

DATA QUALITY ASSESSMENT OF LOW RESPONSE RATE SITUATIONS

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ABSTRACT

Do low response rates necessarily indicate low accuracy? Do low response rates affect all variables equally in a survey with respect to nonresponse error? How can we judge and compare data quality of a survey except via nonresponse rates?

To investigate these questions an instrument of the federal statistical office with low response rates is examined: the permanent sample. The basic idea of the retrieval of the permanent sample is to gain households who have participated in the largest random sample of the general population in Germany, the microcensus. The Microcensus is a mandatory 1% random sample of the population in Germany. Only those households who have finished the Microcensus will be asked whether they are ready to participate from time to time in voluntary household surveys within the framework of the permanent sample. The first year of recruitment for the permanent sample was 2004 for which extensive data of the respondents as well as the nonrespondents are now available for analysis.

Although the Microcensus is an ideal sample basis for the permanent sample because of its restricted, controlled access and the spectrum of socio-economic variables it provides, there is a disadvantage of high response burden. The Microcensus takes four years and every year there is an extensive mandatory interview on a range of items including financial aspects and the labour force survey. Most households who finish after four years are not interested in any further voluntary cooperation with official statistics. As a result the response rate for the permanent sample is low – only 10% on average. Needless to say efforts are taken and will be taken to increase the response in the coming years, e. g. via improved training of the interviewers. However, an increase of response rates to ‘more acceptable numbers’ like 50% response or more is illusory.

Does the permanent sample still provide an acceptable sampling basis for voluntary household surveys at all or is the nonresponse error per se too high? To answer this and the questions above the relative nonresponse bias (RB_{NR}) is calculated for a range of socio-economic variables.

The results indicate that nonresponse error is not exclusively influenced by the response rate. Different variables produce different results although the response rate is the same. The comparison of the results from different regional offices (in charge of the field work) show, that higher response rates are not always reducing nonresponse bias. Finally, it will be discussed how the analysis of the nonresponse bias might be an effective means for monitoring data quality of the permanent sample in the forthcoming years.

KEY WORDS: Nonresponse bias, Response rates, Nonresponse error

1. INTRODUCTION

Nonresponse, generally the failure to obtain required information in a survey, is an issue at least for all voluntary surveys. When respondents' attributes or attitudes, which are of interest for the respective survey, differ systematically from the nonrespondents, nonresponse leads to nonresponse bias, which adds substantially to the overall nonsampling error (e. g. Biemer and Lyberg, 2003; Groves et al., 2004). In this paper the influence of unit nonresponse, which is the failure to obtain any information from a unit sampled on the nonresponse bias, is exemplary investigated in a situation where extremely high nonresponse rates occur, namely the recruitment of the permanent sample in Germany for the year 2004.

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Implicitly high response rates are frequently still taken as the only indication of good survey quality with respect to nonresponse error failing to investigate the kind of nonresponse which occurs. The exemplary data used in this study have a number of advantages to investigate the relation of response rates and nonresponse bias. Their overall response rate is very low. Moreover, there is not only one response rate that can be calculated because German official statistics is organised federally: from 16 different independent regional offices 16 different response rates are obtained which can be subsumed to a 17th overall response rate throughout Germany. Finally they are extracted from the permanent sample of German official statistics which provides a range of suitable socio-economic variables for analysis.

To provide some background knowledge on the data used, an introduction to the permanent sample is given before the actual analysis will be presented.

2. THE PERMANENT SAMPLE

The permanent sample of disposed households is a sampling frame for voluntary household surveys of official statistics. After a large scale pilot study, the permanent sample has been implemented in early 2004 in order to counteract a number of challenges voluntary household surveys in German official statistics are facing. Among other improvements it counteracts against the growing reluctance of households to respond in surveys. The basic idea of the permanent sample is to permanently recruit households who have participated in the largest random sample of the general population in Germany, the microcensus. Those households who have been recruited successfully will be asked from time to time to participate in voluntary household surveys (for further details see Körner and Nimmergut, 2004; Nimmergut and Körner, 2004; Körner et al., 2006).

