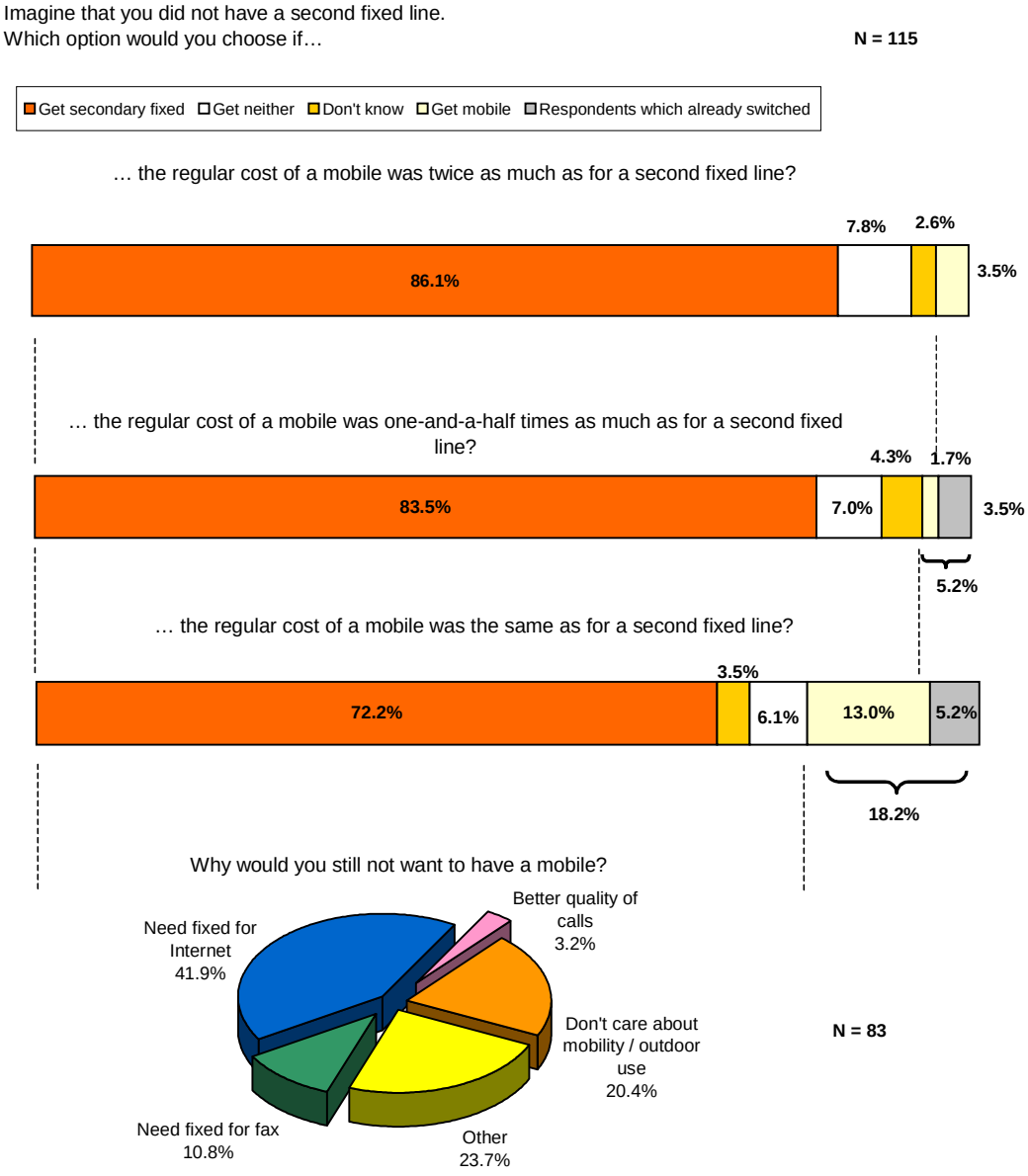
Respondents with multiple fixed lines (but no mobile) were asked to imagine that they only had one fixed line and, on this basis, to choose between either a mobile or a second fixed line at different relative prices. The results are reported in Figure 47. The main findings are as follows:

- respondents exhibited a strong preference for retaining their second line and price sensitivity was relatively modest. At equal prices, only 18.2% said that they would prefer a mobile, falling to just 3.5% in the event that the cost of a mobile was twice that of fixed line; and

- at equal prices, the main reason for preferring a second fixed line was to use the Internet (41.9%). Other important reasons were an indifference to mobility (20.4%) and the need for a dedicated fax line (10.8%).

The relatively low level of price sensitivity for this group is not particularly surprising. In general, the ability to maintain more than one fixed line indicates that respondents are likely to be sufficiently affluent to also own a mobile phone. The fact that they do not suggests that most place a relatively low value on mobile telephony.

Figure 47: Line choice under different prices – multiple fixed line users

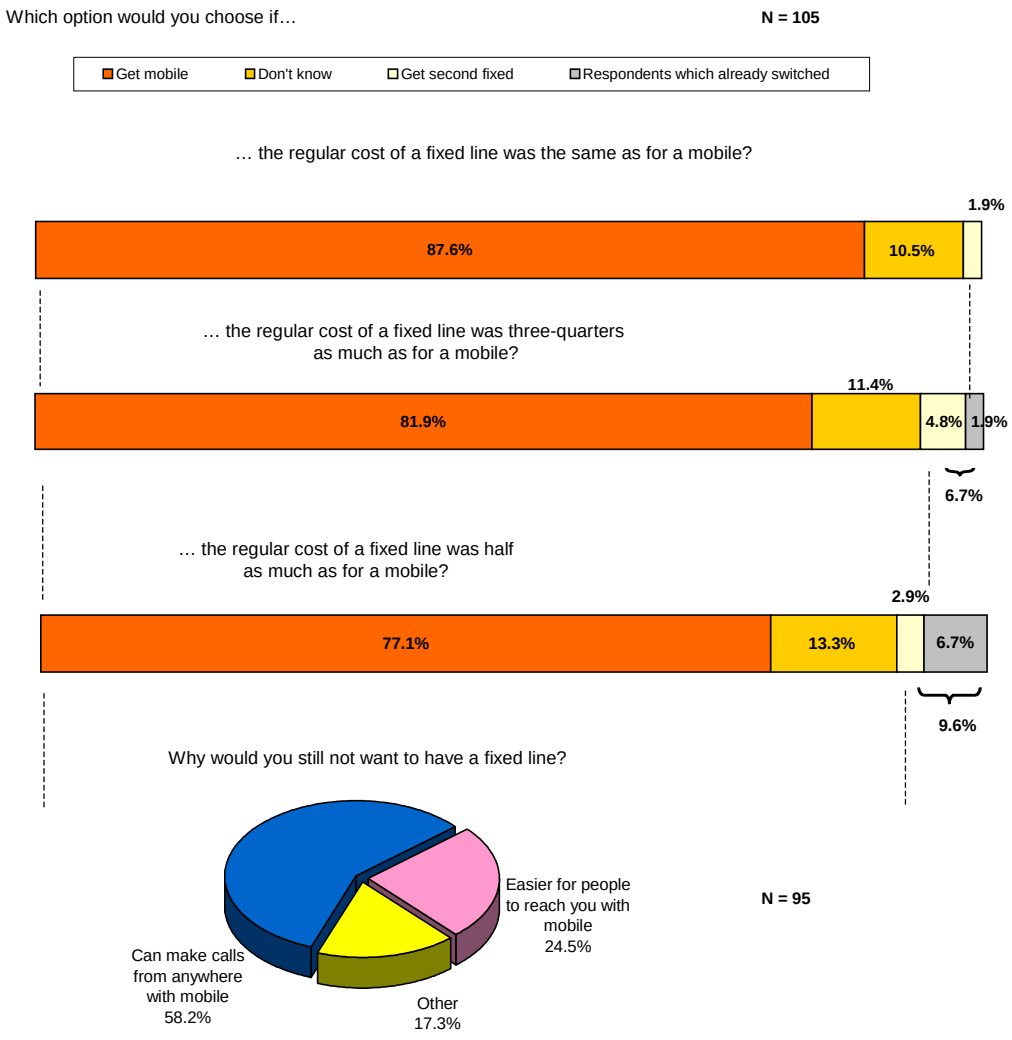


5.4.4. POTENTIAL MOBILE ADOPTERS

Single fixed line users who did not currently have a mobile but were considering getting one were asked to choose between either a mobile or a fixed line at different relative prices. The results are reported in Figure 48. The main findings are as follows:

- respondents displayed a strong preference for mobiles. Even if the cost of a fixed line was only half that of a mobile, over three-quarters of respondents said that they would definitely chose a mobile, and less than 10% said they would definitely get a second fixed line instead; and
- among those who would still get the mobile at twice the cost of a second line, most cited the ability to make calls (58.2%) and receive calls (24.5%) from anywhere as the reason for their choice.

Figure 48: Line choice under different prices – potential mobile adopters



5.4.5. POTENTIAL ADOPTERS OF SECONDARY FIXED LINES

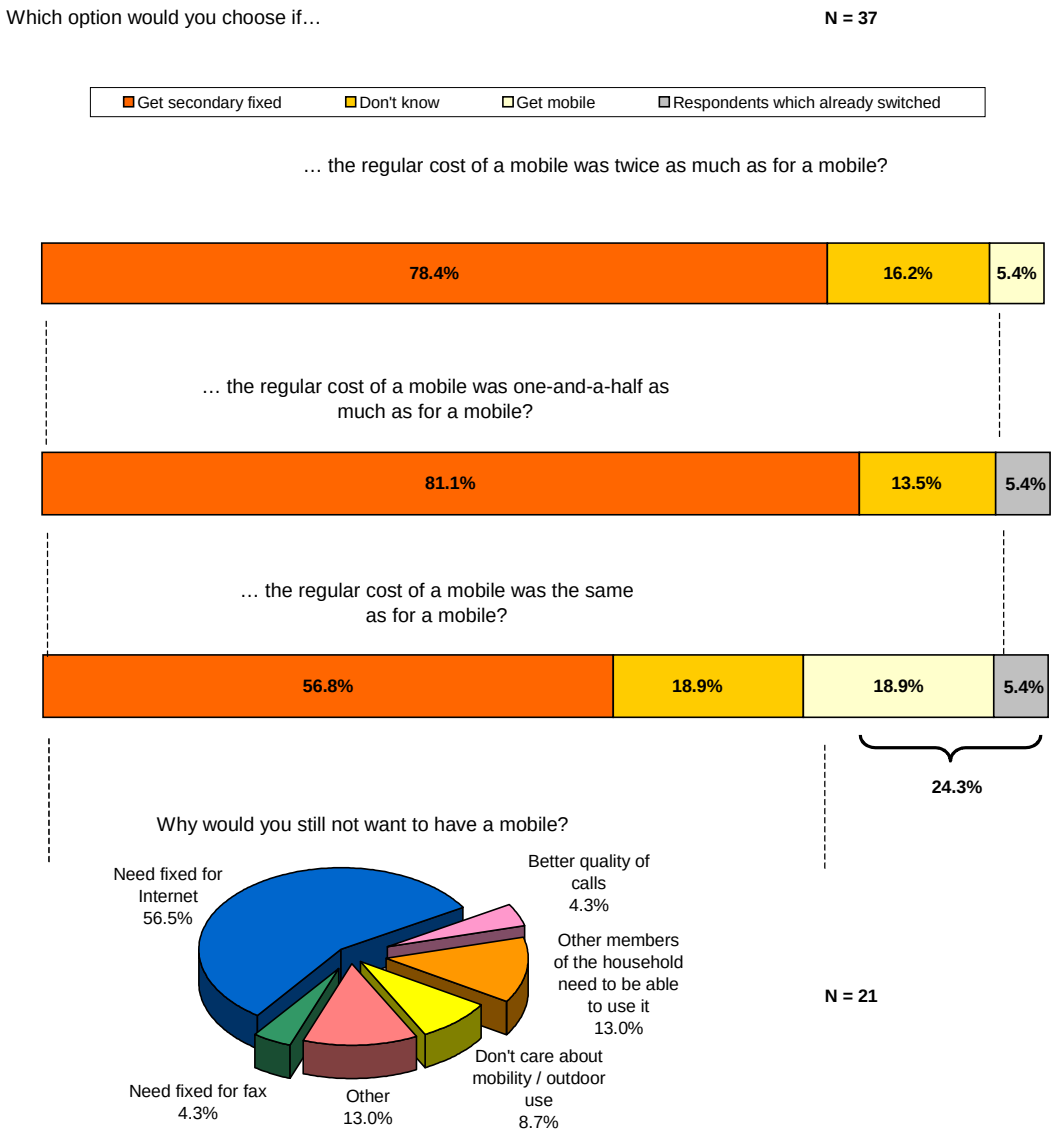
Single fixed line users who were considering getting a second fixed line were asked to choose between a fixed line or a mobile at different relative prices. The results are reported in Figure 49. The main findings are as follows:

- respondents were strongly committed to a second fixed line only when mobiles were priced at a significant premium. At equal cost, only 56.8% of respondents said that they would definitely get another fixed line, down from 81.1% if the cost of a mobile was 50% higher. The corresponding figures for certain mobile take-up are 24.3% and 5.4%; and

- among respondents who would still chose a second fixed line at equal cost, some 56.5% sited Internet access as the reason for their choice.

These results, when contrasted with those in Section 5.4.4, provide further evidence that while mobiles are a potential substitute for second fixed lines, the same is generally not true vice versa. If mobiles are perceived to be significantly higher in cost than fixed lines, users who value regular Internet access highly but would make only modest use of mobile telephony have a strong incentive to get a second line. However, if the cost of a mobile and second fixed line are perceived to be equal, then such users could potentially benefit from migrating voice onto a mobile and using the existing single fixed line for data.

Figure 49: Line choice under different prices – potential adopters of secondary fixed lines



APPENDICES

APPENDIX A:
SUMMARY OF CONCLUSIONS FROM THE SEPTEMBER 1999 REPORT

The substitution of mobile phones for fixed lines is a phenomenon acknowledged by many industry experts – but it is widely regarded as something that will happen in the future rather than today. However, the results of market research conducted in August and September 1999 on behalf of BT show that fixed-mobile substitution is actually taking place already, corroborating the findings in earlier studies commissioned by BT.

Perhaps the most surprising finding was that fixed-mobile substitution was not only taking place with regard to *calls*, but also with regard to *lines*:

Call substitution

- A surprisingly large number of respondents made calls on their mobile even when a fixed line was readily available. The main reason given for calling from a mobile rather than a fixed phone when at home was that mobile calls were cheaper at certain times. Only a small proportion of mobile users said they would wait until they had access to a fixed line for making calls.

- Around half of the respondents rated their frequency of mobile usage as about the same or higher than their frequency of fixed line usage.

