2007 Census Test: The effects of including questions on income and implications for the 2011 Census

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1. Executive Summary

The 2007 Census Test tested innovations to the Census design in preparation for the 2011 Census. One such innovation was the inclusion of questions regarding the sources and level of each individual's (usual resident's) income. Around 100,000 households were asked to participate in the 2007 Test: around half received 2007 Test questionnaires that included these questions, and the remainder received questionnaires with no income questions.

The effect of these questions on response rates, field operations and the public view of the Census were assessed, as was the quality of the data obtained from these questions.

Four key findings are in support of the proposal to include an income level question in the 2011 Census:

- Around 90.9% of individuals who submitted valid responses to the 2007 Test also completed the income level question, even though this was the last question asked on the questionnaire.
- The inclusion of the income questions did not affect the item response rates to the other questions. This is consistent with findings from NISRAs 2007 Census Test in Northern Ireland, GROS' 2006 Census Test in Scotland and the 1997 Test taken in Great Britain.
- The inclusion of the income questions did not result in additional individuals contacting the Census Contact Centre regarding these questions.
- The inclusion of the income questions did not have a negative impact on the coverage of individuals within households.

On the other hand, five key findings are in support for not including an income level question:

- The overall response rate for questionnaires with no income questions was 53.3% whereas the response rate for income questionnaires was 50.6% - a statistically significant difference of 2.7 percentage points, which is consistent with findings from the 1997 Test. This indicates that more households would need to be followed-up for non-return of questionnaires if income questions were included in the 2011 Census.
- Individuals who were unemployed, over 65 years of age, less qualified, from certain ethnic minority backgrounds, living in Local Authorities identified as generally low income areas or females tended to report lower income and had lower item response rates to the income level question than comparison groups.
- 404 individuals who completed the 2007 Test income level question also took part in the Census Test Evaluation Survey (CTES), in which they were asked this question again. Responses matched in only 66.8% of cases, indicating that the question was difficult to answer. This is consistent with findings from NISRAs 2007 Test.
- There was evidence that individuals who submitted valid 2007 Test responses had concerns about the income questions: more than half of those that did not answer the income level question did answer the ethnic identity or qualifications questions.
- Many newspapers took a negative stance in their reporting of the inclusion of income questions in the 2007 Test and proposals to include such questions in the 2011 Census.

If income questions were included, to build on the substantial research already undertaken, further research would be needed to ascertain how to make the questions clearer, more acceptable to the public and provide more reliable data. The fact that the questions are difficult to answer and that some Census income data would be collected by proxy indicate that the Census may not be the best method to collect data on income. The Integrated Household Survey (IHS) or model-based income estimates produced by ONS should be able to meet at least some of Census users' requirements for data on income. Additionally, these sources could provide information on a more frequent basis than the Census.

Taking full account of the limitations of generalising the findings from the 2007 Test to the population of England and Wales, the strength of Census users' requirements for income questions in comparison to other questions and the availability of alternative sources of income data, it is recommended that questions on income should not be included in the 2011 Census for England and Wales.

2. Objectives

The 2007 Census Test was designed to test innovations to the Census design prior to the 2011 Census. There were three areas of primary evaluation:

- Testing the feasibility of asking individuals (usual residents) about the sources and level of their income.
- Testing the feasibility of posting-out questionnaires via a postal service provider rather than using the traditional method of employing enumerators to hand-deliver them.
- Testing the feasibility of outsourcing recruitment, training and pay to a recruitment agency.

This paper concerns the evaluation of the effects of including income questions in the 2007 Test (see Annex 1 for the wording of these questions), and will inform the decision on whether to include such questions in the 2011 Census.

2.1 Primary evaluation questions

This paper presents answers to the following four primary income evaluation questions:

- Do income questions result in a significant drop in response?
- What is the impact of income questions on the quality of response?
- What are the cost differences for income questions?
- What are the views of the public on the income questions?

2.2 Supplementary evaluation questions

Answers to the following six supplementary income evaluation questions will also inform the decision-making process:

- Do income questions result in more individuals being missed from households that have returned a questionnaire?
- What alternative sources of data on income are there?
- What supporting evidence is available from the Northern Ireland Statistical and Research Agency's (NISRAs) evaluation of their individual income questions in their 2007 Test?
- What supporting evidence is available from the General Register Office for Scotland's (GROS') evaluation of their household income question in their 2006 Test?
- What supporting evidence is available from the results of the 1999 Census Rehearsal regarding the income question?
- What supporting evidence is available from the results of the 1997 Census Test regarding the income question?

The final decision on the inclusion of income questions in the 2011 Census will be dependent not only on the results of this evaluation but also on the strength of Census data user requirements in comparison to other questions and the space available on the questionnaire.

The evaluation of the income question will be presented at the Primary Decision Level which is the responsibility of the 2011 Census Project Board. GROS and NISRA will be involved in the evaluation to understand differences in design and inform decisions on an income question in their respective Census.

3. Background

3.1 Census data users' need for income questions in the 2011 Census

The decision to include income questions in the 2007 Census Test arose from a demand from some Census data users to include a question on income level in the 2011 Census. This was largely driven by a widely held belief that asking about income is the best method for identifying areas of deprivation and affluence at various levels of geography. For this purpose, previous Censuses have used questions such as accommodation type, condition and ownership; occupation; and car ownership for this purpose. However, this method is not very reliable for special population groups such as large households, and will not be sufficient to fully meet users' requirements for the 2011 Census.

The strength of user requirement for questions on income in the 2011 Census was confirmed in a three month formal consultation from May to August 2005 with central and local government, academics, the business community and other groups (e.g. faith groups, charities) and the general public. For more detail, see the papers: 'The 2011 Census: Initial view on content for England and Wales', 'The 2011 Census: Assessment of initial user requirements on content for England and Wales' and 'The 2011 Census: Development of a questionnaire for the 2007 Census Test'. Users were particularly interested in the use of income data to identify areas of deprivation to understand better the causes of poverty and more effectively target interventions. For example, the Office of the Deputy Prime Minister claimed that:

'Information on income is vital to understand levels of deprivation. Low income remains a central component of the definition of multiple deprivation in the Indices of Deprivation 2004 and an income question in the Census would certainly greatly improve any future update to the Indices.'

The Department of Health claimed that:

'Small area analysis of household income would support neighbourhood renewal; regeneration; social inclusion; health and social care interventions targeted at those most in need; and delivery of the public health agenda set out in ' Choosing Health'.'

Consulted Local Government departments agreed that:

'Income data would allow Local Authorities to assess the geographical distribution of poverty and identify small pockets of poverty.'

Help the Aged claimed that:

'Information on income is vital for the targeting of our efforts to help combat poverty and deprivation amongst older people.'

For more detail on user requirements, see the paper: 'Summary of user requirements for income data from the 2011 Census'.

However, Census user requirements must be carefully weighed against the effect of including income questions on overall response rates, response rates to the other questions asked, Census field operations, the public view of the Census and the coverage of individuals within households. In addition, the reliability and validity of the data obtained; and the availability, reliability and validity of income data as provided from other sources must be taken into account.

Data from the 2007 Test income questions may not prove to be particularly reliable because, even with carefully prepared questions, individuals may find it difficult to judge what they should and should not include in calculating their income. Furthermore, a potentially adverse public reaction to income questions in the Census could affect Census field operations and the quality of the data obtained from the other questions. It is also possible that a sample survey could satisfy the Census user demand for information on income. All of these issues are discussed in this paper.

3.2 2007 Test field design

The 2007 Test took place on the 13 May 2007 - participation was voluntary. A split-sample of just over 100,000 households was selected for participation: around half received questionnaire that included income questions, and the remainder received questionnaires with no income questions. The inclusion of income questions was balanced across questionnaire delivery method, Local Authority (LA), and Enumeration Targeting Category (ETC). Income question inclusion was assigned at the Enumeration District (ED) level. These four terms are explained further below.

Note: If income questions were included in the 2011 Census it would be included nationally in all Census questionnaires and not targeted to specific areas only.

3.2.1 Delivery method

There were two questionnaire delivery methods: around half of the 2007 Test sample had their questionnaires delivered to them by the traditional method used in the 2001 Census of employing Enumerators to hand-deliver them (hand-delivery method); and the remainder had their questionnaires posted to them via the Postal Service Provider Royal Mail (post-out method). Delivery method was assigned at the ED level. For both groups questionnaires were delivered from the 28 April to the 6 May.

For hand-delivery, enumerators attempted to contact households on 3 occasions to deliver questionnaires. If unsuccessful, they posted the questionnaire through the letterbox.

3.2.2 Local Authorities

The LAs Bath and North-East Somerset, Camden, Carmarthenshire, Liverpool and Stoke-on-Trent participated in the 2007 Test. These LAs were purposively selected in order to satisfy a range of criteria including:

- LAs that provide an overall 'representative' sample of LAs found within England and Wales. They are drawn from five different LA Supergroups: Prospering UK (Bath and North-East Somerset), London Centre (Camden), Coastal and Countryside (Carmarthenshire), Services and Cities (Liverpool) and Mining and Manufacturing (Stoke on Trent).
- Only LAs with a combination of a high number of people from difficult-to-enumerate groups (e.g. young men).
- At least one LA in Wales.
- At least one LA with rapid population movement.
- At least one LA with rapid development.

3.2.3 Enumeration Districts

EDs cover all of England, Scotland and Wales with no exception or overlap. In the 1991 Census, each ED represented the workload of an enumerator who delivered and followed-up all Census questionnaires by hand. They were also used as a basis for distributing enumerator workload in the 2001 Census. The size of EDs takes account of the number of households and other factors that affect enumeration. EDs have on average around 200 households each, but range from a few up to several hundred. 516 EDs were selected for the 2007 Test. One ED was excluded from the overall response rate analysis (section 4) because the Enumerator could not be contacted during the questionnaire delivery phase and so it was unknown which households in this ED had received questionnaires. Questionnaire data from this ED is included in the analysis reported in sections 5, 6, 7 and 8.

3.2.4 Enumeration Targeting Classification

The ETC was constructed from six variables (referred to as domains). The domains used were:

- Age – young adults.
- Housing accommodation type – non-standard housing (conversions in commercial addresses and caravan/temporary accommodation).
- Ethnicity – individuals from ethnic minority backgrounds.
- Household tenure – private rental.
- Household tenure – LA or Housing Associated rental and part rent part mortgage.
- Low income.

These domains were selected because they represent characteristics that were found to be associated with low response to the 2001 Census and data were available at the Lower Super Output Areas (LSOA) level of geography.

The low income domain was created by comparing data on the number of individuals claiming Jobseeker's Allowance (JSA) and Income Support in August 2004 according to the Department for Work and Pensions (numerator) with the number of individuals aged 16 to 64 in the 2001 Census data (denominator). All of the other domains were derived exclusively from 2001 Census data.

There are two limitations of the income domain:
- There is a difference in the dates of collection between the JSA and income support data (August 2004) and the 2001 Census (29 April 2001).
- Information regarding children affected by low income households is not included.

The domains were aggregated into an index of five categories ranging from 1 (very easy to enumerate) to 5 (very difficult to enumerate. LSOAs were then categorised 1 to 5 depending on where their score sits on the index. ETCs at the LSOA level could not be directly translated on to ED boundaries because the boundaries of LSOAs and EDs overlap. Therefore, a best-fit method of translation was applied to produce an approximate categorisation for EDs. For more detail on how the ETC scale was devised, see the paper: 'Enumeration Targeting Classification to be used in the 2007 Test.'

The distribution of all EDs in England and Wales and the 2007 Test sample across the ETC categories are presented in Table 3.1:

Table 3.1: *English and Welsh EDs and 2007 Test Sample EDs by ETC Category*

ETC	All England and Wales EDs	2007 Test EDs	
	Perc	Freq	Perc
1 – very easy-to-enumerate	60%	100	19.4%
2	20%	92	17.9%
3	10%	96	18.6%
4	8%	111	21.6%
5 – very difficult-to-enumerate	2%	116	22.5%

Note: Freq = Frequency, Perc = Percentage. Column percentages are presented.

As can be see from Table 3.1, the proportion of difficult-to-enumerate EDs was greater in the 2007 Test sample than in England and Wales in general. However, the ETC distribution of the 2007 Test sample was representative of the ETC distribution in the 2007 Test LAs overall. The inclusion of a greater proportion of more difficult-to-enumerate EDs provided a more stringent test of field procedures.

This greater proportion of more difficult-to-enumerate EDs must be taken into account when drawing comparisons between the 2007 Test sample and the England and Wales population. For more detail on the implications of this, see the paper: 'The 2007 England and Wales Census Test: the effect of delivery method and the inclusion of an income question on response.'

3.2.5 Follow-up

For the questionnaires that were not posted-back relatively promptly, they were followed-up from the 23 May to the 22 June. Follow-up enumerators attempted to contact households on 3 occasions (4 in most areas of Bath and North-East Somerset, Camden and Liverpool) to encourage them to post-back their questionnaires, answer any questions and collect any questionnaires. Also, a follow-up card encouraging households to return their questionnaires if they had not already done so was sent to households that had not yet returned their questionnaire between the 7 and 11 June.

3.2.6 Summary

The distribution of 2007 Test EDs across LAs and ETC categories is presented in Table 3.2:

Table 3.2: *2007 Test EDs by LA and ETC Category*

ETC	Bath		Camden		Carmarthen		Liverpool		Stoke	
	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc	Freq	Perc
1 – very easy-to-count	24	51%	0	0%	35	67%	22	11%	19	28%
2	8	17%	4	3%	13	25%	40	20%	27	39%
3	7	15%	8	5%	4	8%	59	30%	18	26%
4	8	17%	68	45%	0	0%	30	15%	5	7%
5 – very difficult-to-count	0	0%	71	47%	0	0%	45	23%	0	0%
Total	**47**	**9%**	**151**	**29%**	**52**	**10%**	**196**	**38%**	**69**	**13%**

Note: Carmarthen = Carmarthenshire

Not all EDs within the 2007 Test LAs participated in the 2007 Test; the proportion of EDs selected in each LA is presented in Table 3.3:

Table 3.3: *EDs Selected for the 2007 Test from each LA*

	Total EDs	Selected EDs	
Local Authority	**Frequency**	**Frequency**	**Percentage**
Bath and North-East Somerset	365	47	12.9%
Camden	517	151	29.2%
Carmarthenshire	472	52	11.0%
Liverpool	1,015	196	19.3%
Stoke on Trent	494	69	14.0%
Total	**2,863**	**515**	**18.0%**

More EDs were selected from Camden and Liverpool to ensure that enough difficult-to-enumerate EDs were included in the 2007 Test sample.

499 EDs (96.9%) were randomly selected in blocks of four and then allocated to the four treatment groups: income and hand-delivery, income and post-out, no income and hand-delivery, no income and post-out. The remaining 16 EDs were purposively selected to ensure the inclusion of coastal EDs with caravan parks, remote rural EDs and Camden ETC2 and Carmarthenshire ETC3 EDs.

For more detail on the 2007 Test design, see the papers: '2007 Census Test Design and Sample Size. Recommendations: England and Wales' and '2007 Census Test Household Sample: England and Wales. Sampling Criteria and Method'.

3.3 2007 Test questionnaire design

3.3.1 Household questionnaire design

Households selected for the 2007 Test received a household questionnaire (an 'H questionnaire') which comprised a 'household section' that asked for general details of the household such as accommodation type and the names of usual residents and visitors; and an 'individual section' which asked for additional details from the usual residents (henceforth, 'usual residents' are referred to as 'individuals'). Space for five individuals and four visitors was provided on the H questionnaire.

3.3.2 Individual questionnaire design

If there were additional individuals or visitors each additional person was asked to complete a separate individual questionnaire (an 'I questionnaire'). These were separate questionnaires containing the same questions (including the income questions where applicable) as one individual section of the H questionnaire. Individuals could also request to complete an I questionnaire in place of the individual section of the H questionnaire if they wished to keep their details private from the other individuals and visitors of their household. I questionnaires were distributed by enumerators where appropriate during questionnaire delivery and follow-up, and posted-out to households on request via the Contact Centre. Testing undertaken prior to the 2001 Census indicated that households - particularly those comprising unrelated adults – prefer the privacy of being able to complete their own questionnaire. Evidence indicated that individuals will disclose more accurate information if they believe it to be more private.

3.3.3 Income questions design

Income questions were asked at the end of each individual section of income H and I questionnaires (see Annex 1 for the wording of these questions). Each section included an income sources question where individuals were asked to provide details of their sources of income (e.g. whether their income came from their salary, investments, pensions etc.); and an income level question where individuals were asked to indicate which income band their total gross income fell into between 1 April 2006 and 31 March 2007 (e.g. '£24,000 to £36,999'). 'Gross income' refers to one's total income from all sources before tax and National Insurance deductions; 'Net income' refers to one's total income after these deductions.

The design and wording of the income questions took account of findings from small-scale testing and semi-structured cognitive interviews prior to the 2007 Test. Based on the income question used in the 1999 Census Rehearsal (see Annex 2), a number of different versions of the income question were developed and tested to establish which type of question the individuals found easiest to answer, would provide the highest quality information and be capable of meeting user requirements. For more detail, see the paper: 'Developing an income question for the 2011 Census'.

The main rationale for the income sources question was to encourage individuals to think about their various sources of income before answering the income level question, and give them guidance on which sources to include and exclude in calculating their income level. Data from the income level question is of primary interest to users.

For the income level question, a closed banded question was preferred to an open question in which individuals simply write down the level of their income because testing carried out prior to the 2007 Test and the 2001 Census found that closed income questions:

- Have a better response rate.
- Provide more valid information.
- Are less burdensome for the individual.
- Are considered less intrusive.

Broad bands are not ideal for complex analysis and limit the usefulness of the data. Banding introduces a degree of inaccuracy that means that the needs of some users cannot be fully met. However, the band approach still provides useful data for many users. A banded income question was used in the General Register Office for Scotland's (GROS') 2006 Census Test in Scotland, 1999 Census Rehearsal and the 1997 Census Test.

The income level question also asked individuals to provide details of their gross rather than net income. While net income is probably preferable for users interested in using income as a measure of deprivation, research has shown that collecting information on net income is substantially more difficult than collecting gross income. Salaries form a major part of income for most people, and people tend to be better able to recall their gross salary.

The income sources and level questions in Annex 1 were employed for the 2007 Test by ONS in England and Wales and by the Northern Ireland Statistical and Research Agency (NISRA) for their own 2007 Census Test. For the 2006 Census Test carried out in Scotland by GROS, in contrast, households were asked to state their total income and an income sources question was not asked. The wording and accompanying instructions of GROS' income question was also slightly different (see Annex 3).

Asking a household income question reduces the risk of double-counting individuals' income. However, there are problems with asking about household income directly. Whoever is filling in the questionnaire would need to know the income of each individual in the household to work out the total household income. If this person does not know each individual's income or the individuals are not willing to share this information, this could lead to the question not being answered at all, or incorrect information being supplied due to the information being estimated. This may particularly affect the income data provided from households comprising unrelated adults.

For more detail on the research and consultations on questionnaire content, see the papers: 'The 2011 Census: Initial view on content for England and Wales'; 'The 2011 Census: Assessment of initial user requirements on content for England and Wales'; and 'The 2011 Census: Development of a questionnaire for the 2007 Census Test'.

3.4 Return and response rates

The 'return rate' refers to the number of questionnaires returned as a proportion of the number 'satisfactorily' delivered.

The primary measure of the effect of the income questions on individuals' decisions to participate in the 2007 Test is the 'response rate'. The response rate refers to the number of questionnaires returned that passed the 'two-of-four rule' as a proportion of the number of households that had questionnaires 'satisfactorily' delivered to them during the delivery and follow-up phases (follow-up enumerators distributed questionnaires to any households they found in their area that had not had a questionnaire previously delivered to them). For a household to pass the two-of-four rule, at least one individual on the questionnaire must have answered two out of four key demographic questions:

1) Name (a 'valid' response - for more detail see Annex 4).
2) Sex (any response valid).
3) Date of Birth (a 'valid' response - for more detail see Annex 4).
4) Marital Status (any response valid).

The rationale for this rule was to provide a benchmark for what qualified as a valid response and thus exclude questionnaires that were returned blank and spurious data. Spurious data was created in cases where the questionnaires had been marked in some way; for example, where individuals had scored through pages that were not applicable to them. Because the H questionnaire data was captured electronically by scanners, if the score lines went through any tick or text boxes these were recorded as responses.

See Annex 4 for more detail on the calculation of return and response rates.

The analysis of overall return and response rates are presented at a *household* level for primary question 1 in section 4. For a household to be included in the numerator, at least one individual on the questionnaire must pass the two-of-four rule. The analysis of response rates for primary questions 2 and 3 - in sections 5 and 6 respectively - are presented at an *individual* level. For individuals to be included in the analysis, their data must pass the two-of-four rule.

The analysis of overall return and response rates in section 4 include only the 499 EDs that were randomly selected. The analysis of individual responses in section 5 and 6 include questionnaire data from these EDs, the 16 purposively selected EDs and the ED where the delivery enumerator could not be contacted during the delivery phase.

Henceforth, H questionnaires that pass the two-of-four rule are referred to as 'valid' questionnaires' that contribute toward the 'overall response rate'. Individual data from H and I questionnaires that pass the two-of-four rule are referred to as 'valid responses'. Response rates to specific questions on the questionnaire (e.g. the income level question) are referred to as 'item response rates'.

Unlike the H questionnaire data, the I questionnaire data was not captured by scanners; instead, just over half of the returned I questionnaires were keyed in manually. The consequence of this was that the I questionnaire data could not be combined with the H questionnaire individual section data for analysis purposes. Analysis of the I questionnaire data are reported separately in section 6.3

3.5 Census Test Evaluation Survey design

From June to July 2007, a sample of 2007 Test households who returned valid 2007 Test questionnaires ('respondents') and a sample of households who did not return a questionnaire ('non-respondents') were asked to participate in the Census Test Evaluation Survey (CTES), a Computer Assisted Personal Interview (CAPI). These were cluster

samples randomly selected from 86 of the 2007 Test EDs. One individual from each household that agreed to participate was interviewed (preferably the individual who completed the household section and, failing that, their own individual section).

Respondents were asked a number of questions including income questions equivalent to those asked in the 2007 Test and what they thought about the questions asked in the 2007 Test. Non-respondents were asked different questions such as why they were unable to return their 2007 Test questionnaire.

Of 1,697 2007 Test respondents asked to participate in the CTES: 992 respondents were drawn from households who had returned their questionnaires fairly promptly, and the remaining 705 were drawn from households who had returned their questionnaires late. 752 (75.8%) of the 'early respondents' and 471 (66.8%) of the 'late respondents' agreed to participate. Of 653 non-respondents asked to participate in the CTES, 247 (37.8%) agreed to do so. For analysis purposes the early and late respondent groups were collapsed.

2007 Test respondents and non-respondents that agreed to participate were distributed relatively evenly across ETC as shown in Table 3.5:

Table 3.4: *CTES participants by ETC*

ETC	**2007 Test**			
	Respondents		**Non-respondents**	
	Freq	**Perc**	**Freq**	**Perc**
1 – very easy-to-enumerate	266	21.7%	33	13.4%
2	252	20.6%	61	24.7%
3	248	20.3%	49	19.8%
4	229	18.7%	44	17.8%
5 – very difficult-to-enumerate	228	18.6%	60	24.3%
Total	**1,223**		**247**	

Note: Column percentages are presented.

All of the non-respondents and 1,212 (99.1%) of the respondents were interviewed face-to-face on a one-to-one basis. 11 (5 who had received income questionnaires and 6 who had received no income questionnaires) were interviewed by telephone because a face-to-face interview was not possible.

3.6 Data presentation

For findings regarding the income level question, the income level bands are reported by their 'per year' categories rather than their 'per week' categories.

4. Primary question 1: Do income questions result in a significant drop in response?

4.1 Objectives

To test whether there are statistically significant differences between the return and response rates where income questions were included or not included in the 2007 Census Test questionnaire for England and Wales.

4.2 Analysis

4.2.1 Description

Three sets of analysis are reported here showing the:

- Initial return rate - prior to the follow-up stage of the 2007 Test (i.e. returns up until day 10).
- Final return rate - after follow-up.
- Response rate - valid questionnaires.

Data was extracted from the Operational Intelligence (OI) system to identify which questionnaires had been returned by specific dates. Note the use of *return* and *response*, as the return data merely identified whether the questionnaire had been sent back (or deactivated for other reasons e.g. derelict). The return data also contained invalid questionnaires that had yet to be deactivated. Full data capture was not available at an early stage of the Test for the return data, but has subsequently been applied to the response data to determine whether a returned Test questionnaire qualifies as a valid questionnaire (i.e. passed the two-of-four rule). The definition for the rates is given in Annex 4.

4.2.2 Cases used

Conceptually, for the rate analysis every household contributed to the analysis (i.e. there was full response to the Test) because the analysis variable was whether a questionnaire had been returned or not. In practice, however, some cases were omitted as being outside the scope of the Test. The definition for the cases is also given in Annex 4.

4.3 Statistical tests selected

Two different approaches were taken to the statistical analysis. First, straightforward t-tests compared the return and response rates for groups with questionnaires which included or did not include the income questions. Secondly, logistic models were fitted to the data, including area-level covariates. Both these approaches took account of the sample and experimental design used in the 2007 Test, in particular they accounted for the differential sampling rates, the stratification and the clustering caused by both selecting all cases within the sampled Enumeration Districts (EDs) and applying the same delivery method and type of questionnaire to all households in an ED. Details of these two approaches and their results will form part of a separate statistical analysis paper. As both approaches produced very similar conclusions, only the simpler t-tests are reported here.

4.3.1 Initial return rates - before follow-up

The initial analysis is based on the observed return rates at day 10 in different subgroups (i.e. Enumeration Targeting Categorisation - ETC). Day 10 is an operational cut-off point representing the start of the non-respondent follow-up work. Table 4.1 shows the initial results using one-sided t-tests where values of t in excess of 1.65 are statistically significant at the 5% level[1].

[1] There is a 5% chance of concluding there is a significant drop in return rates resulting from the inclusion of the income questions, when in reality there is no difference

Table 4.1: *Initial Return Rate Differences by Income Question Inclusion*

ETC	Number of EDs	No Income Questions	Income Questions	Difference	SE(diff)	t-test
1 – very easy	92	43.4%	41.9%	1.5%	1.9%	0.81
2	88	33.7%	33.2%	0.5%	2.1%	0.20
3	92	28.8%	27.1%	1.7%	1.6%	1.00
4	111	23.2%	20.3%	2.9%	1.1%	2.61
5 – very difficult	116	18.1%	17.5%	0.6%	1.3%	0.56
All cases	**499**	**33.4%**	**31.8%**	**1.6%**	**0.9%**	**1.78**

Note: the statistical analysis was carried out on the 499 randomly selected EDs.

The inclusion of the income questions results in a statistically significant reduction of around 1.6 percentage points in the overall initial return rate. At the ETC level, the difference in initial returns was only significant for ETC4 which represents 8% of the Country.

Although income questions would only be used nationally, Table 4.1 also presents and statistically tests the rates per ETC. As expected, the observed return rates decrease in line with the level of ETC difficultly.

4.3.2 Final return rates – after follow-up

The final return analysis is based on all the observed return data in different subgroups (i.e. ETC). Using one-sided t-tests, values of t in excess of 1.65 in Table 4.2 below are significant at the 5% level.