The microcensus which can be considered as the core of the system of household surveys in German official statistics constitutes the basis for the establishment of the permanent sample. It is a multi-purpose random sample containing about 320 000 households being surveyed mandatorily every year. The microcensus provides statistical information on a large array of socio-economic variables (including comprehensive demographic and socio-economic information, the employment status as well as vocational and training issues). These are available in the context of the permanent sample and in turn can be used for effective weighting of the households. Due to its large sample size and a response rate of nearly 100 percent the results of the microcensus are considered highly reliable.

All households who completed their last microcensus interview (normally after four years) will be asked whether they are disposed to participate from time to time in voluntary household surveys of official statistics. The permanent sample is introduced to the households under the product name "Households Today" (*Haushalte Heute*) as the term "permanent sample" would have been too technical to be used in the recruitment process. The microcensus interviewers address the households directly after the last microcensus interview.² The interviewers inform the households of the permanent sample and hand over an information leaflet explaining the participants' role in the permanent sample in more detail. At the end of the interview, households have the opportunity to directly decide for a participation in the permanent sample, but they have the option to reconsider and join the permanent sample at a later stage via declaring their consent over mail. All participants have to sign a declaration of consent which provides the legal basis for the storage of the information from the last microcensus interview into the data base of the permanent sample as well as to keep some selected variables up-date every year.

In order to cover the sample of the microcensus entirely, printed information material is sent to the households which were not reached by the interviewer or which asked to complete the microcensus' self-administered questionnaire. In this case, the printed information material is accompanied by a cover letter which introduces the request to the households from the head of the statistical office and asks the households to mail back the declaration of consent.

² During the pilot study, this recruitment method has proven to be the one with the best cost-effectiveness ratio. (Nimmergut et al., 2004).

The permanent sample serves as sampling frame for sample surveys of households and individuals which do not require a mandatory response and for which a comparatively small sample size is considered sufficient. Compared to other sampling frames for household surveys, the permanent sample is characterised by a number of special features which are essential for its effective use. Extensive socio-economic information is available from the last microcensus interview. This information can be used for detailed investigation of the nonresponse bias occurring during the recruitment stage and to correct for it. For developing effective weighting techniques it is important to note that this socio-economic information from the microcensus is available for both participants and non-participants of the permanent sample.

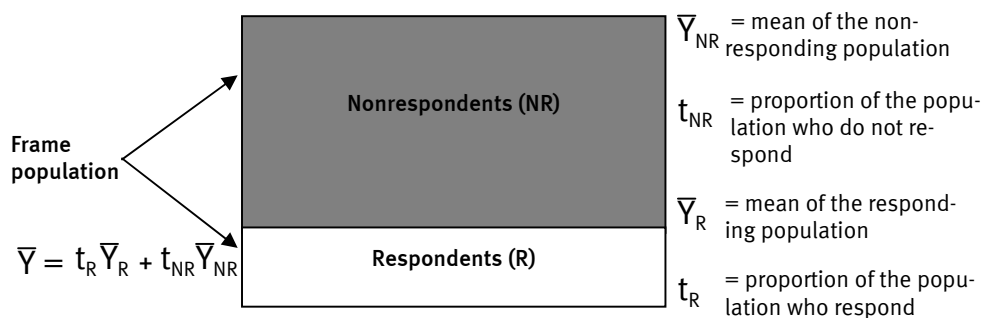
From the full set of microcensus variables, a subset of “core variables” is stored in the data base of the permanent sample and up-dated regularly. The core variables play an important role, as they can be used as stratification variables. In practice this means that for many surveys focusing on sub-populations it is not necessary to carry out a screening prior to the data collection. The core variables can be used equally in order to tailor the fieldwork to the requirements of different sub-populations.

3. CALCULATING NONRESPONSE BIAS FOR THE RECRUITMENT OF THE PERMANENT SAMPLE

Response rates for the permanent sample are calculated via dividing the participating households (7 709 households altogether for Germany in 2004) by the number of households who have participated in their last microcensus interview (normally after four years; 81 838 households altogether for Germany in 2004). Accordingly the overall response rate for the permanent sample in the year 2004 is 9.4%. The response rates of the regional offices are equally calculated for the households of the respective federal states. Their response rate values vary from 5.5% to 15.1% (compare tables 1 to 6 in the appendix) meaning that we deal with a threefold discrepancy in the regional offices’ response rates. If the response rates would be a direct predictor of the nonresponse bias, the calculated nonresponse bias values of the offices with the highest response rates would perform best.