- Whilst the majority of respondents reported no change in their fixed line usage after having acquired a mobile, almost one third of users say that they use their fixed line less than before. By contrast, only a small minority reported an increase in fixed line usage, thus rejecting the view that fixed and mobile phones are complements rather than substitutes.

- A large proportion of individuals would reduce their fixed usage if the price of mobile calls fell, i.e. there is a clear cross-price elasticity of demand for calls.

Line substitution

- There were a surprisingly large number of mobile-only customers. More than 40% of these had access to a fixed line when they acquired the mobile, but subsequently cancelled their fixed line subscription or did not get reconnected after moving house.

- Line substitution was driven by increased demand for access as a result of Internet and data usage. Internet and data usage were important drivers of demand for additional fixed lines, but statistical testing showed that their impact was much weaker for customers who have a mobile. This suggests that migrating voice traffic to the mobile phone and using the existing fixed line for Internet and data traffic is a good substitute for additional fixed lines.

- Given a choice between a fixed and a mobile line over a range of hypotethical price differentials, the majority of respondents were price-responsive, i.e. there is a cross-price elasticity of demand for lines. If the costs of using fixed and mobile phones were the same, the large majority of respondents would choose a mobile.

APPENDIX B:
SAMPLING METHODOLOGY AND DISCARDED OBSERVATIONS

DATA COLLECTION

The February 2000 survey

A telephone survey of fixed and mobile phone users was undertaken between 17 January and 5 February 2000, by FDS International. The full questionnaire is included in Appendix C.

There were two sample feeds:

- ***Households with fixed lines***. A core random UK sample of fixed telephony numbers was purchased from a reputable list builder, then one digit was subtracted and added to each number. Only the new numbers were called.

- ***Individuals with mobile phones***. Six-digit numbers were generated completely randomly, and these were appended systematically to each of a list of known mobile phone prefixes[5].

Overall, this generated 19,480 fixed numbers, of which 15,632 were used, resulting in 2,033 interviews. Out of 67,918 randomly generated mobile numbers, 66,340 were used (due to unobtainable numbers and phones switched off), leading to 977 interviews. Taken together, this gave a total sample size of 3,010. Out of these, 3,003 observations were used in the report.

The September 1999 survey

This survey, also undertaken by FDS International, took place between 25 August 1999 and 22 September 1999. Overall, the survey generated 12,664 fixed numbers, of which 7,007 were used, resulting in 1,735 interviews. Out of 57,206 randomly generated mobile numbers, 3,964 were used (due to unobtainable numbers and phones switched off), leading to 908 interviews. Taken together, this gave a total sample size of 2,643.

The September 1999 and February 2000 surveys were undertaken along similar lines in order to allow comparison between the data sets, with the aim of highlighting potential trends in fixed-mobile substitution. However, in order to improve the quality of the data set, certain changes and additions have been made from the previous one. For these parts, comparisons with the previous survey are not appropriate.

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[5] The prefixes were taken from the Oftel website – which is updated every month – and then selected randomly from the list; the numbers were generated according to the number of digits required for each network. There were no quotas set on network prefixes.

DISCARDED OBSERVATIONS

This section reports the diagnosis and treatment of outliers and wrong entries in the February 2000 survey. Similar details on the September 1999 survey can be found in the Fixed Mobile Substitution report dated 8 November 1999.

Detecting odd responses

Specific tracking of the answers given by a respondent was triggered by odd answers. Specifically, the criteria for detecting atypical data were:

- reporting more than fifteen inhabitants in the household;
- reporting more individuals having a mobile in the household than total individuals in the household;
- reporting usage of the Internet or fax when the respondent did not have a fax machine nor Internet connection; and
- reporting choice of secondary fixed over mobile because of fax, data and Internet needs and not having the hardware required for it.

Dropped observations

Four individuals reported a household size of 600, 300, 400 and 40; these individuals were either in hotels, students or old peoples' residences. These observations were dropped, since such individuals do not live in a household that can be treated as a single economic unit for the purposes of decisions about telephony services.

Two individuals reported more mobile users in the household than household members. These observations were also dropped.

One individual reported having fourteen fixed lines but a typical quarterly bill of less than £20. This respondent also reported being retired but using his/her secondary fixed lines about half and half for work and personal purposes. This individual was dropped.

Miskeys and amendments

Four observations made sense as a whole except for one answer, which was not consistent with the rest. In these cases where miskeyed data was detected, the presumed incorrect entry was replaced.

Replaced entries are reported in Table 5.

Table 5: Miskeys and amendments

Observation number	*Presumed wrong entry*	*Replacing value*	*Reason*
8469	*Do you have an Internet connection for your PC?* ***NO***	***YES***	Respondent reported need for Internet as the reason for choosing secondary fixed over mobile; also reported very high usage of data and Internet, typically through the secondary fixed line.
14586	*Why did you prefer a secondary fixed line over a mobile phone?* ***Mainly required for Internet***	***Don't Know***	Respondent reported not having Internet connection and not using it at all; but reported need for Internet as the reason for choosing secondary fixed over mobile.
5249	*Do you have a fax machine?* ***NO***	***YES***	Respondent reported need for fax as the reason for choosing secondary fixed over mobile; as well reported occasional usage of a fax, typically through the secondary fixed line.
7621	*How much is your typical quarterly bill on all your fixed lines?* ***Less than £20***	***Don't Know***	Respondent reported having three fixed lines; but his/her estimated bill was unrealistically low.

APPENDIX C:
ESTIMATION OF POPULATION TYPE PROPORTIONS

Estimating the relative share of the telephony market population (i.e. all UK individuals over sixteen subscribing to at least one telephony service) accounted for by each user category (single fixed, single fixed and mobile, multiple fixed, multiple fixed and mobile and mobile only) is a difficult task. The sample proportions observed in the survey do not directly provide estimates of the sizes of these groups. This is because sample proportions are subject to systematic sampling bias owing to the telephone-based survey method used to contact them. There are three sources of potential bias:

- oversampling of respondents who have both a fixed line and a mobile, as they can be contacted via both forms of telephony;
- oversampling of multiple fixed lines respondents, as there is a greater likelihood of contacted them by random number than single fixed users; and
- undersampling of the most common categories (i.e. single fixed, and single fixed and mobile), as interviews of respondents in these categories did not take place once a quota of 1,000 was reached.

To overcome these problems, we used a simple maximum likelihood estimation. The idea is to consider the population proportions of the five user categories as given parameters and calculate the sample numbers that we should, by our random sampling method, expect to obtain. In order to do so, we must compute the probability of reaching each type of respondent. Additionally, we must take consideration of quotas, and how the sample proportions evolve once these are reached.

In order to estimate the population proportions, we have divided the sample between those individuals interviewed on a mobile and those reached on their fixed lines. Via fixed line we can reach all but mobile-only individuals. On the mobile sample we find only user groups who have a mobile phone. Hence we compute, given some (unknown) population proportions, the probabilities of reaching each category in each of the two samples and, given the sample size, the expected sample proportions. The two samples are considered separately, but are used jointly in the estimation process.

We further divide the sample between those observations gathered when quotas were not yet reached and those obtained once the first quota is achieved. For once a quota is reached, only the relative proportions of the remaining categories in the sample will be considered.

THE FIXED SAMPLE

Note that there is some room for confusion when dealing with fixed line subscribers. It is important to stress that we are considering proportions of *individuals* in certain user categories, rather than proportions of *households.*

Muliple fixed lines

Once a randomly generated fixed line number is successfully rung, we ask whether a single fixed line or else a multiple fixed line household has been reached. It is reasonable to assume that multiple fixed line households have a greater probability of being reached, since they have more numbers were they can be reached. However, secondary lines may not be not connected to a telephone, but a fax machine or a modem. Hence the probability that a multiple fixed line household is reached through a secondary fixed line should be less than that of reaching a fixed line household on its main fixed.