Table 4.2: *Final Return Rate Differences by Income Question Inclusion*

ETC	Number of EDs	No Income Questions	Income Questions	Difference	SE(diff)	t-test
1 – very easy	92	64.6%	63.3%	1.3%	1.9%	0.70
2	88	53.4%	50.6%	2.8%	2.5%	1.12
3	92	47.6%	42.8%	4.8%	2.0%	2.41
4	111	37.5%	34.3%	3.2%	2.0%	1.65
5 – very difficult	116	31.1%	29.1%	1.9%	2.1%	0.94
All cases	**499**	**52.2%**	**49.5%**	**2.7%**	**1.0%**	**2.75**

Table 4.2 shows that the final return rates (after follow-up) are substantially higher than the initial rates (before follow-up). This is in line with the pre-test expectations due to an extended return time and the effect of follow-up. However, there remains a highly statistically significant difference of around 2.7 percentage points in the final return rates between areas with income questions and no income questions. This difference has increased from the initial rate of 1.6% and now has two ETCs that have statistically significant differences (ETC3 & ETC4). These two ETC groups represent 18% of the country.

4.3.3 Final response rates

The final analysis relates to the response rate. See full definition in Annex 4.

The final response analysis is based on all the returned valid questionnaires, in different subgroups (i.e. ETC). Using one-sided t-tests, values of t in excess of 1.65 in Table 4.3 below are significant at the 5% level.

Table 4.3: *Response Rate Differences by Income Question Inclusion*

ETC	Number of EDs	No Income Questions	Income Questions	Difference	SE(diff)	t-test
1 – very easy	92	66.0%	64.2%	1.8%	1.8%	1.02
2	87	54.9%	51.9%	3.0%	2.4%	1.27
3	92	48.2%	43.9%	4.3%	2.0%	2.14
4	111	37.9%	35.9%	2.0%	1.9%	1.01
5 – very difficult	116	32.8%	30.3%	2.5%	2.1%	1.16
All cases	**498**	**53.3%**	**50.6%**	**2.7%**	**1.0%**	**2.81**

1 further ED was not included in the overall response rate analysis because all the households in that ED were excluded from the analysis (for more detail, see the cases removed and reasons for deactivation sections of Annex 4). Thus, the statistical analysis was carried out on 498 randomly selected EDs.

The results shown in Table 4.3 are similar to those for the final return rates, with an overall statistically significant drop of around 2.7 percentage points in response rates in areas where income questions were included in the Test questionnaire. At the ETC level the difference in response is only statistically significant for ETC3 which represents 10% of the country.

Additionally, consideration has been given to testing the effect on response rates for any interaction between the income questions and the delivery method (hand-delivery or post-out). Table 4.4 extends the previous analysis. Using one-sided t-tests, values of t in excess of 1.65 in Table 4.4 below are significant at the 5% level.

Table 4.4: *Response Rate Differences by Delivery Method and Income Question Inclusion*

Delivery Method	No. of EDs	No Income Questions	Income Questions	Difference	SE(diff)	t-test
Hand delivery	248	54.5%	52.3%	2.2%	1.4%	1.59
Post-out	250	52.3%	49.0%	3.3%	1.3%	2.45
All cases	**498**	**53.3%**	**50.6%**	**2.7%**	**1.0%**	**2.81**

The inclusion of income questions and using post-out delivery has a greater statistically significant drop in response of around 3.3 percentage points. However, this effect was not confirmed by the logistic modelling and may therefore be unreliable. For more detail, see the paper: 'The 2007 England and Wales Census Test: the effect of delivery method and the inclusion of an income question on response.'

4.4 Conclusions

There are some challenges in interpreting the results because the conditions for the Test do not mirror exactly the conditions for a Census. Unlike the Test, the 2011 Census is compulsory which will naturally increase response. Being compulsory will also give empowerment to the follow-up enumerators when requesting the return of the Census questionnaires which will also increase response. There will also be national and local publicity and enhanced LA and community liaison.

A difference in response rates between the inclusion of income questions or not was in line with prior expectations. There is also some weaker evidence that the drop in response caused by including income questions may be larger in post-out areas. This is concerning as the current working assumption for the 2011 Census is that post-out will be used in at least 95% of the country. This significant decrease in response indicates that a substantial amount of additional follow-up resource would be required if income questions were included in the 2011 Census.

The drop in response is likely to be smaller overall than that found in the 2007 Test because the Local Authorities used in the Test sample included more hard-to-enumerate areas than the country as a whole. However, there is no satisfactory way to predict exactly how big the drop in response due to including income questions would be in the real 2011 Census based on this Test. For further detail, see the paper: 'The 2007 England and Wales Census Test: the effect of delivery method and the inclusion of an income question on response'.

5. Primary question 2: What is the impact of income questions on the quality of response?

5.1 Introduction

The inclusion of income questions in the 2011 Census may have implications for the quality of response. Six sets of analysis are presented:

- The proportion of individuals who submitted valid responses from the number of individuals counted by income question inclusion.
- Valid and invalid multi-tick item response rates to the income questions.
- The proportion of children aged under 16 and students who live elsewhere during their term time that *incorrectly* provided responses to the income questions.
- Comparison of item response rates to the ethnic identity and qualifications question by income question inclusion.
- Comparison of responses to the income level question by sex, age, ethnic identity, education level, employment status, LA and ETC.
- Comparison of responses between the 2007 Test income questions and the identically worded CTES income questions.

It was not possible to ascertain the validity of responses to the income sources and level questions by checking them against wage slips, bank statements etc.

5.2 The difference between response rates for income and no income questionnaires

The inclusion of income questions may have resulted in more individuals not completing their individual sections comprehensively enough to qualify as valid responses. The frequencies and percentages of Individual response rates by H questionnaire type are presented in Table 5.1:

Table 5.1: *Valid and Invalid responses on H Questionnaires by Questionnaire Type*

H Questionnaire type	Valid response			
	No		Yes	
	Freq	Perc	Freq	Perc
English with income	1,086	3%	39,443	97.3%
English no income	1,154	3%	41,670	97.3%
Welsh (in English) with income	126	2%	5,179	97.6%
Welsh (in English) no income	139	2%	5,953	97.7%
Welsh (in Welsh) with income	6	2%	287	98.0%
Welsh (in Welsh) no income	5	1%	366	98.7%
Total with income	**1,218**	**2.6%**	**44,909**	**97.4%**
Total no income	**1,298**	**2.6%**	**47,989**	**97.4%**

Note: total = 95,414 recorded individuals (data from 45,193 returned questionnaires). Row percentages are presented. Delivery method had no effect when included as a factor in the analysis.

Table 5.1 shows that there was no effect of the inclusion of the income questions on the number of individuals who submitted valid responses.

5.3 Income question item response rates

It may be the case that although most individuals submitted valid responses, they did not actually answer the income questions. The analysis of item response rates to the income questions will give an indication of public acceptability of any income questions included in the 2011 Census. The analysis of the proportion of invalid multi-tick responses will give an indication of the clarity of the questions.

For this analysis children aged under 16 and students who do not live at their address during term time were excluded since they were not supposed to answer the income questions. Individuals who did not answer the age question were also excluded. These exclusions reduced the sample from 44,909 individuals (see Table 5.1) to 37,644. Analysis of income

data from children aged under 16 and students not living at the same address during term time are presented in section 5.4 below.

For the income sources question, individuals were asked: 'Tick as many boxes as you need to show all of the sources of income you had in the 12 months that ended on 31 March 2007', and given eight response options (e.g. 'Income from self-employment', 'No source of income during that time'). See Annex 1 for more detail. Responses to this question are presented in Table 5.2. 'No response' represents individuals who did not answer the income sources question; 'Invalid multi-tick response' represents individuals who ticked the option 'No source of income during that time' *and* one other response option representing a source of income; and 'Valid response' represents individuals who ticked 'No source of income during that time' *or* at least one other response option. The proportion of individuals selecting each response option is also presented.

Table 5.2: *Valid, Multi-tick and No Responses to the Income Sources Question*

Response	**Income Sources Question**	
	Frequency	**Percentage**
No response	**1,948**	**5.2%**
***Invalid* multi-tick response**	**181**	**0.5%**
Valid response	**35,515**	**94.3%**
Earnings	17,300	46.0%
Self-employment	3,162	8.4%
Pensions	10,219	27.1%
Benefits	8,970	23.8%
Interest	8,356	22.2%
Rent	1,230	3.3%
Other	1,165	3.3%
None	2,003	5.3%

Note: total = 37,644.individuals. Item response rates to this question did not vary by delivery method – for hand-delivery the response rate was 94.3% and for post-out 94.4%.

Table 5.2 shows that around 94.3% of individuals who submitted valid responses also gave a valid response to the income sources question. Around 0.5% of individuals submitted invalid multi-tick responses.

For the income level question, individuals were asked: 'From all the sources of income you ticked in question 28, what is your total income?', and given eight response options (e.g. 'Nil or loss', '£12,000 to £16,999'). See Annex 1 for more detail. Responses to this question are presented in Table 5.3. 'No response' represents individuals who did not answer the income level question; 'Invalid multi-tick response' represents individuals who ticked more than one response option; and 'Valid response' represents individuals who ticked just one response option. The proportion of individuals selecting each response option is also presented.

Table 5.3: *Valid, Multi-tick and No Responses to the Income Level Question*

Response	**Income Level Question**	
	Frequency	**Percentage**
No response	**3,364**	**8.9%**
Invalid multi-tick response	**56**	**0.1%**
Valid response	**34,224**	**90.9%**
Nil or loss	1,460	3.9%
£1 to £3,999	3,838	10.2%
£4,000 to £7,999	7,441	19.8%
£8,000 to £11,999	5,725	15.2%
£12,000 to £16,999	4,639	12.3%
£17,000 to £23,999	3,824	10.2%
£24,000 to £36,999	3,666	9.7%
£37,000 or more	3,631	9.7%

Note: total = 37,644 individuals. Item response rates to this question did not vary by delivery method – for hand-delivery the response rate was 90.7% and for post-out 91.1% (but see page 69).

Table 5.3 shows that around 90.9% of individuals who submitted valid responses also gave a valid response to the income level question. More individuals gave invalid multi-tick responses to the income sources question than the income level question.

The main rationale for the income sources question was to encourage individuals to think about their various sources of income before answering the income level question. It is therefore important to ascertain how many individuals who answered the income level question also answered the income sources question. If many individuals answered the income level question but not the income sources question, this would negatively affect the quality of the data provided from the income level question. A direct comparison of the frequencies and percentages of responses to the income questions is presented in Table 5.4:

Table 5.4: *Comparison of Individuals' Responses to the Income Sources and Level Questions*

Income Level Question	**Income Sources Question**					
	No response		**Invalid multi-tick response**		**Valid response**	
	Freq	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**
No response	1,350	3.6%	32	0.1%	1982	5.3%
Invalid multi-tick response	5	<0.1%	2	<0.1%	49	0.1%
Valid response	593	1.6%	147	0.4%	33,484	88.9%

Note: total = 37,644 individuals. Cell percentages are presented. Note invalid multi-ticks are counted as responses.

Table 5.4 shows that only around 1.6% of individuals who submitted 2007 Test valid responses (passed the two-of-four rule) submitted valid responses to the income level question but not the income sources question. The vast majority of individuals who answered the income level question had just previously reflected on their various sources of income. However, around 5.3% of individuals answered the income sources question but not the income level question and around 3.6% did not disclose any details of their income.

Overall, the findings reported in this section indicate that at least some individuals may have thought that they did not need to answer the income questions because they had no income, found the income questions too difficult to answer or they were not prepared to disclose information regarding their income. The non-response rate reduced the quality of the data obtained. The implication of these findings is that if an income level question were included in the 2011 Census, there would perhaps need to be publicity stressing the importance of answering this question.

5.4 Routing analysis

Only certain individuals were supposed to answer the income questions. Individuals aged under 16-years-old and individuals who lived elsewhere during their school, college or university term were asked not to complete the income questions via the routing instructions on the questionnaire. Although some children aged under 16 and students who live at a second address during their term times do have an income, the decision was made to ask these groups not to complete the income questions since any potential income questions used for the 2011 Census would employ the same exclusions. The reasons for employing these exclusions are summarised below.

As well as the income questions, children aged under 16 were asked not to answer the employment situation questions (questions 22 to 26) and the qualifications question (question 27) since for the vast majority of such persons these questions are not applicable. If children aged under 16 had been asked not to answer questions 22-27 but answer questions 28 and 29, additional routing instructions on the questionnaire would have been needed. This would have taken up space and made the questionnaire appear more complicated. Moreover, the objective of the income level questions is to provide measures of deprivation and affluence at various levels of geography. Income data from children aged under 16 would not be very informative in meeting these objectives.

Students who live at a different address during their term time were asked not to answer questions 7 to 29 to minimise the risk of them being counted twice: once at their term-time address and once at their other address.

An analysis of the number of children aged under 16 and students who live elsewhere during their term time who *incorrectly* answered the income questions will indicate the clarity of the routing instructions.

If it is found that many children aged under 16 or students who live elsewhere during term times *incorrectly* chose to answer the income questions, this would indicate that the routing instructions might need to be made clearer and more salient on the questionnaire. The responses of individuals that are under 16-years-old are presented in Table 5.5, and the responses of individuals who live elsewhere during their term time are presented in Table 5.6:

Table 5.5: *Responses to the Income Questions by Individuals aged under 16*

Response	Individuals aged under 16-years-old			
	Income Sources Question		Income Level Question	
	Frequency	Percentage	Frequency	Percentage
No response	5,955	94.4%	5,990	94.9%
Response	355	5.6%	320	5.1%

Note: total = 6,310 individuals. Column percentages are presented.

Table 5.5 shows that around 6% of children aged under 16 incorrectly answered the income questions. The response options are applicable to children under 16, e.g. a 15-year-old who has no source of income can tick 'No sources of income during that time' for the income sources question and 'Nil or loss' for the income level question, which may have encouraged them to answer these questions. Although this is not a serious problem since the data from children aged under 16 can be excluded at the analysis level so long as they provide details of their date of birth, the implication of these findings is that the routing instructions on the questionnaire may not have been clear enough.

Table 5.6: *Responses to the Income Questions by Individuals Not Living at the Address during their Term Time*

Response	Individuals who do not live at the address during the school, college or university term			
	Income Sources Question		Income Level Question	
	Frequency	Percentage	Frequency	Percentage
No response	358	72.6%	365	74.0%
Response	135	27.4%	128	26.0%

Note: total = 493 individuals. Column percentages are presented.

Table 5.6 shows that just over a quarter of individuals not living at the address during their term time *incorrectly* chose to answer the income questions. As with the income data from children aged under 16, data from students who live elsewhere can be excluded at the analysis level so long as they have answered 'no' to question 6: "Do you live at the address shown on the front of this questionnaire during the school, college or university term?" These findings nevertheless indicate that the routing instructions were not clear and salient enough on the questionnaire and would need to be modified if income questions were used in the 2011 Census.

It is possible that the unclear routing instructions increased the response burden on individuals and resulted in them not returning their questionnaires, not completing questions or completing questions incorrectly. Further research on the routing instructions is needed, particularly if income questions are included in the 2011 Census.

5.5 Comparison of item response rates between the income questions and the ethnic identity and qualifications questions

Although around 5.2% and 8.9% of individuals did not answer the income sources and level question respectively, these findings do not in and of themselves provide an indication of the degree to which individuals were reluctant to provide details regarding their income. It may be that around 5% to 9% of individuals did not answer all of the other questions on the questionnaire. On the other hand, it is possible that nearly all individuals completed all the other questions and there was a distinct decrease in response to the income questions.

The fact that the proportion of valid 2007 Test responses did not differ by income question inclusion (see Table 5.1) rules out the possibility that many individuals flicked through all the questions on the questionnaire and then, after seeing the income questions, they chose to return the questionnaire but not answer any of the questions. However, it is possible that they flicked through the questionnaire and after seeing the income questions they chose not to answer the income questions and other questions they deemed to be intrusive. Another possibility is that they were more likely not to answer the questions toward the end of the questionnaire after seeing the income questions.

To determine if either possibility is the case, the item response rates to the ethnic identity and qualifications question by income question inclusion are compared in Table 5.7. The responses to the ethnic identity question are presented since it is intuitively one of the questions that some individuals may deem to be intrusive. Note that for valid comparison, individuals aged under 16-years and individuals who did not give a valid response to the date of birth question were excluded from this analysis. The responses to the qualifications question are presented since it is the question immediately preceding the final income questions. The distribution of different types of valid response to these questions are not presented.

Table 5.7: *Valid, Invalid Multi-tick and No Responses to the Ethnic Identity and Qualifications Questions by Income Question Inclusion*

H questionnaire type	Response type	Ethnic Identity Question		Qualifications Question	
		Freq	Perc	Freq	Perc
No income questions	No response	1,418	3.5%	3,583	8.9%
	Invalid multi-tick	N/A	N/A	132	0.3%
	Valid response	38,663	96.5%	36,366	90.7%
With income questions	No response	1,168	3.1%	3,138	8.3%
	Invalid multi-tick	N/A	N/A	119	0.3%
	Valid response	36,476	96.9%	34,387	91.3%

Note: total = 77,725 individuals (40,081 who received no income questionnaires and 37,644 who received income questionnaires). Column percentages are presented.

Table 5.7 shows that for income questionnaires item response rates to the ethnic identity and qualifications questions were around 96.9% and 91.3% respectively, this compares to response rates for the income level question of around 90.9%. There was therefore only a slight decrease in response of around 0.4 percentage points from the qualifications question to the income level question.

Table 5.7 also shows that the ethnic identity question response rate was around 0.4 percentage points *higher* for income questionnaires. There was therefore no evidence that, after flicking through the questionnaire and seeing the income questions, individuals were more likely not to answer the income questions and other questions that they may deem to be intrusive.

The qualifications question response rate was around 0.6 percentage points *higher* for income questionnaires. There was therefore no evidence that, after flicking through the questionnaire and seeing the income questions, individuals were more likely not to answer the questions toward the end of the questionnaire.

It is possible that the individuals who did not answer the income level question made up most of the individuals that did not answer the ethnic identity and qualifications questions. Alternatively, it may be that many individuals who answered the ethnic identity and qualifications question did not subsequently answer the income level question. If this proves the case, it would indicate that some individuals did not answer the income level question because they deemed it intrusive. Table 5.8 presents a direct comparison of individuals' responses to the income level question and the ethnic identity question, and Table 5.9 presents a direct comparison of individuals' responses to the income level question and the qualifications question:

Table 5.8: *Comparison of individuals' Responses to the Ethnic Identity and Income Level Questions*

Income level response	Ethnic identity response			
	No response		Valid response	
	Freq	Perc	Freq	Perc
No response	371	1.0%	2,993	8.0%
Invalid multi-tick	1	<0.1%	55	0.1%
Valid response	796	2.1%	33,428	88.8%

Note: total = 37,644 individuals. Cell percentages are presented. '<' = less than.

Table 5.9: *Comparison of Individuals' Responses to the Qualifications and Income Level Questions*

Income level response	Qualifications response					
	No response		Invalid multi-tick		Valid	
	Freq	Perc	Freq	Perc	Freq	Perc
No response	1,435	3.8%	3	<0.1%	1,926	5.1%
Invalid multi-tick	2	<0.1%	0	0%	54	0.1%
Valid	1,701	4.5%	116	0.3%	32,407	86.1%

Note: total = 37,644 individuals. Cell percentages are presented.

Tables 5.8 and 5.9 show that the majority of individuals who did not answer the income level question, did answer the ethnic identity or qualifications question. Of individuals that did not answer the income level question, 90.0% answered the ethnic identity question and 57.3% answered the qualifications question. One plausible explanation of this finding is that these individuals did not answer the income level question because they deemed it intrusive or too difficult to answer. The analysis of data from the CTES reported in section 7.6.4.2 is consistent with this interpretation. Also, consistent with this interpretation is the fact that although the item response rate to the income level question was relatively high, it had one of the lowest rates of all the questions asked. Only the schoolchild/student (89.6%) and long-term illness and disability (84.6%) questions had lower item response rates.

There was also evidence from Tables 5.8 and 5.9 that the majority of individuals who did not answer the ethnic identity or qualifications questions did answer the income level question. One plausible explanation of this finding is that some individuals deemed these questions intrusive or too difficult to answer. Again, analysis of the CTES data reported in section 7.6.4.2 is consistent with this interpretation.

5.6 Responses to the income level question by sex, age, ethnic identity, education level, employment status, LA and ETC

Previous surveys of income have found that:

- Males tend to have higher income than females.
- Income is positively correlated with age for working-age adults, with individuals older than 65 years tending to have low income.
- Individuals from ethnic minority backgrounds tend to have lower income.
- Income is positively correlated with education level.
- Employed individuals tend to have higher income than unemployed individuals.

If the data obtained from the income level question is a valid measure of the 'true' income levels of individuals who returned valid responses, then the trends above should be evident in the data. If they are, this would demonstrate the predictive validity of the data, and the implication would be that income data collected from the 2011 Census would also have predictive validity.

A prediction was also made concerning the relationship between LA and income. The LAs were selected partially because they are collectively representative of the different LAs found in England and Wales. Bath and North-East Somerset, Camden and Carmarthenshire have been identified as areas with generally above-average income in the UK, whereas Liverpool and Stoke on Trent have been identified as areas with generally below-average income.

Individuals from Bath and North-East Somerset, Camden and Carmarthenshire should therefore report higher income levels than individuals from the other two LAs.
No prediction was made concerning the relationship between ETC and income since areas of deprivation and affluence can be easy or difficult to enumerate.

Income levels by sex, age, ethnic identity, education level (responses to the qualifications question), employment status, LA and ETC are presented in Annex 5. Summaries of the findings are presented below.

For analysis purposes, all individuals who had selected a particular income band were assumed to have the same income. Individuals who selected the 'Nil or loss' band were assigned an estimated income of £0. For the other bands, means were calculated based on the mid-points of the ranges, e.g. all individuals who selected the '£1 to £3,999' band were assigned an estimated income of £2,000. Individuals who selected the '£37,000 or more' band were assigned an estimated income of £43,500. This was calculated by using the range of the income band '£24,000 to 36,999'. Means were rounded to the nearest pound. Table 5.10 presents a list of estimated income levels by income level band:

Table 5.10: *Estimated Income Levels of Individuals by Selected Income Level Band*

Income level band	Estimated income level
Nil or loss	£0
£1 to £3,999	£2,000
£4,000 to £7,999	£6,000
£8,000 to £11,999	£10,000
£12,000 to £16,999	£14,500
£17,000 to £23,999	£20,500
£24,000 to £36,999	£30,500
£37,000 or more	£43,500

Data from 34,224 individuals was used in the analysis reported below (37,644 individuals minus 3,364 individuals who did not answer the income level question and 56 individuals who gave invalid multi-tick responses (see Table 5.3)). The mean income of these individuals was £15,340 and the standard deviation was £12,867.

5.6.1 Income level by sex
The mean income for males and females are presented in Table 5.11:

Table 5.11: *Mean Income Level by Sex*

Sex	Number of cases	Income level	
	Freq	Mean	SD
Males	16,087	£18,143	£13,603
Females	17,958	£12,853	£11,626

Note: total = 34,045. Individuals who did not answer or made invalid multi-tick responses to the sex question were excluded. SD = Standard deviation.

As expected, males tended to report that they had a higher level of income than females. See Annex 5, Table A.5.1 for more detail. The difference in income level was statistically significant, $t(31{,}820) = 38.3$, $p<.001$.

5.6.2 Income level by age
For analysis purposes, individuals were divided into eleven age groups from age 16-20 up to 66+. Each intermediate age group has a range of five years. The mean income of each age group are presented in Table 5.12:

Table 5.12: *Mean Income Level by Age*

Age group	Number of cases	Income level	
	Freq	Mean	SD
16-20 years	1,677	£3,273	£4,646
21-25 years	2,276	£10,296	£8,518
26-30 years	2,500	£19,458	£12,637
31-35 years	2,478	£21,348	£14,020
36-40 years	2,883	£20,526	£14,291
41-45 years	2,950	£19,792	£14,254
46-50 years	2,907	£18,409	£13,567
51-55 years	2,860	£17,884	£13,425
56-60 years	3,172	£15,742	£12,924
61-65 years	2,847	£13,950	£11,839
Older than 65 years	7,674	£10,770	£9,062

Note: total = 34,224

As expected, income level varied by age group – with income level increasing with age from the 16-20 years group up to the 36-40 years group. See Annex 5, Table A.5.2 for more detail.

A one-way ANOVA with age group as a between-group factor revealed that income level significantly differed between the age groups, $F(10, 34{,}213) = 547.9$, $p<.001$. The 16-20 years age group had significantly lower levels of income than all of the other groups, *t's* = 33.2 to 59.6, *p's*<.02. The older than 65 years age group had significantly lower levels of income than all of the age groups, *t*'s = 13 to 35.3, *p*'s<.02, except the 16-20 years and 21-25-years age groups, $t(3{,}928) = 2.3$. Two-sided Bonferroni t-tests were used in the analysis to control for Type I error inflation due to multiple pairwise comparisons.

5.6.3 Income level by ethnic identity

For analysis purposes, individuals were divided into five ethnic groups: White, Mixed, Asian or Asian British, Black or Black British and Other Ethnic Group. 810 individuals selected response options from more than one ethnic group category (e.g. 'White' and 'Asian or Asian British'); such cases were added to the 'Mixed' ethnic group. The mean income of each group are presented in Table 5.13:

Table 5.13: *Mean Income Level by Ethnic Identity Group*

Ethnic identity group	Number of cases	Income level	
	Freq	Mean	SD
White	30,644	£15,651	£12,838
Mixed	658	£13,929	£12,967
Asian or Asian British	1,367	£14,218	£14,654
Black or Black British	575	£11,732	£11,371
Other Ethnic Group	184	£15,114	£14,728

Note: total = 33,428. Individuals who did not answer the ethnic identity question were excluded.

As expected, individuals who identified their ethnic group as White tended to report that they had a higher level of income than individuals who identified themselves as belonging to a different ethnic group. See Annex 5, Table A.5.3 for more detail.

A one-way ANOVA with ethnic identity group as a between-group factor revealed that income level significantly differed between the ethnic identity groups, $F(4, 33{,}423) = 19.1$, $p<.001$. Individuals who identified themselves as White had significantly higher levels of income than all of the other groups, *t's* = 3.4 to 8.2, *p's*<.005, except the 'Other' ethnic identity group, $t(185) <1$. Two-sided Bonferroni t-tests were used in the analysis.

5.6.4 Income level by education level

For analysis purposes, individuals were classified into seven ranked education level groups based on their responses to the qualifications question:

Group 1 = selection of the response option:
- No qualifications

Group 2 = selection of at least one response option from:
- 1+ O levels/CSEs/GCSEs (any grades), Basic Skills.
- NVQ level 1, Foundation GNVQ.

Group 3 = selection of the response option:
- Other vocational work-related qualifications.

Group 4 = selection of the response option:
- Foreign qualifications.

Group 5 = selection of least one response option from:
- 5+ O levels.
- NVQ Level 2.

Group 6 = selection of least one response option from:
- Apprenticeship.
- 2+ A levels.
- NVQ Level 3.

Group 7 = selection of at least one response option from:
- First degree.
- NVQ Level 4-5.
- Professional qualifications.

The mean income of each group are presented in Table 5.14:

Table 5.14: *Mean Income Level by Education Level Group*

Education level	Number of cases	Income level	
	Freq	Mean	SD
Group 1	8,858	£8,188	£6,271
Group 2	3,261	£13,283	£11,857
Group 3	1352	£12,923	£9,135
Group 4	218	£10,034	£7,718
Group 5	4146	£12,552	£10,280
Group 6	4,168	£14,759	£11,271
Group 7	10,404	£25,048	£14,216

Note: total = 32,407. Individuals who did not answer or made invalid multi-tick responses to the qualifications question were excluded.

As expected, income level tended to vary by education level - individuals with higher levels of education tended to report that they had higher levels of income. There was a marked increase in reported income levels for the highest education level group, and the second highest education level group reported the second highest income level. See Annex 5, Table A.5.4 for more detail.

