A follow-up of nonresponse in the Dutch Labour Force Survey

Discussion paper 07004

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Explanation of symbols

.	= data not available
*	= provisional figure
x	= publication prohibited (confidential figure)
–	= nil or less than half of unit concerned
0 (0,0)	= less than half of unit concerned
–	= (between two figures) inclusive
blank	= not applicable
2005–2006	= 2005 to 2006 inclusive
2005/2006	= average of 2005 up to and including 2006
2005/'06	= crop year, financial year, school year etc. beginning in 2005 and ending in 2006
2003/'04–2005/'06	= crop year, financial year, etc. 2003/'04 to 2005/'06 inclusive

Due to rounding, some totals may not correspond with the sum of the separate figures.

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Summary: From July to December 2005 a large scale follow up of non-respondents in the Dutch Labour Force Survey (LFS) was conducted at Statistics Netherlands. In the study a sample of non-respondents in the LFS was approached once more by a small number of selected interviewers. The sample consisted of LFS households that refused, were not processed or were not contacted in the LFS of the months July – October.

Approximately 43% of the initial non-respondents participated in the follow-up study, leading to an overall response of the population of 77%.

We analyze the additional response obtained in the follow-up study and compare the composition of this group to the LFS response. We show that the follow up respondents are different from the LFS respondents but that differences in employment status disappear within poststratification classes. Furthermore, the follow up response resembles the remaining non-response.

Keywords: Call-back, refusal conversion, non-response reduction, non-response adjustment.

1. Introduction

From July to December 2005 a large scale follow-up of non-respondents in the Dutch Labour Force Survey (LFS) was conducted at Statistics Netherlands. In the study a sample of non-respondents in the LFS was approached once more by a small set of selected interviewers. The sample consisted of LFS households that refused, were not processed or were not contacted in the LFS of the months July – October. This follow-up is part of a larger study that also includes a follow-up of non-respondents using condensed CATI, web and paper questionnaires and a follow-up of respondents that refused to participate in the CATI waves of the LFS. For a description of the whole study see Bethlehem, Cobben and Schouten (2005). In this paper we focus completely on the CAPI follow-up of non-respondents using the original LFS questionnaire. The other parts of the study will be discussed in separate papers.

Unit non-response is one of the sources of error in surveys. Part of the survey sample does not respond due to a variety of reasons, leading to missing data. In interviewer assisted surveys, the most important reason for non-response is a refusal of the selected household or person. In household surveys that Statistics Netherlands conducts, approximately one quarter of the households that are contacted refuses participation. The second most important reason is no contact. For about 5 to 10% of the sampled households no contact is established during the survey.

For decades it is known that non-respondents are different from respondents and that non-response is a potential risk for the quality of statistics that are based on surveys. For extensive overviews of survey non-response and its consequences, see Groves et al. (2002) and Stoop (2005).

There are two ways to deal with non-response, adjustment and reduction. Non-response adjustment methods use auxiliary information from administrative data to predict the answers of non-respondents. Methods are usually model-based. The missing-data-mechanism is modelled and the methods thus rely on assumptions about the behaviour of non-respondents. See e.g. Bethlehem (2002) or Kalton and Flores-Cervantes (2003). Non-response reduction methods aim at diminishing non-response. One method of reducing non-response is the so-called call-back approach. After a household is processed as non-response, it is once more approached in order to insist on participation in the survey. Call-backs were already suggested by Hansen and Hurwitz (1946). Recently, Laaksonen and Chambers (2006) discussed how to make statistical inference from surveys with call-backs.

Uncertainty about the impact of non-response, especially about the bias of population estimators, is a constant boost for research in methods for non-response reduction and adjustment. In the Netherlands, because of the relatively low response rates, a lot of research and literature has been devoted to the analysis of non-response. Daas (2004) gives an overview of research at Statistics Netherlands over the years 1987 – 2003. This overview shows that at Statistics Netherlands the non-response problem led to several research programmes and studies, e.g. De Mast (1990), Camp, De Heer, Akkerboom and Israëls (1993) and Snijkers (2002).

The lasting uncertainty about the influence of non-response was the incentive for various studies with intensive call-backs of non-respondents. We refer to Elliott, Little and Lewitzky (2000), Keeter et al. (2000), Lynn et al. (2002), Stoop (2001 and 2004) and Voogt (2004). The studies aim at a full response in a call-back of non-respondents or at least a non-response that is Missing-Completely-at-Random. Stoop (2004) describes a study in the Netherlands in which about 70% of the former non-responding households were converted to respondents. In this study only non-respondents were eligible for call-back in case they were labelled as ‘hard’ refusals. It is this study that was the main motivation for the present LFS follow-up study.

We mainly followed the fieldwork recommendations given by Stoop (2004). However, we increased the sample size and decided that all non-respondents are eligible for follow-up. The sample size in the study by Stoop (2004) was relatively small; approximately 350 non-respondents were selected for follow-up. The small sample size does not allow for strong conclusions about differences between respondents, converted refusals and persistent refusals. As Statistics Netherlands disposes of a large set of administrative data, we can also enrich the samples with a lot of auxiliary variables.

The study will answer the following research questions:

- Do follow-up respondents have similar demographic, geographic and socio-economic characteristics as LFS respondents?

- Are LFS respondents and follow-up respondents different with respect to employment and unemployment?
- If LFS respondents and follow-up respondents are different with respect to employment and unemployment, can this difference be adjusted for by stratification using auxiliary information?
- Are follow-up respondents similar to follow-up non-respondents?
- Does a follow-up study lead to a more representative pool of respondents?

The research questions relate to the concept of a continuum of resistance, see e.g. Groves and Couper (1998). In two dimensions, contactability and willingness to participate, households can be put on a scale from easy to difficult. It is conjectured that easy-to-convert non-respondents are similar to respondents, while hard-to-convert non-respondents may be different. Literature does not present a consistent view of differences between easy and difficult responders. Lynn et al. (2002) conclude that extended efforts change both the composition of the response as well as survey estimates. They base their findings on three surveys with a range of topics; the Family Resources Survey, the Health Survey and the Social Attitudes Survey. One of their main conclusions is that the impact of extended interviewer efforts is particularly great for the variables age and employment status. They claim, however, that these changes are largely due to the follow-up of difficult-to-contact households and to a lesser extent to the follow-up of reluctant refusals. Stoop (2005) concludes that persistent refusers are different from converted refusers and that a follow-up not necessarily leads to a better response.

First, we want to investigate whether a follow-up of non-respondents gives more of the same. In other words, are converted non-respondents similar to respondents. Given the literature, it is interesting in general to identify differences between the LFS and follow-up respondents. In the light of the LFS is it important to investigate whether non-respondents are more often unemployed or not a member of the labour force. This study indicates that converted non-respondents are different but that differences with respect to (un)employment are insignificant and disappear within subpopulations.

Second, it is the question whether follow-up respondents represent the whole of non-response. Can we find differences between non-respondents that we were able to convert and non-respondents that persisted in non-response. We find that there are indeed differences, but there is only a small set of variables for which the difference is significant at the usual levels of confidence. We have to add that the sample size in the follow-up study was only 775.

Third, we will compare the composition of the LFS response to that of the combined response of LFS and follow-up study in order to investigate the similarity to the sample. We will do so using so-called R-indexes, see Schouten and Cobben (2006). We find that the composite response is more representative of the sample than the LFS response with respect to available auxiliary variables.

Section 2 starts with a description of the LFS and the follow-up study. Next, section 3 contains the various analyses. The conclusions follow in section 4.

2. Design of the follow-up study

2.1 The Dutch Labour Force Survey

The Dutch Labour Force Survey (LFS) is a monthly household survey. In 2005 the sample size was approximately 6500 addresses per month. The target population consists of all inhabitants of the Netherlands of 15 years and older, except for people living in institutions. The main objective of the LFS is a set of statistics about the employment status of persons and households. Most statistics concern the population of 15 – 64 years. However, the LFS also produces statistics about persons of 65 years and older.

The sampling frame of the LFS is the Dutch municipality administration (Gemeentelijke Basisadministratie or GBA). The survey is a two-stage sample, where geographical stratification is based on the so-called COROP-classification. In the first stage clusters are formed by municipalities. From the clusters simple random samples without replacement are drawn consisting of addresses. The first-order inclusion probabilities differ only for age. Addresses with all inhabitants older than 64 years have a lower inclusion probability. Also in the allocation of addresses the sample is reduced for some interviewer districts due to workload or staffing of interviewers. For each address up to four households can be interviewed and within each household the maximum of interviewed persons is set to eight.