An oversampling parameter d was introduced; which should lie between 0 and 1. A single fixed household can now be reached via one telephone number, while a multiple fixed line household can be reached via $1+d$ "effective" telephone numbers.

Mobile phones

Once a household is reached, only one individual answers the telephone and responds to the questionnaire. This individual may or may not own a mobile phone.

The first approach to this problem is consider the average number of individuals and the average number of mobile owners for that type – single or multiple fixed – of household. We assume that the probability that the telephone is answered by a respondent without a mobile will be the average number of non mobile individuals divided by the average total individuals in that type of household. Similarly, the probability that the respondent owns a mobile will be the average of the number of mobiles in the household over the total individuals in the household. Only individuals over sixteen are considered. This was estimated using the unquoted sample. This should prove quite a robust estimator, since sample sizes are large and for each individual respondent we gather information not only on the respondent but also for the whole household.

Mobile and non-mobile users cannot be considered as having equal likeliness of answering the telephone. Imagine a two member household with one mobile. If the fixed line rings, do both individuals have the same chances of answering the telephone? It could be argued that the mobile owner is likely to be the family head, and hence more likely to answer the call. However, it could also be argued that when the fixed line rings, the mobile owner does not bother answering the call, since he/she owns mobile to receive personal calls.

In the analysis we introduced a parameter m, which was supposed to take a value between –1 and 1, to measure this mobile ownership effect on fixed call answering. The estimation gave a negative value for m. This means that mobile owners are less keen to answer fixed line calls than other household members. This result would imply fixed mobile substitution at the access level. This finding seems to be backed by some fixed and mobile respondents reporting to use their mobile as their main means of receiving voice calls.

THE MOBILE SAMPLE

Dealing with the mobile sample was easier. Different types of mobile users have equal probabilities of being reached on their mobile, and that is regardless how many fixed lines they have. Hence, no corrections for known sampling bias had to be undertaken.

DATA ONCE QUOTAS CLOSE

When a quota is achieved for a category, then no more observations of that type are gathered. Hence, once an interviewer reaches this type of individuals, the observation is dropped. But even though the proportions of these types would then be understated, using the data gathered in this second stage, provides further information on the relative proportions of the remaining categories.

The idea is that once a type reaches the quota, it is still possible to compute the expected proportions of the rest of categories for the remaining observations. The quotas were closed for 'single fixed' and 'single fixed and mobile' respondents.

ESTIMATION METHOD

Once all probabilities were computed, the population proportions were estimated by a simple maximum likelihood method. This method computes the probability of obtaining the observed sample depending on the population parameters, and estimates these parameters that maximise this probability.

APPENDIX D:
THE QUESTIONNAIRE[6]

```
INTRO       Good %POD%. My name is ..... from FDS Market Research. We are
            conducting a survey on behalf of BT about people's use of fixed and
            mobile telephones, to help plan networks for the future.  The
            interview will take about 15 minutes. Is it convenient now?

_____________________________________________________________________________

SECTA       CONTINUE
_____________________________________________________________________________
~

~
Q1          How many fixed phone lines does your household have? That is, how
            many separate phone numbers do you have, including any numbers used
            for fax and the Internet, but not counting mobile phones?

            0/1/2/3 TO 99                          _____________  (9-10)
_____________________________________________________________________________

            ROUTE(Q1=1)GO CLOSEQ
            IF(Q1>9){
_____________________________________________________________________________

CHK1        INTERVIEWER: ANSWER WAS OVER 9 FIXED LINES - PLEASE CHECK AND
            CONFIRM Q1

                                                                    SP
            OK to continue.................................[]
_____________________________________________________________________________

Q2          Do you have a personal computer in the household?

                                                          (11)  SP
            Yes.............................................1
            No..............................................2    GO TO CONQ4A
_____________________________________________________________________________

Q3          Do you have an Internet connection for this computer?

                                                          (12)  SP
            Yes.............................................1
            No..............................................2
_____________________________________________________________________________

CONQ4A      ROUTE(Q1=0)GO Q4B
_____________________________________________________________________________

Q4A         Do you have a fax machine at home?

                                                          (13)  SP
            Yes.............................................1
            No..............................................2
_____________________________________________________________________________

Q4B         Do you have a mobile phone yourself?
```

6 The full questionnaire and the routing code are given below; where there is a jump on the numbering of questions, a question have been removed *before* the interviews took place.

```
                                                          (14)  SP
          Yes.....................................................1
          No......................................................2
```

```
          UNSET Q4HC
          IF(Q1=1.AND.Q4B='No'){
          SET Q4HC=1
          }
          IF(Q1>1.AND.Q4B='No'){
          SET Q4HC=2
          }
          IF(Q1=1.AND.Q4B='Yes'){
          SET Q4HC=3
          }
          IF(Q1>1.AND.Q4B='Yes'){
          SET Q4HC=4
          }
          IF(Q1=0.AND.Q4B='Yes'){
          SET Q4HC=5
          }
          ROUTE(Q4HC=NULL)GO CLOSEQ
          QUOTA Q4HC PASS=OK
          ROUTE(.NOT.OK)GO CLOSEQ
          ROUTE(Q1=0.AND.Q4B='Yes')GO SECTC
          ROUTE(Q1=0.AND.Q4B='No')GO CLOSE1
```

```
SECTB     CONTINUE
ROUTE(Q1>1)GO CONQ18
```

```
Q5        How much roughly is your typical total quarterly bill for your fixed
          line at home?


                                                           Card: 03 (6-7)
                                                          (15)  SP
          Less that #20...........................................1
          #20 - #40...............................................2
          #40 - #60...............................................3
          #60 - #80...............................................4
          #80 - #100..............................................5
          #100 - #120.............................................6
          More than #120..........................................7
          Don't know..............................................Y
          Refused.................................................{
```

```
Q6        Which operator do you rent your fixed line from?


                                                          (16)  MP
          BT......................................................1
          Kingston................................................2
          C&W.....................................................3
          Other Cable Operator....................................4
          Atlantic................................................5
          Other (specify)                                         0


                                                        (17-26)
          Specified Other
                                                          (16)  MP
          Don't know..............................................Y
          Refused.................................................{
```

```
Q7        Is your fixed line used:


                                                          (27)  SP
          Mainly for work.........................................1
          Mainly for personal purposes............................2
          About half and half.....................................3
```

```
Q9        How likely is your household to get a second fixed line in the next
          12 months?
```

```
                                                        (32)  SP
          Very likely.....................................1
          Quite likely....................................2
          Not very likely.................................3    GO TO SECTC
          Not at all likely...............................4    GO TO SECTC
```

Q10 Do you yourself have a say in this decision?

```
                                                        (33)  SP
          Yes.............................................1
          No..............................................2    GO TO SECTC
```

Q11 Do you expect to get a second line from the same operator from which you rented your first line?

```
                                                        (34)  SP
          Yes.............................................1    GO TO D13
          No..............................................2
```

Q12 From which operator do you expect to get your second line? Write in

```
                                                        (35)  SP
          BT..............................................1
          Kingstone.......................................2
          C&W.............................................3
          Other Cable Operator............................4
          Atlantic........................................5
          Other (specify)                                 0

                                                      (36-45)
          Specified Other
                                                        (35)  SP
          Don't know......................................Y
          Refused.........................................{
```

D13

Now I'd like to ask you how you expect to use the second fixed line, if and when you get one:

```
         SET I=ITERATION
         IF(I=1){
         SET TXT='So, '
         }ELSE{
         SET TXT=''
         }
```

Q13A

-1- Making outgoing voice calls

-2- Receiving voice calls

-3- Sending and receiving faxes

-4- Internet and data calls

	-1-	-2-	-3-	-4-
	(46)	(47)	(48)	(49)
.....	_____	_____	_____	_____

Q13B [+txt+]How much do you expect to use the second fixed line (for [+a+])?