A one-way ANOVA with education level as a between-group factor revealed that income level significantly differed between the education level groups, $F(6, 32{,}400) = 2010.9$, $p<.001$. Individuals in Group 1 had significantly lower levels of income than individuals in Group 6 and 7, *t's* = 35.2 to 109.2, *p's*<.011. Individuals in Group 2 had significantly lower levels of income than individuals in Group 6 and 7, *t's* = 5.5 to 47.1, *p's*<.011. Individuals in Group 3 had significantly lower levels of income than individuals in Group 6 and 7, *t's* = 6.1 to 42.6, *p's*<.011. Individuals in Group 4 had significantly lower levels of income than individuals in Group 6 and 7, *t's* = 8.6 to 27.8, *p's*<.011. Individuals in Group 5 had significantly lower levels of income than individuals in Group 6 and 7, *t's* = 9.3 to 59, *p's*<.011. Two-sided Bonferroni t-tests were used in the analysis.

5.6.5 Income level by employment status

For analysis purposes, individuals were classified into two employment status groups based on their responses to the employment status question:

Unemployed group = selection of at least one response option from:
- On a Government sponsored training scheme.
- Away from work ill, on maternity leave, on holiday or temporarily laid off.
- None of the above.

Employed group = selection of at least one response option from:
- Working as an employee.
- Self-employed or freelance.
- Working paid or unpaid for your own or your family's business.
- Doing any other kind of paid work.

The mean income of each group are presented in Table 5.15:

Table 5.15: *Mean Income Level by Employment Status Group*

Employment status	Number of cases	Income Level	
	Freq	Mean	SD
Unemployed	14,861	£8,583	£8,432
Employed	17,766	£21,596	£13,146

Note: total = 32,627. Individuals who did not answer or made invalid multi-tick responses to the employment status question were excluded. Individuals who selected response options from both employment status categories were also excluded.

As expected, employed individuals tended to report that they had a higher level of income than unemployed individuals. See Annex 5, Table A.5.5 for more detail. The difference in income level was significant, $t(30{,}668) = 108$, $p<.001$.

5.6.6 Income level by LA

The mean income for each LA are presented in Table 5.16:

Table 5.16: *Mean Income Level by LA*

LA	Number of cases	Income level	
	Freq	Mean	SD
Bath and North-East Somerset	4,784	£17,734	£13,464
Camden	7,663	£22,533	£16,068
Carmarthenshire	4,145	£12,937	£10,257
Liverpool	12,136	£12,428	£10,380
Stoke on Trent	5,496	£11,468	£8,990

Note: total = 34,224.

As expected, there was a tendency for individuals situated in Bath and North-East Somerset, Camden and Carmarthenshire to report that they had a higher level of income than individuals situated in Liverpool and Stoke on Trent. See Annex 5, Table A.5.6 for more detail.

A one-way ANOVA with LA as a between-group factor revealed that income level significantly differed between the LAs, $F(4, 34{,}219) = 1076.3$, $p<.001$. Individuals situated in Liverpool had significantly lower levels of income than individuals situated in Bath, Camden and Carmarthenshire, *t's* = 2.7 to 49, *p's*<.037. Individuals situated in Stoke on Trent also had significantly lower levels of income than individuals situated in Bath, Camden, and Carmarthenshire, *t's* = 7.3 to 50.3, *p's*<.037. Two-sided Bonferroni t-tests were used in the analysis.

5.6.7 Income level by ETC

The mean income for each ETC are presented in Table 5.17:

Table 5.17: *Mean Income Level by ETC*

ETC	Number of cases	Income level	
	Freq	Mean	SD
1 – very easy-to-enumerate	10,165	£14,400	£11,381
2	7,413	£12,861	£10,743
3	5,981	£14,112	£12,249
4	5,895	£19,072	£15,259
5 – very difficult-to-enumerate	4,770	£18,123	£14,779

Note: total = 34,224.

There was a tendency for individuals situated in ETC4 and 5 areas to report that they had higher levels of income than individuals situated in ETC1, 2 and 3 areas. See Annex 5, Table A.5.7 for more detail.

A one-way ANOVA with ETC as a between-group factor revealed that income level significantly differed between the ETCs, $F(4, 34{,}219) = 284.9$, $p<.001$. Almost all differences were significant. ETC2 areas had significantly lower levels of income than ETC3 areas, $t(11{,}983) = 6.2$, $p<.007$. The difference in income levels between ETC3 and 1 areas was not significant, $t(11{,}806) = 1.5$, but the difference in income levels between ETC2 and 1 areas, $t(17{,}516) = 9.1$, $p<.007$, and ETC 3 and 5 areas, $t(9{,}219) = 15.1$, $p<.007$, were significant. The difference in income levels between ETC 1 and 5 areas was significant, $t(7{,}520) = 15.4$, $p<.007$, as was the difference between ETC5 and 4 areas, $t(10{,}327) = 3.3$, $p<.007$. By default, the other differences were significant. Two-sided Bonferroni t-tests were used in the analysis.

5.7 Non-response bias to the income level question by sex, age, ethnic identity, education level, employment status, LA and ETC

The analysis in section 5.6 reported that the following population groups tend to have low income:

- Females.
- Individuals 16 to 20 years and over 65 years of age.
- Individuals from Mixed, Asian or Asian British and Black or Black British ethnic minority backgrounds.
- Individuals who are not educated to at least A-level, or NVQ level 3 or Apprenticeship level.
- Individuals who are unemployed.
- Individuals whose households are situated in Liverpool or Stoke on Trent in comparison to Bath, Camden, or Carmarthenshire.
- Individuals whose households are situated in ETC1, 2 and 3 areas.

If these population groups are more likely not to complete the income level question, this would affect the reliability of the income data obtained as a measure of deprivation. Non-response rates are presented below.

Data from 37,588 individuals was used in the analysis reported below (37,644 individuals minus 56 individuals who gave invalid multi-tick responses to the income level question. The non-response rate to the income level question for all these individuals was 8.9% (see Table 5.3).

5.7.1 Non-response bias by sex

There was a slight non-response bias in that around 9.6% of females did not complete the income level question compared to only around 8.0% of males. See Annex 5, Table A.5.1 for more detail. This difference was significant, $t(37{,}254) = 5.1$, $p<.001$.

5.7.2 Non-response bias by age

There was a very strong non-response bias in that around 26.5% of individuals 16 to 20 years of age and around 13.6% of individuals over 65 years of age did not complete the income level question compared to around 4.3% to 8.6% of individuals in the other age groups. See Annex 5, Table A.5.2 for more detail.

A one-way ANOVA with age group as a between-group factor revealed that income level question completion significantly differed between the age groups, $F(10, 37{,}577) = 151.3$, $p<.001$. Individuals in the 16-20 years age group were less likely to complete the income level question than individuals in all of the other age groups, *t's* = 12.9 to 22, *p's*<.02. The older than 65 years age group were less likely to complete the income level question than individuals in all of the age groups except the 16-20 years age group, *t*'s = 8.1 to 17.3, *p*'s<.02. Two-sided Bonferroni t-tests were used in the analysis.

5.7.3 Non-response bias by ethnic identity

There was also a strong non-response bias for ethnic identity. Around 7.8% of individuals who identified themselves as White did not answer the income level question compared to around 14.5% of individuals who identified their ethnic identity as Mixed, 11.8% who identified themselves as Asian or Asian British, 14.0% of individuals who identified themselves as Black or Black British and 11.4% of individuals who identified themselves as belonging to a different ethnic group. See Annex 5, Table A.5.3 for more detail.

A one-way ANOVA with ethnic identity group as a between-group factor revealed that income level question completion significantly differed between the ethnic identity groups, $F(4, 36{,}416) = 27.9$, $p<.001$. Individuals who identified themselves as White were more likely to complete the income level question than individuals in all of the other groups, *t's* = 4.7 to 5.3, *p's*<.005, except the 'Other' ethnic identity group, $t(209) = 1.7$. Two-sided Bonferroni t-tests were used in the analysis.

5.7.4 Non-response bias by education level

There was also a strong non-response bias for education level. Individuals educated to at least A-level, NVQ level 3 or Apprenticeship standard (Group 6 and 7) had a non-response bias of around 2.4% to 4.1%, whereas the non-response bias of the other groups ranged from around 5.2% to 9.3%. Individuals who reported that they had no qualifications were the least likely to complete the income level question. See Annex 5, Table A.5.4 for more detail.

A one-way ANOVA with education level as a between-group factor revealed that income level question completion significantly differed between the education level groups, $F(6, 34{,}326) = 83$, $p<.001$. Individuals in Group 1 were less likely to complete the income level question than individuals in Group 6 and 7, *t's* = 12.3 to 20.9, *p's*<.05. Individuals in Group 2 were less likely to complete the income level question than individuals in Group 6 and 7, *t's* = 5.5 to 10.1, *p's*<.05. Individuals in Group 3 were less likely to complete the income level question than individuals in Group 6 and 7, *t's* = 2.8 to 5.7, *p's*<.05. There was no difference in income level question completion between Group 4 and Group 6, $t(249) <1$, and Group 7, $t(235) = 2.1$. Individuals in Group 5 were less likely to complete the income level question than individuals in Group 7, $t(6{,}177) = 7.5$, $p<.05$, but not Group 6, $t(8{,}630) = 2.3$. Two-sided Bonferroni t-tests were used in the analysis.

5.7.5 Non-response bias by employment status

There was a very strong non-response bias in that around 3.0% of all individuals in the employed group did not answer the income level question compared to around 9.8% of the unemployed group. See Annex 5, Table A.5.5 for more detail. This difference was significant, $t(25{,}699) = 25.7$, $p<.001$.

5.7.6 Non-response bias by LA

There was a non-response bias for LA. Individuals situated in LAs identified as generally low income areas tended to have higher non-response rates than the other LAs. Liverpool had a non-response rate of around 9.3% and Stoke had a non-response rate of 11.1% compared to non-response rates of around 7.2% to 9.1% for the other LAs. See Annex 5, Table A.5.6 for more detail.

A one-way ANOVA with LA as a between-group factor revealed that income level question completion significantly differed between the LAs, $F(4, 37{,}583) = 17.8$, $p<.001$. Individuals situated in Liverpool were less likely to complete the income level question than individuals in situated in Bath and Camden, *t's* = 4 to 4.8, *p's*<.007, but not Carmarthenshire, $t(17{,}941) <1$. Individuals situated in Stoke on Trent were less likely to complete the income level question

than individuals in situated in Bath, Camden and Carmarthenshire, *t's* = 3.4 to 7.3, *p's*<.007. Two-sided Bonferroni t-tests were used in the analysis.

5.7.7 Non-response bias by ETC

There was no clear evidence of a non-response bias for ETC. See Annex 5, Table A.5.7 for more detail. Although a one-way ANOVA with ETC as a between-group factor was significant, $F(4, 37{,}583) = 2.9$, $p = .023$, none of the pairwise comparisons were significant, t's = <1 to 2.7.

5.8 Summary of groups with low income and who were less likely to complete the income level question

Table 5.18 presents the income level question item response rates for groups who tend to have low income:

Table 5.18: *Groups who tend to have Low Income and Low Item Response Rates to the Income Level Question*

Group	Income level question		
	Mean	SD	Item response rate
All	£15,340	£12,867	90.9%
Females	£12,833	£11,626	90.3%
16-20 year olds	£3,273	£4,646	73.5%
66+ year olds	£10,770	£9,062	86.2%
Mixed ethnic identity	£13,929	£12,967	85.1%
Asian or Asian British	£14,218	£14,654	88.2%
Black or Black British	£11,732	£11,371	85.7%
Less qualified	£8,168-£12,923	£6271-£11857	90.5%-93.7%
Unemployed	£14,861	£8,432	90.0%
Situated in Liverpool	£12,428	£10,380	90.5%
Situated in Stoke	£11,468	£8,990	88.7%

Note: All group = individuals who were supposed to answer the income questions. Less qualified group = individuals who do not have at least 5 O-levels, an NVQ level 2, foreign qualifications or professional qualifications.

Table 5.18 shows that even though the item response rate to the income level question was high overall, many groups who tend to have low income were less likely to answer this question than comparison groups. These non-response biases indicate that the question may not be an accurate measure of deprivation.

5.9 Comparison of the 2007 Census Test and CTES income question answers

For the CTES, 1,223 individuals who returned valid 2007 Test questionnaires were re-asked income sources and level questions identical in wording to the 2007 Test questions. In both cases, individuals were asked to give details of their sources and level of income over the period: 1 April 2006 to 31 March 2007 (see Annex 1 for the wording of the income questions).

For the CTES, after each question was asked, the interviewer went on to read out the response options given on a showcard. For the income sources question, for each response option, individuals judged whether they had that particular source of income. For the income level question, the interviewer listed the different income bands given on a showcard and individuals judged which band encompassed their income level.

The instructions on the 2007 Test questionnaire specified that gross income should be provided for the income level question; this guidance was not provided for the CTES. Instead, individuals were asked a further question, "Can I just check, did you give gross income or net income?"

For analysis purposes, individuals' responses to the income sources and level questions in the 2007 Test and CTES are compared. The paper '2011 Census - Critical Success Factors' states that for Census question responses to be considered high quality:
'70% of questions [should] *have at least 95% agreement with* [the] *Quality Survey and all questions* [should] *have at least 60% agreement with the Quality Survey.'* (The quality survey

will be a follow-up survey in which a sample of individuals will be re-asked questions they answered in the 2011 Census).

Data from the 2001 Census met this critical success factor. Therefore, as a benchmark for data quality, correspondence of responses to the income questions asked in the 2007 Test and CTES should be at least 60% and preferably at or approaching 95%.

Of the 1,223 2007 Test respondents who participated the CTES, 588 completed a 2007 Test income questionnaire. A number of these were excluded from the analysis according to the criteria below in turn:

- Individuals whose 2007 Test and CTES income question data could not be matched because of insufficient information on the 2007 Test questionnaire (2 individuals).
- Individuals who did not submit a valid 2007 Test response (1 individual).
- Individuals who were under 16 years of age (13 individuals).
- Individuals who lived elsewhere during their school, college or university term (4 individuals).
- Individuals who refused to answer any questions on income for the CTES (94 individuals).
- Individuals who were not asked income questions for the CTES (18 individuals).

Some individuals were excluded specifically from the income sources question analysis:

- Individuals who refused to answer the CTES income sources question once it had been asked (2 individuals).
- Individuals who did not answer the 2007 Test income sources question (16 individuals).
- Individuals who gave *invalid* multi-tick responses to the 2007 Test income sources question (5 individuals).

Some individuals were excluded specifically from the income level question analysis:

- Individuals who refused to answer the CTES income level question once it had been asked (14 individuals).
- Individuals who said that they did not know the answer to the CTES income level question once it had been asked (12 individuals).
- Individuals who did not answer the 2007 Test income level question (24 individuals).
- Individuals who gave invalid multi-tick responses to the 2007 Test income level question (2 individuals).

The decision was taken to exclude individuals who refused to answer questions on income for the CTES, since the aim of this analysis is to provide a measure of the test-retest reliability of the 2007 Test income questions, not look at the general contingency between the 2007 Test and CTES income questions. Data from such individuals does not indicate the reliability of the 2007 Test data since it is not clear whether, had they chose to disclose general details of their income in the CTES interview, they would have given responses that matched their 2007 Test income responses.

Following these exclusions, data from 433 individuals was used in the income sources analysis and data from 404 individuals was used in the income level analysis. All of these individuals had completed their own individual section of the 2007 Test questionnaire.

Some individuals' CTES income level question responses were corrected based on their response to the question, “Can I just check, did you give gross income or net income?” For individuals who stated that they gave net income or a mixture of net and gross income, their CTES income response were coded as a successful match for their 2007 Test income response if it was the same response or one response below. For example, if individuals stated that their income was 'between £17,000 to £23,999' for the 2007 Test, then net income responses of '£17,000 to £23,999' or '£12,000 to £16,999' on the CTES were classified as matched responses. In such cases, the CTES data points were adjusted to be in line with the 2007 Test data points.

128 individuals stated that they gave net income and 11 stated that they gave a mixture of gross and net income (31.7% and 2.7% of all responses included in the 2007 Test and CTES

comparison). These individuals therefore had their CTES income level adjusted if applicable. Given the substantial minority of individuals who gave net income when asked about their level of income, an income level question for the 2011 Census would need to clearly state that individuals should give their gross income.

The comparison of the income sources responses to the 2007 Test and CTES is presented in Table 5.19; and the income level comparison is presented in Table 5.20:

Table 5.19: *Comparison of Individuals' Responses to the Income Sources Question of the 2007 Test and CTES*

Response	**Income Sources Question**		
	2007 Test Freq	**CTES Freq**	**Percentage (CTES/Test)**
Earnings	174	163	93.7%
Self-employment	47	29	61.7%
Pensions	163	130	79.8%
Benefits	141	109	77.3%
Interest	114	79	69.3%
Rent	13	10	76.9%
Other	15	5	33.3%
None	11	4	36.4%
Total	**678**	**529**	**78.0%**

Total = 433 individuals

Table 5.20: *Comparison of Individuals' Responses to the Income Level Question of the 2007 Test and CTES*

Response	**Income Level Question**		
	2007 Test Freq	**CTES Freq**	**Percentage (CTES/Test)**
Nil or loss	10	4	40.0%
£1 to £3,999	25	10	40.0%
£4,000 to £7,999	108	70	64.8%
£8,000 to £11,999	80	54	67.5%
£12,000 to £16,999	57	38	66.7%
£17,000 to £23,999	45	28	62.2%
£24,000 to £36,999	40	31	77.5%
£37,000 or more	39	35	89.7%
Total	**404**	**270**	**66.8%**

Total = 404 individuals

The first column in each table represents the number of individuals who submitted this response to the given income question for the 2007 Test. The second column represents the number of individuals who also submitted this response for the CTES. The third column represents the percentage of individuals who submitted this response to both the 2007 Test and CTES (Percentage = frequency of CTES response / frequency of 2007 Test response).

Table 5.19 shows a moderate correspondence overall, with around 78.0% of response options selected by individuals on their 2007 Test questionnaires also selected in their CTES interviews. A 2 X 2 chi-square test revealed that the overall correspondence was statistically significant, χ^2 (1, N = 3,464) = 1801.4, p<.001. Yates' correction for continuity was not applied in this and all subsequent chi-square tests reported in this paper.

2 X 2 chi-square tests also revealed that the correspondence of the earnings, pension, benefits and interest response options were significant, χ^2 = 108.3 to 302.3, p<.001. However, the significance of the self-employment, rent from property, other and no source of income during that time response options could not be tested for because, in each case, the expected frequency of at least one of the cells was less than 5.

The overall 78.0% correspondence meets the 2011 Census data quality critical success factor insofar that all question responses should have 60% agreement with Quality Survey

question responses. However, it falls short of being one of the 70% of questions that should have a 95% response agreement with the Quality Survey.

Data for earnings shows very good correspondence, and data for pensions, benefits and rent show good correspondence. The correspondence for the self-employment data was not as high. One explanation of this finding is that there is an overlap between the 'Earnings, wages, salary and bonuses' response option and the 'Income from self-employment' response option. It may have been the case that some individuals construed their income from self-employment as their earnings, wage or salary. Self-employed individuals may have selected the first presented response option 'Earnings, wages, salary and bonuses' to refer to their income from self-employment, and then moved straight on to the next question without looking at the other response options.

Data from the 'other' and 'none' response options showed quite poor correspondence with only around a third of such response options selected by individuals for both the 2007 Test and CTES. Both of these response options fell short of the 60% agreement critical success factor. These findings are not altogether surprising. The low correspondence could be due to the small sample of individuals that selected these response options. Unlike the other response options, for the 'other' response option individuals did not benefit from having the response option they gave in the 2007 Test read out to them in their CTES interview.

See Annex 6 for the full contingency tables.

Table 5.20 shows a relatively poor correspondence overall, with only around 66.8% of individuals selecting the same income band for the 2007 Test and CTES. Although the correspondence was poor it was statistically significant, $r(402) = .8$, $p<.001$.

The overall correspondence meets the 2011 Census data quality critical success factor insofar that all question responses should have 60% agreement with Quality Survey question responses. However, it falls way short of being one of the 70% of questions that should have a 95% response agreement with the Quality Survey.

The degree of correspondence depended on the income level band selected. Over three quarters of individuals who selected one of the top two income bands for the 2007 Test selected the same response option for the CTES. Over half of individuals who selected from '£4,000 to £7,999' up to '£17,000 to £23,999' selected the same response option for the CTES. The test-retest reliability of income level responses at the bottom of the range was poor with less than half of individuals who selected 'Nil or loss' or '£1 to £3,999' selecting the same response option for the CTES. Both of these response options fell short of the 60% agreement critical success factor. The low correspondence of the bottom two income bands may be due to the small sample of individuals in these income bands. Another possibility is that the income level of individuals with generally low income may be more variable, due to periods of temporary employment for example. These individuals may therefore have found it more difficult to recall their level of income over the specified period.

See Annex 7 for the full contingency table.

Overall, the test-retest reliability is moderate for the income sources question and relatively poor for the income level question. There are some limitations with these comparisons. The comparison sample was relatively small and, because only one adult from each household participated in the CTES, individuals from large households will be under-represented. Moreover, all individuals in the 2007 Test and CTES income analysis had completed their own individual section of the 2007 Test questionnaire. The correspondences above are therefore an overestimation of the reliability of equivalent income questions used for the 2011 Census, since at least some of the data will be collected by proxy.

5.10 Conclusions

Eight findings reported in this section stand out:

- Around 88.9% of individuals who returned valid responses to the 2007 Test also gave valid responses to both income questions when correct to do so.

- Around 0.5% of individuals who answered the income sources question gave invalid multi-tick responses compared to only 0.1% of individuals answering the income level question.
- Around 6% of children aged under 16 and 27% of individuals who lived elsewhere during their school, college or university term answered the income questions when *incorrect* to do so.
- There was no effect of the inclusion of income questions on the responses to the name, sex, age, marital status, ethnic identity and qualifications questions.
- Of individuals that did not answer the income level question, 90.0% answered the ethnic identity question and 57.3% answered the qualifications question. .
- Individuals who were unemployed, over 65 years of age, less qualified, from certain ethnic minority backgrounds, living in LAs identified as generally low income areas, or females tended to report lower income and had lower response rates to the income level question than comparison groups.
- Around 78.0% of responses that a small sample of individuals gave for the CTES income sources question matched their previous responses to the 2007 Test income sources question, which only partially meets the 2011 Census data quality critical success factor.
- Around 66.8% of responses that a small sample of individuals gave for the CTES income level question matched their previous responses to the 2007 Test income level question, which only partially meets the 2011 Census data quality critical success factor.

The item response rates to the income questions appear to be acceptably high considering that the questions were the final questions on a four-pages-per-person questionnaire. However, the question did have one of the lowest response rates of al of the questions asked. Only the schoolchild/student (89.6%) and long-term illness and disability (84.6%) questions had lower item response rates.

Moreover, groups who tended to report that they had low income were also those groups that tended to be less likely to answer the income level question. This reduces the quality of the data obtained. One plausible explanation for these non-response biases is that individuals with no income may have assumed that the income questions were not applicable to them, even though on close inspection there are 'No sources of income during that time' and 'Nil or loss' response options. Another possibility is that it was more difficult for individuals with low income to calculate their income because it tends to be more variable.

The low to moderate test-retest reliabilities of the income questions and the clarity of the routing instructions also raise concerns about the quality of the data obtained. In both cases, findings indicate that some individuals found the income questions difficult to answer.

The fact that over half of individuals who did not answer the income level question but did answer the ethnic identity or qualifications question indicate that these individuals did not answer the income level question because they deemed it intrusive or too difficult to answer.

There was no evidence that inclusion of the income questions led to individuals completing their questionnaires less comprehensively.

6. Primary question 3: What are the cost differences for income questions?

6.1 Introduction

The inclusion of income questions may have implications for the overall cost of the 2011 Census. Including income questions may result in the requirement for additional follow-up, I questionnaires, Contact Centre support and research on refining the income questions. Four sets of analysis on the income question cost implications are presented:

- Projected estimate of the number of additional households that will need to be followed-up if income questions were included in the 2011 Census.
- A comparison of the number of income and no income I questionnaires requested for continuation and privacy reasons.
- A comparison of the number of income and no income I questionnaires requested for continuation and privacy reasons that were returned and qualified as valid responses.
- The number of telephone queries to the Contact Centre regarding the income questions.

6.2 Follow-up

The response rate for households that received a questionnaire without the income questions was 53.3% whereas the response rate for households that received a questionnaire with no income questions was 50.6%. This difference of 2.7 percentage points is statistically significant (see Table 4.3). However, this result only applies to the five LAs that were included in the 2007 Test. To use this result to predict what would have happened in the 2007 Test in England and Wales as a whole is problematic because of the way the LAs were selected and therefore only a general indication can be given.

If it is assumed that the different 2007 Test response rates in different ETC areas are a rough guide to their relative values in ETC areas in other LAs, the known distribution of these ETC areas across England and Wales can be used to model what the difference in 2007 Test response rates might have been if the Test had covered the whole of England and Wales. This leads to a rough estimate of 59.1% response with no income questions and 56.8% response with income questions, a smaller difference of 2.3 percentage points.

Unfortunately, there is no satisfactory way of extrapolating this difference in the voluntary 2007 Test, with its modest response rates, to what might happen in the real, mandatory Census but a significant drop in response could be expected. The additional follow-up effort targeted toward households that had not yet returned their questionnaire would, in turn, incur increased cost with a real risk that many of the additional non-respondents would never complete their Census questionnaire.

6.3 I questionnaires

The inclusion of income questions may have resulted in more individuals requesting I questionnaires to keep their data confidential from the other members of their household.

1,199 I questionnaires were sent to households on request because they had either six or more usual residents or five or more visitors or because household members wished to keep their personal data confidential.

If more income I questionnaires were requested than no income I questionnaires or if fewer income I questionnaires were returned than no income I questionnaires, they would have cost implications for the inclusion of income questions in the 2011 Census. Specifically, if income questions were included, to encourage individuals to return valid responses more I questionnaires would need to be printed and more follow-up visits would be needed. The number of I questionnaires requested by questionnaire type (income or no income) is presented in Table 6.1 and the number of I questionnaires returned is presented in Table 6.2. Note that the data reported in these tables refer to return rates not response rates. Since not all of the I questionnaire data was captured, it was not possible to determine whether each returned I questionnaire qualified as a valid response.

Table 6.1: *Number of I Questionnaires Requested*

	I Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
I questionnaires requested	609	50.8%	590	49.2%

Note: total = 1,199 requested I questionnaires. Row percentages are presented.

Table 6.1 shows that, contrary to expectation, slightly more no income than income I questionnaires were requested by individuals. However, a 1 X 2 chi-square test revealed that this difference was not statistically significant, χ^2 (1, N = 1,199) <1.

Table 6.2: *Number of I Questionnaires Returned*

I Questionnaire Type					
No Income questions			With income questions		
Freq requested	Freq returned	Perc	Freq requested	Freq Returned	Perc
609	333	54.7%	590	246	41.7%

Note: total = 579 returned I questionnaires.

Table 6.2 shows that, as expected, fewer income I questionnaires were returned than no income I questionnaires – a difference of around 13.0 percentage points. A 1 X 2 chi-square test revealed that this difference is significant, χ^2 (1, N = 570) = 13.1, p<.001, and consistent with the lower response rate of income H questionnaires compared to no income H questionnaires reported in section 4.

Unlike the H questionnaires, I questionnaires were not captured by scanners. Therefore, for evaluation purposes, 303 (52.3%) were randomly selected and keyed in manually: 143 were income I questionnaires and 160 were no income I questionnaires. 4 of these questionnaires did not qualify as valid responses and are therefore excluded from the analysis presented below.