The nonresponse bias calculation in this study follows a simple model published in Biemer and Lyberg (2003) according to which the mean of the entire population can be constructed by weighting the respondent and nonrespondent means together (figure 1).

Figure 1: Illustration of nonresponse according to Biemer and Lyberg (2003)



If it is assumed that the mean of the microcensus for a variable equals the mean of the population in Germany, the formula can be redrawn to calculate the mean values of the nonrespondents, which can not be extracted directly from the data set available, according to equation (1) (for input values and results compare tables 1 to 6 in the appendix).

$$(1) \quad \bar{Y}_{NR} = \frac{\bar{Y} - t_R \bar{Y}_R}{t_{NR}}$$

Correspondingly, the nonresponse bias (B_{NR}) can be calculated according to equation (2) and the relative nonresponse bias (RB_{NR}) can be calculated according to equation (3).

$$(2) \quad B_{NR} = (1 - t_R) (\bar{Y}_R - \bar{Y}_{NR})$$

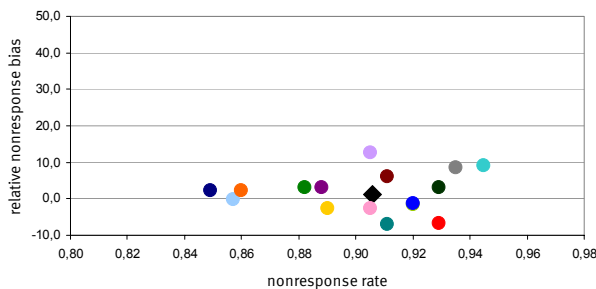
$$(3) \quad RB_{NR} = (1 - t_R) \frac{\bar{Y}_R - \bar{Y}_{NR}}{\bar{Y}}$$

These calculations can not only be done for the composite values for the whole of Germany but for each of the regional offices (compare tables 1 to 6 in the appendix). Their results can be compared amongst each other and plotted against the nonresponse rate. There should be linear relationships if the response rate predicts the magnitude of the nonresponse bias. If response rate is THE quality indicator we should expect similar patterns for different variables.

4. RESULTS

First of all the relative nonresponse bias is calculated for the household size, measured in persons per household (figure 2, table 1 appendix). Household size is a first indication for the distribution of different households in the population and the sample and hence a core information for every voluntary household survey. The relative nonresponse bias for household size can be calculated directly as persons per household is a linear measure. As figure 1 exhibits, the relative nonresponse bias of the composite value for the whole of Germany (black square) and some regional offices (coloured dots) is low, but for some other regional offices the values range between -8 and 12.5. There is, however, no correlation between the response rate and the bias. Although slightly higher nonresponse bias values are observed for offices with higher nonresponse (over 90%) there are still offices with extremely high nonresponse (over 92%) but low relative nonresponse values.

Figure 2: household size DSP 2004

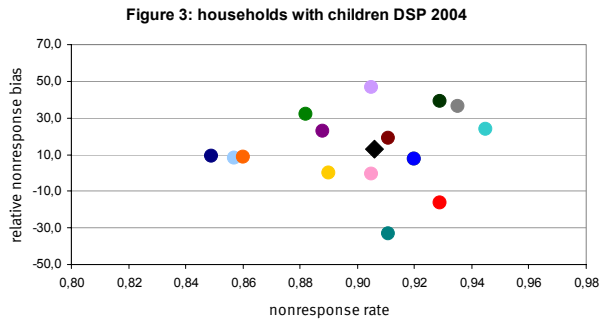


More meaningful with respect to the distribution of different households is the variable household type, which however is not linear. In Germany the following classes of household types are commonly investigated:

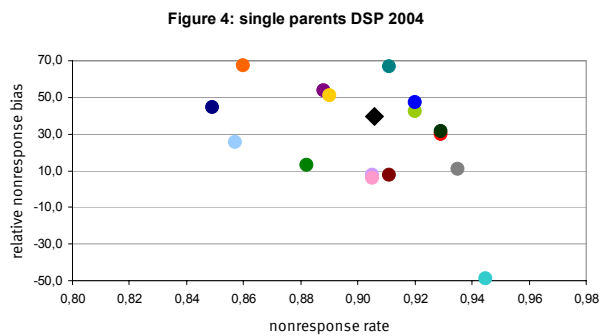
- Single persons
- Couples with children
- Couples without children
- Single parents
- Other household types

Due to the importance of this variable for voluntary household surveys an analysis of the relative nonresponse bias is nevertheless attempted. In this case calculations are based on the proportion of the individual classes

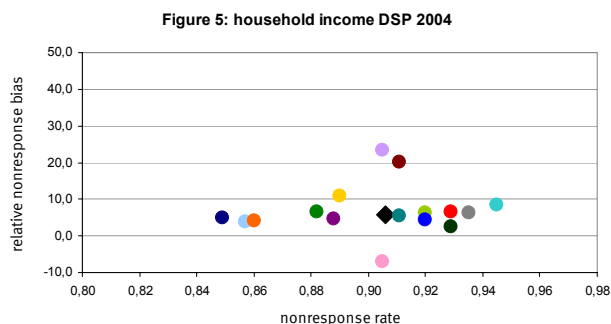
compared to their proportions in the microcensus (figures 3 and 4, tables 2 and 3 appendix). The household types ‘Couples with children’ and ‘Single parents’ are exemplified.



Compared to the mean values which are used to assess linear variables e. g. household size, the comparison of proportions used to assess class variables e. g. household type, lead to greater difference values (see column ‘Difference respondents – nonrespondents’ in the tables of the appendix) compared to the population value (\bar{Y}) which in turn leads to much higher nonresponse bias estimates. Accordingly, it might be problematic to judge bias calculations based on proportions similarly to the calculations based on means.



Still some interesting features become obvious. Again it is not the regional offices with the highest response rates that obtain the lowest nonresponse bias values. This pattern is even more obvious in figures 3 and 4 than in figure 2. Furthermore the nonresponse bias values of different household groups are very different for the same offices with the same response rates.

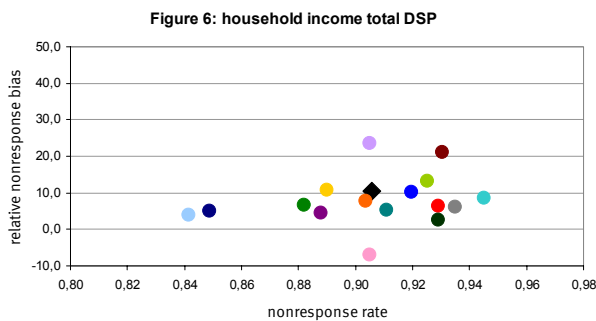


Analysis of household net income returns to a linear measure and comparison between estimated means. As a variable ‘household net income’ is one of the most important information in the permanent sample because

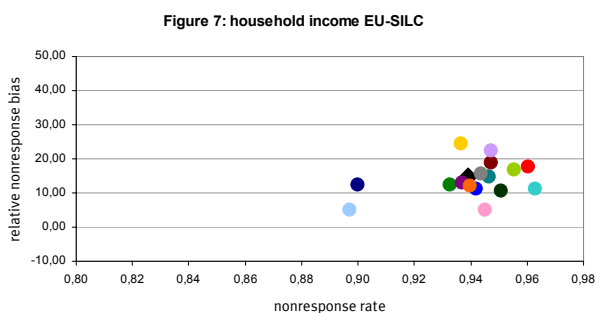
many voluntary household surveys are interested in it and it is frequently used for stratification purposes. Accordingly one can judge this variable as a crucial test for the usability of the permanent sample.

The relative nonresponse bias of the composite value for entire Germany is less than 6% and it ranges between 2% and 7% for most of the regional offices. Accordingly with respect to the relative nonresponse bias for household net income it can be concluded that the permanent sample is an acceptable sampling basis for voluntary household surveys with an interest in household income. Again there is no relation to the response rate. The offices with relative nonresponse values greater 10% are not the ones with the lowest response rates.