The selected households are interviewed face-to-face in CAPI (Computer Assisted Personal Interviewing). Proxy interviewing is allowed under certain circumstances. The LFS is a rotating panel. Each household is asked whether it is willing to participate in four CATI (Computers Assisted Telephone Interviewing) interviews with time lags of three months. Hence, the last interview is 12 months after the CAPI interview. In this paper we will concentrate on the CAPI interview and the non-response in this interview.

The CAPI response is weighted to known population totals using the generalised regression estimator, see e.g. Bethlehem (1988). The weighting model has the following form

$$(\mathrm{Lftgsl}_8 \otimes \mathrm{Regio}_{44}) \oplus (\mathrm{Gsl} \otimes \mathrm{Lft}_{21}) \oplus (\mathrm{Lft}_5 \otimes \mathrm{Burgst}_2) \oplus (\mathrm{Gsl} \otimes \mathrm{Lft}_5 \otimes \mathrm{Herk}_8)\ ^{[1]},$$

where Lftgsl_8 is a combination of age and gender in eight classes, Regio_{44} is the COROP-stratification, Gsl is gender, Lft_{21} and Lft_5 are stratifications of age, Burgst_2 is a dichotomy of marital status in married and unmarried, and Herk_8 is a stratification in 8 categories based on ethnic background. Boonstra et al. (2005) investigate an extension of the weighting model using administrative data of the

[1] '⊗' and '⊕' indicate interaction and main effects, respectively.

Dutch Centres for Work and Income (Centra voor Werk en Inkomen or CWI). People looking for a job can subscribe to these centres. Boonstra et al. propose to add variables from this register as they are closely related to the main topics of the LFS and serve as predictors for the employment status. For this reason we will also consider CWI related variables.

For further details we refer to Hilbink, Van Berkel and Van den Brakel (2000), Cuppen and Martinus (2001) and Boonstra et al. (2005).

2.2 The follow-up study

In the follow-up study we took samples out of the non-responding households for the months July to October. In the design of the follow-up study we used the recommendations in the studies by Stoop (2004) and Voogt (2004). Our study had the following characteristics:

- Original LFS questionnaire to be answered by all members of the household of 15 years and older in CAPI
- A selection was made of 28 of the best CAPI interviewers
- Allocation of address to interviewer was different from LFS interviewer that received non-response
- No prenotification letter was sent to non-respondent in order not to alarm them or to give them additional ammunition to refuse co-operation.
- Interviewer could offer incentives in the form of gift vouchers
- Interviewers received additional training in doorstep interaction, a special newsletter was made to inform them and halfway the study a meeting was organised to exchange experiences and to increase motivation
- Interviewers could receive a bonus based on their response rate
- A paper summary of the characteristics of the non-responding household was sent to the interviewer in order to support the timing of the contact attempt and to prepare the doorstep interaction
- Allocation of address one week after processing as non-response
- Extended fieldwork period of two months
- Eligible response types were refusal, no contact and unprocessed[2]

The questionnaire and interview mode of the study were the same as in the LFS. This was done deliberately in order to avoid mode and questionnaire effects.

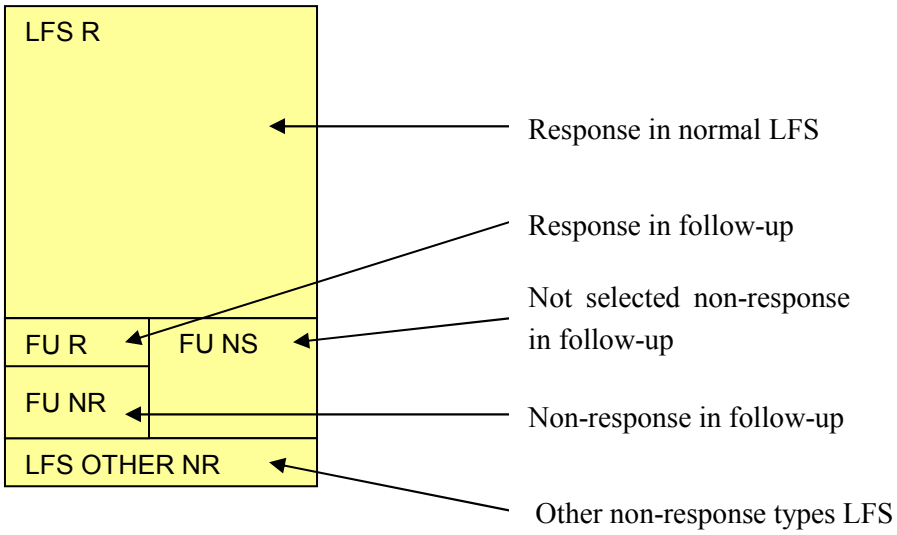
In 2005 Statistics Netherlands had 13 interviewer districts. These interviewer districts are allocated monthly portions of addresses. Eleven districts participated in the study. Two districts were not able to assist because of a lack of available interviewers. In the participating districts two or three of the best interviewers were

[2] response codes 11, 20, 21 and 24 in the fieldwork administration

selected depending on the geographical size of the district. We needed at least two interviewers per district to be able to assign each address to a new interviewer. In five districts a number of municipalities were excluded so that travelling distances were acceptable. Appendix A contains the list of excluded municipalities.

A label 0 or 1 was assigned randomly to all sample units in the LFS beforehand. A label 1 implied that the household was a candidate for follow-up, i.e. in case it would not respond it was selected for follow-up. A label 0 meant that no follow-up was undertaken irregardless of the response type of the household. The labelling was based on historic response rates in the participating interviewer districts. In districts with a lower response rate more households were assigned a label 1. The labelling procedure was necessary because non-respondents were selected before the end of the fieldwork period and because we wanted to send an interviewer to the address a week after processing of the address. A week after a household is processed as a refusal the total number of non-respondents is still unknown and the labels ensured that non-responding households were selected at random.

Figure 2.2.1: The various groups in the LFS and follow-up study



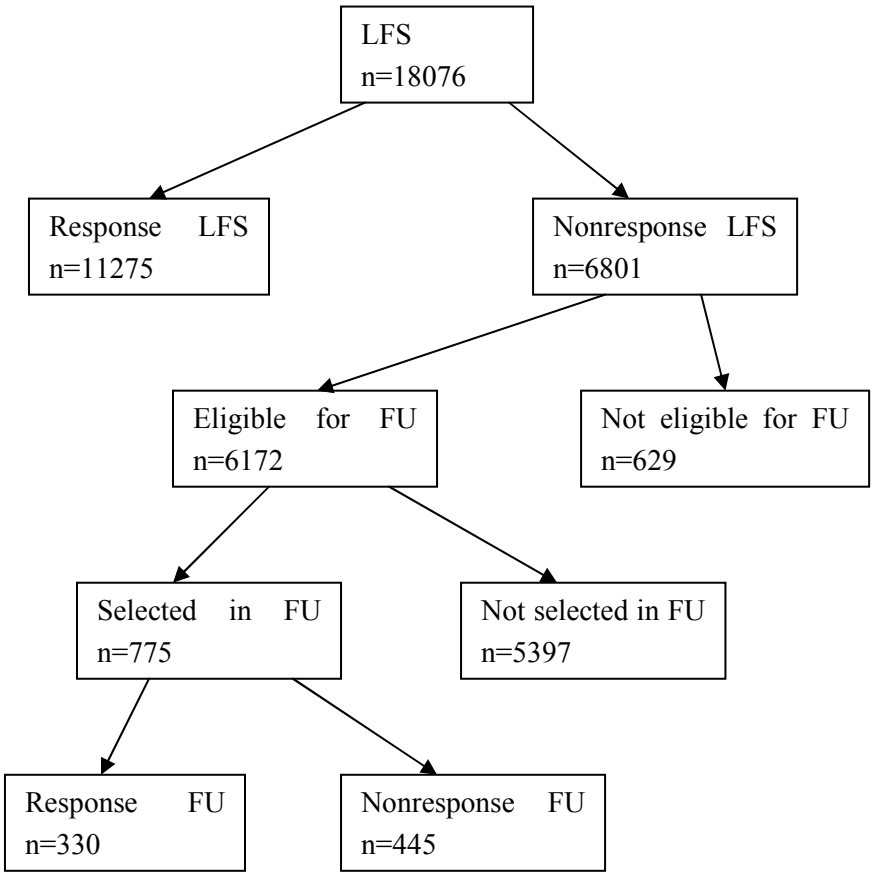
Paper forms that were sent to the interviewers contained background information on the composition, gender and age of the household, the type of non-response and the timing and number of contact attempts. Interviewers were, however, not obliged to adapt their contact and refusal conversion strategy to the background information. It was solely provided to support them.