-1- Making outgoing voice calls

-2- Receiving voice calls

-3- Sending and receiving faxes

-4- Internet and data calls

	-1-	-2-	-3-	-4-	
	(50)	(51)	(52)	(53)	SP
Very much.....	1	1	1	1	
Quite a lot.....	2	2	2	2	
Somewhat.....	3	3	3	3	
Not very much, or.	4	4	4	4	
Not at all.....	5	5	5	5	
Don't know.....	Y	Y	Y	Y	

ROUTE(Q4B='Yes')GO SECTC

Q14 You said you are likely to get a second fixed line in the next 12 months. Have you considered getting a mobile phone instead?

	(54)	SP
Yes	1	
No	2	

Q15 Why do you prefer a second fixed line to a mobile phone? (Probe and circle from list. Do not prompt.)

	(55)	MP
cheaper	1	
available to other members of the household	2	
mainly required for fax	3	
mainly required for Internet	4	
better quality of calls	5	
don't care about mobility/outdoor use	6	
don't prefer one to other - planning to get both	7	
Other (specify)	0	

(56-65)

Specified Other

	(55)	MP
Don't know	Y	

You said your household doesn't have a second fixed line at the moment, but that you are likely to get one in the next 12 months. How would you choose between getting a second fixed line and getting a mobile phone if the regular bills for using a mobile phone (including both call andsubscription/line rental charges, but excluding any connection or installation charges) were:

SET NG=ITERATION

Q16 [+a+]?

-1- Twice as much as a second fixed line

-2- What if it cost one-and-a-half times as much as a second fixed line

-3- What if it cost the same as a second fixed line

	-1-	-2-	-3-	
	(66)	(67)	(68)	SP
Get mobile phone..	1	1	1	
Get second fixed line.....	2	2	2	
Don't know.....	Y	Y	Y	

ROUTE(NG=3.AND.Q16(*)=DK)GO SECTC

Q17 Why would you still not want to have a mobile phone, even if it cost the same as a second fixed line phone? (Probe and circle from list. Do not prompt.)

```
                                                          (69)  MP
          need fixed line for fax.........................1
          need fixed line for Internet....................2
          better quality of calls.........................3
          other members of the household need to be able
          to use it.......................................4
          don't care about mobility/outdoor use...........5
          Other (specify)                                 0


                                                       (70-79)
          Specified Other
```

```
          ROUTE(Q4B='Yes')GO SECTC
          ROUTE(Q4B='No')GO CONQ68
```

```
CONQ18    CONTINUE
          ROUTE(Q1<2)GO SECTC
```

```
Q18       Which operator(s) do you rent your fixed lines from? Write in


                                                          (80)  MP
          BT..............................................1
          Kingstone.......................................2
          C&W.............................................3
          Other Cable Operator............................4
          Atlantic........................................5
          Other (specify)                                 0
                                                                Card: 04 (6-7)


                                                         (8-17)
          Specified Other
                                                                Card: 03 (6-7)
                                                          (80)  MP
          Don't know......................................Y
          Refused.........................................{
```

```
Q19       Do you use a digital line, such as BT's Home Highway service?


                                                                Card: 04 (6-7)
                                                          (18)  SP
          Yes.............................................1
          No..............................................2
          Don't know......................................Y
```

```
Q20       When did you get your second fixed line?


                                                          (19)  SP
          Less than 1 year ago............................1
          1-2 years ago...................................2
          2-5 years ago...................................3
          More than 5 years ago...........................4
```

```
Q21       How much roughly is your typical total quarterly bill on all your
          lines at home?


                                                          (20)  SP
          Less that #20...................................1
          #20 - #40.......................................2
          #40 - #60.......................................3
          #60 - #80.......................................4
          #80 - #100......................................5
          #100 - #120.....................................6
          More than #120..................................7
          Don't know......................................Y
          Refused.........................................{
```

```
Q22       Is your main fixed line used:
```

(21) SP

Mainly for work.....1
Mainly for personal purposes.....2
About half and half.....3

Q23 And what about your second fixed line? Is it used:

(22) SP

Mainly for work.....1
Mainly for personal purposes.....2
About half and half.....3

ROUTE(Q4B='No')GO Q25

Q24 Which did you get first, the second fixed line or the mobile?

Card: 08 (6-7)

(70) SP

Second fixed line.....1
Mobile.....2 GO TO SECTC

Q25 Did you yourself have a say in the decision to get a second fixed line?

Card: 04 (6-7)

(31) SP

Yes.....1
No.....2 GO TO SECTC

Q26 When you got your second fixed line, did you consider getting a mobile phone instead?

(32) SP

Yes.....1
No.....2

Q27 Why did you prefer a second fixed line to a mobile phone?(Probe and circle from list. Do not prompt.)

(33) MP

cheaper.....1
available to other members of the household.....2
mainly required for fax.....3
mainly required for Internet.....4
better quality of calls.....5
don't care about mobility/outdoor use.....6
Other (specify) 0

(34-43)

Specified Other

(33) MP

Don't know.....Y

ROUTE(Q4B='Yes')GO SECTC

Q28 If you were getting your 2nd fixed line today, would you consider using a mobile phone instead?

(44) SP

Yes.....1
No.....2

Imagine that your household didn't have a second fixed line. You could choose between getting a second fixed line and getting a mobile phone. Which would you

choose if the regular cost of using a mobile phone (that is the total cost including call and subscription/line rental charges, but excluding connection/installation charges) was:

SET NG=ITERATION

Q29 [+a+]?

-1- Twice as much as a second fixed line

-2- What if it cost one-and-a-half times as much as a second fixed line

-3- What if it cost the same as a second fixed line

	-1-	-2-	-3-	
	(45)	(46)	(47)	SP
Get mobile phone..	1	1	1	
Get second fixed line.....	2	2	2	
Get neither.....	3	3	3	
Don't know.....	Y	Y	Y	

ROUTE(NG=3.AND.(Q29(*)='<neither'.OR.Q29(*)=DK))GO SECTC

Q30 Why would you still not want to have a mobile phone, even if it cost no more than a second fixed line phone? (Probe and circle from list. Do not prompt.)

(48) MP

need fixed for fax.....1
need fixed for Internet.....2
better quality of calls.....3
don't care about mobility/outdoor use.....4
Other (specify) 0

(49-58)

Specified Other

SECTC CONTINUE
ROUTE(Q4B='No')GO CONQ68

Q32 When did you get your mobile phone?

(59) SP

Less than 1 year ago.....1
1-2 years ago.....2
2-5 years ago.....3
More than 5 years ago.....4

Q33 Which network is it on?

(60) SP

BT Cellnet.....1
Vodafone.....2
Orange.....3
One to One.....4
Virgin Mobile.....5
Other (specify) 0

(61-70)

Specified Other

(60) SP

Don't know.....Y

Q34 Is it contract or pre-paid?