A problem with the analysis of I questionnaire data is that no record was made of whether households requested I questionnaires for continuation or confidentiality purposes. An imperfect method of distinguishing between continuation and confidentiality I questionnaires was employed:

- The 'continuation group' contains I questionnaires where the name on the I questionnaire did not match any of the names of the individuals as written on the household or individual section of the H questionnaire, or the individual on the I questionnaire was under 16-years-old.
- The 'confidentiality group' contains I questionnaires where the name on the I questionnaire matched the name of one of the individuals on the H questionnaire, and the individual on the I questionnaire was at least 16-years-old. 3 near matches where the captured name on the H questionnaire differed from the captured name on the I questionnaire by one letter were counted as matches after checking the questionnaire images.
- The 'No match group' contains I questionnaires where the households did not return an H questionnaire. For these I questionnaires, therefore, it is unclear whether they were used for continuation or confidentiality purposes.

The vast majority of the continuation group were I questionnaires used for continuation purposes; there may, however, be some I questionnaires that were used for confidentiality purposes included in this group. All of the 'confidentiality group' were I questionnaires used for confidentiality purposes.

If the inclusion of income questions results in more individuals requesting an I questionnaire for confidentiality purposes then there should be more income than no income I questionnaires assigned to the confidentiality group. There should be no difference in the number of income and no income I questionnaires assigned to the continuation and no match groups. The number of I questionnaires returned by the three groups are presented in Table 6.3:

Table 6.3: *Number of Manually Keyed in I Questionnaires Returned by the Reason for the Request*

I questionnaire group	I Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
Continuation group	125	54.6%	104	45.4%
Confidentiality group	12	57.1%	9	42.9%
No match	21	42.9%	28	57.1%

Note: total = 299 I questionnaires. Row percentages are presented

From Table 6.3, the number of cases in the confidentiality group is too small to draw any firm conclusions. Individuals wishing to keep their income data confidential may not have returned an I questionnaire at all. Consistent with this interpretation, more no income I questionnaires than income I questionnaires were returned overall (see Table 6.2).

In the Stoke on Trent Team Manager (TM) debrief, a TM commented that all of her/his staff found that the majority of I questionnaires were needed for continuation purposes.

6.4 Contact Centre telephone query log

If the Contact Centre received a large number of telephone queries from the public regarding the income questions, this would have cost implications for the inclusion of income questions in the 2011 Census. Specifically, there would be increased operational costs, e.g. more staff would be needed to take the calls and there would be an increased volume of call-backs.

Data were recorded from all telephone queries between the 23 April and 25 July 2007 for analysis purposes. Over this period, 4,898 queries were received from the public regarding the 2007 Test (note that a householder could make more than one query in a single call). 2,094 (42.8%) queries were from income households, 2,160 (44.1%) were from no income households and 644 (13.1%) were from unknown households. Only 26 queries (around 0.5% of all queries) were regarding the income questions. 22 were from income households, 2 were from no income households and 2 were from unknown households. The inclusion of income questions on the 2007 Test questionnaire clearly did not result in the public making more telephone queries to the Contact Centre. The implication of this is that including questions on income in the 2011 Census should not incur increased cost in terms of the provision of Contact Centre support.

6.5 Further research

Findings regarding the overall response rates (section 4), item response rates to the income questions, routing instructions, non-response bias to the income level question and 2007 Test and CTES income question comparisons (section 6), indicate that If income questions are included in the 2011 Census, substantial further work would be needed to improve the clarity of the questions which would incur additional costs.

6.6 Conclusions

Three findings reported in this section stand out:

- The 2007 Test data showed a significant reduction in household response when income questions were included. Although the number of additional non-responding households needing to be followed up and the number irrevocably lost cannot be reliably predicted, these numbers are likely to be substantial.
- Around 54.7% of requested no income I questionnaires were returned compared to only 41.7% of requested income I questionnaires.
- The Contact Centre was not greatly affected by the inclusion of income questions since only around 0.5% of telephone queries made to the Contact Centre were regarding the income questions.

On balance, the evidence presented here indicates that the inclusion of income questions for the 2011 Census would incur substantial costs in terms of additional follow-up and further research, but not in the need to provide additional I questionnaires and Contact Centre support.

7. Primary Question 4: What are the views of the public on the income questions?

7.1 Introduction

The public's view of the 2007 Test income questions will provide an indication as to how such questions would be received if they were included in the 2011 Census. Five sets of analysis are presented:

- Detail on the subject of telephone queries made to the Contact Centre regarding the income questions.
- References to the income questions made in field staffs' observation notes.
- Field staffs' comments on the income questions in their debriefs.
- A summary of the publicity surrounding the inclusion of income questions in the 2007 Test.
- 2007 Test respondents and non-respondents answers to CTES questions that gauged their opinions of the 2007 Test questions.

7.2 Contact Centre telephone query log

It may have been the case that the Contact Centre received many telephone queries regarding the income questions, which would have indicated that the public had strong views on the subject. However, only 26 (around 0.5%) of queries received were regarding the income questions (see section 6.4 for more detail).

The analysis of the subject of these queries will nevertheless be informative in indicating whether most were from individuals requiring help or further information in answering the questions or from individuals informing the Contact Centre that they will not be answering the income questions or will not be taking part in the 2007 Test because of the income questions. The subjects of the queries are presented in Table 7.1:

Table 7.1: *Number of Contact Centre Telephone Queries Relating to the Income Questions by the Subject of the Query*

Subject of telephone query	Freq	Perc
Request for help with income questions	15	58%
Why are there questions on income?	6	23%
Refusal to complete questionnaire because of income questions	3	12%
Refusal to complete the income questions	1	4%
Received an income and a no income questionnaire	1	4%

Note: total = 26 queries. Column percentages are presented.

Table 7.1 shows that most queries made were from individuals asking for help in completing the income questions. These findings indicate that very few individuals found the income questions objectionable to the extent that they contacted the Contact Centre to voice their concerns.

7.3 Field staff observation notes

Delivery and follow-up enumerators were asked to keep an observation book where they could document their experiences of their training and work. Of relevance to the income question evaluation, they were asked to document their experiences in contacting households. If households frequently raised the issue of income questions to field staff there may be frequent reference to the income questions in the observation books.

119 delivery observation books and 91 follow-up observation books were received from field staff. In the delivery observation books, only one mention was made of the income questions - that individuals were wary about the income section.

There were a lot more comments regarding the income questions in the follow-up observation books – presumably because by this time individuals had flicked through the questionnaire and had formed views on the questions asked.

11 follow-up observation books referred to the income questions. Nearly all references were accounts of individuals raising concerns about the intrusiveness of the income questions. Although all of the references made to the income questions indicate that individuals have negative views of the income questions (e.g., 'One or two individuals had reservations over the questions', 'In income question areas the income questions were the main topic of conversation and many individuals didn't complete them because they found them intrusive'). These negative comments must be considered in relation to their low number – only 12.1% of returned follow-up observation books mentioned the income questions. Individuals that were not overly concerned about the inclusion of income questions would have been less likely to discuss them with field staff they encountered compared to those that have strong negative views.

See Annex 8 for a full list of comments on the income questions documented by field staff.

7.4 Field staff debriefs

Debriefs were given to area managers, team managers, delivery enumerators and follow-up enumerators. In all cases, none of the semi-structured questions asked of field staff related to the income questions. However, all staff were given the opportunity to provide any comments on the 2007 Test. If the inclusion of income questions was an issue that affected their work then they may have made references to the income questions when asked for further comments on the 2007 Test.

The income questions were only discussed at three follow-up debriefs. One follow-up enumerator commented that the 'Income questions had a small impact: one household refused to complete the questionnaire and another completed everything except those questions'. In another debrief some follow-up enumerators stated that the income questions did affect return rates. Others found that individuals did not mention the income questions. In the final debrief, follow-up enumerators stated that the income questions were off-putting to some individuals.

The debrief sessions may have provided more information on the individuals' views had income been specifically covered in the semi-structured questions.

7.5 2007 Test income question publicity

Proposals to include questions on income in the 2011 Census and the inclusion of income questions in the 2007 Test were widely reported in national newspapers. There were spikes in publicity in May 2005, March 2006 and November 2006. In May 2005, proposals to revise the content of the Census – including adding an income question - were put forward (see the paper: 'The 2011 Census: Initial view on content for England and Wales' for more detail). The paper: 'The 2011 Census: Assessment of initial user requirements on content for England and Wales' was published in March 2006. The paper: 'The 2011 Census: Development of a questionnaire for the 2007 Census Test' that summarises the consultations regarding the questions likely to be asked was published in October 2006.

With some exceptions (i.e. Evening Standard, 31/10/06; Guardian, 05/05/05, 01/11/06; Metro, 17/05/05; Times, 05/05/05, 17/05/05, 01/11/06), most newspapers expressed at least a slightly negative view of the income questions, stating that they are intrusive and that the information may be used in the calculation of tax rises.

The Daily Mail (09/08/06; see also 09/03/05, 01/11/06, 02/11/06) stated that: 'Questions on income and wealth will be included for the first time in the most intrusive survey of the population ever carried out by the state.' The Daily Express (05/05/05, 19/05/05, 01/11/06), Daily Telegraph (09/03/06, 10/03/06, 01/11/06) and Western Mail (17/05/05) echoed this opinion. The Daily Express (01/11/06) added '…critics warned that the sensitive information being gathered by the government could be used to prepare crippling new tax rises.' (see also the Daily Mail, 01/11/06); and, after stating that plans for the 2011 Census amount to a major invasion of privacy, the Daily Star (05/05/05) ran a readers' poll on whether the proposed Census questions, including the income questions, are intrusive.

The public view of the Census has a reciprocal relationship with the views expressed in the media. Therefore, given these negative comments, if income questions were included in the 2011 Census, there would need to be a sustained nationwide publicity campaign to clarify how the information collected on income would be beneficial and exactly how it would be used, e.g. individuals' personal data would not be shared with other Government departments such as the Inland Revenue. Justification for the wording of the questions would also need to be included to prevent misconceptions arising such as, '[The wording of the income questions]…suggests that anybody earning more than £37,000 a year will be considered 'wealthy' when the Census results are assessed' (Daily Mail, 01/11/06). This publicity campaign would substantially add to the cost of delivering a successful 2011 Census.

7.6 CTES

7.6.1 Rationale

Part of the rationale for the CTES was to gauge the views of the public on the inclusion of income questions in the 2007 Test. The analysis of the CTES data will ascertain whether 2007 Test respondents identified the income questions as being difficult to answer or whether they were unhappy about answering them. The analysis will also show whether 2007 Test non-respondents identified the income questions as a reason for them choosing not to participate in the 2007 Test.

7.6.2 The sample

1,223 individuals who responded to the 2007 Test and 247 individuals who did not respond to the 2007 Test participated in the CTES. Of the respondents, 588 returned a valid income questionnaire and 635 returned a valid no income questionnaire. Of the non-respondents, 115 did not return an income questionnaire and 132 did not return a no income questionnaire. CTES individuals were asked a number of questions regarding what they thought about the 2007 Test.

7.6.3 The questions asked

Respondent sample questions

Respondents were asked the following seven questions of relevance to the income question evaluation:

1. Were there any questions which you found particularly difficult to answer?

If individuals answered "yes", they were then asked:
2. Which questions did you find difficult to answer?

If applicable, individuals were asked question 3 for each question they identified as difficult to answer for question 2:
3. Why was the question about [question stated in question 2] difficult to answer?

4. Were there any questions you felt particularly unhappy about answering?

If individuals answered "yes", they were then asked:
5. Which questions were you particularly unhappy answering?

If applicable, individuals were asked question 6 for each question they stated they were unhappy to answer for question 5:
6. Why were you unhappy about answering the question about [question stated in question 5]?

7. Is there anything else about the Census questionnaire you would like to comment on?

Note: Individuals could refer to a copy of the 2007 Test questionnaire to help them answer these questions.

Non-respondent sample questions
Non-respondents were asked the following four questions of relevance to the income question evaluation:

1. Did you receive a Census questionnaire?

If individuals said "yes" or "can't remember", they were then asked:
2. Why weren't you able to send the completed Census questionnaire to us?

If for question 2, individuals said that they found the questionnaire intrusive in some way, they were asked:
3. Can I just check, which questions did you find too intrusive?

If for question 2, individuals said that they found the questionnaire difficult to understand in some way, they were asked:
4. Can I just check, which questions did you find difficult to understand?

Note: this is not a comprehensive list of the questions asked for the CTES - they are only questions of relevance to the income question evaluation.

The number of individuals that identified the income questions in response to each question is compared to the number of individuals that identified the ethnic identity and qualifications questions. These comparisons will indicate whether, for example, individuals specifically identified the income questions as being difficult to answer or, alternatively, whether they tended to identify a number of questions in addition to the income questions as being difficult to answer.

The responses to the ethnic identity question are presented since it is intuitively one of the questions that some individuals would be unhappy about answering. The responses to the qualifications question are presented since it is the question immediately preceding the income questions and may appear complicated because, like the income questions, it has accompanying completion instructions and a large number of response options.

7.6.4 Analysis of 2007 Test respondent interviews

7.6.4.1 Questions that respondents found difficult to answer
The responses to respondent question 1 are presented in Table 7.2:

Table 7.2: *Were there any questions which you found particularly difficult to answer?*

Response	H Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
Yes	62	10.0%	68	11.9%
No	515	83.3%	466	81.8%
Can't remember	41	6.6%	36	6.3%

Note: total asked this question = 1,188 (618 no income respondents and 570 income respondents). Column percentages are presented.

Table 7.2 shows that, as expected, more individuals who returned an income questionnaire found at least one question difficult to answer than individuals who returned a no income questionnaire. However, a 2 X 2 chi-square test revealed that this difference was not statistically significant, χ^2 (1, N = 1,111) = 1.1, p = .303. 'Can't remember' responses were excluded from the chi-square analysis.

The responses to respondent question 2 are presented in Table 7.3:

Table 7.3: *Which questions did you find difficult to answer?*

Response	H Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
Ethnic identity	12	19.4%	8	11.8%
Qualifications	15	24.2%	9	13.2%
Income Sources	N/A	N/A	11	16.2%
Income Level	N/A	N/A	13	19.1%

Note: total asked this question = 130 (62 no income respondents and 68 income respondents). 11 responses could not be matched to a question. Percentages of respondents selecting the given response option are presented.

Table 7.3 shows that of 130 individuals who identified a question as difficult to answer only 13 identified one or both of the income questions. The majority of individuals did not appear to find the income questions difficult to answer.

Only around 2.3% of individuals who returned income questionnaires identified at least one of the income questions as being difficult to answer (13/570).

The responses to respondent question 6 are presented in Table 7.4.

Table 7.4: *Why was the question about [question stated in question 2] difficult to answer?*

Question	Response	H Questionnaire Type	
		With income questions	
		Freq	Perc
Income Sources	Too long	0	0%
	Didn't understand	1	13%
	Badly worded	1	13%
	Badly laid-out	1	13%
	Too complicated	3	38%
	Couldn't answer	3	38%
Income Level	Too long	0	0%
	Didn't understand	3	30%
	Badly worded	2	20%
	Badly laid-out	0	0%
	Too complicated	1	10%
	Couldn't answer	6	60%

Total asked this question regarding the income sources question = 8 income questionnaire respondents, Total asked this question regarding the income level question = 10 income questionnaire respondents. Percentages of respondents selecting the given response option are presented

Table 7.4 shows that most individuals found the income questions difficult to answer because they 'couldn't answer' them. One interpretation of these findings is that the sources or level of some individuals' income could not be easily translated into the discrete response option categories provided for these questions. It may have been useful to have asked these individuals why they could not answer the questions or how the income questions could be modified to make them easier to answer and recorded their responses verbatim.

7.6.4.2 Questions that respondents were unhappy about answering

The responses to respondent question 3 are presented in Table 7.5:

Table 7.5: *Were there any questions you felt particularly unhappy about answering?*

Response	H Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
Yes	36	5.8%	88	15.4%
No	554	89.6%	453	79.5%
Can't remember	28	4.5%	29	5.1%

Note: total asked this question = 1,188 (618 no income respondents and 570 income respondents). Column percentages are presented.

Table 7.5 shows that more individuals who returned an income questionnaire were unhappy about answering at least one question than individuals who answered a no income questionnaire. A 2 X 2 chi-square test revealed that this difference was significant, χ^2 (1, N = 1,131) = 29.9, p<.001. 'Can't remember' responses were excluded from the chi-square analysis.

The responses to respondent question 4 are presented in Table 7.6:

Table 7.6: *Which questions were you particularly unhappy answering?*

Response	H Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
Ethnic Identity	11	30.5%	8	9.1%
Qualifications	4	11.1%	2	2.3%
Income Sources	10	27.8%	42	47.7%
Income Level	11	30.5%	51	58.0%

Note: total asked this question = 124 (36 no income respondents and 88 income respondents). 2 responses could not be matched to a specific question. Percentages of respondents selecting the given response option are presented

Table 7.6 shows that, surprisingly, some individuals who completed a no income questionnaire actually identified one of the income questions as one that they were unhappy to answer. Some individuals who received no income questionnaires presumably interpreted the question asked by the CTES interviewer as: 'Which questions *would you be* particularly unhappy answering?

More individuals from the income group reported that they would be unhappy about answering the income questions. This difference was around 19.9 percentage points for the income sources question and 27.5 percentage points for the income level question. 1 X 2 chi-square tests revealed that both differences were significant: income sources, χ^2 (1, N = 52) = 19.7, p<.001; income level, χ^2 (1, N = 62) = 25.8, p<.001.

Table 7.6 also shows that many respondents who stated that they were unhappy about answering at least one of the questions identified the income level question as one they were unhappy to answer (although these individuals did return a valid H questionnaire). 1 X 3 chi-square tests revealed that individuals who had returned income questionnaires were more likely to state that they were unhappy about answering the income level question than the ethnic identity or qualifications questions, χ^2 (1, N = 61) = 70.3, p<.001, but there was no difference in the type of question identified by individuals who had returned no income questionnaires, χ^2 (1, N = 26) = 3.8, p = .152. However, this latter analysis should be treated with a degree of caution given that the analysed sample is less than 30 cases. Individuals tended to state that they were unhappy about answering both of the income questions or neither income question; therefore, responses to the income sources question were excluded from the analysis above since the income sources and level responses do not appear to be independent.

Around 8.9% of individuals who returned income questionnaires identified at least one of the income questions as one which they were unhappy to answer (51/570).

The responses to respondent question 7 are presented in Table 7.7:

Table 7.7: *Why were you unhappy about answering the question about [question stated in question 5]?*

Question	Response	H Questionnaire Type			
		No Income Questions		With income questions	
		Freq	Perc	Freq	Perc
Income Sources	Too intrusive	3	33%	26	63%
	Too personal	5	56%	21	51%
	HH concerns*	0	0%	0	0%
	Questions were Irrelevant	3	33%	4	10%
	Government concerns**	2	22%	3	7%
	Refusals	0	0%	0	0%
Income Level	Too intrusive	3	30%	28	56%
	Too personal	7	70%	25	50%
	HH concerns*	0	0%	0	0%
	Questions were Irrelevant	4	40%	8	16%
	Government concerns**	1	10%	5	10%
	Refusals	0	0%	0	0%

Note: total asked this question regarding the income sources question = 50 individuals (9 no income questionnaire respondents and 41 income question respondents), Total asked this question regarding the income level question = 60 individuals (10 no income questionnaire respondents and 50 income questionnaire respondents). Percentages of respondents selecting the given response option are presented
* HH concerns include response options such as, "Didn't want others in the household to see my responses",
**Government concerns include response options such as, "It's none of the government's business".

Table 7.7 shows that the majority of individuals that were unhappy about answering the income questions were unhappy because they deemed them too personal or intrusive.

7.6.4.3 General comments on the income questions by respondents
570 individuals who had returned an income questionnaire were asked this respondent question 7: 'Is there anything else about the Census questionnaire you would like to comment on?' 114 (20.0%) said that they would and went on to comment on the questionnaire - only 13 (11.4%) of these comments referred to the income questions. Comments on the income questions were nearly all negative, most stating that the income question was intrusive. For example:

"Some people might think that the income questions are a bit too personal, my wife did."

"[I] *felt the income questions should be left to the revenue, nothing to do with ONS."*

"Difficult to answer? On finance for other members of the household."

See Annex 9 for a full list of these comments.

7.6.5 Analysis of 2007 Test non-respondent interviews

7.6.5.1 Did non-respondents receive a 2007 Test questionnaire?
The responses to non-respondent question 1 are presented in Table 7.8:

Table 7.8: *Did you receive a Census questionnaire?*

Response	H Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
Yes	83	70.9%	68	67.3%
No	18	15.4%	22	21.8%
Can't remember	11	9.4%	9	8.9%
Other	5	4.3%	2	2.0%

Note: total individuals = 218 (117 no income questionnaire non-respondents and 101 income questionnaire respondents). Column percentages are presented.

Table 7.8 shows that individuals who were sent an income questionnaire were more likely to state that they did not receive it. However, a 2 X 2 chi-square test revealed that this difference was not significant, χ^2 (1, N = 191) = 1.3, p = .262. 'Can't remember' and 'other' responses were excluded from the chi-square analysis.

7.6.5.2 Why non-respondents chose not to participate
The responses to non-respondent question 2 are presented in Table 7.9:

Table 7.9: *Why weren't you able to send the completed Census questionnaire to us?*

Response	H Questionnaire Type			
	No Income questions		With income questions	
	Freq	Perc	Freq	Perc
Too busy	36	38%	20	26%
Other	19	20%	14	18%
Forgot	10	11%	9	12%
Don't feel it's important	5	5%	11	14%
Don't know	8	9%	6	8%
Don't like to disclose personal details	6	6%	6	8%
Didn't want to (no specific reason)	6	6%	5	7%
Did not understand questionnaire or some question	5	5%	5	7%
Respondent has sent questionnaire in	5	5%	4	5%
Question(s) too intrusive	3	3%	4	5%
Thought someone else in household did	2	2%	4	5%
Questionnaire not in appropriate language	1	1%	2	3%
Questionnaire too long	1	1%	2	3%
Don't trust government	3	3%	1	1%

Note: total individuals = 171 (94 no income questionnaire non-respondents and 77 income questionnaire non-respondents).

Table 7.9 shows that more individuals who received a no income questionnaire stated that they had been too busy to complete the 2007 Test questionnaire. More individuals who received an income questionnaire stated that they didn't participate in the 2007 Test because they didn't feel that it was important. Because of the small frequencies, these findings may well be attributable to chance.

7.6.5.3 Which questions did non-respondents find difficult to understand or intrusive?
7 of the individuals who stated that the questions were intrusive were asked, "Can I just check, which questions did you find too intrusive?" 3 (1 income and 2 no income non-respondents) stated that they found the income questions intrusive. Therefore, only 1.8% (3/171) of non-respondents asked why they did not complete the 2007 Test questionnaire specifically identified the income questions as the reason.

3 of the individuals who stated that they did not understand the questionnaire or a question were asked, "Can I just check, which questions did you find difficult to understand?" None identified the income questions as difficult to understand.

7.7 Conclusions
Six findings reported in this section stand out:

- Very few telephone queries made to the Contact Centre were regarding the income questions (only around 0.5% of all queries, see section 6.4); and more than half of these queries were requests for help in completing the questions.
- Field staff made very few references to the income questions in their observation notes and debriefs.
- For the CTES, only 2.3% of individuals who returned income questionnaires stated that they found at least one of the income questions difficult to answer.
- For the CTES, 8.9% of individuals who returned income questionnaires stated that they were unhappy about answering at least one of the income questions. However, these individuals did return a valid H questionnaire.

- For the CTES, more individuals who returned income questionnaires stated that they were unhappy about answering the income level question than the ethnic identity or qualifications questions.
- For the CTES, only around 1.8% of 2007 Test non-respondents stated that the reason they did not respond was that the income questions were intrusive or difficult to answer.

Overall, the findings from the Contact Centre telephone query log, field staff observation notes and debriefs indicate that there was not a widespread negative view of the inclusion of income question in the 2007 Test. These findings indicate that including questions on income for the 2011 Census would not lead to a need for more intensive follow-up of individuals unhappy about answering questions on income above the additional follow-up requirements stated in sections 4 and 6.

Findings from the CTES 2007 Test respondent interviews reported in this section indicate that lower overall response rates due to the inclusion of income questions and non-response to the income questions was due more to individuals being unhappy to answer these questions rather than finding these questions too difficult to answer. However, few 2007 Test non-respondents cited the income questions as a reason for their non-response. In addition, the low to moderate test-retest reliabilities of the income questions indicate that individuals did find them difficult to answer (see section 5.9).

8. Supplementary question 1: Do income questions result in more individuals being missed from households that have returned a questionnaire?

8.1 Objective

The inclusion of income questions may have negatively affected the coverage of individuals. To determine whether this is the case, the analysis presented in this summary compares the number and names of individuals as stated on the 2007 Test questionnaire with the number and names of individuals as stated in the CTES interviews by income question inclusion.

8.2 Analysis

In order to account for everyone in the household, it was assumed that the 'true' usual residents in the household were those named as such in the CTES. Thus, if there were any extra individuals in the CTES that do not appear on the 2007 Test questionnaire then they would be considered as undercount, and if there were individuals on the 2007 Test questionnaire who do not appear in the CTES then they would be considered as an overcount. It is likely that this approach will underestimate the undercount (as not all missed individuals will be in the CTES) and overestimate the overcount (as there will be some recall errors in the CTES).

The data from 132 households (10.8% of the sample) were affected by problems. Most of these problems were caused by a failure of the software used for the CTES interview to properly read the input name list, causing it to disregard names stored in two variables, with 9 cases having names accidentally duplicated during the coding stage. While these cases were manually corrected, the data has nevertheless still been compromised in its quality.

The total number of individuals (assuming the CTES results are the true population) and the undercount and overcount by income question inclusion is presented in Table 8.1:

Table 8.1: *Individuals 'Missing' from the 2007 Test and CTES by Income Question Inclusion*

	No income questions		With income questions	
	Freq	Perc	Freq	Perc
Total individuals	1,384		1,279	
Undercoverage: 2007 Test 'missed' individuals	45	3.3%	27	2.1%
Overcoverage: CTES 'missed' individuals	8	0.6%	15	1.2%

Note: total individuals = 2007 Test respondents who were resident at households as recorded in CTES interviews.

Table 8.1 shows that 2007 Test no income questionnaires from CTES households had *more* 'missing' individuals than income questionnaires from CTES households – the difference being around 1.2 percentage points. This difference is in the opposite direction to what was expected.

Tests of equality of proportions revealed that at a 5% level of significance (the equivalent of a 95% confidence interval) the difference in undercoverage just failed to reach statistical significance (p = .067). The difference in overcoverage was also not significant (p = .102).

8.3 Conclusions

There is no evidence that the inclusion of income questions in the 2011 Census would result in greater undercoverage of individuals within households.

The proportion of individuals missed within households from both income and no income households was higher than the 2% estimated undercoverage of the 2001 Census.

9. Supplementary question 2: What alternative sources of data on income are there?

9.1 Objectives

This summary reviews what alternative sources of income data will be available by 2011 and asks whether it would be more appropriate to collect income data from one of these sources rather than from the Census. It reviews existing surveys, and surveys that are likely to be in place by 2011 throughout the UK, and considers whether any of these sources could act as a suitable alternative to the Census.

9.2 Introduction

There is an increasing requirement from users for income data at the smallest possible geographical level. The National Statistics Quality Review on 'Issues in Measuring Household Income and the Redistribution of Income', published in March 2004, identified that there was a gap in income statistics, suggesting that reliable income data from country/Government Office Region (GOR) level down to ward/sub-ward level were required. Although an income question on the Census questionnaire would meet this requirement, it may also affect response rates, and the data may not be of a sufficiently high quality. It is therefore necessary to consider if any feasible alternative sources of income data exist, or are likely to exist by 2011.