It was decided not to send interviewers to households that did not respond due to problems with language or due to a mental or physical handicap or long term illness. In practice this is, however, a relatively small group.

Figure 2.2.2 gives an overview of the number of households in the LFS in the participating districts and municipalities. Approximately 62% (11275 out of 18076) of the households responded. Of the remaining 6801 households 6172 were eligible

for follow-up. From the LFS non-response of July – October 775 eligible households were selected, which is 12.6% (775 out of 6127). Of the selected households 330 responded, a response rate of 43% (330 out of 775). Figure 2.2.1 gives a schematic overview of the various groups in the pilot.

Figure 2.2.2: Sizes and response rates of the various groups in the follow-up study in the selected interviewer districts and municipalities



In the analysis we will assign weights to all households in order to let households that were selected represent all of the eligible households. In section 3.1 we will describe how these weights are chosen. For the moment we only remark that eligible households that were not selected receive a weight equal to zero, i.e. we will omit them from the analyses. The selected eligible households thus represent the whole group of eligible households.

Table 2.2.1 shows the weighted response rates within the non-response and within the total sample. The total number of 6803 households deviates a little bit from the 6801 non-responding households in figure 2.2.2 because of rounding. In the non-response almost one out of ten of the households is not eligible for follow-up. In the sample this is 3.5%. Hence, after the follow-up study the maximal (weighted) response of the population would have been 96.5%. The response LFS together with the response in the follow-up led to a 62.4% + 14.5% = 76.9% response rate.

Table 2.2.1: Response rates in the follow-up study with respect to the LFS non-response and to the LFS sample.

Group	*Weighted frequency*	*Rate*	
		non-response	*sample*
Eligible for follow-up and response	2629	38.6%	14.5%
Eligible for follow-up and non-response	3545	52.1%	19.6%
Not eligible for follow-up	629	9.2%	3.5%
Total	6803	100%	37.6%

Table 2.2.2 makes a distinction between the three eligible non-response types. Approximately three quarters of the selected non-response consists of refusals. The selected unprocessed addresses are by far the smallest group in the FU. The response rates in the FU for the three types are different. As expected the response rate under the former refusals is the lowest, 38%, while the response rate under non-contacts is 58%. In table 2.2.2 no weights are used as the weights are the same for all selected eligible households.

Table 2.2.2: The three types of eligible non-respondents and their response rates in the follow-up study.

Non-response type	*Size*	*Proportion in FU*	*FU response*
Not processed	16	2%	56%
Non-contact	160	21%	58%
Refusal	599	77%	38%
Total	775	100%	43%

2.3 The fieldwork of the follow-up study

The first group of non-respondents was selected in the first week of July and allocated to interviewers in the second week of July. The last group was selected in the last week of October and allocated to interviewers in the first week of November.

We selected addresses that were processed as refusal, non-contact and unprocessed. An unprocessed address is an address for which no contact attempt was made by an interviewer. Hence, the non-response is the result of a lack of interviewing time and is not directly related to the characteristics of the household. Refusals can be processed during the whole monthly fieldwork period, while non-contacts and unprocessed cases are only processed at the end of the corresponding month. In the LFS an interviewer is obliged to follow a contact strategy that prescribes six contact attempts. Preferably, these contact attempts are spread over evenings, mornings and afternoons and over the first and second half of the month. For this reason households cannot be processed as non-contact until the end of the month.

Unprocessed addresses of an interviewer are to be allocated to new interviewers during the fieldwork month. However, in practice a number of addresses remains unprocessed until the end of the month. As a consequence in the follow-up study interviewers received refusals during the whole of the month and non-contacts and unprocessed cases at the beginning of the next month.

We encountered three practical problems during the fieldwork. First, in one of the districts the response in the follow-up study was low because of illness of two of the three selected interviewers. It was not possible to replace those interviewers on short notice because of the workload in the district and because the new interviewers would lack the special training and instructions. Second, due to an error in the labelling process the number of selected households was too low in July and August. Fortunately, this low selection was random over the districts. In September and October the number of selected addresses was increased to make up for July and August. Consequently, the selection probabilities are different for the first and last two months of the study. Third, another error in the selection process caused only refusals to be allocated to interviewers in July and August. At first non-contacts and unprocessed addresses were not allocated by mistake. In September we allocated those addresses to interviewers.

The two errors in the selection and allocation of addresses resulted in an increased workload for interviewers in September and October. As the interviewers could only spend a fixed amount of hours into the follow-up, it was decided to prolong the fieldwork period of two months until the end of 2006 for all cases that were in the field in September.

We have to account for the errors in the analysis of the follow-up study. This will be the topic of section 3.1.

3. Analysis

Since we used the same questionnaire and data collection mode as the LFS, there was no reason to form an experimental control group. We can assume that the influence of measurement and processing errors is negligible.

Two interviewer districts did not participate in the study and in order to avoid large travelling distances for the participating interviewers a number of municipalities was excluded. This implies that estimates cannot be compared directly to LFS estimates. However, the selected municipalities cover the full range from rural to strongly urbanized areas and make up about 75% of the population.

The LFS questionnaire is long. Therefore, we focus on two main target variables of the LFS. First, in the questionnaire it is asked whether the respondent has a paid job. Second, following this question a series of questions is posed in order to derive the employment status of the respondent. We will use a classification of the employment status in three categories, employed, unemployed and non labour force. The exact definitions are complex. Essentially someone is employed if he or she has

a paid job for at least 12 hours a week and is unemployed if he or she is working less than 12 hours a week but is actively seeking and available for one or more jobs with a total of more than 12 hours a week. The remaining persons are not a member of the labour force. We will refer to them as non labour force.

In the analysis we make four comparisons using a set of auxiliary variables that was linked from administrative data. Appendix B contains the list of the auxiliary variables and their abbreviations that we will refer to throughout the paper. In the following we will use LFS and FU as abbreviations for labour force survey and follow-up study, respectively. We compare

- the LFS response with the LFS sample (section 3.2)
- the LFS plus FU response with the LFS sample (section 3.3)
- the LFS response with the FU response (section 3.4)
- the FU response with the FU sample (section 3.5).

The comparisons are described in sections 3.2 to 3.5. In section 3.6 we discuss the composition of the response with and without FU using so-called R-indexes. R-indexes are indicators for the deviation from a representative response. However, we start with an account of the problems that are described in section 2.3.

3.1 Fieldwork and analysis

Before we discuss the three problems that we encountered in section 2.3, we have to make an important note. In the fieldwork we used an extended fieldwork period of two months, which causes a delay in time for the FU response with respect to the LFS response. It is known that employment has seasonal and cyclical components. Hence, a delay in time may imply that we find a difference in employment rate that is to be attributed to the month of observation and not to non-response bias. Unless a time series model is posed for employment, it is not possible to disentangle the effects of non-response and time. We will not do that but accept the time lag.

The first problem concerned the drop out of two interviewers in district 1. This district covers the provinces of Groningen and Friesland. Part of Groningen was already excluded from the FU. In September the interviewers dropped out leaving one interviewer to do the addresses. In the analysis we will keep the selected households in district 1 in the dataset. Consequently, one may expect that a follow-up will turn out to be selective with respect to region. This is indeed the case. Since this selectivity can be explained by the drop out of the interviewers we keep the records. In section 3.5 we will return to this issue.

The second problem is an unequal selection probability for eligible households in the months July and August. Table 3.3.1 shows the number of selected households in July-August and September-October. The error can easily be corrected for by differentiating weights over the first two months and the last two months. In the analyses LFS respondents and households that are not eligible receive a weight one. Households that were selected for follow-up in July-August receive a weight of 3039/391=7.77. In September-October this weight is equal to 3133/384=8.16. We

recall that eligible households that were not selected receive weight zero. The various analyses of sections 3.2 - 3.4 make use of weighted tests of independence and weighted logistic regression models. We refer to Rao and Scott (1984) for details. In section 3.5 we do not use weights as this analysis is conducted within the group of households that is selected for follow-up.

Table 3.1.1: The selection of eligible households for FU in July-August and September-October, weights and sizes.