The household net income is also investigated in figure 6 and figure 7 to reveal two other aspects of the relative nonresponse bias. One of them is the change of the sampling basis over time. For its investigation a recourse to pilot study data is necessary because there are no data of the permanent sample for 2005 available yet. Five regional offices took part in this pilot study of the permanent sample for which households were recruited already in 2001. If these are considered additionally, the relative nonresponse bias increases (figure 6).



Although these are only exemplary data because panel maintenance is significantly better for the permanent sample than for the pilot study, figure 6 reveals the potential of calculating nonresponse bias to detect changes over time. A regular monitoring of the permanent sample can be established accordingly by using the relative nonresponse bias to assess the impact of panel attrition on the sample basis.



The last nonresponse calculation of this paper focuses on the response of an actual survey – here the respondents of the first EU-SILC wave 2005 in Germany. The overall response rate for EU-SILC from the households of the permanent sample was about 65%. However, this response rate has to be multiplied by the initial recruitment response rates out of the microcensus. Extremely low response rates result. Despite this, the relative nonresponse bias³ is still acceptable for the composite value of Germany and most of regional offices. How-

³ Income values are still based on the information from the permanent sample. Information on income data from EU-SILC has not been available at the time of Q2006. Calculations will be updated when the data from EU-SILC are available.

ever, an increase of the relative nonresponse bias compared to the original response for the permanent sample can be noted. Again there is no relation to the response rate.

5. CONCLUSION

If there is the possibility to ,calculate‘ the (relative) nonresponse bias with the help of auxiliary data this is a very effective tool to assess aspects of survey results which can not be revealed via calculating response rates alone. Having auxiliary data available to estimate the variables mean of the population or the mean of the nonrespondents the approach presented is easy and simple to accomplish.

The method is slightly restricted when class variables or population groups need to be assessed because no mean values can be calculated from them. However, class variables are important socio-economic variables for many voluntary household surveys and their assessment should be incorporated. A way of doing this is to use the of proportions of single classes instead of means but these estimates need to be interpreted carefully and can not be directly compared to nonresponse bias estimations of linear variables.

Although the response rates presented in this paper are very low altogether, there is still considerable variation between the response rates of different regional statistical offices – between the lowest and the highest response rate there is nearly a factor three difference. Despite this difference the bias results presented do not exhibit a pattern which could be predicted by response rate: for some variables in some regional statistical offices the bias is quite low although nonresponse is very high.

The response for the permanent sample needs to be definitely increased in the following years – the results presented here should not be interpreted as an argument against this necessity (considering e. g. sample size, variance, comparability between regional statistical offices). However just increasing response rates alone might not be the cure-all; certain measures to increase the response rates might even be counterproductive. Accordingly the calculation of the (relative) nonresponse bias will be a powerful tool to assess different measures that are taken to increase future response rates to assess how a measure that increases response rates influences the bias.

The data presented in this paper show that low response rates do not necessarily indicate low accuracy and that any assessment needs to consider more complex factors in the response process than response rates alone. Additionally, not all variables are influenced in the same way by a certain response rate, i. e. the bias can be very different for different variables of the same response rate (survey).

Accordingly to obtain a more comprehensive picture of response data than by calculation of response rates alone, the assessment of nonresponse bias is an alternative. The simplified model presented here is one method to conduct an easy and expeditious assessment which however has great potential to add to our understanding of the accuracy of a statistic.