9.3 Potential alternative sources

Potential alternative sources have been identified through the Office for National Statistics' topics consultation and research within the ONS 2011 Census Division and the ONS Social and Health Analysis Reporting Division:

- Integrated Household Survey.
- Family Resources Survey.
- Households Below Average Income.
- British Household Panel Survey.
- United Kingdom Longitudinal Household Survey.
- Survey of Personal Incomes.
- Annual Survey of Hours and Earnings.
- Index of Deprivation.
- Department for Work and Pensions Benefit Data including the Work and Pensions Longitudinal Study.
- Modelled Income Data.
- Commercial Modelled Income Data.

9.3.1 Integrated Household Survey

The Integrated Household Survey (IHS) is being implemented in phases (from January 2008) and will integrate the Labour Force Survey and its associated boosts, the General Household Survey, the Expenditure and Food Survey, the Omnibus Survey and the newly developed English Housing Survey. ONS has successfully introduced the new IHS core questions to three survey modules for January 2008 (the former Expenditure and Food Survey (EFS), General Household Survey (GHS) and Omnibus surveys) using their existing clustered designs. The new Housing Survey, also containing the core questions, started (in April 2008) with an unclustered design.

User demand was strong for the inclusion of a measure of household income in the IHS Core. Household income is a useful classificatory variable for analysis, in particular, it can be used as a deprivation measure and with other variables (housing, education etc) as an indicator of social exclusion. While household income can be derived from responses from personal income if all householders respond to the personal income questions, derivation of household income would be problematic if there is any missing information in the household. Thus, the IHS core individual income questions are followed by some additional questions to determine household income if not all household members answer the personal income questions. Under these circumstances, a first attempt is made to obtain an estimate of total gross

income of the whole household. If this is not known or the respondent refuses to answer, the respondent is then asked for a banded estimate. The slight exception to the rule is the 'Opinions' module (formerly Omnibus Survey), where the selected respondent to the Opinions module is asked questions on:

- Their personal income.
- Their spouse/partner's income (if applicable).
- Their joint income (if their personal income or their spouse/partner's income is not known) (if applicable).
- The household income (if the household contains more than two adults, or two adults who are not living together as a couple) (if applicable).

By 2009 the standard income question will be asked across all components of the IHS. Approximately 200,000 unique households in Great Britain will be available for the annual IHS Core dataset, and will allow for the addition of Northern Ireland data to provide UK results. The core module will enable users to analyse a number of key variables, including household income, in combination with a considerably larger sample than is possible from existing surveys.

The IHS will provide the opportunity for more regular, coherent reporting of estimates from a single source. The IHS will measure both gross household and individual income (preceded by a sources of income question) and data will be rolled out annually on a quarterly basis, and will be made available to GOR and LA level where the sample size allows.

The IHS should therefore be considered advantageous as a potential alternative source to collecting income from the Census. It would enable the collection of data from a large sample size, available to a relatively low level, and on a much more frequent basis than the Census would be able to provide. As the IHS comprises mainly face-to-face interviews and some telephone interviews, more detailed questions can be asked, and asking such sensitive questions on a one-to-one basis (i.e. interviewer and respondent) may be considered as more appropriate, rather than asking the entire UK population for what may be deemed personal sensitive data.

9.3.2 Family Resources Survey

The sample size for the Family Resources Survey (FRS) is around 24,000 households, and so is about four times as large as the Expenditure and Food Survey (EFS). The response rate is also slightly higher, generally at around 65%. The FRS did not originally cover Northern Ireland; however, it has been extended to cover the whole of the UK from April 2002.

A study of non-response in relation to the ACORN geo-demographic classification system suggested that the FRS under-represents wealthier neighbourhoods and over-represents poorer neighbourhoods and workless households. However, comparisons with the Survey of Personal Incomes (SPI) data suggest that the FRS captures more households with very high incomes than the EFS does.

The FRS covers people in households, but not those in communal establishments. Income data is collected for each adult in the household on the amount of income from each source, including gross earned income and some information on regular outgoings. This means that although individual income is not included in the published reports, it is possible to construct these measures and to include or exclude money from different sources as appropriate. As with the EFS, the FRS dataset includes detailed and summary income variables. However, there is very little substantive income analysis published. The income estimates are not on an equivalised basis.

The sample size is relatively small, so it is not generally possible to get estimates below regional level.

9.3.3 Households Below Average Income

The Households Below Average Income (HBAI) analysis was developed in the late 1980's, initially using EFS data, and now using mainly FRS data. HBAI is the primary source of income distribution statistics in the UK, and it reports some results for the whole of the income distribution. HBAI is the government's main source for measuring household poverty.

The HBAI statistics rank individuals by income, by taking the income of their household and adjusting this for household size and composition. The analysis of disposable income is presented on two bases: before housing costs and after housing costs. Both bases are used to take into account variations in housing costs that themselves do not correspond to comparable variations in the quality of housing.

The focus of HBAI is on disposable income rather than gross income. This is because the main purpose is to provide a proxy for material living standards. Due to known deficiencies at the top of the FRS income distribution, an adjustment is employed to correct for volatility in the highest incomes captured.

The survey covers approximately 27,000 households in Great Britain, however, the survey only considers private households – people living in communal establishments, such as nursing homes, halls of residence and homeless people are not included.

This data is not available at small area level and cannot be cross-tabulated.

9.3.4 British Household Panel Survey

The British Household Panel Survey (BHPS) is run by the Institute of Social and Economic Research at the University of Essex, and has been the primary UK source of longitudinal data on income, until the arrival of the United Kingdom Longitudinal Household Survey (UKLHS) in 2008. The BHPS samples 5,500 households each year.

The BHPS is a multi-purpose study following a sample of people over several years to look at change at an individual and household level. The survey collects detailed information on income from sources other than earnings and a range of information on expenditure.

The BHPS enables the study of persistent low (or high) incomes and the nature of the events that trigger significant income changes over time.

9.3.5 United Kingdom Longitudinal Household Survey

The UKLHS will commence fieldwork in early 2009. The UKLHS will aim for a target sample size of 40,000 households / 100,000 individuals, with an ethnic minority booster sample of over 3,000 households. It will also incorporate the existing BHPS sample.

The UKLHS will involve interviews with each respondent every twelve months, and each wave will spread over a two year period. The UKLHS will likely include a combination of questions asked on a frequent basis and questions asked on a rotating basis, i.e. every two or three waves. It is anticipated that questions on income will be asked in wave one on current receipt of pensions, benefits, non-employment income and interest received from savings and investments; with probable questions on self-employment income; and possible questions on the summary household income measure and annual estimate. At present however, it is uncertain as to the likely questions on income that will be included on the UKLHS by 2011.

9.3.6 Survey of Personal Incomes

The SPI is a sample survey based on information held by HM Revenue & Customs (HMRC) tax offices on persons who could be liable to UK tax. It is carried out annually and covers the income assessable for tax in each tax year.

The latest survey data available is for 2005-06 and contains a sample of 540,000 individuals. The sample is stratified by age, sex and income but not by geography.

For those whose incomes exceed the threshold for paying tax, the survey provides a comprehensive source of information on personal incomes. However the individual is the only possible unit of analysis, and there is very little classificatory data available. As the survey is based on taxpayers, it does not contain much information on those whose incomes fall below the threshold for paying tax. Therefore, it is not fully representative of people in the lower end of the income distribution.

The data available covers the United Kingdom and the following sub-level geography levels: country, regional, county, metropolitan borough, LA district and parliamentary constituency.

9.3.7 Annual Survey of Hours and Earnings
The Annual Survey of Hours and Earnings (ASHE) provides information about the levels, distribution and make-up of earnings and hours paid for employees within industries, occupations and regions.

The ASHE was developed to replace the New Earnings Survey (NES) in 2004. This included improvements to the coverage of employees, imputation for item non-response and the weighting of earnings estimates.

The ASHE tables contain UK data on earnings for employees by sex and full-time / part-time workers. Further breakdowns include by region, LA, parliamentary constituency occupation, industry, region by occupation and age groups. These breakdowns are available for the following variables: gross weekly pay, weekly pay excluding overtime, basic pay including other pay, overtime pay, gross hourly pay, hourly pay excluding overtime, gross annual pay, annual incentive pay, total paid hours, basic paid hours and paid overtime hours.

ASHE takes its sample from the PAYE system and so includes employees only. It therefore does not provide data on individuals who do not engage in paid employment and income from other sources.

9.3.8 Index of Deprivation
Income deprivation is one of seven domain indices in the Index of Deprivation. The index provides a measure of income deprivation at Lower Super Output Area (LSOA) level.

The most deprived LSOA for each Index is given a rank of 1 and the least deprived LSOA is given a rank of 32,482. The ranks show how an LSOA compares to all other LSOAs in the country.

The income deprivation domain in 2007 was based on take-up of benefits such as job-seekers allowance, income support and tax credits.

The index is a relative measure of deprivation and therefore it cannot be used to say how much more deprived one area is from another. Scores and ranks cannot be used as absolute measures of deprivation or to identify absolute change over time.

9.3.9 Department for Work and Pensions Benefit Data
The Department for Work and Pension's (DWP) benefit data is another source of data that could be used to measure income.

Of most value would be income-related benefits, which are only payable if the recipient's income is below a certain threshold. This provides a means of identifying geographical areas with a large proportion of low income households.

There are two sources for this data:

1. Work and Pensions Longitudinal Survey

Introduced in January 2004, and enhanced in October 2005, the Work and Pensions Longitudinal Study (WPLS) links benefit and programme information held by DWP on its customers, with employment records from Her Majesty's Revenue & Customs (HMRC).

The WPLS data provides a 100% sample of claimants and covers information such as age, gender and geographical location of claimants, type and duration of claims.

2. Five percent sample data

The five percent sample data can provide more detailed breakdowns than the WPLS but is less comprehensive. It contains similar classificatory variables as the WPLS.

Overall, problems with benefit data are that entitlement to income-related benefits cannot necessarily be equated with poverty. Take up of benefits can vary between different groups and eligibility criteria for income-related benefits inevitably means that some groups in poverty will not be captured, for example, the in-work poor. It will also provide little information about the middle and top end of the income distribution and is not available below district level.

9.3.10 Modelled Income Data

Another possible alternative data source is the model-based estimates of income which have been produced by ONS. The principal reason for using model-based small area estimation is that sample surveys are not typically designed to produce direct estimates for all small areas. There is also the problem of sample design. Most of the principal national household surveys have clustered designs. The problem with this for small area estimation is that for areas of sizes like middle super output areas, the vast majority will contain no sample respondents at all, and hence no direct survey estimate would be possible.

A modelling technique is used which combines data from the FRS with data from a variety of other sources, such as DWP data, HMRC data, Census data on car ownership and housing tenure, and country/regional indicators. Although individually none of these sources is good enough to produce small area income information, they can be combined using model-based small area estimation techniques to derive estimates that are substantially better than any single source.

The estimates produced are values of mean middle super output area income along with the associated confidence interval (representing the uncertainty of the estimates caused by modelling) for the following four income types:

1. Gross household weekly income (unequivalised) – the sum of the gross income of every member in the household. It is calculated as the sum of income from:

- Earnings (gross).
- Self-employment.
- Investments.
- Disability benefits.
- Retirement pensions and income support.
- Other benefits.
- Other pensions.
- Other/remaining sources.

2. Net household weekly income (unequivalised) – the sum of the net income of every member in the household. It is calculated using the same components as gross income, but income is net of:

- Income tax payments.
- National insurance contributions.
- Domestic rates/council tax.
- Contributions to occupational pension schemes.
- All maintenance and child support payments, which are deducted from the income of the person making the payments.
- Parental contribution to students living away from home.

3. Net household weekly income before housing costs (equivalised) – composed of the same elements as net household weekly income but is subject to the McClement's Equivalisation scale.

4. Net household weekly income after household costs (equivalised) - composed of the same elements of net household weekly income but is subject to the following deductions prior to the McClement's equivalisation scale being applied:

- Rent (gross of housing benefit).
- Water rates, community water charges and council water charges.
- Mortgage interest payments (net of any tax relief).
- Structural insurance premiums (for owner-occupiers).
- Ground rent and service charges.

The technique relies on good information about income being available from a survey for which the location of each respondent is known. Other sources then provide information that is correlated with income and include data for each small area in the country. Given the address-level information from the survey data, and the area-level information from the other sources, the relationship between income and other variables can be estimated for those small areas covered by the survey. These relationships can be used to predict income levels in all other small areas of the country.

The data used in the model can be updated each year as new survey and administrative data becomes available and the area estimates derived from survey data should be less affected by poor data quality than data derived from a Census income question.

However, the surveys only cover private households, so the modelled estimates of income relate only to private households. These model-based estimates assume that certain relationships between income and other variables are constant (or nearly constant) over all or part of the country and so the estimates do not capture the extent of variability at local level. In addition, although the model estimates can be used to rank wards by income, they cannot be used to make any conclusions about the distribution of income levels over the wards. The estimation procedure tends to shrink estimates towards the mean level of income for the whole population, so estimates at each end of the scales tend to be over or under estimated respectively.

Although the approach has some limitations, it still represents a substantial advance in data availability and could potentially be a suitable alternative source of income data to the 2011 Census.

9.3.11 Commercial Modelled Income Data

There is also modelled income data available from commercial companies, such as Paycheck from CACI Ltd. However, there are a number of problems with this commercial data:

- The data is unreliable at small area level.
- The data is not available nationally.
- There are usage restrictions associated with this data.
- Sample errors affect the data.
- Cost is an issue as the data has to be purchased.
- The data relies on estimation.
- The information is not as reliable as the Census would be in picking up income from home-working and other informal arrangements, which are a significant feature in some areas.

The commercial modelled income data did, however, provide useful information before the modelled income estimates from ONS were available.

9.4 Is there a feasible alternative to Census income data?

The alternative sources of income data highlighted above can provide a rich source of information on the level, type and characteristics of individual and household incomes. However, individually none provide a fully comprehensive source of information on incomes. This is because of the small sample sizes, and the fact that the data is not always reliable, if it

is available at all, at a small geographical level or for small population groups. Some of the surveys also do not have a suitable level of coverage, for example, the FRS only covers household residents, and the ASHE is mainly confined to employees in PAYE schemes. The risk of significant non-response bias in many surveys is also a cause for concern. Users have a particular interest in the tails of the income distributions, both upper and lower, and these are the parts of the distribution where there is most likely to be high non-response and therefore the most risk of non-response bias.

A question on income on the IHS could possibly act as a more suitable alternative to Census income data than the current data provided by surveys due to a larger sample being used (approximately 200,000 households across Great Britain). It would be able to provide information on household income and, to a lesser extent, individual income. The IHS could also be considered more beneficial as a potential alternative source as data could be made available on a quarterly basis, as opposed to once every 10 years. Data could therefore be collected from a large sample size and available to a low geographical level. The IHS may also be a more suitable source in terms of data collection method (one-to-one interview as opposed to self-completion questionnaire). However, consideration should still be given to the fact that, since the data is collected from a sample survey, it will still be subject to sampling errors and non-response bias. Furthermore, the income data will normally only be collected from one person per household, so it may not be as reliable as that collected in a Census. For a relatively high proportion of usual residents, particularly young adults, income data will be collected by proxy. In most of these cases, the respondent will be asked to estimate total household income only.

The SPI is a good source of information on incomes for people in the middle and top end of the income distribution. However, it only holds information on people who could be liable for tax and therefore it is not representative of people at the lower end of the income distribution.

The income domain of the Index of Deprivation is not a suitable alternative to Census income data, as it does not provide actual income levels, only ranks and scores. The index also does not offer the geographical flexibility that the Census would.

Benefit data from DWP could not be considered a suitable alternative to Census income data. Although entitlement to income-related benefits can give some indication of low income households, it cannot be directly equated with poverty. The data also gives very little information on the characteristics of the recipients of benefits, and provides very little or no information on those in the middle and at the higher end of the income distribution.

The Work and Pensions Longitudinal Study does not currently provide a suitable alternative to a Census question on income, and is unlikely to do so by 2011. This is because of the problems associated with ONS getting access to this data. Even if these problems were overcome, there would still be an issue with not being able to link this data to other sources. Although there are likely to be substantial developments in this area over the next few years, it is unlikely that a Census question on income will be rendered redundant.

Modelled income data produced by commercial companies such as CACI Ltd and Experian is not a suitable substitute for Census income data. The main reasons for this are that the data is unreliable at small area level, is based on estimation, is not available nationally, and is subject to sampling errors.

The model-based income estimates produced by ONS represent a substantial advance in data availability and are currently the best alternative source of income data to the Census. The data can be produced for small areas, can be updated regularly and can provide several different measures of income. However, the estimates currently do not meet all the user requirements for income data and are not likely to do so by 2011. The main reasons for this are that the results are at ward level as opposed to output area level, and are not suitable for cross-classification with other variables.

9.5 Conclusions

Alternative income data sources may be more appropriate than a Census question due to difficulties in defining income sufficiently clearly within the context of a Census, and difficulties in obtaining accurate information. There is also concern about the effect an income question on the Census would have on overall response rates and item response rates to other questions.

Although there are currently no alternative sources of income data available that are able to meet all user requirements, the IHS which will start in October 2008, and the modelled income estimates currently offer the best alternatives to a Census income question. These sources could provide information on a more frequent basis than would be able to be provided by the Census, and data would be available to a low geographical area. The increased sample size of the IHS is also advantageous.

10. Supplementary Q.3: What supporting evidence is available from NISRAs evaluation of their individual income questions in their 2007 Census Test?

10.1 Objectives

In May 2007 a Census Test was undertaken by NISRA Census Office within 5 Local Government Districts (LGDs) in Northern Ireland: Belfast, Coleraine, Craigavon, Magherafelt and Fermanagh. In line with arrangements across the rest of the UK, it incorporated an operational test of proposed procedures, processes and associated systems. In addition, the Test design enabled statistical testing of the effect that delivery method (i.e. enumerator hand-delivery versus post-out) and questionnaire content (i.e. include income questions versus not include income questions) have on the level and quality of response.

The main income question evaluation objectives were as follows:

- To assess the impact on overall response rates of inclusion of income questions identical in wording to those used in ONS' England and Wales 2007 Test (see Annex 1).
- To assess whether the level of questionnaire completion differed by the inclusion of income questions.
- To review alternative income data sources (see NISRAs 2007 Census Test Income Evaluation Report for this review).

10.2 Design

Following detailed analysis based on 2001 Census information at Output Area (OA) level, the LGDs were purposively selected because they exhibit specific socio-economic characteristics that are known to provide difficulties with the enumeration process, such as increased incidence of students, migrant workers and holiday homes. The desire to test the design variables across a balanced set of socio-economic strata led to the selection of 96 OAs. In line with arrangements across the rest of the UK, it was agreed that the main design variables would be delivery method (i.e. hand-delivery versus post-out) and income question inclusion (i.e. include questions on income versus not include questions on income).

In order to arrive at the 96 OAs, all of the OAs across the five chosen LGDs were categorised into 12 individual strata (urban / rural, deprived / non-deprived, Protestant / Roman Catholic / Mixed). OAs were classified as Urban if they fell mainly within any settlement with a population of 4,500 persons or more; and Rural for all other areas. OAs were categorised as deprived / non-deprived using the economic deprivation measure from the Northern Ireland Multiple Deprivation Measure 2005, using the median rank (2,511 out of 5,022 OAs) as the break-point. For community background, OAs were classified (using 2001 Census data) as predominantly Protestant if over 80% of the population were Protestant (or other Christian), predominantly Roman Catholic if over 80% of the population were Roman Catholic and Mixed for all other areas. Eight OAs were then random selected from within each of the 12 stratum to give 96 OAs in total.

10.3 Return and response rate definition

For the purposes of the 2007 Test in Northern Ireland, the return rate definition was:
'The proportion of responding households out of the total number of households where a returned questionnaire could have been expected' (i.e. it therefore excludes addresses that couldn't be found, were demolished or vacant, had their questionnaire returned by Royal Mail as undeliverable, or had their status changed from residential to non-residential).

Poorly completed and blank returns count towards the return rate. The response rate (below) adjusts the return rate to remove poorly completed and blank returns. The response rate definition was:
'The proportion of valid responding households out of the total number of households where a returned questionnaire could have been expected' (i.e. it therefore excludes addresses that couldn't be found, were demolished or vacant, had their questionnaire returned by Royal Mail

as undeliverable, or had their status changed from residential to non-residential). *A valid returned questionnaire refers to a questionnaire where at least two of four basic items of data (name, gender, date of birth, marital status) are completed for at least one household member.'*

The main difference between the return and response rate is the exclusion of poorly completed and blank returns from the response rate. In practise, of 5,777 household returns, only 102 (1.8%) were either poorly completed or blank.

10.4 Findings

10.4.1 Impact of income questions on return and response rates

The biggest implication on data quality by income question inclusion is potentially a reduction in overall response rates leading to a higher proportion of imputed persons and households in the Census, and consequently, less robust population estimates.

The observed return and response rates for the 2007 Test in Northern Ireland are presented in Table 10.1:

Table 10.1: *Response Rate Differences by Income Question Inclusion*

Area	Eligible households	Initial return rate		Final return rate		Response rate	
	Freq	Freq	Perc	Freq	Perc	Freq	Perc
No income	6,543	1,983	30.3%	3,005	45.9%	2,957	45.2%
Income	6,376	1,661	26.1%	2,772	43.5%	2,718	42.6%
Hand-delivery and no income	3,186	1,105	34.7%	1,628	51.1%	1,608	50.5%
Hand-delivery and income	3,211	895	27.9%	1,405	43.8%	1,373	42.8%
Post-out and no income	3,357	878	26.2%	1,377	41.0%	1,349	40.2%
Post-out and income	3,165	766	24.2%	1,367	43.2%	1,345	42.5%
All	**12,919**	**3,644**	**28.2%**	**5,777**	**44.7%**	**5,675**	**43.9%**

Table 10.1 shows that the average response rate to questionnaires including income questions was 42.6% compared to 45.2% for questionnaires without income questions – a difference of around 2.6 percentage points. However, this difference was not statistically significant (p=0.13). The inclusion of income questions was therefore not proven to have a statistically significant effect on the response rate to the Census Test.

As stated, the Census Test involved samples across 12 balanced socio-economic strata. When tested, no consistent pattern of the impact of income question inclusion on response rates was demonstrated. Significant effects were observed in a small number of strata ($p<0.05$), although these included both apparently significant reductions and increases induced by the inclusion of the income questions.

Furthermore, notwithstanding statistical significance, 5 of the 12 strata had observed increases in response rates associated with the inclusion of income questions, while the remaining 7 had observed decreases.

In summary, there is no evidence that the inclusion of the income questions has affected the Test response rate.

10.4.2 Item response rates to the income questions

The majority of respondents who returned valid income questionnaires also answered the income questions. 93.6% answered the income sources question. For the income level

question, 89.6% of respondents submitted valid responses, 0.2% (*N* = 10) submitted invalid multi-tick responses and 10.3% (*N* = 544) submitted no response. Whilst these response rates are lower than response rates for key demographic variables (such as sex and date of birth), they are within the range of response rates for other questions.

10.4.3 Impact of income questions on the level of questionnaire completion
The average rate of completion score for income questionnaires was 82.2% which is broadly similar to the corresponding figure of 81.8% for no income questionnaires. This difference was minimal and non-significant, highlighting that the response rate to other questions was unaffected by income question inclusion.

10.4.4 CTES
The aim of the CTES was to examine the quality of the information provided by respondents on the Census Test questionnaire by repeating the Census Test questions with a sample of respondents. A number of questions were also asked to determine the acceptability of the questionnaire in terms of its overall appearance, and to find out whether there were any questions which had caused particular difficulties or which respondents found unacceptable. Questions asked specifically of Census Test non-responding households were used to discover reasons for non-response, and particularly whether this was associated with one (or more) of the key design variables of the Test.

Whereas respondents indicated that they did not find the Income questions difficult to answer (relative to other questions), the questions about which most unease was expressed were the Income questions (4.8% of respondents indicated that they were unhappy answering the income questions). Indeed, whilst these numbers represent a very small proportion of respondents, the need exists to consider them within the context of a voluntary survey where the respondents are more likely to represent the more cooperative sections of society.

Furthermore, whilst the mean level of agreement between Census Test questions and equivalent questions asked in the CTES was high at 85.9%, the level of agreement for the income level question was much lower at 49.5% (36.4% lower than the mean).

10.5 Conclusions
- Overall, the inclusion of income questions did not have a statistically significant effect on the overall response rate to the Census Test.
- The item response rates to the income questions were acceptable
- There was no evidence that inclusion of the income questions led to householders completing their questionnaires less comprehensively.
- The data obtained from the income questions in the Census Test generate plausible distributions relative to existing data sources (data provided in the NISRA 2007 Test Income Question Evaluation Report).
- The inclusion of a question or questions on income in the 2011 Census is not likely to have any major impact on the overall success of the exercise. However, any decision to include a question or questions on Income must be taken within the context of limited space available in the proposed questionnaire.
- Alternative income data sources may also be more appropriate than a Census question due to difficulties in defining income sufficiently clearly within the context of a Census, and difficulties in obtaining accurate information.

10.6 Recommendations
- NISRA Census Office should continue to work closely with colleagues in ONS and GROS to further assess the level of user need for a question or questions on income within the context of the findings of the 2007 Census Test Evaluations in Northern Ireland and England and Wales, and GROS' 2006 Census Test Evaluation in Scotland.
- Census Office should continue to work closely with colleagues in ONS and GROS to further assess the impact of the inclusion of a question or questions on income on the length of the 2011 Census Questionnaire and the impact that further lengthening the questionnaire would have on response rates, data quality and costs.
- Census Office should seek to initiate further research/small scale testing to ascertain whether non-response rates to the income question vary between households of different

income levels and demographic characteristics, particularly those households in rural or deprived areas.

- If a decision is taken to include Income questions in the 2011 Census, the question should be included in the individual section rather than the household section of the questionnaire (based on the finding that more 'I' questionnaires were requested in 'Income' areas than in 'No Income' areas for privacy purposes).

11. Supplementary Q.4: What supporting evidence is available from GROS' evaluation of their household income question in their 2006 Census Test?

11.1 Introduction

GROS' 2006 Census Test was designed to test innovations to the Census design in preparation for the 2011 Census in Scotland. One such innovation was the inclusion of a question on household income (see Annex 3 for this question). Just like the 2007 Test, around half of households received a questionnaire with an income question and the remainder did not. Findings and conclusions from the 2006 Test income evaluation will therefore be very informative for the 2007 Test income evaluation.

This summary presents a synopsis of GROS' 2006 Test objectives, design and findings pertaining to the income question. The objectives, design and findings from GROS' 2006 Test follow-up survey are also briefly discussed. The implications for these findings for the inclusion of income questions in the England and Wales 2011 Census are then discussed.

Six sets of analysis are presented:

- Overall response rates by income question inclusion.
- Item response rates to the household income question.
- Multi-tick responses to the income question.
- Comparison of questionnaire completion ratios by income question inclusion.
- Individuals' views on the income question as ascertained by the final 'Your views' question asked on the questionnaire, "Were there any household questions you were unhappy with?"
- Summary of relevant findings from the follow-up survey.

Direct comparisons are made between the 2006 and 2007 Tests where appropriate. If findings from the income analysis of the 2007 Test and GROS' 2006 Test correspond, this will demonstrate the reliability of the findings and further justify any conclusions or recommendations based on these findings. On the other hand, if they do not correspond, this will need to be taken into account. In either case, the difference between the individual income question used in ONS' 2007 Test and NISRAs 2007 Test and the household income question used in GROS' 2006 Test will be given due consideration.