Group	*Total size*	*Size selection*	*Weight*
Eligible FU July-Aug	3039	391	7.77
Eligible FU Sep-Oct	3133	384	8.16
Not eligible July-Oct	629	0	1

The third problem is more difficult to deal with. Here, we will have to make an assumption. In July and August households that were not contacted or processed and that were selected for follow-up, were mistakenly not allocated to interviewers. These households were allocated to interviewers in September, a delay of at least two weeks and at most six weeks. Also, in order not to make the workload unacceptably high for interviewers, we prolonged the fieldwork period to the end of 2005. Fortunately, it can be expected that part of the households that were not contacted in July or August were not at home because they took a summer holiday or leave. It is likely that a return to these households directly after they were processed as non-contact may have resulted in another non-contact. Nonetheless, the answers that we obtained in the FU from these households show a bigger time lag than the other FU respondents. From literature it is known, see e.g. Groves and Couper (1998), Lepkowski and Couper (2002), Bethlehem and Schouten (2004), Nicoletti and Peracchi (2005), that non-contacts and refusals correspond to households that have different characteristics. As the ease of contact is to some extent related to employment, see e.g. Huisman (1999), Lynn et al. (2002) and Beaumont (2005), it may be expected that non-contacted households are also different with respect to work and unemployment. We will assume in the analyses that refusals, non-contacts and unprocessed addresses do not differ in employment rate volatility, i.e. they may be different with respect to (un)employment but this difference is constant during the FU fieldwork period. Furthermore, it needs to be stressed again that differences that we will encounter in the analyses that follow, are a result of non-response and time lag. We cannot disentangle the two effects.

3.2 A comparison of LFS response with LFS sample

The first analysis concerns the response in the regular LFS, see figure 3.2.1. We ignore the FU for a moment and investigate the composition of the response of the LFS. Since the FU is a random sample out of the eligible non-responding households, we assigned weights to the FU households. The FU households, therefore, represent all non-response in the LFS eligible for the FU. In the

subsequent sections we will perform weighted logistic regressions. To be consistent with these analyses, we will compare the LFS response to the weighted LFS sample. Hence, we omit the eligible non-responding households that were not selected and weight the selected FU households, as in figure 3.2.2.

Figure 3.2.1: A comparison of LFS response with the LFS sample

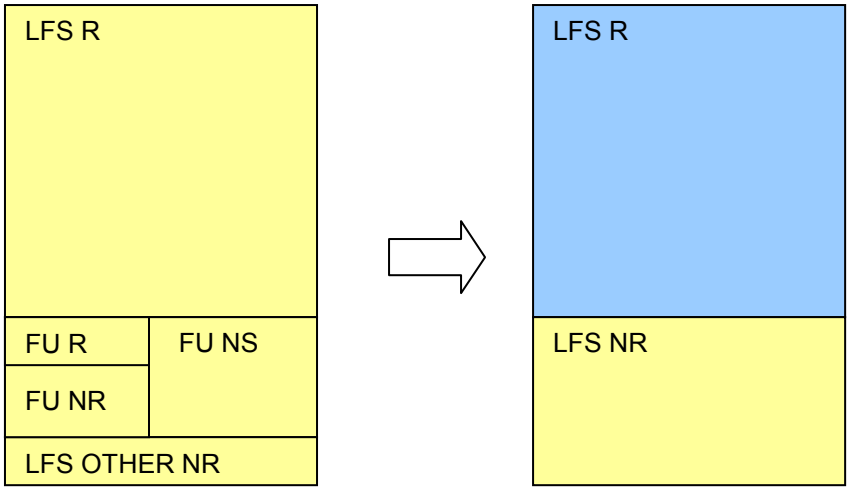
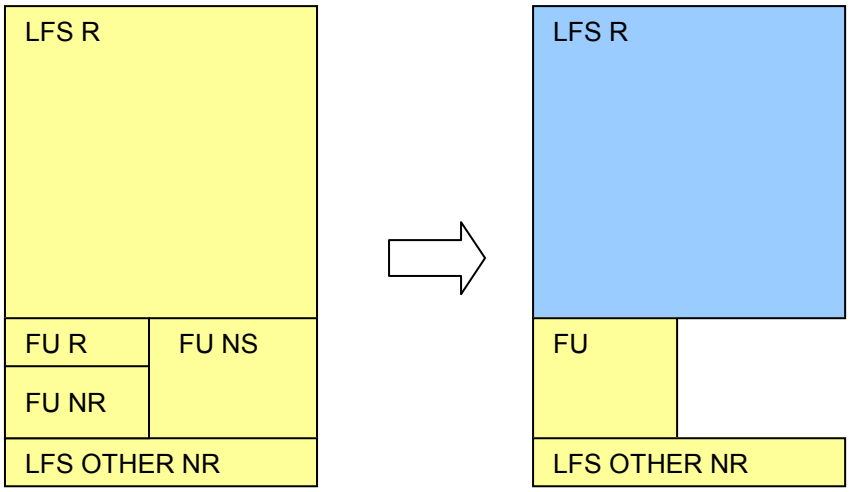


Figure 3.2.2: A weighted comparison of LFS response with LFS sample



First, we will compare the composition of the auxiliary variables in the response to the composition in the sample. In Appendix C the proportions are given for the weighted LFS response and sample (columns 1 and 3 in each of the contingency tables). Table 3.2.1 shows the *p*-values for two univariate tests for independence between response and auxiliary variables. The test statistics are in line with each other and lead to similar conclusions. For many variables independence of response behaviour is rejected at 5% or 1% levels. The exceptions are average age at household level, CWI subscription, unemployment allowance, self-employed and disability allowance. Surprisingly, the *p*-value for age is high. In many other

analyses of non-response age turned out to be one of the strongest explanatory characteristics for response in household surveys. In the LFS we do not find a strong relation to response at the household level.

Table 3.2.1: Univariate tests of independence between response and auxiliary variables. Test statistics are the adjusted Pearson's Chi square and the adjusted Wald statistic.

Variable	*p-value*	
	Pearson's Chi square	*Wald statistic*
Urbanity	< 0.0001	< 0.0001
Phone	< 0.0001	< 0.0001
Region	< 0.0001	< 0.0001
Province	< 0.0001	< 0.0001
Gender	< 0.0001	< 0.0001
Ethnicity	< 0.0001	< 0.0001
House value	< 0.0001	< 0.0001
Percentage non-native	< 0.0001	< 0.0001
Household type	< 0.0001	< 0.0001
Job	0.0033	0.0049
Disability allowance	0.1122	0.1306
Social allowance	< 0.0001	0.0003
CWI subscription	0.1067	0.1275
Unemployment allowance	0.7886	0.7847
Self employed	0.2573	0.2758
Average age	0.2482	0.2559

Table 3.2.2: The adjusted Wald statistic for the auxiliary variables in the logistic regression model. Also given are the corresponding p-values.

Model	*Phone*	*Reg*	*Etn*	*HhType*	*Urb*
Phone	63.37				
	<0.0001				
Phone+Reg	52.96	15.75			
	<0.0001	<0.0001			
Phone+Reg+Etn	38.40	14.47	5.35		
	<0.0001	<0.0001	<0.0001		
Phone+Reg+Etn+HhType	29.13	13.60	5.90	3.70	
	<0.0001	<0.0001	<0.0001	0.0005	
Phone+Reg+Etn+HhType+Urb	25.10	9.17	4.92	2.84	2.47
	<0.0001	<0.0001	<0.0001	0.0059	0.0426

Next, we perform a weighted logistic regression with LFS response as a dependent variable and the available auxiliary variables as covariates. Table 3.2.2 describes the model fit to the LFS response. Stepwise the variables phone, region, ethnic group, household type and urbanisation are added to the model. In each step the most significant variable is added. After the addition of the variable urbanisation none of the remaining variables gives a significant contribution at the 0.05 level.

Table 3.2.3: The parameters in the logistic regression for LFS response with standard errors and p-values. One and two asterisks denote significance at 5% and 1% level, respectively. Each first category is used as a reference category.