6. REFERENCES

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APPENDIX

- Tabulation of relevant parameters for calculating the nonresponse bias from the permanent sample in 2004 –
- Response rates are calculated by dividing participating households (7 709 households altogether in Germany in 2004, 10 543 households considering the 2001 recruitment additionally) by the number of households who have participated in their last microcensus interview (normally after four years; 81 838 households altogether in Germany in 2004) –
- Table 5 considers also data from the pilot phase of the permanent sample (recruitment 2001) –
- Income values for EU-SILC participants are still based on the information from the permanent sample. Information on income data from EU-SILC has not been available at the time of Q2006. Calculations will be updated when the data from EU-SILC are available. –

Table 1: Tabulation of nonresponse bias parameters in the permanent sample for household size

	\bar{Y} Estimated mean Mi- crocensus	\bar{Y}_R Mean per- manent sample	\bar{Y}_{NR} Mean non- respondents	Difference respon- dents-non- respondents	t_R Response rate	t_{NR} Non- response rate	B_{NR} Non- response bias	RB_{NR} Relative non- response bias
	Persons/ household	Persons/ household	Persons/ household	Persons/ household				
Total permanent sample	2,13	2,16	2,13	0,03	0,09	0,91	0,02	1,1
<i>Regional offices</i>								
A	2,11	1,97	2,13	-0,16	0,09	0,91	-0,15	-6,9
B	1,87	1,74	1,88	-0,13	0,07	0,93	-0,13	-6,7
C	2,14	2,32	2,13	0,19	0,06	0,94	0,18	8,5
D	1,86	2,03	1,85	0,18	0,06	0,95	0,17	9,0
E	2,14	2,11	2,15	-0,03	0,08	0,92	-0,03	-1,5
F	2,18	2,31	2,16	0,15	0,09	0,91	0,13	6,1
G	2,20	2,27	2,19	0,08	0,12	0,88	0,07	3,2
H	2,23	2,30	2,22	0,08	0,11	0,89	0,07	3,0
I	2,22	2,19	2,22	-0,03	0,08	0,92	-0,03	-1,4
K	2,05	2,31	2,02	0,28	0,10	0,91	0,26	12,5
L	1,82	1,77	1,82	-0,06	0,11	0,89	-0,05	-2,7
M	2,12	2,12	2,12	0,00	0,14	0,86	0,00	-0,2
N	2,13	2,08	2,14	-0,06	0,10	0,91	-0,05	-2,5
O	2,04	2,09	2,03	0,05	0,15	0,85	0,05	2,2
P	2,08	2,15	2,08	0,07	0,07	0,93	0,06	3,1
S	2,12	2,17	2,12	0,06	0,14	0,86	0,05	2,3

Table 2: Tabulation of nonresponse bias parameters in the permanent sample for households with children under 18 years and two parents

	\bar{Y} Estimated proportion Microcensus [%]	\bar{Y}_R Proportion permanent sample [%]	\bar{Y}_{NR} Proportion non- respondents [%]	Difference respon- dents-non- respondents [%]	t_R Response rate	t_{NR} Non- response rate	B_{NR} Non- response bias	RB_{NR} Relative non- response bias
Total permanent sample	18,71	21,11	18,46	2,65	0,09	0,91	2,40	12,8
<i>Regional offices</i>								
A	18,23	12,21	18,82	-6,61	0,09	0,91	-6,02	-33,0
B	13,78	11,56	13,95	-2,39	0,07	0,93	-2,22	-16,1
C	19,03	25,96	18,55	7,41	0,06	0,94	6,93	36,4
D	12,13	15	11,96	3,04	0,06	0,95	2,87	23,7
E	19,43	20,85	19,31	1,54	0,08	0,92	1,42	7,3
F	19,62	23,32	19,26	4,06	0,09	0,91	3,70	18,9
G	20,15	26,61	19,29	7,32	0,12	0,88	6,46	32,1
H	21,17	25,99	20,56	5,43	0,11	0,89	4,82	22,8
I	20,64	22,21	20,50	1,71	0,08	0,92	1,57	7,6
K	16,68	24,49	15,86	8,63	0,10	0,91	7,81	46,8
L	12,14	12,15	12,14	0,01	0,11	0,89	0,01	0,1
M	17,24	18,67	17,00	1,67	0,14	0,86	1,43	8,3
N	17,42	17,31	17,43	-0,12	0,10	0,91	-0,11	-0,6
O	16,06	17,54	15,80	1,74	0,15	0,85	1,48	9,2
P	15,62	21,69	15,16	6,53	0,07	0,93	6,07	38,9
S	16,94	18,42	16,70	1,72	0,14	0,86	1,48	8,7