This summary is based on GROS' reports: '2006 Census Test General Evaluation Report' and 'Statistical Evaluation of the 2006 Census Test in Scotland: Methodology Review', and the presentation: '2006 Census Test – Evaluation Methodology', given at a Royal Statistical Society (RSS) seminar in April 2008.

11.2 Objectives

The objectives of the 2006 Test were to test a range of strategies, procedures and instructions to inform future decisions on how to conduct the 2011 Census in Scotland. The 2006 Test had very similar key areas of evaluation to ONS' 2007 Test – these included:

- Testing the feasibility of asking households about the level of their income.
- Testing the feasibility of posting-out questionnaires via a postal service provider rather than using the more traditional method of employing enumerators to hand-deliver them.

11.3 Household income question

For the Scotland 2006 Test, households were asked to state their total income rather than asking each individual to state their level of income as in ONS' and NISRAs 2007 Census Tests (see Annex 3). This question was positioned at the end of the household section of the questionnaire.

11.4 Design

The 2006 Test took place on the 23 April 2006 – participation was voluntary. Around 50,000 households from 31 postcode sectors were selected from the 5 Census Districts (CDs) presented in Table 11.1:

Table 11.1: *2006 Test Census Districts*

Census District type	Census District	Number of postcode sectors
Urban	North Glasgow and South Glasgow	20
Semi-rural	West Dunbartonshire	4
Rural	Breadalbane and Lochabar	7

The 2006 Test had a two-factor design with five blocks (one for each CD), selected using purposive sampling. The first factor - delivery and collection method – had two levels: hand-delivery with the household having the option of post-back or hand-collection, and post-out and post-back. The second factor – income question inclusion – had two levels: income question, and no income question.

Five CDs were enumerated: North Glasgow, South Glasgow, West Dunbartonshire, Breadalbane and Lochabar. Collectively, the selected CDs formed four contiguous areas. The CDs were purposively selected because each presented particular enumeration challenges:

- Part of South Glasgow was chosen because of its high ethnic diversity; part of North Glasgow was chosen because of its high number of asylum seekers.
- West Dunbartonshire was chosen because it had poor housing stock, deprivation and large numbers of young males – one of the most difficult-to-enumerate groups.
- Breadalbane and Lochabar were selected because of the large number of holiday homes and the presence of a number of gypsy/traveller sites.

The 2006 Test sample was therefore not entirely representative of the Scottish population. For the 2007 Test in England and Wales, 96.9% of the EDs were randomly selected within LAs. They are therefore representative of the LAs from which they were selected from, and the LAs were selected to be representative, to an extent, of the different LAs in England and Wales.

For the 2006 Test, the income question and delivery method treatment factors were assigned in four postcode blocks within each ED. Within each ED, the blocks of postcodes that had their questionnaires posted-out were contiguous with the blocks of postcodes that had their questionnaires hand-delivered, whereas the blocks of postcodes that received income questionnaires were not contiguous with the blocks of postcodes that received no income questionnaires. For the 2007 Test, treatment factors were assigned at the ED level.

11.5 Two-of-three overall response rate rule

To qualify as a valid response, data from each recorded individual had to pass a 'two-of-three rule' whereby they had to provide responses to the name, sex and date of birth questions. This criterion is more stringent than the two-of-four rule used for the 2007 Test (for more detail, see section 3.4). The decision was taken not to include marital status for three reasons. First, students who did not live at the address during their term time were asked not to complete individual questions 6 to 28 - the marital status question was question 7. (For the 2007 Test, students who do live at the address during their term time were asked not to complete individual questions 7 to 29 - the marital status question was question 5). Second, the marital status question was question 7 of the individual section and response rate tends to decrease for questions positioned later in the questionnaire. Third, the wording and response options had been modified, so response to this question was unknown.

11.6 Findings

11.6.1 Overall response rates

The response rates by delivery and collection method and income question inclusion are presented in Table 11.2:

Table 11.2: *Response Rates by Delivery and Collection Method and Income Question Inclusion*

Delivery method	H Questionnaire Type					
	No Income question			With income question		
	Delivered	Response		Delivered	Response	
		Freq	Perc		Freq	Perc
Hand-delivery	12,601	5,733	45.5%	12,760	6,826	53.5%
Post-out	13,128	5,604	42.7%	13,174	5,602	42.5%
Total	**25,729**	**11,337**	**44.1%**	**25,934**	**12,428**	**47.9%**

Table 11.2 shows that, surprisingly, there was around a 3.8 percentage point difference in overall response rates *in favour* of income questionnaires compared to no income questionnaires. This difference was consistently evident across different CDs in hand-delivery areas (response rates by CD are not reported here). This compares to an overall response rate difference of around 2.7 percentage points for the 2007 Test in favour of no income questionnaires (see Table 4.3 for more detail).

11.6.2 Logistic regression analysis

A multiple logistic regression with the factors CD, delivery method and income question inclusion revealed that there was no main effect of income on response rates. The two-way interactions between CD and income and delivery method and income on response rates were significant, as was the three-way interaction. Post-hoc comparisons were not reported, but it would appear that this interaction is attributable to a higher response rate in hand-delivery areas irrespective of income question inclusion in all CDs except Lochaber, where post-out areas had a higher response rate for no income questionnaires. (Test statistics and probability values were not reported in the 'Statistical Evaluation of the 2006 Test' paper).

2006 Test areas were purposively selected from difficult-to-enumerate areas to provide a stringent test of enumeration procedures. Consequently, sub-areas were similar in their demographic characteristics and households were not randomly selected. A degree of caution therefore needs to be maintained in generalising the findings from the 2006 Test to the Scottish population.

To provide stronger evidence that the findings can be generalised to the Scottish population to an extent, an additional multiple logistic regression analysis was undertaken on overall response rates. The aim was to determine whether the variation in response rates according to income question inclusion and delivery method were statistically significant when the effects of the clustering of the treatment factors was controlled for. The Scottish Index of Multiple Deprivation (SIMD) was included as a factor in the analysis since it was used in the selection of areas when the 2006 Test was designed. Its inclusion therefore enabled an analysis of the effects of the clustered treatment factors on response rates, and also statistically control for these effects when analysing the effects of income question inclusion and delivery method on response rates.

This test showed that the clustering of the treatment factors did have an effect on response rates, but when these effects were controlled for, delivery method but not income question inclusion had a significant effect on response rates.

11.6.3 Item response rates to the household income question

Item response rates to the income question by delivery method are presented in Table 11.3.

Table 11.3: *Item Response Rates to the Household Income Question by Delivery Method*

Income question response	Delivery method					
	Hand-delivery		Post-out		Total	
	Freq	Perc	Freq	Perc	Freq	Perc
No response	949	13.9%	597	10.7%	1,546	12.4%
Corrected invalid multi-tick response	40	0.6%	13	0.2%	53	0.4%
Valid response	5,837	85.5%	4,992	89.1%	10,829	87.1%

Note: total = 12,428 (6,826 hand-delivered income questionnaires and 5,602 posted-out income questionnaires). Column percentages are presented.

Table 11.3 shows that the GROS household income question had an item response rate of around 87.1%, this compares to an item response rate of around 90.9% for the 2007 Test individual income level question (see Table 5.3 for more detail). Therefore, the GROS household income question had around a 3.8 percentage point lower item response rate, despite being position earlier in the questionnaire.

Table 11.3 also shows that there was around a 3.6 percentage point difference in income question response rates in favour of post-out compared to hand-delivery. The 2007 Test income level question item response rates show the same, albeit very weak, trend: response rates to the income level question were 91.1% for households assigned post-out and 90.7% for households assigned hand-delivery – a difference of around 0.4 percentage points.

The item response rate to the household income question was the lowest of any household question, but it was not the lowest on the questionnaire as a whole.

11.6.4 Multi-tick responses to the household income question

Of 10,882 responses to the income question, 217 (around 2.0%) were initially captured as multi-ticks by electronic scanners. There was a particular problem with the data capture system in that all corrections were captured as multi-ticks. Consequently, the proportion of multi-ticks was inflated compared to the proportion in ONS' 2007 Test.

These responses were therefore manually checked and 164 (around 75.6%) were judged instances where individuals had amended their original response to a different response. Most of these corrections were cases where individuals had made it clear that their original response was an error and ticked the next income band up, e.g. an individual appeared to originally tick the '£5,200 to £10,399' category, crossed this out, and then ticked the '£10,400 to £15,599' category. Other multi-tick responses may have been due to some households assuming that a response was needed for each individual.

For the 2007 Test, in comparison, of 34,224 responses to the income level question, 56 (around 0.1%) were captured as multi-ticks. These multi-ticks were not manually checked to make judgments regarding whether they are genuine multi-ticks or corrections. If income questions were included in the 2011 Census for England and Wales it is unlikely that every captured multi-tick response to the income level question would be manually checked and corrected if necessary. Therefore, for data analysis purposes, captured genuine and corrected multi-ticks would be treated as invalid multi-tick responses.

Around 0.4% of checked responses to the 2006 Test household income question were genuine multi-ticks compared to only 0.1% of scanned responses to the 2007 Test income level question. This finding indicates that GROS' 2006 Test household income question may not be as clear as the 2007 Test income level question in clarifying the response required of individuals.

11.6.5 The effect of income question inclusion on the item response rates to other questions

Household and individual section completion ratios were devised for this analysis, whereby a household scored 100% for the household section if all household questions (excluding income) were answered; and 100% for the individual section if all individual questions were answered where appropriate to do so.

From these ratios, an overall completion ratio was calculated for each household in which all questions on the questionnaire (excluding the household income question) carried equal weight. Hence, a person who should have completed all 36 individual questions carries 4 times as much weight as the household section (9 questions excluding the income question), and just over 5 times as much weight as a person who should have completed the minimum 7 individual questions. The mean completion ratios by income question inclusion are presented in Table 11.4:

Table 11.4: *Completeness Ratios by Income Question Inclusion*

H questionnaire type	Mean household ratio	Mean individual ratio	Mean overall ratio
No income questions	96.6%	85.5%	86.8%
With income questions	96.5%	85.4%	86.8%

Note: frequencies were not reported in the original analysis

Table 11.4 shows that the presence of an income question made little or no difference to whether or not the rest of the questionnaire was completed. These findings are consistent with findings from ONS' 2007 Test whereby there was little or no difference in the number of households that passed the two-of-four rule and completed the ethnic identity and qualification questions by income question inclusion (see Table 5.1 and 5.7 for more detail). These findings are also consistent with those from the NISRAs 2007 Test.

11.6.6 Individuals' views of the questions

On the final page of GROS' 2006 Test questionnaire was a list of the questions asked with adjacent tick boxes. Individuals were asked to tick the appropriate box if they were unhappy with any question. The five questions that households were most unhappy to answer are presented in Table 11.5:

Table 11.5: *Households that were Unhappy About Answering Certain Questions on the 2006 Test Questionnaire*

Question		Households unhappy about question	
Type	Position	Frequency	Percentage
Income	Household Q.11	2,095	16.9%
Religion of upbringing	Individual Q. 18	996	4.2%
Current religion	Individual Q.17	969	4.1%
Eat together	Household Q.10	722	3.0%
Ever worked	Individual Q.22	692	2.9%

Table 11.5 shows that around 16.9% of households who returned an income questionnaire ticked the income question box and this was by far the least popular question. These households did, however, submit a valid response to the 2006 Test. Note that only around half of households received a questionnaire with an income question, the denominator for calculating the percentage of households unhappy about answering the income question was therefore around half the size of the denominator for the other questions.

The original report did not present the number of households unhappy about answering the other questions by income question inclusion.

11.7 Follow-up survey

11.7.1 Objectives

The follow-up survey asked a number of questions of a sample of individuals who were previously asked to participate in the 2006 Test. The survey had two aims:

- Ascertain the opinion of individuals on some of the questions asked in the 2006 Test.
- Check how clear these questions were.

11.7.2 Design

The follow-up survey was carried out on a smaller scale than the ONS' CTES. For part of the survey, 2006 Test respondents and non-respondents were asked some questions designed

to gauge their understanding of the household income question and their opinion on including such a question in the 2011 Census for Scotland.

399 2006 Test respondents and non-respondents participated in the follow-up survey, drawn from a list of postcodes in the South Glasgow CD only; this was a cluster sample with a deliberate bias toward ethnic minority individuals. The sample is therefore not representative of the Scottish population. Data was not provided on exactly which follow-up survey individuals were 2006 Test respondents and non-respondents. Instead, they were asked two check questions:

Check question 1. 'Do you remember receiving a Census Test form?'
319 (79.9%) said that they did 49 (12.3% said that they did not, and the remaining 31 (7.8%) were unsure.

Check question 2. If individuals said that they did remember receiving a questionnaire, they were asked: 'Did someone from this household return the form?
230 (72.1% of 319) said that someone did return the questionnaire, 57 (17.9% of 319) said that they did not think that the questionnaire had been returned and the remaining 32 (10.0% of 319) were unsure.

11.7.3 Questions asked
Selected questions of relevance to the present paper are presented below:

If individuals said 'no' or that they were unsure when asked check question 2, they were asked:
1. Do you know why it [the questionnaire] wasn't returned?
Response options: 'Junk mail', 'Voluntary', 'Refused on principle', 'Too busy', 'Not accessible', 'Other [response recorded by interviewer]'.

All individuals were asked:
2. Can I ask you, would you answer a household income question in a Census?
Response options: 'Yes', 'No', 'Not sure'.

If individuals said 'no' to question 2, they were asked:
3. Can you tell me why you wouldn't answer that question?
Response options: 'Intrusive', 'Means tested (pensioner)', 'Think information will be shared with Council/income/benefits', 'Other [response recorded by interviewer]'.

11.7.4 Findings
Note: the analysis of the questions regarding income was not divided by the 2007 Test respondent or non-respondent questions cited above.

11.7.4.1 Do you know why it [the questionnaire] was not returned?
89 individuals were asked this question of which 83 gave a reason:
- 28 (31.5%) stated that they were too busy.
- 26 (29.2%) stated that they had lost the questionnaire.
- 5 (5.6%) stated that the questionnaire was too personal or that they were concerned about disclosure or confidentiality.
- 4 (4.5%) stated that they were away on Census night.
- 4 (4.5%) stated that they treated the questionnaire as junk mail.
- 3 (3.4%) stated that they did not return the questionnaire because participation was voluntary.

None specifically cited the income question as a reason for non-response.

11.7.4.2 Can I ask you, would you answer a household income question in a Census?
399 individuals were asked this question:
- 234 (58.6%) individuals stated that they would be happy to answer an income question.
- 117 (29.3%) stated that they would not be happy about answering an income question
- 44 (11.0%) stated they did not know.

- The remaining 4 (1.0%) did not provide a response.

11.7.4.3 Can you tell me why you wouldn't answer that [income] question?
Of the 117 individuals who said that they would not be happy to answer a Census income question:
- 84 (71.8%) stated that this was because they thought an income question was too intrusive or personal.
- 7 (6.0%) stated that they found the income question too difficult to answer.
- 6 (5.1%) individuals stated that income was not an appropriate topic for a Census.
- 4 (3.4%) individuals stated that the question was not relevant to them.
- The remaining 4 (3.4%) cited concerns that the information would be shared.

11.8 Conclusions
Six findings reported in this section stand out:
- Surprisingly, there was around a 3.8 percentage point difference in overall response rates in favour of income questionnaires compared to no income questionnaires. However, a conservative multiple logistic regression analysis that controlled for the effects of the clustering of the treatment factors showed that the inclusion of the income question did not affect response rates. These findings run contrary to those reported from ONS' 2007 Test.
- Around 87.1% of households that returned income questionnaires answered the income question. This is around 3.8 percentage points lower than the 2007 Test income level question response rate.
- Around 0.4% of checked responses to the household income question were multi-ticks, compared to only 0.1% of all scanned responses to the income level question of ONS' 2007 Test and 0.2% of all scanned responses in NISRA's 2007 Test.
- There was no evidence that the inclusion of an income question negatively affected the item response rates to other questions. This is consistent with findings from ONS' and NISRAs 2007 Tests.
- Around 16.9% of households that returned an income questionnaire also expressed their unhappiness with the question. These findings are broadly consistent with findings from ONS' CTES in that many individuals identified the income questions as ones that they were unhappy to answer.
- In the follow-up survey, none of the individuals specifically cited the income question as a reason for them not returning a questionnaire. However, around 29.3% of individuals that participated in the follow-up survey said that they would not be happy about answering an income question in the 2011 Census when directly asked about it.

The results presented here indicate that the presence of a household income question did not detrimentally affect overall response rates. This conclusion is made with a degree of caution given that the 2006 Test CDs were not entirely representative of the Scottish population.

One possibility for the 2011 Census in England and Wales would be to use a household income question as used in GROS' 2006 Test, rather than individual income questions as used in the 2007 Test. This would be an especially attractive option if space on the 2011 Census questionnaire is extremely limited. However, the household income question may not be as clear as the individual income level question. Consistent with this interpretation, item response rates to the household income question were a little lower and a greater proportion of responses were invalid multi-tick responses than in ONS' and NISRA's 2007 Tests.

Research prior to the decision to include individual income questions in the 2007 Test showed that more accurate data is obtained from an individual income question compared to a household income question, and that respondents were unable or unhappy about answering the household income question on behalf of others. For more detail, see the paper: 'Developing an income question for the 2011 Census'.

12. Supplementary Q.5: What supporting evidence is available from the results of the 1999 Census Rehearsal regarding the income questions?

12.1 Introduction

The 1999 Rehearsal was designed to rehearse the procedures planned for the 2001 Census. The Rehearsal questionnaire included an income question at the end of each individual section (see Annex 2 for this question). Findings and conclusions from the 1999 Rehearsal income evaluation will therefore be informative for the 2007 Test income evaluation.

This summary presents a synopsis of the 1999 Rehearsal objectives, design, findings and conclusions pertaining to the income question. The implications for these findings for inclusion of income questions in the England and Wales 2011 Census are then discussed.

Two sets of analysis are presented:
- Overall response rates by area.
- Item response rates to the sex, ethnic identity, religion and income questions by area.

Direct comparisons are made between the 1999 Rehearsal and 2007 Test where appropriate. This summary is based on the reports: '1999 Census Rehearsal Plan GB and NI', '1999 Census Rehearsal update', '1999 Rehearsal Item Response Rates' and 'The 2001 Census of Population - White Paper'.

12.2 Objectives

The Rehearsal was planned to replicate the 2001 Census as closely as possible in order to confirm that all aspects will serve to achieve the Census Strategic aims. This is reflected in its objectives:
- To test and confirm that all the methodologies and systems proposed for the 2001 Census, in their own right and in sequence and/or parallel with relevant dependencies, will meet its strategic aims.
- To obtain final verification that the package of topics and their questions, the questionnaire, and the enumeration procedures will be acceptable to the public.
- To measure the quality of the data which can be expected as a result of enumeration and processing so that the required public statements about quality for 2001 can be formulated.
- To provide staff in the Census Offices with experience of the range of situations likely to be met in the 2001 Census operation so that they are geared up to respond constructively to its challenges.

12.3 Design

The 1999 Rehearsal took place on 25 April 1999 – participation was voluntary. Details of the sample are provided in Table 12.1:

Table 12.1: *Number of EDs and Households in the 1999 Rehearsal Sample*

Area	EDs	Approximate number of households
England	455	94,489
Bournemouth	98	19,682
Leeds	175	37,462
Lincoln	182	37,345
Wales	98	16,352
Ceredigion	46	7,806
Gwynedd	52	8,546
Scotland	N/A	22,631
Angus	N/A	8,747
Dundee City	N/A	13,884
Northern Ireland	N/A	5,822
Total for England and Wales	**553**	**110,841**
Total for United Kingdom	**N/A**	**139,294**

Note: data on the number of participating EDs in Scotland could not be found. Northern Ireland is not broken down into ED areas. Households include only those where a questionnaire was successful delivered.

12.4 Findings

12.4.1 Overall return rates

Return rates by area are presented in Table 12.2:

Table 12.2: *Return Rates by Area*

Area	Return Rate	
	Frequency	Percentage
England	48,097	50.9%
Bournemouth	9,095	46.2%
Leeds	16,586	44.3%
Lincoln	22,416	60.0%
Wales	10,182	62.3%
Ceredigion	4,677	59.9%
Gwynedd	5,505	64.4%
Scotland	12,384	54.7%
Angus	6,165	70.5%
Dundee City	6,219	44.8%
Northern Ireland	3,447	59.2%
Total for England and Wales	**58,279**	**52.6%**
Total for United Kingdom	**74,110**	**53.2%**

Table 12.2 shows that the overall return rate for England and Wales a little higher than the return rate for 2007 Test households who received income questionnaires (49.5% - see Table 4.2 for more detail). This is not unexpected given that the 2007 Test sample was selected to have a greater proportion of difficult-to-enumerate EDs than England and Wales in general (see Table 3.1 for more detail).

12.4.2 Income question item response rate

For comparison purposes, response rates to the income question are presented alongside response rates to the sex, ethnic identity and religion questions in Table 12.3:

Table 12.3: *Item Response Rates to the Sex, Ethnic Identity, Religion and Income Questions*

		Question			
Area	**Response**	**Sex**	**Ethnic Identity**	**Religion**	**Income**
Bournemouth	No response	7.6%	8.3%	9.4%	16.4%
	Invalid multi-tick response	0.1%	0.7%	0.2%	1.1%
	Valid response	92.3%	91%	90.4%	82.5%
Leeds	No response	6.1%	9.8%	12.9%	18.9%
	Invalid multi-tick response	0.1%	1.5%	0.2%	1.0%
	Valid response	93.8%	88.7%	87.0%	80.1%
Lincoln	No response	3.7%	4.9%	6.6%	13.2%
	Invalid multi-tick response	<0.1%	0.5%	0.1%	0.9%
	Valid response	96.2%	94.6%	93.3%	85.9%
Scotland	No response	4.0%	4.8%	N/A	14.6%
	Invalid multi-tick response	0.1%	0.1%	N/A	0.4%
	Valid response	96.0%	95.0%	N/A	85.0%
Northern Ireland	No response	3.5%	7.6%	15.2%	16.9%
	Invalid multi-tick response	<0.1%	0.1%	0.1%	0.9%
	Valid response	96.5%	92.3%	84.7%	82.1%

Note: Summary income question item response rates for the UK were not provided in the original paper ('1999 Rehearsal Item Response Rates'). Item response rates for the Welsh CDs could not be found. Direct comparison of individuals' responses to the questions was also not reported (see Tables 5.4, 5.8, 5.9 for examples). A religion question was not asked in the 1999 Rehearsal for Scotland.

Table 12.3 shows that, across all areas, individuals were most likely to complete the sex question followed by the ethnic identity question, followed by the religion question and finally the income question. Item response rates for the equivalent questions asked in the 2007 Test were – sex (99.3%), ethnic identity (94.2%), religion (91.8%) and income (90.9%). The 1999 Rehearsal sex question and, in particular, the income question, had consistently lower response rates than the equivalent questions asked in the 2007 Test. This is not the case for the ethnic identity and religion questions.

12.5 Decision not to include an income question in the 2001 Census

Although an income question was included in the 1999 Rehearsal, the decision was made not to include such a question in the 2001 Census because of the danger that it may negatively affect the public view of the Census which in turn may impact on:

- Cost of delivering an effective Census.
- Field operations.
- Coverage of individuals within households.
- The quality of the data obtained from an income question.
- The quality of the data obtained from the other questions.

There were also concerns regarding the clarity of the income question itself and the effect this would have on the quality of the data obtained from it. Furthermore, it was concluded that some of Census users' requirements for data on income could be satisfied by alternative data sources.

12.6 Conclusions

Two findings reported in this section stand out:

- The 52.6% overall return rate to the 1999 Rehearsal in England and Wales areas is a little higher than the 49.5% final return rate for 2007 Test households who received income questionnaires. One explanation for this is that the 2007 Test sample was weighted toward more difficult-to-enumerate areas.
- The 80.1% to 85.9% item response rates to the income question were lower than the 90.9% response rate to the 2007 Test income level question. This was not the case for the ethnic identity and religion questions.

The findings here add to the findings from the 2007 Test reported in section 5.5 that individuals were less likely to answer a questions on their income level than other questions. The implication of this finding is that there may be a higher non-response rate to questions on

income than other questions in the 2011 Census, which would compromise the quality of the income data obtained from the 2011 Census.

The concerns behind the decision not to include questions on income in the 2001 Census are similar to the concerns regarding including questions on income in the 2011 Census given the findings reported here. Findings from the 2007 Test and CTES indicate that including income questions in the 2011 Census would affect the public view of the Census, the cost of delivering an effective Census and the quality of data obtained from questions on income. Furthermore, alternative data sources may meet some of Census users' income data requirements.

13. Supplementary Q.6: What supporting evidence is available from the results of the 1997 Census Test regarding the income questions?

13.1 Introduction

The 1997 Test was a voluntary survey designed to test innovations to the Census design in preparation for the 2001 Census. One such innovation was the inclusion of a question on income at the end of each individual section (see Annex 10 for this question). Just like the 2007 Test, around half of households received a questionnaire with an income question and the remainder did not. Findings and conclusions from the 1997 Test income evaluation will therefore be very informative for the 2007 Test income evaluation.

This summary presents a synopsis of the 1997 Test objectives, design and findings pertaining to the income question. The implications for these findings for inclusion of income questions in the England and Wales 2011 Census are then discussed.

Five sets of analysis are presented:

- Design 1 overall response rates by income question inclusion, questionnaire collection method and ethnic identity question type.
- Design 2 overall response rates by income question inclusion, collection method and questionnaire style.
- Design 3 overall response rates by income question inclusion and questionnaire delivery and collection method.
- Design 1 and 2 overall response rates by income question inclusion and Census District (CD).
- Sex, ethnic identity, religion, qualifications and Income question answer rates.

Direct comparisons are made between the 1997 and 2007 Tests where appropriate. If findings from the income analysis of the 2007 Test and 1997 Test correspond, this will demonstrate the reliability of findings from the 2007 Test and further justify any conclusions or recommendations based on these findings. On the other hand, if the findings do not correspond, this will need to be taken into account.

This summary is based on the reports: 'Statistical Evaluation of the 1997 Test' and 'Evaluation of the main objectives of 1997 GB Census Test'.

13.2 Objectives

The 1997 Test tested four modifications to the Census design:

1. Inclusion of an income question of which there were two variations:

- Income question.
- No income question.

2. Delivery and collection method of which there were three variations:

- Hand-delivery and hand-collection (standard method used in the 1991 and 2001 Censuses).
- Hand-delivery and post-back (used in the 2001 Census and 2007 Test).
- Post-out and post-back (used in the 2007 Test).

3. Questionnaire style of which there were two variations:

- Matrix style (standard method used in the 1991 Census).
- Pages-per-person style (used in the 2001 Census and 2007 Test).

4. Inclusion of an ethnic identity question of which there were two variations

- Ancestry wording question type.
- Minimum change wording question type.

13.3 Design

The 1997 Test took place on the 15 June 1997 – participation was voluntary. Around 97,000 households from 509 EDs were selected from the 12 CDs presented in Table 13.1:

Table 13.1: *1997 Test Census Districts*

Census District type	Census District
Inner London	Brent A and Brent B
Inner City	Birmingham A and Birmingham B Glasgow A and Glasgow B
Mainstream	Thame and Alton
Remote/rural	Bridlington and Craven South-West Argyle A and South-West Argyle B

Each CD pair in Table 13.1 (e.g., Brent A and Brent B) were matched for number of different types of households, number of elderly and student residents, tenure of households and unemployment rates by sex.