Category	*Parameter*	*Standard error*	*p-value*
Constant	0.414*	0.184	0.025
Urbanity			
very strong	0		
strong	0.196*	0.096	0.042
moderate	0.288*	0.114	0.012
little	0.312*	0.121	0.011
not	0.258*	0.132	0.050
Phone			
no	0		
yes	0.378**	0.075	<0.001
Region			
north	0		
east	-0.437*	0.188	0.020
west	-0.558**	0.171	0.001
south	-0.091	0.186	0.626
Household type			
single	0		
not married	0.049	0.140	0.727
married	0.087	0.110	0.432
not married + children	0.134	0.177	0.447
married + children	0.372**	0.100	<0.001
single parent	0.314*	0.152	0.039
other	0.181	0.394	0.645
>1 household	0.483*	0.210	0.021
Ethnicity			
native	0		
Moroccan	-0.898**	0.214	<0.001
Turkish	-0.372	0.221	0.093
Surinam/Antilles	-0.040	0.197	0.840
other non-western	-0.415**	0.134	0.002
other western	-0.345*	0.176	0.050
mix	0.023	0.117	0.846

The variable that gives the strongest explanation is the availability of a fixed land-line phone. This result for the LFS is confirmed by other studies of CAPI surveys, e.g. Schouten (2004), Van den Brakel, Van Berkel and Hofman (2004), Cobben and Bethlehem (2005), and can be explained to some extent by the fact that interviewers are allowed to make appointments with respondents by phone after a third failure to make contact. Also, households for which no phone number is available may have an unlisted phone number. These households may be less willing to participate in a survey. The impact of the availability of a phone number is reduced as the variables region, ethnic group and household type are added to the model. This is not a surprising result as the availability rate of fixed land-line phones is especially low in the larger cities, under single households and under some ethnic groups. The impact of region is somewhat smaller after the addition of degree of urbanisation. In the Netherlands the western part of the country is more densely populated.

Table 3.2.3 gives the regression parameters of the final logistic regression model of table 3.2.2. An intercept is included in the model. From the regression parameters we can conclude that the availability of a phone number increases response. Furthermore, the north and south of the Netherlands have a higher response rate than the western and eastern parts. Within regions the more urbanised areas tend to have a lower response. Relative to native households, Moroccan, non-western groups other than Moroccan or Turkish households and western households other than Surinam or Dutch Antilles have a lower response rate. When it comes to the type of household the married couples with children, the single parent households and the addresses with more than one household do better than households consisting of only one person. These conclusions are confirmed by other studies; see Cuppen and Martinus (2001), Van Cruchten and Hartgers (2002) and Boonstra et al. (2005).

3.3 A comparison of LFS plus FU response with LFS sample

Next, we add the FU response to the LFS response and repeat the analysis of section 3.2. Figure 3.3.1 shows the groups involved. Appendix C shows the weighted proportions in the LFS plus FU response (column 2 in each of the contingency tables).

Figure 3.3.1: A weighted comparison of LFS plus FU response with LFS sample.

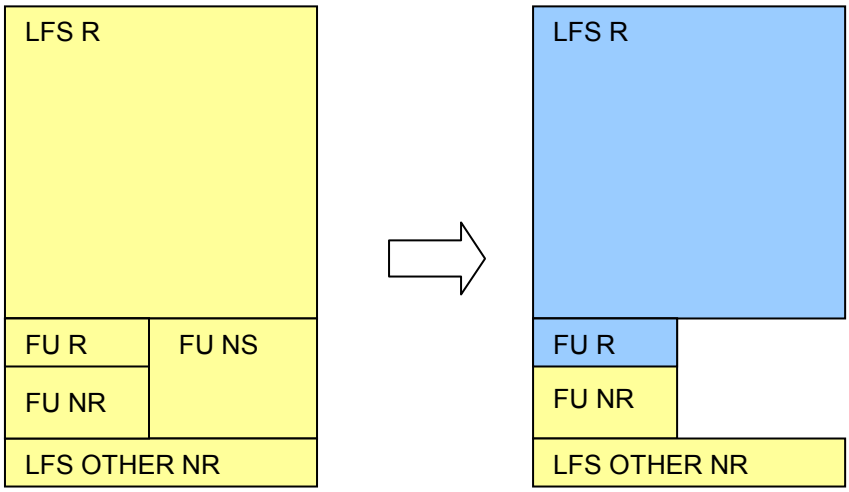


Table 3.3.1 contains the *p*-values of the univariate weighted tests for independence of response in LFS plus FU and various auxiliary variables. In general all *p*-values are increased when the FU response is added. Independence is not rejected at the 5% level for variables age and disability allowance. These conclusions are the same as for the LFS response alone. However, at the 1% level independence of gender, average house value and paid job is not rejected anymore, contrary to the LFS response. Hence, with respect to these variables the response has become more representative.

Table 3.3.1: Univariate tests of independence between LFS + FU response and auxiliary variables. Test statistics are the adjusted Pearson's Chi square and the adjusted Wald statistic.

	p-value	
Variable	*Pearson*	*Wald*
Urbanity	< 0.0001	< 0.0001
Phone	< 0.0001	< 0.0001
Region	< 0.0001	< 0.0001
Province	< 0.0001	< 0.0001
Gender	0.0232	0.0295
Ethnicity	< 0.0001	0.0001
House value	0.0300	0.0336
Percentage non-native	0.0037	0.0104
Household type	0.0008	0.0004
Job	0.0410	0.0486
Disability allowance	0.1598	0.1820
Social allowance	0.0003	0.0019
CWI subscription	0.3836	0.4004
Unemployment allowance	0.8579	0.8600
Self employed	0.9798	0.9798
Average age	0.6558	0.6603

Table 3.3.2: The adjusted Wald statistic for the auxiliary variables in the logistic regression model. Also given are the corresponding p-values.

Model	*Urb*	*Phone*	*Reg*	*HhType*
Urb	10.66			
	<0.0001			
Urb + Phone	7.04	22.87		
	<0.0001	<0.0001		
Urb + Phone + Reg	3.54	21.91	5.05	
	0.0068	<0.0001	0.0017	
Urb + Phone + Reg + HhType	3.41	24.02	5.80	2.55
	0.0085	<0.0001	0.0006	0.0126

The model fit of logistic regression models for the LFS plus FU response is given in table 3.3.2. The final model is similar to the model for the LFS response except that ethnic group is not included. Table 3.3.3 gives the corresponding regression parameters. Again the less urbanised areas of the Netherlands show a higher response but differences between regions are small contrary to the LFS response alone. It must be noted that the FU response rate in the northern region is affected by the drop out of interviewers. However, this region had a higher response rate in the LFS so that response becomes more representative with respect to region. Having a fixed land-line phone number still implies a higher response rate. This is again not surprising as the phone number was used to make appointments with households, also in the FU. With respect to household type there is only a small change. Single parent households do not have a significantly higher response rate anymore.

We can conclude that the addition of the FU response led to changes in the composition of the total response. We still find that the same variables contribute to the explanation of non-response, but the explanatory power is weaker.

Table 3.3.3: The parameters in the logistic regression for LFS and FU response with standard errors and p-values. One and two asterisks denote significance at 5% and 1% level, respectively. The first category is used as a reference category.

Category	*Parameter*	*Standard error*	*p-value*
Constant	0.723**	0.211	0.001
Urbanity			
very strong	0		
strong	0.309**	0.120	0.010
moderate	0.160	0.135	0.237
little	0.405**	0.145	0.005
not	0.450**	0.165	0.006
Phone			
no	0		
yes	0.447**	0.091	<0.001
Region			
north	0		
east	0.090	0.224	0.688
west	-0.224	0.196	0.254
south	0.276	0.217	0.204
Household type			
single	0		
not married	0.091	0.172	0.596
married	-0.130	0.131	0.322
not married + children	0.200	0.226	0.377
married + children	0.249*	0.121	0.039
single parent	0.264	0.186	0.157
other	0.022	0.439	0.960
>1 household	0.745**	0.264	0.005

3.4 A comparison of LFS response with FU response

In the preceding two sections we compared the response to the sample. It turned out that the response has become slightly more representative of the sample when the FU response is added. Now, we make a direct comparison of LFS response and FU response in order to see whether we can find a confirmation of these conclusions. See figure 3.4.1 for the groups involved.

In table 3.4.1 again a summary is given of weighted univariate tests for independence of response group, LFS or FU, and the various auxiliary variables. Contrary to tables 3.2.1 and 3.3.1 we also give the univariate tests for two target variables on the household level; job status of household and employment status of household. See Appendix B. From table 3.4.1 we can see that independence for these two target variables is not rejected. Between the two response groups there is no significant difference in job and employment status on the household level. Also, the job related auxiliary variables do not lead to a rejection of independence of

response group at the 5% level. For all other auxiliary variables independence is rejected at the 5% level, except for age which has a Pearson *p*-value below 5% but a Wald *p*-value above 5%. The strongest differences are in the geographical variables and the availability of a phone number. Hence, these univariate tests confirm the results of the previous sections.