Table 3: Tabulation of nonresponse bias parameters in the permanent sample for households which are single parents

	\bar{Y} Estimated proportion Microcensus [%]	\bar{Y}_R Proportion permanent sample [%]	\bar{Y}_{NR} Proportion non- respondents [%]	Difference respon- dents-non- respondents [%]	t_R Response rate	t_{NR} Non- response rate	B_{NR} Non- response bias	RB_{NR} Relative non- response bias
Total permanent sample	3,84	5,37	3,68	1,69	0,09	0,91	1,53	39,8
<i>Regional offices</i>								
A	4,12	6,87	3,85	3,02	0,09	0,91	2,75	66,7
B	4,72	6,12	4,61	1,51	0,07	0,93	1,40	29,7
C	3,66	4,06	3,63	0,43	0,06	0,94	0,40	10,9
D	4,88	2,5	5,02	-2,52	0,06	0,95	-2,38	-48,8
E	3,53	5,03	3,40	1,63	0,08	0,92	1,50	42,5
F	3,46	3,73	3,43	0,30	0,09	0,91	0,27	7,8
G	3,62	4,09	3,56	0,53	0,12	0,88	0,47	13,0
H	3,38	5,2	3,15	2,05	0,11	0,89	1,82	53,8
I	3,48	5,13	3,34	1,79	0,08	0,92	1,65	47,4
K	3,80	4,08	3,77	0,31	0,10	0,91	0,28	7,4
L	5,57	8,41	5,22	3,19	0,11	0,89	2,84	51,0
M	4,68	5,87	4,48	1,39	0,14	0,86	1,19	25,4
N	5,45	5,77	5,42	0,35	0,10	0,91	0,32	5,9
O	4,31	6,23	3,97	2,26	0,15	0,85	1,92	44,5
P	4,43	5,82	4,32	1,50	0,07	0,93	1,39	31,4
S	4,19	7,02	3,73	3,29	0,14	0,86	2,83	67,5

Table 4: Tabulation of nonresponse bias parameters in the permanent sample for household net income (recruitment 2004)

	\bar{Y} Estimated mean Mi- crocensus [€]	\bar{Y}_R Mean per- manent sample [€]	\bar{Y}_{NR} Mean non- respondents [€]	Difference respon- dents-non- respondents [€]	t_R Response rate	t_{NR} Non- response rate	B_{NR} Non- response bias	RB_{NR} Relative non- response bias
Total permanent sample	2100,04	2220,96	2087,49	133,47	0,09	0,91	120,92	5,8
<i>Regional offices</i>								
A	2128,78	2243,63	2117,56	126,08	0,09	0,91	114,86	5,4
B	2096,54	2232,68	2086,14	146,55	0,07	0,93	136,14	6,5
C	2092,38	2221,89	2083,38	138,51	0,06	0,94	129,51	6,2
D	1810,33	1965,40	1801,30	164,10	0,06	0,95	155,07	8,6
E	2118,91	2251,24	2107,40	143,85	0,08	0,92	132,34	6,2
F	2293,45	2757,67	2248,10	509,57	0,09	0,91	464,22	20,2
G	2190,03	2335,78	2170,53	165,25	0,12	0,88	145,75	6,7
H	2330,28	2436,21	2316,92	119,30	0,11	0,89	105,93	4,5
I	2292,26	2395,37	2283,30	112,07	0,08	0,92	103,11	4,5
K	1944,41	2400,39	1896,54	503,85	0,10	0,91	455,99	23,5
L	1835,58	2033,28	1811,15	222,13	0,11	0,89	197,70	10,8
M	1835,05	1906,06	1823,19	82,87	0,14	0,86	71,02	3,9
N	1714,81	1595,57	1727,33	-131,75	0,10	0,91	-119,24	-7,0
O	1730,32	1816,89	1714,92	101,97	0,15	0,85	86,57	5,0
P	1694,68	1736,22	1691,51	44,72	0,07	0,93	41,54	2,5
S	1735,21	1808,12	1723,34	84,78	0,14	0,86	72,91	4,2

Table 5: Tabulation of nonresponse bias parameters in the permanent sample for household net income (additionally considering pilot-study recruitment form 2001 in five regional offices)