(71) SP

```
          contract.....................................1
          pre-paid.....................................2
```

```
Q35       What is the size of your typical total monthly expenditure on your
          mobile phone?

                                                        (72)  SP
          Less that #20................................1
          #20 - 40.....................................2
          #40 - 60.....................................3
          #60 - 80.....................................4
          More than #80................................5
          Don't know...................................Y
          Refused......................................{
```

```
Q36       Do you use your mobile phone:

                                                        (73)  SP
          Mainly for work..............................1
          Mainly for personal purposes.................2
          About half and half..........................3
```

```
Q37       Was your mobile phone:

                                                        (74)  SP
          bought by you?...............................1
          given to you as a gift?......................2
          bought for you by your employer?.............3
```

```
Q38A      Who pays the regular bill for your mobile phone?

                                                                Card: 09 (6-7)
                                                        (8)   SP
          Yourself.....................................1
          Your employer................................2
          Someone else (specify).......................3
          Other (specify)                               0

                                                      (9-18)
          Specified Other
```

```
         SET N24=NBIT(Q24)
         ROUTE(N24=1.OR.Q1=0)GO Q39
```

```
Q38B      When you got your mobile phone, did you consider getting a second
          fixed line instead?

                                                        (19)  SP
          Yes..........................................1
          No...........................................2
```

```
Q38C      Why did you prefer a mobile to your second fixed line? (Probe and
          circle from list. Do not prompt)

                                                        (20)  MP
          Can make calls from anywhere with a mobile.....1
          Easier for people to reach you with a mobile.....2
          Having a mobile is important for image...........3
          Bill paid by someone else.....................4
          Other (specify)                               0

                                                     (21-30)
          Specified Other
                                                        (20)  MP
          Don't know...................................Y
```

Q38D If you were getting your mobile today, would you consider getting a second fixed line instead?

	(31)	SP
Yes	1	
No	2	

Q39 Do you have easy access to a fixed line at your place of work?

Card: 04 (6-7)

	(76)	SP
Yes	1	
No	2	GO TO D42
Not working	3	GO TO D42
No answer	X	GO TO D42

Q40 How often do you make calls on your mobile phone when you are at work?

	(77)	SP
often	1	
sometimes	2	
rarely	3	GO TO D42
never	4	GO TO D42

Q41 Why don't you use a fixed line to make these calls? (Probe from list. Do not prompt.)

	(78)	MP
can't always get to a fixed line	1	
I don't pay the bill	2	
want to talk in private/don't want to be overheard	3	
cheaper at certain times	4	
fixed line sometimes being used	5	
Other (specify)	0	

Card: 05 (6-7)

(8-17)

Specified Other

D42

For each of the following possible reasons for having a mobile phone, please say whether each is very important, quite important, not very important, or not at all important for you:

Q42 ....?

-1- So people can contact me to do with work or business

-2- So I can contact other people to do with work or business

-3- So friends or family can contact me more easily

-4- So I can contact friends or family more easily

-5- So I can make calls in an emergency

-6- So people can call me in an emergency

-7- Because it matters for my image

	-1-	-2-	-3-	-4-	-5-	-6-	-7-	
	(18)	(19)	(20)	(21)	(22)	(23)	(24)	SP
Very important	1	1	1	1	1	1	1	
Quite important	2	2	2	2	2	2	2	
Not very important	3	3	3	3	3	3	3	
Not at all important	4	4	4	4	4	4	4	

In each of the following situations, please say whether you have your mobile phone switched on most of the time, some of the time, not very much or hardly ever.

Q43 ....?

-1- Whenever you're at home

-2- Whenever you're at your place of work

-3- Whenever you're out and about during the day

-4- Whenever you're out and about during the evening

	-1- (25)	-2- (26)	-3- (27)	-4- (28)	SP
Most of the time..	1	1	1	1	
Some of the time..	2	2	2	2	
Not very much of the time.....	3	3	3	3	
Hardly ever.....	4	4	4	4	

Can you tell me whether you agree or disagree with the following statments:

SET NG=ITERATION
ROUTE(NG=8.AND.Q1=0)GO SKP44

Q44 ....?

-1- My mobile phone represents good value for money

-2- I think about cost every time I use my mobile phone

-3- I use my mobile phone more than I thought I would when I got it

-4- I would use my mobile phone more if the calls cost less

-5- I would use my mobile phone more if the call quality was better

-6- I would use my mobile phone more if I could always get a connection

-7- I often wait till i can get to a fixed phone rather than use my mobile

	-1- (29)	-2- (30)	-3- (31)	-4- (32)	-5- (33)	-6- (34)	-7- (35)	SP
Strongly agree....	1	1	1	1	1	1	1	
Agree.....	2	2	2	2	2	2	2	
Neither agree nor disagree.....	3	3	3	3	3	3	3	
Disagree.....	4	4	4	4	4	4	4	
Strongly disagree.	5	5	5	5	5	5	5	

-8- If I didn't have a mobile phone, I would use my fixed line more

-9- If I didn't have a mobile phone, I would use other fixed lines more

-10- If I didn't have a mobile phone, I would use payphones more

-11- I would leave my mobile phone switched on more of the time, but I worry about the batteries running out

-8- -9- -10- -11-

	(36)	(37)	(38)	(39)	SP
Strongly agree....	1	1	1	1	
Agree.....	2	2	2	2	
Neither agree nor disagree.....	3	3	3	3	
Disagree.....	4	4	4	4	
Strongly disagree.	5	5	5	5	

SKP44 CONTINUE

ROUTE(Q4B='No')GO Q48
ROUTE(Q1>0)GO CONQ58

Q46 How long have you been living without a fixed line?

(41) SP
less than 6 months.....1
6 months-1 year.....2
1-2 years.....3
more than 2 years.....4

Q45 When you got your mobile phone, did you and your household have a fixed line?

(40) SP
Yes.....1
No.....2 GO TO Q50

Q47 You said you used to have a fixed line and a mobile, but now you have just a mobile. Did you cancel your subscription for your fixed line or did you move to accommodation where there was no fixed line?

(42) SP
Cancelled subscription for fixed line.....1
Moved somewhere where no fixed line.....2 GO TO Q49

Q48 Why did you cancel your fixed line subscription? (Probe and circle from list. Do not prompt.)

(43) SP
Didn't use it often enough to make it worthwhile.1
Prefer to have just one phone number.....2
Problems dividing up the bill with other people..3
Other (specify) 0

(44-53)
Specified Other

GOTO Q50

Q49 What type of accommodation did you move to?

(54) SP
student hall of residence.....1
Bedsit/rented room in private house.....2
Shared rented accommodation.....3
Hostel.....4
Hotel.....5
Other (specify) 0

(55-64)
Specified Other

Q50 If you wanted to, could you have a fixed line installed where you live?

(65) SP

Yes.....1
No.....2 GO TO Q53

Q51 How likely are you to get a fixed line installed where you live within the next 12 months?

(66) SP

Very likely.....1 GO TO Q55
Quite likely.....2 GO TO Q55
Not very likely.....3
Not at all likely.....4

Q52 Why not? (PROBE AND FROM LIST. DO NOT PROMPT.)

(67) MP

Won't be living here long enough to make it worthwhile.....1
Wouldn't use it often enough to make it worthwhile.....2
Prefer to have just one phone number.....3
Problems dividing up the bill with other people..4
Other (specify) 0

(68-77)

Specified Other

GOTO Q55

Q53 If you could, would you have a fixed line installed?

(78) SP

Yes.....1 GO TO Q55
No.....2

Q54 Why not? (Probe and circle from list. Do not prompt)

Card: 06 (6-7)

(9) MP

won't be living here long enough to make it worthwhile.....1
wouldn't use it often enough to make it worthwhile.....2
prefer to have just one phone number.....3
problems dividing up the bill with other people..4
Other (specify) 0

(10-19)

Specified Other

Q55 Imagine that you did not have a mobile phone and nor did anyone else in your household. Your household could choose between getting one or more mobile phones or getting a fixed line. Would you have a say in this decision?