Figure 3.4.1: A weighted comparison of LFS response with FU response

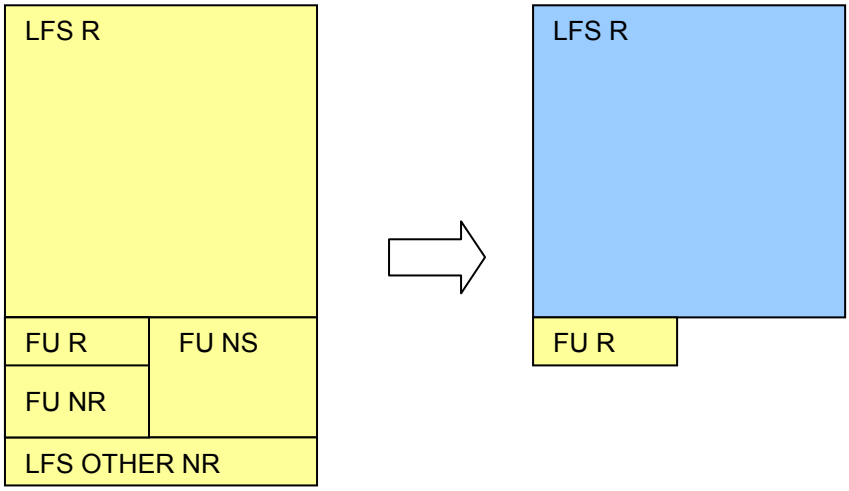


Table 3.4.1: Univariate tests of independence between response in LFS and FU and auxiliary variables. Test statistics are the adjusted Pearson's Chi square and the adjusted Wald statistic.

Variable	*p-value*	
	Pearson	*Wald*
Job status	0.56	0.57
Employment status	0.32	0.39
Urbanity	0.0001	0.0002
Phone	0.0001	0.0001
Region	0.0001	< 0.0001
Province	< 0.0001	< 0.0001
Gender	0.0010	0.0023
Ethnicity	0.0002	0.0174
House value	0.0162	0.0153
Percentage non-native	0.0014	0.0003
Household type	0.0104	0.0165
Job	0.0986	0.1151
Disability allowance	0.5395	0.5538
Social allowance	0.1017	0.1507
CWI subscription	0.2578	0.2935
Unemployment allowance	0.6217	0.5987
Self employed	0.1724	0.2076
Average age	0.0471	0.0697

In tables 3.4.2 and 3.4.3 the logistic regression model for LFS response versus FU response is given. The model contains the variables region, phone and ethnic

background. With respect to these variables the two response groups are significantly different from each other. As expected the northern parts of the Netherlands are overrepresented in the LFS response, while the FU response has an overrepresentation of the west and east provinces. The southern part of the Netherlands is also overrepresented in the FU response, but the difference is not significant at the 5% level. Furthermore, LFS respondents more often have an available fixed land-line phone number. Hence, in the FU we get relatively more households for which we do not have a phone number. Finally, in the FU response there are more households with a Moroccan or a non-western background other than Turkish.

Table 3.4.2: The adjusted Wald statistic for the auxiliary variables in the weighted logistic regression model. Also given are the corresponding p-values.

Model	*Reg*	*Phone*	*Etn*
Reg	6.31		
	0.0003		
Reg + Phone	5.78	13.91	
	0.0006	0.0002	
Reg + Phone + Etn	5.39	10.74	3.27
	0.0010	0.0011	0.0033

Table 3.4.3: The parameters in the weighted logistic regression for LFS and FU response with standard errors and p-values. One and two asterisks denote significance at 5% and 1% level, respectively. The first category is used as a reference category.

Category	*Parameter*	*Standard error*	*p-value*
Constant	2.15**	0.32	<0.001
Region			
north	0		
east	-1.02**	0.35	0.003
west	-1.03**	0.33	0.002
south	-0.61	0.35	0.079
Phone			
no	0		
yes	0.38**	0.12	0.001
Ethnicity			
native	0		
Moroccan	-1.00**	0.33	0.002
Turkish	-0.18	0.40	0.645
Surinam/Dutch Antilles	0.22	0.36	0.552
other non-western	-0.52*	0.21	0.013
other western	0.18	0.43	0.671
mix	0.31	0.20	0.121

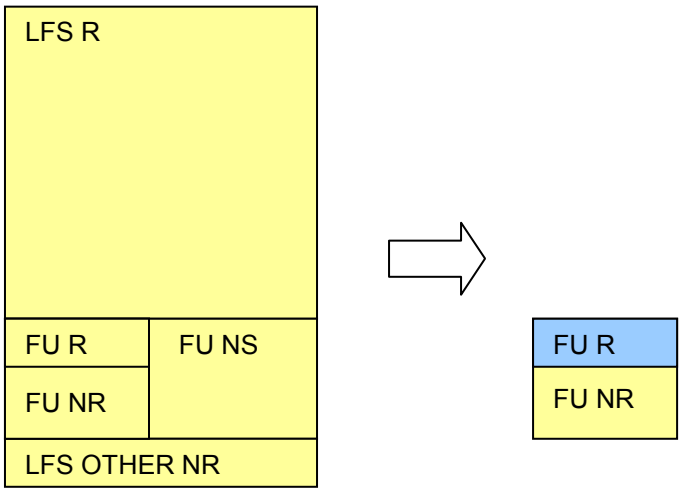
The results of the logistic regression suggest that the response became more representative with respect to region and ethnicity as the households that do worse in the LFS are overrepresented in the FU response. This explains why the variable ethnic background is not contained anymore in the logistic regression model for the union of LFS and FU response. While the drop out of interviewers in district 1 was a disappointment, it happened in an area of the country where the response rate is relatively high in the LFS.

We have to stress that in the multivariate setting again the LFS variables job status and employment status did not give a significant contribution to the model. In Appendix C small differences can be found for these variables between the various response groups. The differences are, however, not significant, and no strong relation is found in a multivariate setting either.

3.5 A comparison of FU response with FU sample

The final analysis is within the FU study itself. We compare the FU response to the FU sample, see figure 3.5.1. For this analysis it is not necessary to use weights since all selected households have the same weight.

Figure 3.5.1: The FU response and sample.



The *p*-values corresponding to Pearson's Chi square for independence of response and auxiliary variables are given in table 3.5.1. The only variable that shows a significant association with response at the 5% level is the average age of the household core. However, if we account for multiple testing, then we would not reject independence of FU response behaviour and average age. The *p*-values for the geographic variables region and province are also small but not significant.

Table 3.5.1: Univariate test of independence between response and non-response in FU and auxiliary variables. Test statistic is Pearson's Chi square.

Variable	*p-value*	*Variable*	*p-value*
Urbanity	0.199	Household type	0.110
Phone	0.502	Job	0.913
Region	0.080	Disability all	0.842
Province	0.072	Unemployment all	0.656
Gender	0.793	CWI subscription	0.488
Ethnicity	0.135	Self employed	0.471
House value	0.644	Social all	0.893
Perc non-native	0.625	Average age	0.048

Table 3.5.2: Logistic regression model for FU response. Omnibus Chi square, univariate Wald statistics and Nagelkerke's R^2 are given. Corresponding p-values for univariate Wald statistics are between brackets.

Model	*Omnibus*	*Age*	*Reg*	R^2
Age	15.95	6.03 (0.049)		1.1%
Age + Reg	15.73	6.52 (0.038)	7.89 (0.048)	2.5%

Table 3.5.3: The parameters in the logistic regression for FU response with standard errors and p-values. One and two asterisks denote significance at 5% and 1% level, respectively. The first category is used as a reference category.

Category		*Parameter*	*Standard error*	*p-value*
Constant		-0.207	0.218	0.342
Age				
	0 – 34	0		
	35 – 54	0.490*	0.204	0.016
	> 54	0.096	0.175	0.581
Reg				
	north	0		
	east	-0.868*	0.420	0.039
	west	0.051	0.264	0.846
	south	-0.332	0.209	0.111

Next, we constructed a logistic regression model for the FU response indicator. The model and regression parameters are given in table 3.5.2 and 3.5.3, respectively. The model contains only two variables, age and region. The proportion of 'variance' that is explained by the model is also small, 2.5% using Nagelkerke's definition. The lack of dependence with the available covariates is a remarkable result, even with the relatively small sample size of 775 addresses in mind. It implies that the response in the FU is not very selective, which explains also why the total response of LFS and FU better resembles the LFS sample than the LFS response alone.

In table 3.5.3 we see that the households with an average age between 35 and 54 years had a higher response rate in the FU. Furthermore, in the eastern parts of the Netherlands fewer households participated than in the other parts of the country.