	\bar{Y} Estimated mean Mi- crocensus [€]	\bar{Y}_R Mean per- manent sample [€]	\bar{Y}_{NR} Mean non- respondents [€]	Difference respon- dents-non- respondents [€]	t_R Response rate	t_{NR} Non- response rate	B_{NR} Non- response bias	RB_{NR} Relative non- response bias
Total permanent sample	2100,04	2322,00	2076,90	245,10	0,09	0,91	221,96	10,6
<i>Regional offices</i>								
A	2128,78	2243,63	2117,56	126,08	0,09	0,91	114,86	5,4
B	2096,54	2232,68	2086,14	146,55	0,07	0,93	136,14	6,5
C	2092,38	2221,89	2083,38	138,51	0,06	0,94	129,51	6,2
D	1810,33	1965,40	1801,30	164,10	0,06	0,95	155,07	8,6
E	2118,91	2400,77	2096,15	304,61	0,07	0,93	281,86	13,3
F	2293,45	2777,49	2257,36	520,14	0,07	0,93	484,04	21,1
G	2190,03	2335,78	2170,53	165,25	0,12	0,88	145,75	6,7
H	2330,28	2436,21	2316,92	119,30	0,11	0,89	105,93	4,5
I	2292,26	2522,89	2272,10	250,78	0,08	0,92	230,63	10,1
K	1944,41	2400,39	1896,54	503,85	0,10	0,91	455,99	23,5
L	1835,58	2033,28	1811,15	222,13	0,11	0,89	197,70	10,8
M	1835,05	1906,06	1821,68	84,39	0,16	0,84	71,02	3,9
N	1714,81	1595,57	1727,33	-131,75	0,10	0,91	-119,24	-7,0
O	1730,32	1816,89	1714,92	101,97	0,15	0,85	86,57	5,0
P	1694,68	1736,22	1691,51	44,72	0,07	0,93	41,54	2,5
S	1735,21	1867,01	1721,13	145,88	0,10	0,90	131,81	7,6

Table 6: Tabulation of nonresponse bias parameters in the permanent sample for household net income (for EU-SILC 2005 respondents)

	\bar{Y} Estimated mean Mi- crocensus [€]	\bar{Y}_R Mean per- manent sample [€]	\bar{Y}_{NR} Mean non- respondents [€]	Difference respon- dents-non- respondents [€]	t_R Response rate	t_{NR} Non- response rate	B_{NR} Non- response bias	RB_{NR} Relative non- response bias
Total permanent sample	2100,04	2410,71	2079,89	330,82	0,06	0,94	310,67	14,8
<i>Regional offices</i>								
A	2128,78	2441,79	2111,14	330,65	0,05	0,95	313,01	14,7
B	2096,54	2463,55	2081,40	382,15	0,04	0,96	367,01	17,5
C	2092,38	2416,93	2072,99	343,94	0,06	0,94	324,55	15,5
D	1810,33	2014,48	1802,46	212,02	0,04	0,96	204,15	11,3
E	2118,91	2474,52	2102,27	372,25	0,04	0,96	355,61	16,8
F	2293,45	2727,29	2269,26	458,03	0,05	0,95	433,84	18,9
G	2190,03	2462,19	2170,38	291,81	0,07	0,93	272,16	12,4
H	2330,28	2635,08	2309,76	325,32	0,06	0,94	304,80	13,1
I	2292,26	2546,90	2276,52	270,38	0,06	0,94	254,64	11,1
K	1944,41	2381,72	1920,10	461,62	0,05	0,95	437,31	22,5
L	1835,58	2282,71	1805,28	477,43	0,06	0,94	447,13	24,4
M	1835,05	1926,85	1824,53	102,32	0,10	0,90	91,81	5,0
N	1714,81	1798,42	1709,95	88,46	0,05	0,95	83,61	4,9
O	1730,32	1942,27	1706,75	235,53	0,10	0,90	211,95	12,2
P	1694,68	1876,43	1685,27	191,16	0,05	0,95	181,75	10,7
S	1735,21	1942,73	1721,93	220,80	0,06	0,94	207,53	12,0