(20) SP

Yes.....1
No.....2 GO TO SECTD

Q56 Which option would you choose if the regular cost of using a fixed line (including line rental and call charges, but not installation charges) was the same as for your mobile phones or phones?

(21) SP

Get fixed line.....1 GO TO SECTD

```
          Get mobile phone(s).............................2
          Don't know......................................Y
```

```
Q56B      What if it was three-quarters as much as for your mobile phones or
          phones?

                                                          (22)  SP
          Get fixed line..................................1    GO TO SECTD
          Get mobile phone(s).............................2
          Don't know......................................Y
```

```
Q56C      What if it was half as much as for your mobile phones or phones?

                                                          (23)  SP
          Get fixed line..................................1    GO TO SECTD
          Get mobile phone(s).............................2
          Don't know......................................Y
```

```
Q57       Why would you still not want to have a fixed line, even if it cost
          only half as much as your mobile phones or phones? (Probe and circle
          from list. Do not prompt.)

                                                          (24)  SP
          Can make calls from anywhere with mobile.........1
          Easier for people to reach you with mobile.......2
          Having a mobile is important for image...........3
          Bill is paid by someone else.....................4
          Other (specify)                                  0

                                                        (25-34)
          Specified Other
```

```
          GOTO SECTD
```

```
CONQ58    CONTINUE
          ROUTE(Q1=0.OR.Q4B='No')GO CONQ68
          COLUMN 643
```

```
Q59       Since you got a mobile phone, do you make phone calls on your home
          fixed line:

                                                          (43)  SP
          Much more than before...........................1
          Somewhat more than before.......................2
          About the same as before........................3    GO TO Q61
          Somewhat less than before.......................4
          Much less than before...........................5
```

```
Q60       Did this happen because you got a mobile phone, or was it for other
          reasons?

                                                          (44)  SP
          Because of mobile phone.........................1
          For other reasons...............................2
          Don't know......................................Y
```

```
Q61       How often do you make calls on your mobile phone when you are at
          home?

                                                          (45)  SP
          Often...........................................1
          Sometimes.......................................2
          Rarely..........................................3    GO TO Q63
          Never...........................................4    GO TO Q63
```

```
Q62       Why don't you use your main fixed line to make these calls? (PROBE
```

FROM LIST. DO NOT PROMPT.)

(46) MP

Want to keep separate billing, e.g. for work.....1
Cheaper at certain times.....2
Fixed line sometimes being used.....3
Want to talk in private/don't want to be overheard.....4
Other (specify) 0

(47-56)

Specified Other

Q63 If the cost of calls on your mobile phone fell by a quarter, what difference would it make to how much you use your fixed line (or lines)? Would you use your fixed line . . . ?

(57) SP

Much less.....1
Somewhat less.....2
A little less.....3
Same as now.....4

Q63A And what if the cost of calls on your mobile phone fell by half?

(58) SP

Much less.....1
Somewhat less.....2
A little less.....3
Same as now.....4

ROUTE(Q1>1.AND.Q4B='Yes')GO SECTD

Q65 Imagine that you did not have a mobile phone and nor did anyone else in your household. Your household could choose between getting one or more mobile phones or getting a second fixed line. Would you have a say in this decision?

(70) SP

Yes.....1
No.....2 GO TO SECTD

Q66 Which option would you choose if the total cost of having and using a second fixed line was the same as for your mobile phones or phones?

(71) SP

Get second fixed line.....1 GO TO SECTD
Get mobile phone(s).....2
Don't know.....Y

Q66A What if it was three-quarters as much as for your mobile phones or phones?

(72) SP

Get second fixed line.....1 GO TO SECTD
Get mobile phone(s).....2
Don't know.....Y

Q66B What if it was half as much as for your mobile phones or phones?

(73) SP

Get second fixed line.....1 GO TO SECTD
Get mobile phone(s).....2
Don't know.....Y

Q67 Why would you still not want to have a second fixed line, even if it

cost only half as much as your mobile phones or phones? (PROBE FROM LIST. DO NOT PROMPT.)

(74) MP

Can make calls from anywhere with mobile.....1
Easier for people to reach you with mobile.....2
Having a mobile is important for image.....3
Bill is paid by someone else.....4
Other (specify) 0

Card: 07 (6-7)

(8-17)

Specified Other

GOTO SECTD

CONQ68 CONTINUE
ROUTE(Q4B='Yes')GO SECTD

Q68 How likely are you to get a mobile phone in the next 12 months?

(18) SP

Very likely.....1
Quite likely.....2
Not very likely.....3 GO TO SECTD
Not at all likely.....4 GO TO SECTD

Q69 Would it be contract or pre-paid?

(19) SP

Contract.....1
Pre-paid.....2
Don't know.....Y

Q70 Would your mobile phone be used:

(20) SP

Mainly for work.....1
Mainly for personal purposes.....2
About half and half.....3

Now I'd like to ask you how you might use your mobile phone:

SET I=ITERATION
IF(I=1){
SET TXT='So, '
}ELSE{
SET TXT=''
}

Q71A

-1- Making outgoing voice calls?

-2- Receiving voice calls?

-3- Sending and receiving faxes?

-4- Internet and data calls?

	-1-	-2-	-3-	-4-
	(21)	(22)	(23)	(24)
.....	_____	_____	_____	_____

Q71B [+txt+]How much would you use the mobile phone for [+a+]?

-1- Making outgoing voice calls?

-2- Receiving voice calls?

-3- Sending and receiving faxes?

-4- Internet and data calls?

	-1-	-2-	-3-	-4-	
	(25)	(26)	(27)	(28)	SP
Very much.....	1	1	1	1	
Quite a lot.....	2	2	2	2	
Somewhat.....	3	3	3	3	
Not very much, or.	4	4	4	4	
Not at all.....	5	5	5	5	
Don't know.....	Y	Y	Y	Y	

Q72 If you got a mobile phone, do you think you would use your main fixed line at home:

(29) SP

Much more than now.....1
Somewhat more than now.....2
About the same.....3
Somewhat less than now.....4
Much less than now.....5

ROUTE(Q1>1)GO Q75

Q73 You said you are likely to get a mobile phone in the next 12 months. have you considered getting a second fixed line instead?

(30) SP

Yes.....1
No.....2

Q74 Why do you prefer a mobile phone to a second fixed line? (PROBE AND LIST. DO NOT PROMPT.)

(31) MP

Don't prefer one to other - planning to get both.1
Can make calls when away from home.....2
Easier for people to reach you with mobile.....3
Having a mobile is important for image.....4
Use when main line is being used/engaged.....5
Bill is paid by someone else.....6
Other (specify) 0

(32-41)

Specified Other

Q75 Who would pay for your mobile phone?:

(42) SP

Yourself.....1 GO TO COND76
Your employer.....2
Someone else (write in).....3
Other (specify) 0

(43-52)

Specified Other

(42) SP

Don't know.....Y

GOTO SECTD

COND76 ROUTE(Q1>1)GO SECTD

You said you don't have a mobile phone at the moment, but that you are likely to get one in the next 12 months. How would you choose between getting a mobile phone and getting a second fixed line if the regular cost of using a second fixed line (including call and line rental charges, but excluding any connection or installation charges) was:

Q76A The same as for a mobile phone?

(53) SP

Get second fixed line.....1 GO TO SECTD
Get mobile phone.....2
Don't know.....Y

Q76B Three-quarters as much as for a mobile phone?