3.6 Composition of response

Clearly, the follow-up study produces additional response and, hence, increases the overall response rate. From table 2.2.1 we saw that the weighted response rate increased from 62.5% to 76.9%. We should, however, ask ourselves also the question whether the representation of the response is more similar to that of the original sample.

Cobben and Schouten (2005) and Schouten and Cobben (2006) propose a number of indicators that can be used to measure the similarity between the response to a survey and the sample of that survey. These so-called R-indexes are indicators of survey quality next to the response rate. A higher response rate corresponds to a smaller maximum impact of non-response bias. However, there are various examples in the literature where a higher response rate led to more non-response bias, see e.g. Schouten (2004). For this reason we also apply the R-index to the LFS response and the composite response of LFS and FU.

We use the R-index, see Schouten and Cobben (2006) that is based on the variance of estimated response probabilities

$$R = 1 - \frac{1}{(n-1)\bar{\rho}(1-\bar{\rho})} \sum_{i=1}^{n} (\rho_i - \bar{\rho})^2,$$

where n=6801 is the sample size, ρ_i is the estimated response probability of household i according to some model and $\bar{\rho}$ is the average estimated response probability.

Since a sample was drawn out of the eligible households, the R-index needs to be weighted according to table 3.1.1. If we let w_i be the weight of household i, then the weighted R-index has the form

$$R = 1 - \frac{1}{(n-1)\bar{\rho}_W(1-\bar{\rho}_W)} \sum_{i=1}^{n} w_i (\rho_i - \bar{\rho}_W)^2,$$

with $\bar{\rho}_W = \frac{1}{n} \sum_{i=1}^{n} w_i \rho_i$ the weighted average of estimated response probabilities.

For the estimation of the individual response probabilities we used the logistic regression models of sections 3.2 and 3.3, i.e.

$$Phone \oplus Reg \oplus Etn \oplus HhType \oplus Urb$$

for the LFS response, and

$$Phone \oplus Reg \oplus HhType \oplus Urb$$

for the LFS + FU response.

Table 3.6.1: Response rates and R-indexes for the LFS and LFS + FU response.

	Response rate	R-index
LFS	62.5%	95.2%
LFS + FU	76.9%	96.7%

Table 3.6.1 contains the response rates and weighted R-index for the LFS response and the response of LFS plus FU. The weighted R-index attains a value between 0 and 1, where 1 corresponds to the ideal situation, i.e. the composition of the response cannot be distinguished statistically from that of the sample. The R-indexes show that the representativity of the response has increased after addition of the FU respondents. This result again supports the conclusion that in the FU the overrepresentation of some groups was slightly decreased.

Table 3.6.2: Lower and upper boundaries for variable job status using LFS and LFS + FU response.

Job status	*LFS*		*LFS + FU*	
	Estimate	*Interval*	*Estimate*	*Interval*
All paid job	53.2%	33.2 – 70.8%	52.7%	40.5 – 63.6%
Part paid job	26.0%	16.2 – 53.8%	26.1%	20.1 – 43.2%
None paid job	20.8%	13.0 – 50.6%	21.2%	16.3 – 39.4%

The overall response rate of LFS and FU is 76.9%. This means that there is still a large non-response group that can potentially affect the estimates for key statistics of the LFS. From the analyses we can conclude that the FU response is not very different from the FU non-response with respect to auxiliary variables. A number of these auxiliary variables like having a paid job (at the 1st of January 2005), receiving various forms of allowance (at the date of interview) or a subscription to the CWI database (at the date of interview) directly relate to LFS topics employment and unemployment. This is a promising result. However, the non-response in the FU might still be non-ignorable for those variables. Table 3.6.2 gives lower and upper boundaries for the job status of the household for LFS and LFS + FU. The boundaries are constructed by assigning none or all of the non-respondents to the category. The size of the interval is reduced as is expected, but still has a width of approximately 20%.

4. Discussion and conclusions

In the paper we describe the follow-up of LFS non-respondents and analyse the differences between LFS respondents, converted LFS non-respondents and persistent LFS non-respondents. The response rate in the follow-up study is lower

than studies by Stoop (2001) and Voogt (2004). Approximately 43% of the selected former non-respondents participated in the study. This lower response rate is to some extent due to a drop out of selected interviewers in one of the interviewer districts. However, without this district the response rate is still lower than the other studies. The present study followed most of the fieldwork recommendations by Stoop (2001), but concerns a very different survey and questionnaire, and has a larger sample size. We suspect that especially the topic of the LFS, employment, caused response rates to be lower than in the by Stoop (2001).

During the fieldwork we encountered an error in the selection of non-respondents. In July and August only refusals were re-allocated to interviewers. The other eligible types of non-response, non-contact and unprocessed cases were erroneously not allocated. This error was corrected for by allocation of those addresses in September. Since it concerns mostly non-contacted households, the consequences are not serious. However, we must remark that it is not possible to disentangle effects due to the time lag and due to non-response. This implies that in case a difference is found, this difference can be attributable to both non-response bias and seasonal and business cycle effects.

Five research questions were posed at the beginning of this paper. We will discuss them separately.

It was questioned whether LFS and follow-up respondents are different. We find that they are indeed different. When the two groups are compared directly, they are especially different for geographic variables, the possession of a registered fixed land-line phone and ethnic background. The follow-up response has an overrepresentation of the most urbanised, western parts of the Netherlands. Also, households for which we do not have a phone number are overrepresented in the follow-up. Finally, Moroccan and non-western households other than Moroccan and Turkish households are overrepresented in the study.

When it comes to key LFS questions, we find no significant difference between the job and employment status of the household in the LFS and the follow-up study. This important finding holds both in a univariate comparison as well as in a multivariate setting. As the survey estimates are not significantly different, a further investigation of non-response bias adjustment was needless.

A comparison of the follow-up response and non-response revealed that there are only small differences between those groups. We find only differences for average age of the household and part of the country where the household lives. The latter is not a surprise as in the north of the Netherlands two interviewers dropped out.

The small difference between follow-up response and non-response suggests that with respect to the available demographic, geographic and socio-economic characteristics, the response has become more similar to the sample. The analyses indicate that this is indeed true. A comparison of the combined response to the original LFS sample leads to smaller p-values and, hence, less significant differences. Also, we find that indicators for the representativity of the response increase when the follow-up response is added to the LFS response.

The analyses indicate that converted non-respondents are different from respondents and that they resemble persistent non-respondents. Non-contacts, unprocessed addresses and refusals were eligible for follow-up. The selected refusals are the biggest non-response group; they make up 77% of the follow-up sample. Not surprisingly, the follow-up response rate was highest for the former non-contacts, 58%. As a consequence, non-contacts are overrepresented in the group of converted non-respondents. This finding conforms to that of Lynn et al (2002), i.e. an intensive follow-up is especially successful for the difficult to contact. However, contrary to Lynn et al. (2002), we do not find that the survey estimates of employment and unemployment are affected by the addition of the follow-up response.

We draw three main conclusions. Analyses indicate that:

- Converted non-respondents are different from LFS respondents with respect to demographic and socio-economic characteristics.
- Converted non-respondents resemble persistent non-respondents with respect to demographic and socio-economic characteristics.
- Converted nonrespondents are not different from LFS respondents with respect to job and employment status of the household.

Clearly, we have to be careful when drawing conclusions about the employment status of the non-converted non-respondents. While there is indication that they resemble converted non-respondents in socio-economic characteristics, there is no significant difference in number of paid jobs, social allowances and average house value, the conversion rate of refusals was only 38% and still leaves room for differences in employment status. However, there is no clear indication that we should worry about the key LFS question about the employment and unemployment of non-respondents.

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Appendix A: Excluded interviewer districts and municipalities

Excluded interviewer districts: 10 and 12

Excluded municipalities:

Municipality	*Code*	*Municipality*	*Code*
Aa en Hunze	1680	Midden-Drenthe	1731
Aalten	197	Montferland	1955
Almere	34	Nijkerk	267
Appingedam	3	Noordenveld	1699
Assen	106	Noordoostpolder	171
Barneveld	203	Oude IJsselstreek	1509
Bedum	5	Pekela	765
Bellingwedde	7	Reiderland	1661
Bergeijk	1724	Renkum	274
Berkelland	1859	Reusel-De Mierden	1667
Best	753	Scheemda	39
Bladel	1728	Scherpenzeel	279
Borger-Odoorn	1681	Slochteren	40
Coevorden	109	Son en Breugel	848
Delfzijl	10	Stadskanaal	37
Doetinchem	222	Ten Boer	9
Dronten	303	Texel	448
Ede	228	Tynaarlo	1730
Eemsmond	1651	Urk	184
Eersel	770	Valkenswaard	858
Eindhoven	772	Veendam	47
Emmen	114	Veldhoven	861
Groenlo	240	Vlagtwedde	48
Haren	17	Waalre	866
Hattem	244	Wageningen	289
Hoogeveen	118	Westerveld	1701
Hoogezand-Sappemeer	18	Winschoten	52
Lelystad	995	Winterswijk	294
Loppersum	24	Zeewolde	50
Menterwolde	1987		

Appendix B: Available auxiliary variables and their abbreviations

Individual auxiliary information is aggregated to the household level through the members of the core of the household, i.e. the head and the partner if present.