The 1997 Test was essentially three split-plot survey designs that together formed an unbalanced survey design. Findings pertaining to the inclusion of the income question are presented for each split-plot design and then from the combined data from two of the survey designs. For the purposes of this paper, it is necessary to summarise findings pertaining to the inclusion of the income question for each split-plot design and the combined data because the findings between the separate and combined analysis differ.

The delivery and collection methods used were balanced by CD according to the pairing presented in Table 13.1 for each survey design. The questionnaire style, ethnicity question type and income question inclusion variables were balanced by CD and ED for each survey design.

13.3.1 Design 1

Design 1 was used in the English inner city CDs: Birmingham and Brent. The questionnaire style was held constant: all households received pages-per-person questionnaires. Analysis of overall response rates by collection method, ethnic identity question type and inclusion of the income question were undertaken. A summary of the design is presented in Table 13.2:

Table 13.2: *Design 1*

CD	Collect method (varied by CD)	Style	Ethnic question (varied by ED)	Income question (varied by ED)
Birmingham A	Hand-collection	Pages-per-person	Minimum change and ancestry	No income and income
Birmingham B	Post-back	Pages-per-person	Minimum change and ancestry	No income and income
Brent A	Hand-collection	Pages-per-person	Minimum change and ancestry	No income and income
Brent B	Post-back	Pages-per-person	Minimum change and ancestry	No income and income

13.3.2 Design 2

Design 2 was used in the English mainstream (Thame and Alton), English rural (Bridlington and Craven) and Scottish inner-city (Glasgow) CDs. The ethnic identity question was held constant: all households were asked the minimum change ethnic identity question. Analysis of response rates by collection method, questionnaire style and inclusion of the income question were undertaken. A summary of the design is presented in Table 13.3:

Table 13.3: *Design 2*

CD	Collect method (varied by CD)	Style (varied by ED)	Ethnic question	Income question (varied by ED)
Glasgow B	Hand-collection	Pages-per-person and matrix	Minimum change	No income and income
Glasgow A	Post-back	Pages-per-person and matrix	Minimum change	No income and income
Thame	Hand-collection	Pages-per-person and matrix	Minimum change	No income and income
Alton	Post-back	Pages-per-person and matrix	Minimum change	No income and income
Bridlington	Hand-collection	Pages-per-person and matrix	Minimum change	No income and income
Craven	Post-back	Pages-per-person and matrix	Minimum change	No income and income

13.3.3 Design 3

Design 3 was used in the Scottish rural CDs: South-West Argyle A and B. The questionnaire style was held constant: all households received matrix questionnaires. The ethnic identity question was also held constant: all households were asked the minimum change question. Analysis of response rates by delivery and collection method and inclusion of the income question were undertaken. A summary of the design is presented in Table 13.4:

Table 13.4: *Design 3*

CD	Deliver and collect method (varied by CD)	Style	Ethnic question	Income question (varied by ED)
South-West Argyle A	Hand-delivery and hand-collection	Matrix	Minimum change	No income and income
South-West Argyle B	Post-out and post-back	Matrix	Minimum change	No income and income

13.4 Four-of-four overall response rate rule

To qualify as a valid returned questionnaire, questionnaires had to pass a 'four-of-four rule' whereby at least one individual on the questionnaire had to provide responses to the name, sex, date of birth and marital status questions. This criterion is a little more stringent than the two-of-four rule used for the 2007 Test.

13.5 findings

13.5.1 Design 1 income question findings

The overall response rates for design 1 by CD, collection method, ethnic identity question type and income question inclusion are presented in Table 13.5:

Table 13.5: *Design 1 Overall Response Rates*

CD	Collect method	Ethnic identity question type			
		Ancestral origin		Minimum change	
		No income	Income	No Income	Income
Birmingham A	Hand-collection	57.8%	44.7%	43.5%	47.1%
Birmingham B	Post-back	41.7%	39.7%	40.9%	45.3%
Brent A	Hand-collection	51.8%	45.3%	55.7%	50.1%
Brent B	Post-back	31.9%	26.5%	29.1%	26.6%
Total		**45.3%**	**38.2%**	**40.5%**	**40.1%**

Note: frequencies were not reported in the original analysis. Therefore, the frequencies could not be provided for the purposes of this paper; and the CD, collection method and ethnic identity question type variables could not be collapsed.

Table 13.5 shows that, for ancestral origin questionnaires, income questionnaires had around a 7.1 percentage point lower response rate than no income questionnaires overall. This difference was evident across all CDs. For minimum change questionnaires, income questionnaires had only around a 0.4 percentage point lower response rate than no income questionnaires. This difference was not evident across all CDs.

A mixed four-way ANOVA was applied to the response rates by CD, with CD and collection method as between-group factors and ethnic question type and income question inclusion as within-group factors. This revealed no main effect of income question inclusion, F (1,9) = 3.2, p = .107 and no interaction between ethnic question type and income question inclusion, F (1.9) = 3.15, p = .11. The statistical significance of the two-way interactions between income question inclusion and CD and income question inclusion and collection method were not reported.

Although there was a tendency for lower response rates for income questionnaires this was not statistically significant.

13.5.2 Design 2 income question findings

The overall response rates for design 2 by CD, collection method, questionnaire style type and income question inclusion are presented in Table 13.6:

Table 13.6: *Design 2 Overall Response Rates*

CD	Collect method	H Questionnaire type			
		Matrix		Pages-per-person	
		No income	Income	No Income	Income
Glasgow B	Hand-collection	53.9%	55.4%	56.4%	48.3%
Glasgow A	Post-back	48.8%	49.1%	55.3%	54.9%
Thame	Hand-collection	77.4%	77.9%	79.1%	76.5%
Alton	Post-back	72.2%	69.1%	71.3%	71.4%
Bridlington	Hand-collection	70.1%	64.4%	65.7%	66.8%
Craven	Post-back	69.2%	73.2%	69.3%	65.5%

Note: frequencies are not reported in the original analysis and therefore could not be reproduced here.
Total percentages were not reported.

Table 13.6 shows that there were inconsistent differences between income and no income questionnaires but no robust trends are evident. Surprisingly, the difference between response rates for income and no income questionnaires was not consistently evident across a single area.

A mixed four-way ANOVA was applied to the response rates by CD, with CD and collection method as between-group factors and questionnaire style type and income question inclusion as within-group factors. This revealed no main effect of income question inclusion, F (1,15) = 1.4, p = .256 and no interaction between questionnaire style type and income question inclusion, F (1,15) <1. The statistical significance of the two-way interactions between income question inclusion and CD and income question inclusion and collection method were not reported.

13.5.3 Design 3 income question findings

The overall response rates for design 3 by CD, delivery and collection method and income question inclusion are presented in Table 13.7:

Table 13.7: *Design 3 Overall Response Rates*

CD	Deliver and Collect method	Income question inclusion	
		No income	Income
South-West Argyle A	Hand-delivery and hand-collection	79.6%	83.5%
South-West Argyle B	Post-out and post-back	52.6%	46.8%

Note: frequencies are not reported in the original analysis and therefore could not be reproduced here.

Table 13.7 shows that response rates do not appear to vary by income question inclusion in a consistent direction. No inferential statistical analysis was reported.

13.5.4 Combined design income question findings

In the final analysis, data from design 1 and 2 are combined and the response rates by CD and income question inclusion are presented in Table 13.8:

Table 13.8: *Design 1 and 2 Overall Response Rates*

CD	Income question inclusion					
	No income			Income		
	Delivered	Response	Response rate	Delivered	Response	Response rate
Birmingham A	4,043	2,047	50.6%	4,084	1,871	45.8%
Birmingham B	4,244	1,753	41.3%	5,177	2,195	42.4%
Brent A	3,629	1,948	53.7%	3,595	1,715	47.7%
Brent B	5,189	1,575	30.4%	5,948	1,581	26.6%
Glasgow A	3,562	1,853	52.0%	3,554	1,845	51.9%
Glasgow B	1,688	931	55.2%	1,690	873	51.7%
Thame	4,391	3,434	78.2%	4,526	3,492	77.7%
Alton	6,438	4,619	71.7%	6,407	4,505	70.3%
Bridlington	3,250	2,207	67.9%	3,361	2,204	65.6%
Craven	4,932	3,416	69.3%	4,752	3,293	69.3%
Total	**41,366**	**23,783**	**57.5%**	**43,094**	**23,574**	**54.7%**

Table 13.8 shows that there was around a 2.8 percentage point overall difference in response rates in favour of no income questionnaires. This difference was evident in all CDs except Birmingham B and Craven. The equivalent difference for the 2007 Test was 2.7 percentage points in favour of no income questionnaires.

A mixed three-way ANOVA was applied to the response rates by CD, with CD and collection method as between-group factors and income question inclusion as a within-group factor. This revealed a main effect of income question whereby no income question questionnaires had higher response rates than income questionnaires, F (1,29) = 4.43, p = .044. The questionnaire style type and ethnic identity question type factors were collapsed for this analysis. It is therefore unclear if the income main effect would be statistically significant if these factors were included.

13.6 The effect of income question inclusion on the answer rates to other questions

A questionnaire completion ratio, equivalent to that used for GROS' 2006 Test (see section 11.6.5), was calculated as the total number of questions answered on the questionnaire as a proportion of the total number of answers required. Income questionnaires had a completion ratio of 79.3% and no income questionnaires 79.2%. There was therefore no evidence that the inclusion of an income question affected the answer rates to the other questions. These findings are consistent with those from the 2007 and 2006 Tests (see Table 5.1 and 5.7, section 10.4.3 and Table 11.4 for more detail).

13.7 Income question answer rate

For comparison purposes, 'answer rates' to the income question are presented alongside answer rates to the sex, ethnic identity, religion and qualifications questions in Table 13.9. Answer rates include valid and invalid multi-tick responses (the original paper, 'Evaluation of the main objectives of the 1997 GB Census Test' only presented answer rates).

Table 13.9: *Answer Rates to the Sex, Ethnic Identity, Religion, Qualifications and Income Questions*

	Question				
Response	**Sex**	**Ethnic Identity**	**Religion**	**Quals**	**Income**
No response	6.1%	7.8%	8.4%	15.1%	22.0%
Response	93.9%	92.2%	91.6%	84.9%	78.0%

Note: quals = qualifications.

Table 13.9 shows that, across all areas, individuals were most likely to complete the sex question followed by the ethnic identity question, followed by the religion question, the qualifications question and finally the income question. Item response rates for the equivalent questions asked in the 2007 Test were – sex (99.3%), ethnic identity (94.2%), religion (91.8%), qualifications (91%) and income level (90.9%). Apart from the religion question, all 1997 Test questions had lower answer rates than the equivalent questions asked in the 2007 Test. The biggest difference was for the income question.

13.8 Conclusions

Six findings reported in this section stand out:

- There was around a 2.8 percentage point difference in overall response rates in favour of no income questionnaires compared to income questionnaires. The equivalent difference for the 2007 Test was 2.7 percentage points.
- The 1997 Test difference above was not robust: it was not consistently evident across CD, delivery and collection method, questionnaire style type or ethnic identity question type.
- The combined analysis of overall response rates by the inclusion of an income question just reached statistical significance when the questionnaire style and ethnic identity question factors were collapsed.
- There was no significant difference in overall response rates by income question inclusion for designs 1, 2 and 3.
- There was no evidence that the inclusion of an income question negatively affected the answer rates to other questions. This is consistent with findings from ONS' and NISRAs 2007 Tests and GROS' 2006 Test.
- The answer rate to the income question was only 78.0% - much lower than the 90.9% item response rate for the 2007 Test income level question. .

The conclusion to be drawn from these findings is that there is a difference in overall response rates by income question inclusion, but this difference is small and not robust.

The difference was marginally statistically significant in one analysis, whereas a similar difference in overall response rates for the 2007 Test by income question was highly significant. One explanation for this difference is that the 1997 Test income analysis lacked sufficient statistical power to detect a 'true' difference and therefore the non-significant differences are possibly Type II errors (reporting that there is no significant difference when in matter of fact there is a difference).

14. Overall conclusions

14.1 Introduction

The inclusion of income questions in the 2007 Census Test was a successful enterprise insofar as it has provided data that can contribute toward an informed decision regarding whether to include such questions in the 2011 Census.

This section summarises the case for including questions on income in the 2011 Census. Where appropriate, findings from the 2007 Test are discussed and comparisons are drawn with findings from NISRAs 2007 Test, GROS' 2006 Test, the 1999 Rehearsal and the 1997 Test. The degree to which alternative sources could meet Census users' requirements for income data is then discussed. Finally, it is concluded that income questions should not be included in the 2011 Census and the main reasons behind this recommendation are summarised.

14.2 Summary of the case that income questions should be included in the 2011 Census

Data from income questions asked in the 2011 Census would be of undoubted value to Census users; indeed, this value is what has driven the demand for such questions. Some of the findings reported here can be interpreted as being in support for the case for including income questions in the 2011 Census, as summarised below. However, there are notable caveats to these interpretations, which are also discussed.

14.2.1 Income level question item response rates

Around 90.9% of individuals who submitted valid responses to the 2007 Test also completed the income level question. This item response rate appears to be acceptably high given that this question was the last question asked on a four-pages-per-person voluntary questionnaire. An income question located earlier on the compulsory 2011 Census questionnaire would likely have a higher response rate.

This finding is consistent with the 89.6% income level question response rate found in NISRAs 2007 Test; and the 87.1% household income question response rate found in GROS' 2006 Test in Scotland. However, income question response rates in the 1999 Rehearsal (80.1 to 85.9% by area) and answer rates in the 1997 Test (78.0%) were lower. This improvement in response rates over time could reflect improvements in the clarity of the questions asked. Nevertheless, these findings highlight the potential risk that response rates to the income questions asked in the 2011 Census could be lower than expected based solely on findings from the 2007 Tests and 2006 Test.

The frequency of invalid multi-tick responses to the income level question (0.1% of all responses) is acceptably low and provides some indication that the vast majority of individuals did not find this question difficult to answer. Also consistent with this interpretation, in the CTES only 2.3% of individuals who had returned income questionnaires stated that they found at least one of the income questions difficult to answer. None of the non-respondents stated that the reason they did not return a questionnaire was because the income questions were difficult to answer. Similarly, in NISRAs CTES, 2007 Test respondents indicated that they did not find the income questions difficult to answer relative to other questions; and in GROS' follow-up survey, only 6.0% of individuals stated that they would not complete the household income question because it was difficult to answer.

However, there is strong evidence that the income questions were difficult to answer. The income level question had one of the lowest item response rates of all the questions asked on the questionnaire. Only the schoolchild/student (89.6%) and long-term illness and disability (84.6%) questions had lower item response rates. Moreover, there was evidence that certain population groups were less likely to answer the income question (see section 14.3.2 for more detail) and the test-retest reliability of the income level question was poor (see section 14.3.3).

Individuals also appeared to experience difficulty in following the routing instructions to the income questions with around 5.1% of children aged under 16 and 26.0% of students living elsewhere during their term time *incorrectly* answering these questions. Although these individuals can be excluded at the data analysis stage so long as they provide details concerning their age and where they live during their term time respectively, it is possible that the routing instructions increased the response burden on all individuals and therefore may have resulted in them not returning their questionnaires, not completing questions or completing questions incorrectly. Further research on the routing instructions is needed, particularly if income questions are included in the 2011 Census.

The lower item response rate to GROS' household income question (87.1%) and the greater incidence of multi-tick responses (0.4% of all responses) indicate that it does not offer a feasible compromise between including individual income questions or not in the 2011 Census for England and Wales.

14.2.2 The effect of the income questions on the item response rates to other questions

There was no difference in the proportion of income and no income questionnaires that qualified as valid responses from the questionnaires returned. Phrased another way – there was no difference in item response rates to the name, sex, age and marital status questions by income question inclusion. There was also no difference in item response rates to the ethnic identity and qualifications question by income question inclusion.

These findings are consistent with findings from NISRAs 2007 Test, GROS' 2006 Test and the 1997 Test in that questionnaire completion did not vary by income question inclusion.

The implication of these findings is that including income questions would *probably not* negatively affect the quality of the data provided by other questions. However, even if this possibility is very unlikely, the impact it would have on the success of the 2011 Census requires consideration.

14.2.3 Predictive validity of the income level question

The income level question appears to have predictive validity insofar as income levels significantly varied by demographic variables in the expected manner; income varied by sex, age, ethnic identity, education level, employment status and geography at the LA level. These findings are consistent with those from NISRAs 2007 Test and findings from other surveys that have used questions on income.

14.2.4 I questionnaire requests

There was no difference in the total number of income and no income I questionnaires requested nor in the proportion of income and no income I questionnaires returned that had been completed for privacy reasons. However, only 21 I questionnaires were definitely completed for privacy reasons, which is too small a number to draw firm conclusions.

The implication of these findings is that if income questions were included in the 2011 Census there would not be a greater demand for I questionnaires for privacy reasons, which would have incurred greater cost in printing and delivery. However, an important finding is that that was a statistically significant 13.0 percentage point difference in the proportion of requested income and no income I questionnaires that were returned. This indicates that individuals concerned about the confidentiality of their income did not return a 2007 Test questionnaire at all. Evidence of the 'true' potential demand for I questionnaires for privacy reasons in the 2011 Census if income questions were included may be masked. Consistent with this interpretation, in NISRAs 2007 Test more income I questionnaires were requested for confidentiality purposes than no income questionnaires.

14.2.5 Contact Centre telephone queries

Many individuals may have telephoned the Contact Centre to express concerns about the income questions or state their refusal to participate in the 2007 Test because of the income questions, but this was not the case. Only around 0.5% of telephone queries made were

regarding the income questions and more than half of these were from individuals asking for help in completing them.

These findings are broadly consistent with the notes made by delivery and follow-up enumerators in their observation books during their field activities and the minutes of debriefing meetings. In both cases, few references to the income questions were made.

However, media coverage of the 2011 Census will be much greater than for the 2007 Test. If sections of the media take a negative stance in their view of income questions in the 2011 Census this may result in a greater proportion of telephone queries regarding the income question if they are included.

14.2.6 Individuals' reasons for not participating in the 2007 Test

When a sample of 2007 Test non-respondents were asked why they didn't complete the 2007 Test questionnaire in the CTES, only around 1.8% said it was because they were unhappy about the income questions. This indicates that the inclusion of income questions would not have a substantial detrimental affect on overall response rates. However, more individuals may have cited the income questions as a reason for non-response had they been directly asked about the income questions.

Consistent with this interpretation are findings from GROS' follow-up survey. When 2006 Test non-respondents were asked if they know why the questionnaire was not returned, none specifically identified the income question. In contrast, when respondents and non-respondents were asked if they would be happy to answer an income question in the [2011] Census, 29.3% stated that they would not.

14.2.7 Coverage of individuals within households

It may have been the case that the inclusion of income questions had a negative impact on the coverage of individuals within households. Households may have returned completed questionnaires with details of individuals who wished to participate, but no details of individuals who did not wish to participate because of the income questions who were therefore essentially 'missing'. This was not the case. Using the CTES data on individuals as a base, it was estimated that around 3.3% of individuals were missing from no income 2007 Test questionnaires and around 2.1% were missing from income questionnaires.

14.3 Summary of the case that income questions should not be included in the 2011 Census

Some of the findings reported here can be interpreted as against the case for including income questions in the 2011 Census, as summarised below.

14.3.1 Overall response rates

The overall response rate was 53.3% for questionnaires with no income questions and 50.6% for questionnaires with income questions - a statistically significant difference of 2.7 percentage points.

These findings are consistent with those reported from the 1997 Test, whereby the overall response rate was 57.5% for questionnaires with no income question and 54.7% for questionnaires with an income question - a difference of 2.8 percentage points. Also consistent with these findings, for the 2007 Test a lower proportion of requested income I questionnaires were returned than no income I questionnaires (41.7% versus 54.7% respectively).

For NISRAs 2007 Test, there was a 2.6 percentage point difference in response rates in favour of no income questionnaires, but this difference was not statistically significant. One plausible explanation of this finding is that, possibly like the separate designs of the 1997 Test, the analysis lacked sufficient statistical power to detect a 'true' difference, and therefore the non-significant differences are Type II errors. Consistent with this interpretation, the sample of households in NISRAs Test was much smaller than in ONS' Test (12,919 households versus around 100,000 households); and NISRAs sample was stratified by a difficult-to-enumerate measure comprising 12 levels compared to just 5 for ONS' sample.

For GROS' 2006 Test there was a 3.8 percentage point difference in response rates in favour of income questionnaires, but this difference was not statistically significant in a conservative logistic regression analysis (see section 11.6.2). These findings indicate that the inclusion of an income question on the Census questionnaire would not depress response in some of the most difficult areas to survey in Scotland, though the limitations of the design make it difficult to generalise from this to the whole country.

14.3.2 Non-response bias in responses to the income level question

The following population groups tended to report that they had low income and were less likely to complete the income level question (non-response rates in brackets):

- Females (9.6%).
- Individuals 16 to 20 (26.5%) and over 65 years of age (13.6%).
- Individuals from Mixed (14.5%), Asian or Asian British (11.8%) and Black or Black British (14.0%) ethnic minority backgrounds.
- Individuals who do not have at least 5 O-levels, an NVQ level 2, foreign qualifications or professional qualifications (6.1% to 9.3% depending on education level group).
- Unemployed individuals (9.8%).
- LAs identified as generally low income areas: Liverpool (9.3%) and Stoke on Trent (11.1%).

These non-response biases reduce the effectiveness of the income level question as a measure of deprivation, which is the main rationale for including such a question in the 2011 Census.

One explanation for these non-response biases is that individuals with no income may be more prevalent in these groups. Individuals with no income may not have answered the income level question because they assumed that the question was not applicable to them, even though on close inspection there is a 'Nil or Loss' response option. Consistent with this interpretation, 9.8% of unemployed individuals did not answer the income level question compared to only 3.0% of employed individuals. Another possibility is that it was more difficult for individuals with low income to calculate their income because it tends to be more variable, because of periods of temporary employment for example.

In the Census Statistics Offices' (CSOs) 2004 Census Pilot in the Republic of Ireland, around half of households received questionnaires that included an income question and the remainder received questionnaires with no income question. Across all areas, there was only a 1.5% difference in overall response rates in favour of no income questionnaires; but in post-back areas, this difference rose to 3.5%. Crucially, there was evidence of substantial non-response bias to the income question. The answer rate in non-deprived areas was 73.4%, compared to 61.8% in deprived areas. This bias, along with the availability of alternative sources of income data for Republic of Ireland Census users and the possibility of a potentially adverse public reaction were the main reasons behind the decision not to include a question on income in the 2006 Census for the Republic of Ireland. For more detail, see the paper: 'Report of 2004 Census Pilot Survey', and see Annex 11 for the 2004 Pilot income question. .

14.3.3 Reliability of the data obtained from the income questions

A sample of 2007 Test respondents participated in the CTES in which they were asked an equivalent income level question. Responses between the 2007 Test and the CTES matched in only 66.8% of cases in a favourable comparison that corrected the CTES responses of individuals who gave net income or a mixture of net and gross income if they were one income band below the 2007 Test response.

This figure only partially meets the 2011 Census data quality critical success factor. The response correspondence is above the 60% mandatory requirement. However, it falls way short of the 95% response correspondence required for 70% of questions asked. Moreover, the response correspondence of the two lowest income level bands - both at 40.0% - fall way short of the 60% mandatory requirement, possibly indicating that the income level question may not be an effective measure of deprivation – consistent with evidence of non-response bias to the question summarised in section 14.3.2. For more detail, see the paper, '2011

Census - Critical Success Factors.' The relatively low test-retest reliability, particularly for the lowest income bands which are of primary interest, raise serious concerns regarding the quality of the data collected and its utility for Census users.

These findings are consistent with those from NISRAs CTES in which responses between the 2007 Test and CTES income level question matched in only 49.5% of cases, whereas the mean level of correspondence on all the questions asked in the 2007 Test and CTES was 85.9%.

14.3.4 Public view of the income questions

There were several lines of evidence that individuals who submitted valid responses had concerns about the income questions. Of individuals that did not answer the income level question, 90.0% answered the ethnic identity question and 57.3% answered the qualifications question. One plausible explanation of this finding is that, after seeing the income questions, they judged that they were intrusive and chose not to answer them.

Consistent with this interpretation, for the CTES, 8.9% of 2007 Test respondents who had returned income questionnaires stated that they were unhappy about answering at least one of the income questions. Individuals identified the income level question as one they are unhappy to answer more than any other question. Similarly, 4.8% of 2007 Test respondents in NISRAs CTES indicated that they were unhappy about answering the income questions. In the 'your views' section of the GROS' 2006 Test questionnaire 17.3% responded that they were unhappy about answering the income question – more than for any other question. In GROS' follow-up survey, 29.3% of 2006 Test respondents and non-respondents stated that they would not be willing to answer a question on their income.

If income questions were included in the 2011 Census, further research would need to be undertaken to ascertain why many individuals are unhappy about answering such questions, and what can be done to address this problem.

14.3.5 Publicity regarding the income questions

Many national Newspapers took a negative stance in their reporting of the inclusion of income questions in the 2007 Test and proposals to include such questions in the 2011 Census. There will undoubtedly be increased media interest and coverage for the 2011 Census than the 2007 Test, so any effect of the media on the public view could be compounded.

14.4 Recommendations

ONS' 2007 Test, NISRAs 2007 Test, GROS' 2006 Test, the 1999 Rehearsal and the 1997 Test were all voluntary sample surveys whereas the 2011 Census will be a compulsory survey of the entire UK population. To a certain degree, this fact unavoidably impinges on the extent to which reliable and valid implications for the 2011 Census can be drawn from the findings reported here. However, we have attempted, through modelling (following advice from the National Statistics Methodology Advisory Committee) to predict the likely effects on the overall Census response rate in England and Wales. We have also presented a variety of direct evidence from the tests of public attitudes to these potential Census questions.

Overall, the findings indicate that income questions would be difficult to answer in the 2011 Census – which would affect the quality of data obtained. There are numerous reasons why the income questions are difficult to answer, for example:

- Judging whether a response to income questions are required based on personal circumstances.
- Distinguishing between net and gross income.
- Distinguishing between separate and joint income.
- Taking account of all sources of income in calculating income level.
- Calculating income only over the period of time specified in the question.
- Judging who is the recipient of certain kinds of income, such as child benefit.
- Calculating income on behalf of others.

The findings also collectively indicate that many individuals are unhappy to answer questions on their income because they deem them intrusive.

On balance, findings from the 2007 Test have highlighted serious concerns that raise questions regarding whether to include questions on income in the 2011 Census.

If income questions were included, to build on the substantial research already undertaken, further research would need to ascertain how to make the questions clearer, more acceptable to the public and provide more reliable data. The fact that the questions are difficult for individuals to answer and that at least some Census income data would be collected by proxy indicate that the Census may not be the best method to collect data on income. The IHS or model-based income estimates produced by ONS should be able to meet at least some of Census users' requirements for data on income. These sources could provide information on a more frequent basis than the Census, and, like the Census, data would be available at various levels of geography.

Taking full account of the limitations of generalising the findings from the 2007 Test to the population of England and Wales, the strength of Census users' requirements for income questions in comparison to other questions and the availability of alternative sources of income data, it is recommended that questions on income should not be included in the 2011 Census for England and Wales.