(54) SP

Get second fixed line.....1 GO TO SECTD
Get mobile phone.....2
Don't know.....Y

Q76C Half as much as for a mobile phone?

(55) SP

Get second fixed line.....1 GO TO SECTD
Get mobile phone.....2
Don't know.....Y

Q77 Why would you still not want to have a second fixed line, even if it cost only half as much as a mobile phone? (Probe from list. Do not prompt.)

(56) MP

Can make calls from anywhere with mobile.....1
Easier for people to reach you with mobile.....2
Having a mobile is important for image.....3
Bill is paid by someone else.....4
Other (specify) 0

(57-66)

Specified Other

SECTD CONTINUE
COLUMN 932

SD1 How often do you [+a+]?

-1- Make outgoing voice calls

-2- Receive voice calls

-3- Send and receive faxes

-4- Make Internet and data calls

	-1-	-2-	-3-	-4-	
	9/32	(33)	(34)	(35)	SP
Very often.....	1	1	1	1	
Quite often.....	2	2	2	2	
Sometimes.....	3	3	3	3	
Rarely.....	4	4	4	4	
Never.....	5	5	5	5	
Don't know.....	Y	Y	Y	Y	

ROUTE(Q1=0)GO SOCEC
ROUTE(Q1=1.AND.Q4B='No')GO SOCEC
ROUTE(Q1>1.AND.Q4B='Yes')GO LQCOMPC
ROUTE(Q1=1.AND.Q4B='Yes')GO LQCOMPB

QCOMP Which line so you typically use for [+a+]?

-1- Making outgoing voice calls

-2- Receiving voice calls

-3- Sending and receiving faxes

-4- Internet and data calls

	-1-	-2-	-3-	-4-	
	(36)	(37)	(38)	(39)	SP
Main.....	1	1	1	1	
Secondary.....	2	2	2	2	
Any.....	3	3	3	3	
Don't know.....	Y	Y	Y	Y	

GOTO SOCEC

QCOMPB Which line so you typically use for [+a+]?

-1- Making outgoing voice calls

-2- Receiving voice calls

-3- Sending and receiving faxes

-4- Internet and data calls

	-1-	-2-	-3-	-4-	
	(40)	(41)	(42)	(43)	SP
Fixed.....	1	1	1	1	
Mobile.....	2	2	2	2	
Any.....	3	3	3	3	
Don't know.....	Y	Y	Y	Y	

GOTO SOCEC

QCOMPC Which line do you typically use for [+a+]?

-1- Making outgoing voice calls

-2- Receiving voice calls

-3- Sending and receiving faxes

-4- Internet and data calls

	-1-	-2-	-3-	-4-	
	(44)	(45)	(46)	(47)	SP
Main fixed.....	1	1	1	1	
Secondary fixed...	2	2	2	2	
Mobile.....	3	3	3	3	
Any.....	4	4	4	4	
Don't know.....	Y	Y	Y	Y	

SOCEC CONTINUE

HOMEWOR Do you work primarily from home?

	(48)	SP
Yes	1	
No	2	

Q78 How many people are there in your household, including yourself?

Card: 07 (6-7)

```
         1+                                       __________ (67-75)
         Refused.........................................{
```

```
         IF(Q78>15){
```

```
CHK78    INTERVIEWER: ANSWER WAS OVER 15 PEOPLE IN THE HOUSEHOLD - PLEASE
         CHECK AND CONFIRM Q78

                                                               SP
         OK to continue..................................[]
```

```
         }
```

```
Q78B     And how many of these are aged 16 or over?

                                                        Card: 08 (6-7)

         1+                                       __________  (8-16)
         Refused.........................................{
```

```
         IF(Q78B>15){
```

```
CHK78B   INTERVIEWER: ANSWER WAS OVER 15 PEOPLE OVER 16 IN THE HOUSEHOLD -
         PLEASE CHECK AND CONFIRM Q78B

                                                               SP
         OK to continue..................................[]
```

```
         }
         IF(Q78>0.AND.Q78B>0.AND.Q78<Q78B){
```

```
CHK78X   INTERVIEWER - ERROR: Q78B > Q78 - CHECK AND CORRECT Q78/Q78B

                                                               SP
         NOT OK to continue..............................[]
```

```
         }
```

```
Q79      How many members of your household including you have a mobile phone?

         0+                                       __________ (17-25)
         Refused.........................................{
```

```
         IF(Q79>15){
```

```
CHK79    INTERVIEWER: ANSWER WAS OVER 15 PEOPLE WITH A MOBILE PHONE IN THE
         HOUSEHOLD - PLEASE CHECK AND CONFIRM Q79

                                                               SP
         OK to continue..................................[]
```

```
         }
         IF(Q78>0.AND.Q79>0.AND.Q78<Q79){
```

```
CHK79X   INTERVIEWER - ERROR: Q79 > Q78 - CHECK AND CORRECT Q78/Q79

                                                               SP
         NOT OK to continue..............................[]
```

```
         }
```

Q80 Which of these age groups do you fall into?

(26) SP

16-19.....1
20-24.....2
25-29.....3
30-34.....4
35-39.....5
40-44.....6
45-54.....7
55-64.....8
65+.....9
Refused.....{

```
IF(QSMP='MOBILE'.AND.Q1=0){
SET Q81TXT='What is your occupation'
}ELSE{
SET Q81TXT='What is the occupation of the chief wage earner'
}
```

Q81 %Q81TXT%? PROBE FULLY FOR DETAILS TO ALLOW FOR SOCIAL CLASSIFICATION

(27-36)

Refused.....{

Q82 Which of the following best describes your employment status? Are you...

(37) SP

Working full time (30+ hours per week).....1
Working part time (8-29 hours).....2
Temporarily not working.....3
Retired.....4
A student.....5
Responsible for shopping and looking after the house.....6
Other.....7
Refused.....{

Q83 Do you own your own home or rent it? IF RENT: Is that from a private landlord or from the local authority? IF SOMETHING ELSE: code HA or write in.

(38) SP

Own (incl. mortgage).....1
Rent - Private.....2
Rent - From local authority.....3
Housing Association.....4
Other (specify) 0

(39-48)

Specified Other

(38) SP

Refused.....{

Q83B And is your home....READ OUT:

(49) SP

A detached house.....1
A semi-detached house.....2
A terraced house.....3
A flat/maisonette.....4
Other (specify) 0

(50-59)

Specified Other

(49) SP

Refused.....{

QNAME Can I please ask you your name:

(62)
Refused.....{

QBT You have been interviewed on behalf of BT. BT may be carrying out further research in the future. Would you be willing to be contacted again?

(63) SP
Yes.....1
No.....2

QCLOSE Thank you for your time and co-operation in this survey. If you have any queries about the survey I can give you the name and telephone number of the executive in charge. IF REQUESTED, The FDS executive in charge of the survey is Sheila Carey on 0171 272 7766 Goodbye.

SP
HANGUP.....[]

QSEX INTERVIEWER ENTER RESPONDENTS SEX:

(64) SP
Male.....1
Female.....2

QSOC INTERVIEWER CODE SOCIAL CLASS

(65) SP
A.....1
B.....2
C1.....3
C2.....4
D.....5
E.....6
Don't know.....Y
Refused.....{

QINT INTERVIEWER'S DECLARATION

I hereby declare that I have conducted this interview in full, with the person named below in accordance with your instructions and within the MRS code of conduct.
TYPE IN YOUR INTERVIEWER NUMBER:

1 TO 999 _____ (66-68)