Age = Average age of household core ∈ {15 – 34 years, 35 – 54 years, 55 years and older}

CWI = At least one member of household core has a subscription to the CWI database ∈ {yes, no}

DaAll = Household receives a disability allowance ∈ {yes, no}

EmpStat = Employment status of household core ∈ {all employed, all unemployed, all non labour force, mix employed and unemployed, mix employed and non labour force, mix unemployed and non labour force, other mix}

Etn = Ethnic background of household core ∈ {native, Moroccan, Turkish, Surinam/Dutch Antilles, other non-western, other western, mixed}

Gender = Aggregated gender of household core ∈ {male, female, mixed}

HhType = Type of household ∈ {single, unmarried couple, married couple, unmarried couple with children, married couple with children, single parent, other, more than 1 household}

HsVal = Average house value at zip-code level in 1000 Euro ∈ {not available, 0 – 50, 50 – 75, 75 – 100, 100 – 125, 125 – 150, 150 – 200, 200 – 250, 250 – 300, 300 – 400, more than 400}

Job = At least one member of household core had a paid job at January 1, 2005 ∈ {yes, no}

JobStat = Status of paid jobs in household core ∈ {all paid job, part paid job, none paid job}

PercNn = Percentage of population that is non-native on zip-code level ∈ {Not available, 0 – 5%, 5 – 10%, 10 – 20%, 20% and more}

Phone = Fixed land-line phone available ∈ {yes, no}

Prov = Provinces and four largest cities ∈ {Groningen, Friesland, Drenthe, Overijssel, Flevoland, Gelderland, Utrecht, Noor-Holland, Zuid-Holland, Zeeland, Noord-Brabant, Limburg, Amsterdam, Rotterdam, Den Haag, Utrecht stad)

Reg = Region of the Netherlands ∈ {north, east, west, south}

SelfEmp = At least one member of the household core is self-employed ∈ {yes, no}

SocAll = Household receives a social allowance ∈ {yes, no}

UeAll = Household receives a unemployment allowance ∈ {yes, no}

Urb = Degree of urbanisation ∈ {very strong, strong, moderate, little, not}

Appendix C: Composition of variables in LFS and follow-up study

Compositions of LFS specific topics and administrative variables are given. For the LFS specific topics we observe only the answers of respondents in LFS or FU.

LFS specific topics: status of jobs and employment in household core

JobStat	*Response*	
	LFS	*LFS+FU*
All paid job	53.2%	52.7%
Part paid job	26.0%	26.1%
None paid job	20.8%	21.2%

EmpStat	*Response*	
	LFS	*LFS+FU*
All employed	44.9%	44.8%
All unemployed	1.7%	1.6%
All non labour force	20.6%	21.3%
Mix employed and unemployed	2.7%	2.6%
Mix employed and non labour force	27.6%	27.0%
Mix unemployed and non labour force	1.0%	1.1%
Other	1.4%	1.6%

Administrative information: geographic variables

Prov	*Response*		*Sample*
	LFS	*LFS + FU*	
Groningen	1.6%	1.3%	1.2%
Friesland	5.6%	5.0%	4.8%
Drenthe	0.5%	0.5%	0.4%
Overijssel	10.1%	10.4%	9.9%
Gelderland	5.9%	5.9%	5.5%
Utrecht	8.1%	7.8%	7.4%
Noord-Holland	15.3%	15.3%	14.9%
Zuid-Holland	14.6%	15.3%	16.0%
Noord-Brabant	12.5%	12.3%	11.4%
Limburg	10.7%	9.7%	8.8%
Amsterdam	3.5%	5.0%	6.2%
Rotterdam	5.7%	5.8%	6.6%
Den Haag	3.3%	3.1%	3.8%
Utrecht	2.6%	2.7%	2.5%

Reg	*Response*		*Sample*
	LFS	*LFS + FU*	
North	7.7%	6.8%	6.5%
East	16.0%	16.3%	15.5%
West	53.1%	54.9%	57.7%
South	23.2%	22.0%	20.2%

Urb	*Response*		*Sample*
	LFS	*LFS + FU*	
Very strong	22.3%	24.1%	26.7%
Strong	24.1%	24.7%	24.4%
Moderate	18.3%	17.2%	17.2%
Little	18.9%	18.2%	17.0%
Not	16.4%	15.8%	14.7%

Administrative information: demographic variables

Gender	*Response*		*Sample*
	LFS	*LFS + FU*	
Male	14.3%	15.1%	15.9%
Female	18.9%	19.9%	20.4%
Mix	66.8%	65.0%	63.7%

Etn	*Response*		*Sample*
	LFS	*LFS + FU*	
Native	76.4%	75.7%	73.8%
Moroccan	1.0%	1.4%	1.7%
Turkish	1.4%	1.5%	1.7%
Surinam/Dutch Antilles	2.3%	2.4%	2.7%
Other non-western	4.7%	5.4%	5.8%
Other western	1.9%	1.9%	2.4%
Mixture	12.3%	11.7%	11.9%

Age	*Response*		*Sample*
	LFS	*LFS + FU*	
<35	21.5%	22.6%	22.3%
35-54	49.9%	49.1%	49.0%
>54	28.6%	28.3%	28.6%

HhType	*Response*		*Sample*
	LFS	*LFS + FU*	
Single	23.2%	24.7%	26.2%
Unmarried couple	7.9%	8.1%	8.2%
Married couple	19.8%	18.9%	19.4%
Unmarried family	4.4%	4.5%	4.5%
Married family	33.5%	32.2%	30.5%
Single parent	6.8%	6.9%	6.8%
Other	0.6%	0.7%	0.7%
> 1 household	3.9%	4.0%	3.6%

Administrative data: socio-economic variables

DaAll	*Response*		*Sample*
	LFS	*LFS + FU*	
Yes	13.5%	13.8%	14.0%
No	86.5%	86.2%	86.0%

SocAll	*Response*		*Sample*
	LFS	*LFS + FU*	
Yes	6.5%	6.9%	7.8%
No	93.5%	93.1%	92.2%

Job	*Response*		*Sample*
	LFS	*LFS + FU*	
Yes	75.5%	74.7%	73.9%
No	24.5%	25.3%	26.1%

CWI	*Response*		*Sample*
	LFS	*LFS + FU*	
Yes	17.2%	17.5%	17.8%
No	82.8%	82.5%	82.2%

UeAll	*Response*		*Sample*
	LFS	*LFS + FU*	
Yes	9.0%	8.7%	8.7%
No	91.0%	91.3%	91.3%

SelfEmp	*Response*		*Sample*
	LFS	*LFS + FU*	
Yes	10.9%	11.4%	11.4%
No	89.1%	88.6%	88.6%

HsVal	*Response*		*Sample*
	LFS	*LFS + FU*	
Not available	7.7%	7.2%	6.8%
0 - 50	2.2%	2.4%	2.4%
50 - 75	9.3%	9.5%	10.4%
75 - 100	15.1%	16.5%	16.9%
100 - 125	17.1%	16.8%	17.3%
125 - 150	15.7%	15.9%	15.2%
150 - 200	19.1%	18.3%	17.7%
200 - 250	7.8%	7.4%	7.2%
250 - 300	3.0%	3.1%	3.1%
300 - 400	2.2%	2.2%	2.2%
> 400	0.8%	0.7%	0.8%

Administrative data: other variables

Phone	*Response*		*Sample*
	LFS	*LFS + FU*	
Yes	61.5%	59.4%	56.4%
No	38.5%	40.6%	43.6%

PercNn	*Response*		*Sample*
	LFS	*LFS + FU*	
Not available	2.0%	1.8%	1.7%
< 5%	69.2%	67.6%	66.0%
5% – 10%	20.8%	22.0%	22.8%
10% – 20%	7.3%	7.9%	8.6%
> 20%	0.6%	0.8%	0.9%