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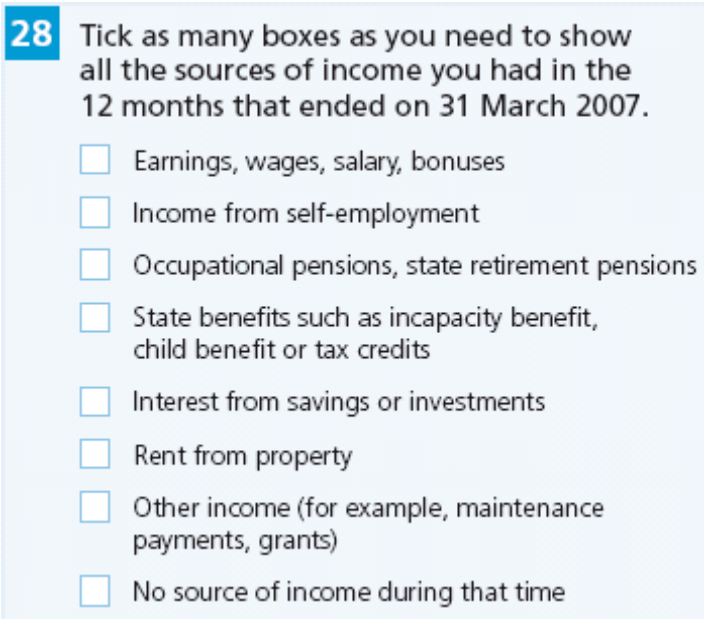
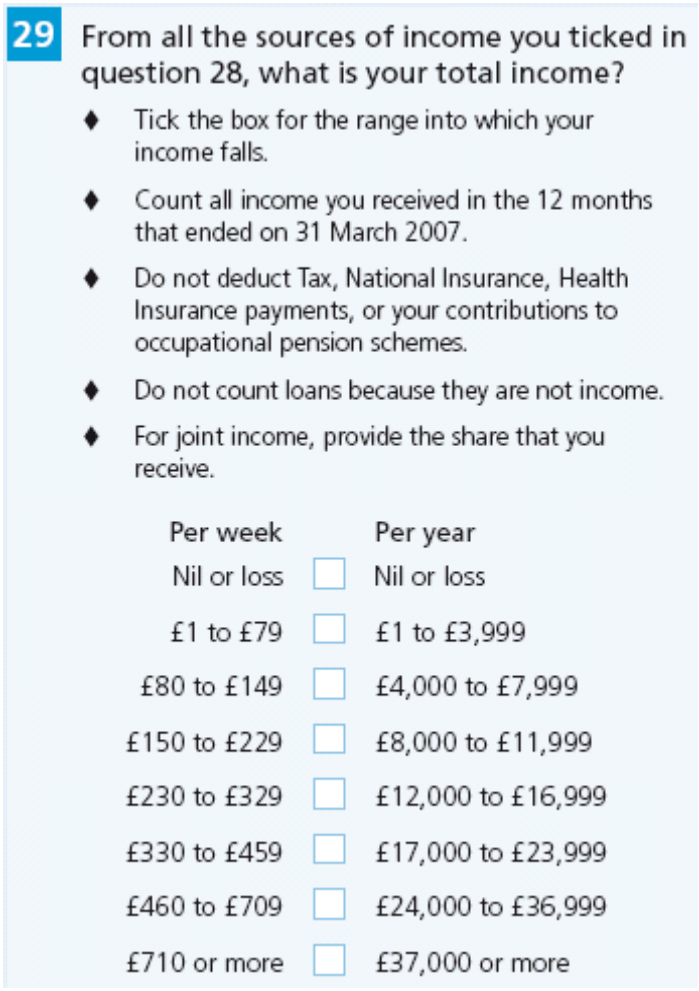
Annex 1 - 2007 Census Test and CTES Income Sources and Level Questions

A.1.1 Income sources question



A.1.2 Income level question



29 From all the sources of income you ticked in question 28, what is your total income?

- Tick the box for the range into which your income falls.
- Count all income you received in the 12 months that ended on 31 March 2007.
- Do not deduct Tax, National Insurance, Health Insurance payments, or your contributions to occupational pension schemes.
- Do not count loans because they are not income.
- For joint income, provide the share that you receive.

Per week		Per year
Nil or loss	☐	Nil or loss
£1 to £79	☐	£1 to £3,999
£80 to £149	☐	£4,000 to £7,999
£150 to £229	☐	£8,000 to £11,999
£230 to £329	☐	£12,000 to £16,999
£330 to £459	☐	£17,000 to £23,999
£460 to £709	☐	£24,000 to £36,999
£710 or more	☐	£37,000 or more

A.1.3 Check question (CTES only)

Can I just check, did you give gross income or net income?
1.Gross. 2.Net. 3.Mixed/both. 4.Not sure. 5.What is difference between gross and net income? 6.Difficult to separate. 7.Refusal. 8.Don't know.

Annex 2 - Income Question used in the 1999 Census Rehearsal

What is your total current gross income from all sources?

- *Do not deduct* Tax, National Insurance, Superannuation or Health Insurance payments
- *Count all income* including:
  - Earnings
  - Pensions
  - Benefits
  - Interest from savings or investments
  - Rent from property
  - Other (for example, maintenance payments, grants)

Per week	**or**	**Per year (approximately)**
Nil	☐	Nil
Less than £60	☐	Less than £3,000
£60 to £119	☐	£3,000 to £5,999
£120 to £199	☐	£6,000 to £9,999
£200 to £299	☐	£10,000 to £14,999
£300 to £479	☐	£15,000 to £24,999
£480 or more	☐	£25,000 or more

Annex 3 - Income Question used in GROS' 2006 Census Test

What is your household's total income from all sources?

- √ the box for the range into which your income falls. Count all income

Do not deduct:

- Taxes
- National insurance contributions
- Superannuation payments
- Health insurance payments

Per week	**or**	**Per year (approximately)**
Nil	☐	Nil
Up to £99	☐	Up to £5,199
£100 to £199	☐	£5,200 to £10,399
£200 to £299	☐	£10,400 to £15,599
£300 to £399	☐	£15,600 to £20,799
£400 to £499	☐	£20,800 to £25,999
£500 to £599	☐	£26,000 to £31.999
£600 to £999	☐	£31,200 to £51,999
£1000 or more	☐	£52,000 or more

Annex 4 - Definition of the Return and Response Rate for the 2007 Test

A.4.1 Definition

The response rate is the proportion of returned questionnaires out of the number of questionnaires delivered.

Numerator: For a questionnaire to be part of the numerator, it had to:

- Be included as part of the analysis i.e. the questionnaire considered for that household and have a valid status (see cases below).
- Have a check-in time - this indicates that the questionnaire has been returned.
- Pass the two-of-four rule - where at least one person on the questionnaire must have answered two out of four key demographic person questions:

1) Name (valid response = any response in the first and second name boxes).
2) Sex (any response valid).
3) Date of Birth (For households - valid response = any response in the day and month columns and the year is between '1895' and '2007') (For individuals – valid response = any response in the day and month columns and the year is between '1895' and '2007' or between '00' and '99' excluding '19 'and '20' .
4) Marital Status (any response valid).

Note: The return rate numerator excluded the two-of-four rule.

Denominator: For a questionnaire to be considered part of the denominator, it has to be:

- Included as part of the analysis i.e. the questionnaire considered for that household and have a valid status (see cases below).

A.4.2 Cases

Cases (Questionnaires) included

The definition was based on the available data. Only **one** questionnaire per household was considered in the rate. The cases for analysis were chosen based on an order of priority:

- Valid return over non-valid return.
- Household questionnaire over Individual questionnaire.
- Returned questionnaire over non-returned questionnaire.

Cases removed

- Questionnaires relating to new households identified during enumeration are excluded from the analysis.
- The Operational Intelligence System 'deactivated' some cases. A case was included or excluded in the response rate analysis depending on the reason for its 'deactivation'.

Reason for Deactivation	Include/Excluded from analysis
Reasons reported by Field Staff or Contact Centre	
Address Split (container/parent address not required)	Excluded
Building Demolished or Not Yet Built	Excluded - both
Communal Establishment or Non Residential	Excluded - both
Couldn't Find	Excluded
In Transit	Included
Manual	Excluded (ambiguous)
Not in Test Area	Excluded
Questionnaire Damaged (Contact Centre or Field)	Excluded – both
Reasons reported by Royal Mail	
Addressee Gone Away or Unknown	Excluded – both
Address Inaccessible	Excluded

▪ Address Incomplete or No Such Address	Excluded – both
▪ No Answer	Included
▪ Not Called For	Included
▪ No Postal Service Provider Information Provided	Excluded
▪ Refused	Included

Annex 5 - Further Analysis of the Income Level Question

Table A.5.1: *Income Level by Sex*

	Sex			
Income Per Year	**Male**		**Female**	
	Freq	**Perc**	**Freq**	**Perc**
No response	**1,410**	**8.0%**	**1,894**	**9.6%**
Multi-tick response	**24**	**0.1%**	**32**	**0.2%**
Valid response	**16,087**	**91.8%**	**17,958**	**90.3%**
Nil or loss	561	3%	890	5%
£1 to £3,999	1,196	7%	2,619	13%
£4,000 to £7,999	2,665	15%	4,730	24%
£8,000 to £11,999	2,573	15%	3,114	16%
£12,000 to £16,999	2,484	14%	2,136	11%
£17,000 to £23,999	2,132	12%	1,675	8%
£24,000 to £36,999	2,052	12%	1,599	8%
£37,000 or more	2,424	14%	1,195	6%
Total	**17,521**	**47%**	**19,884**	**53%**

Note: total = 37,405. 239 individuals were excluded from the analysis: 215 did not answer the sex question and 24 multi-ticked this question.

Table A.5.2: *Income Level by Age*

	Age group										
Income Per Year	**16-20**	**21-25**	**26-30**	**31-35**	**36-40**	**41-45**	**46-50**	**51-55**	**56-60**	**61-65**	**66+**
No response	**604**	**136**	**113**	**132**	**150**	**174**	**184**	**160**	**233**	**267**	**1,211**
	26.5%	**5.6%**	**4.3%**	**5.0%**	**4.9%**	**5.6%**	**5.9%**	**5.3%**	**6.8%**	**8.6%**	**13.6%**
Multi-tick response	**2**	**5**	**4**	**4**	**5**	**5**	**7**	**3**	**6**	**2**	**13**
	0.1%	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.2%**	**0.1%**	**0.2%**	**0.1%**	**0.1%**
Valid response	**1,677**	**2,276**	**2,500**	**2,478**	**2,883**	**2,950**	**2,907**	**2,860**	**3,172**	**2,847**	**7,674**
	73.5%	**94%**	**95.5%**	**94.8%**	**94.9%**	**94.3%**	**93.8%**	**94.6%**	**93.0%**	**91.4%**	**86.2%**
Nil or loss	580	176	94	63	83	72	92	91	116	39	54
	25%	7%	4%	2%	3%	2%	3%	3%	3%	1%	0.6%
£1 to £3,999	651	437	155	158	207	228	222	252	353	308	867
	29%	18%	6%	6%	7%	7%	7%	8%	10%	10%	10%
£4,000 to £7,999	231	447	270	304	379	453	499	500	664	852	2,842
	10%	19%	10%	12%	13%	15%	16%	17%	20%	27%	32%
£8,000 to £11,999	131	415	275	286	391	425	397	402	488	500	2,015
	6%	17%	11%	11%	13%	14%	13%	13%	14%	16%	23%
£12,000 to £16,999	63	395	443	338	382	405	452	423	489	400	849
	3%	16%	17%	13%	13%	13%	15%	14%	14%	13%	10%
£17,000 to £23,999	9	272	488	375	436	378	397	387	372	276	434
	0.4%	11%	19%	14%	14%	12%	13%	13%	11%	9%	5%
£24,000 to £36,999	10	108	475	476	432	437	421	420	336	231	320
	0.4%	5%	18%	18%	14%	14%	14%	14%	10%	7%	4%
£37,000 or more	2	26	300	478	573	552	427	385	354	241	293
	0.1%	1%	12%	19%	19%	18%	14%	13%	10%	7%	3%
Total	**2,283**	**2,417**	**2,617**	**2,614**	**3,038**	**3,129**	**3,098**	**3,023**	**3,411**	**3,116**	**8,898**
% of grand total	**6%**	**6%**	**7%**	**7%**	**8%**	**8%**	**8%**	**8%**	**9%**	**8%**	**24%**

Note: total = 37,644.

Table A.5.3: *Income Level by Ethnic Identity*

	Ethnic identity									
Income Per Year	**White**		**Mixed**		**Asian or Asian British**		**Black or Black British**		**Other Ethnic Group**	
	Freq	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**
No response	**2,579**	**7.8%**	**112**	**14.5%**	**183**	**11.8%**	**95**	**14.0%**	**24**	**11.4%**
Multi-tick response	**49**	**0.1%**	**3**	**0.4%**	**0**	**0.0%**	**1**	**0.1%**	**2**	**1.0%**
Valid response	**30,644**	**92.1%**	**658**	**85.1%**	**1,367**	**88.2%**	**575**	**85.7%**	**184**	**87.6%**
Nil or loss	1,114	3%	56	7%	191	12%	44	7%	17	8%
£1 to £3,999	3,252	10%	99	13%	210	14%	108	16%	29	14%
£4,000 to £7,999	6,554	20%	145	19%	278	18%	136	20%	37	18%
£8,000 to £11,999	5,217	16%	88	11%	153	10%	95	14%	25	12%
£12,000 to £16,999	4,278	13%	68	9%	120	8%	63	9%	19	9%
£17,000 to £23,999	3,521	11%	71	9%	118	8%	50	8%	14	7%
£24,000 to £36,999	3,416	10%	71	9%	97	6%	47	7%	14	7%
£37,000 or more	3,292	10%	60	8%	200	13%	32	5%	29	14%
Total	**33,272**	**91%**	**773**	**2%**	**1,550**	**4%**	**671**	**2%**	**210**	**0.6%**

Note: total = 36.476, data for the ethnic identity question is missing for 1,168 individuals.

Table A.5.4: *Income Level by Education Level*

	Qualifications group													
Income Per Year	**Group 1**		**Group 2**		**Group 3**		**Group 4**		**Group 5**		**Group 6**		**Group 7**	
	Freq	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**
No response	**911**	**9.3%**	**247**	**7.0%**	**88**	**6.1%**	**13**	**5.6%**	**227**	**5.2%**	**180**	**4.1%**	**260**	**2.4%**
Multi-tick response	**18**	**0.2%**	**4**	**0.1%**	**3**	**0.2%**	**0**	**0.0%**	**6**	**0.1%**	**8**	**0.2%**	**15**	**0.1%**
Valid response	**8,858**	**90.5%**	**3,261**	**92.9%**	**1,352**	**93.7%**	**218**	**94.4%**	**4,146**	**94.7%**	**4,168**	**95.7%**	**10,404**	**97.4%**
Nil or loss	439	5%	228	7%	22	2%	12	5%	289	7%	183	4%	216	2%
£1 to £3,999	1,387	14%	441	13%	134	9%	38	17%	582	13%	515	12%	479	5%
£4,000 to £7,999	3,389	35%	704	20%	308	21%	49	21%	745	17%	662	15%	843	8%
£8,000 to £11,999	2,142	22%	540	15%	299	21%	48	21%	731	17%	658	15%	863	8%
£12,000 to £16,999	950	10%	497	14%	258	18%	39	17%	769	18%	767	18%	1,181	11%
£17,000 to £23,999	344	4%	359	10%	190	13%	23	10%	547	13%	640	15%	1,655	16%
£24,000 to £36,999	141	1%	243	7%	108	8%	7	3%	329	8%	510	12%	2,297	22%
£37,000 or more	66	1%	249	7%	33	2%	2	1%	154	4%	233	5%	2,870	27%
Total	**9,787**	**29%**	**3,512**	**10%**	**1,443**	**4%**	**231**	**1%**	**4,379**	**13%**	**4,356**	**13%**	**10,679**	**31%**

Note: total = 34,387. 3,138 individuals were excluded because they did not answer the qualifications question. A further 119 individuals were excluded because they gave invalid multi-tick responses to the qualifications question.

Qualification group key:

Group 1 = Selection of the response option:
- No qualifications

Group 2 = Selection of at least one response option from:
- 1+ O levels/CSEs/GCSEs(any grades), Basic Skills.
- NVQ level 1, Foundation GNVQ.

Group 3 = Selection of the response option:
- Other vocational work-related qualifications.

Group 4 = Selection of the response option:
- Foreign qualifications.

Group 5 = Selection of least one response option from:
- 5+ O levels.
- NVQ Level 2.

Group 6 = Selection of least one response option from:
- Apprenticeship.
- 2+ A levels.
- NVQ Level 3.

Group 7 = Selection of at least one response option from:
- First degree.
- NVQ Level 4-5.
- Professional qualifications.

Individuals were allocated into the highest group possible based on their response options.

The 119 individuals who gave invalid multi-tick responses ticked the 'No qualifications' response option and at least one other response option.

Table A.5.5: *Income Level by Employment Status*

	Employment status			
Income Per Year	**Unemployed**		**Employed**	
	Freq	**Perc**	**Freq**	**Perc**
No response	**1,615**	**9.8%**	**553**	**3.0%**
Multi-tick response	**23**	**0.1%**	**27**	**0.1%**
Valid response	**14,861**	**90.0%**	**17,766**	**96.8%**
Nil or loss	1,330	8%	77	0.4%
£1 to £3,999	2,733	17%	839	5%
£4,000 to £7,999	5,045	31%	1,712	9%
£8,000 to £11,999	2,955	18%	2,445	13%
£12,000 to £16,999	1,344	8%	3,166	17%
£17,000 to £23,999	628	4%	3,129	17%
£24,000 to £36,999	464	3%	3,161	17%
£37,000 or more	362	2%	3,237	18%
Total	**16,499**	**47%**	**18,346**	**53%**

Note: total = 34,845. 2,774 individuals were excluded because they did not answer the employment status question. A further 25 individuals were excluded because they gave invalid multi-tick responses to the employment status question.

Employment group key:

Unemployed group = selection of at least one response option from:
- On a Government sponsored training scheme.
- Away from work ill, on maternity leave, on holiday or temporarily laid off.
- None of the above.

Employed group = selection of at least one response option from:
- Working as an employee.
- Self-employed or freelance.
- Working paid or unpaid for your own or your family's business.
- Doing any other kind of paid work.

The 109 individuals who ticked response options from both of these groups were included in the employed group.

The 25 individuals who gave invalid multi-tick responses ticked the 'None of the above' response option and at least one other response option.

Table A.5.6: *Income Level by LA*

	LA									
Income Per Year	**Bath**		**Camden**		**Carmarthenshire**		**Liverpool**		**Stoke**	
	Freq	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**
No response	**371**	**7.2%**	**645**	**7.8%**	**415**	**9.1%**	**1,247**	**9.3%**	**686**	**11.1%**
Multi-tick response	**6**	**0.1%**	**6**	**0.1%**	**4**	**0.1%**	**28**	**0.2%**	**12**	**0.2%**
Valid response	**4,784**	**92.7%**	**7,663**	**92.2%**	**4,145**	**90.8%**	**12,136**	**90.5%**	**5,496**	**88.7%**
Nil or loss	152	3%	403	5%	151	3%	530	7%	224	4%
£1 to £3,999	515	10%	664	8%	464	10%	1,525	11%	670	11%
£4,000 to £7,999	780	15%	1065	13%	961	21%	3,167	24%	1,468	24%
£8,000 to £11,999	635	12%	683	8%	874	19%	2,369	18%	1,164	19%
£12,000 to £16,999	692	13%	666	8%	684	15%	1,682	13%	915	15%
£17,000 to £23,999	679	13%	789	10%	484	11%	1,297	10%	575	9%
£24,000 to £36,999	698	14%	1,177	14%	352	8%	1,078	8%	361	6%
£37,000 or more	633	12%	2,216	27%	175	4%	488	4%	119	2%
Total	**5,161**	**14%**	**8,314**	**22%**	**4,564**	**12%**	**13,411**	**36%**	**6,194**	**17%**

Note: total = 37,644.

Table A.5.7: *Income Level by ETC*

	ETC									
Income Per Year	**1**		**2**		**3**		**4**		**5**	
	Freq	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**
No response	**955**	**8.6%**	**768**	**9.4%**	**642**	**9.7%**	**535**	**8.3%**	**464**	**8.9%**
Multi-tick response	**21**	**0.2%**	**7**	**0.1%**	**15**	**0.2%**	**6**	**0.1%**	**7**	**0.1%**
Valid response	**10,165**	**91.2%**	**7,413**	**90.5%**	**5,981**	**90.1%**	**5,895**	**91.6%**	**4,770**	**91.0%**
Nil or loss	370	3%	309	4%	254	4%	259	4%	268	5%
£1 to £3,999	1,121	10%	881	11%	683	10%	645	10%	508	10%
£4,000 to £7,999	2,081	19%	1,853	23%	1,516	23%	1,067	17%	924	18%
£8,000 to £11,999	1,885	17%	1,454	18%	1,052	16%	750	12%	584	11%
£12,000 to £16,999	1,621	15%	1,136	14%	805	12%	614	10%	463	9%
£17,000 to £23,999	1,321	12%	790	10%	626	9%	571	9%	516	10%
£24,000 to £36,999	1,124	10%	601	7%	503	8%	761	12%	677	13%
£37,000 or more	642	6%	389	5%	542	8%	1,228	19%	830	16%
Total	**11,141**	**30%**	**8,188**	**22%**	**6,638**	**18%**	**6,436**	**17%**	**5,241**	**14%**

Note: total = 37,644.

Annex 6 – 2007 Test and CTES Income Sources Question Response Contingency

Tick as many boxes as you need to show all the sources of income you had in the 12 months that ended on 31 March 2007.

Table A.6.1: *Earnings, wages, salary, bonuses*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	235	54%	24	6%
Ticked	11	3%	163	38%

Note: total = 433 individuals. Cell percentages are presented.

Table A.6.2: *Income from self-employment*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	379	88%	7	2%
Ticked	18	4%	29	7%

Note: total = 433 individuals. Cell percentages are presented.

Table A.6.3: *Occupational pensions, state retirement pensions*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	252	58%	18	4%
Ticked	33	8%	130	30%

Note: total = 433 individuals. Cell percentages are presented.

Table A.6.4: *State benefits such incapacity benefit, child benefit or tax credits*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	220	51%	72	17%
Ticked	32	7%	109	25%

Note: total = 433 individuals. Cell percentages are presented.

Table A.6.5: *Interest from savings or investments*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	295	68%	24	6%
Ticked	35	8%	79	18%

Note: total = 433 individuals. Cell percentages are presented.

Table A.6.6: *Rent from property*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	418	97%	2	0.1%
Ticked	3	1%	10	2%

Note: total = 433 individuals. Cell percentages are presented.

Table A.6.7: *Other income (for example, maintenance payments, grants)*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	414	96%	4	1%
Ticked	10	2%	5	1%

Note: total = 433 individuals. Cell percentages are presented.

Table A.6.8: *No source of income during that time*

2007 Test response	CTES response			
	Not stated		Stated	
	Frequency	Percentage	Frequency	Percentage
Not ticked	419	97%	3	1%
Ticked	7	2%	4	1%

Note: total = 433 individuals. Cell percentages are presented.

Annex 7 - 2007 Test and CTES Income Level Question Response Contingency

Tick as many boxes as you need to show all the sources of income you had in the 12 months that ended on 31 March 2007.

Table A.7: *Income Level Response Corrected Contingency*

	CTES response																	
2007 Test response	**1**		**2**		**3**		**4**		**5**		**6**		**7**		**8**		**Test Total**	
	Freq	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**	**Freq**	**Perc**
Nil or loss	**4**	**40%**	2	20%	1	10%	1	10%	0	0%	0	0%	0	0%	2	20%	**10**	**3%**
£1 to £3,999	2	8%	**10**	**40%**	9	36%	4	16%	0	0%	0	0%	0	0%	0	0%	**25**	**6%**
£4,000 to £7,999	1	1%	3	3%	**70**	**65%**	21	19%	9	8%	3	3%	1	1%	0	0%	**108**	**27%**
£8,000 to £11,999	0	0%	3	4%	9	11%	**54**	**68%**	8	10%	3	4%	1	1%	2	3%	**80**	**20%**
£12,000 to £16,999	0	0%	1	2%	1	2%	5	9%	**38**	**67%**	9	16%	1	2%	2	4%	**57**	**14%**
£17,000 to £23,999	1	2%	1	2%	2	4%	2	4%	3	7%	**28**	**62%**	8	18%	0	0%	**45**	**11%**
£24,000 to £36,999	0	0%	0	0%	1	3%	0	0%	1	3%	3	8%	**31**	**78%**	4	10%	**40**	**10%**
£37,000 or more	0	0%	0	0%	2	5%	0	0%	0	0%	1	3%	1	3%	**35**	**90%**	**39**	**10%**
CTES Total	**8**	**2%**	**20**	**5%**	**95**	**24%**	**87**	**22%**	**59**	**15%**	**47**	**12%**	**43**	**11%**	**45**	**11%**	**404**	

Note: total = 404 individuals. Row percentages are presented. Individuals who gave net income for the CTES had their response corrected to match the 2007 Test response if the 2007 Test response was one income band above.

Annex 8 - References to the Income Questions made in Field Staffs' Observation Books

Minor amendments to the notes have been made for clarity.

A.8.1 Delivery observation booklet notes
119 booklets received, 1 of which made reference to the income questions:

Liverpool
1. Individuals were wary about the income section.

A.8.2 Follow-up observation booklet notes
91 booklets were received, 11 of which referred to the income questions.

Bath and North-East Somerset
1. In income question areas, the income questions were the main topic of conversation and many individuals didn't complete them because they found them intrusive.

2. In post- and income question areas, many individuals were not happy to complete the income questions and so left them blank.

3. I only had two complaints about income question.

4. Elderly individuals found completing the 2007 Test questionnaire a real chore. They also found the income questions confusing as they weren't earning.

5. Individuals had very strong views about the income question and therefore refused to participate in the 2007 Test. They also felt that the test was unnecessary because they would participate in the 2011 Census; and that the income questions should not be included.

Camden
1. Some individuals thought that the questions on race, religion and income were too intrusive.

Liverpool
1. There was a reluctance to complete the questionnaires, especially those that included income questions

2. I had three districts to follow-up and found that most questionnaires returned were from no income areas

3. One or two individuals had reservations over the questions, e.g. the income questions.

Stoke
1. In income areas, a number of individuals felt that the income questions were too intrusive.

2. The income question didn't appear to have been received very well.

Annex 9 - Comments on the Income Questions made in CTES Interviews

The comments below are responses to the CTES question, “Is there anything else about the Census questionnaire you would like to comment on?” that refer to the income questions.

Comments from individuals who returned an income questionnaire:
1. “Some people might think that the income questions are a bit too personal, my wife did.”

2. “Somewhat concerned about income question but not unhappy to answer.”

3. “Did not like being asked about income questions being intrusive.”

4. “Income questions should have replies Average, below average etc.”

5. “Income question intrusive.”

6. “Felt the income questions should be left to the revenue, nothing to do with ONS.”

7. “Felt income questions invasion of privacy.”

8. “My husband wasn't too keen on the income question.”

9. “Difficult to answer? On finance for other members of the household.”

10. “Didn't like financial questions.”

11. “A little bit uncomfortable about answering income questions.”

12. “Felt earnings question irrelevant to the concept of the Census.”

13. “Question on state benefits -my husband claims for me so I split the amount on both our sections of the questionnaire.”

Comments from individuals who returned a no income questionnaire:
1. “Does not like questions about income.”

2. “I was curious to see whether it included financial questions because I've used the General Household Survey.”

Annex 10 - Income Question used in the 1997 Census Test

- Tick the box for the range into which you income falls, and count ***all*** income including:
  Earned income
  Salary or wages
  Income from self-employment
  Pensions
  Occupational pensions
  State retirement pensions
  Child benefit
  Other state benefits
  Income support
  Family credit
  Unemployment benefit/ Jobseeker's allowance
  Sickness/Invalidity/Incapacity Benefit
  Disability benefits
  Maternity benefits
  Interest or annuity from savings or investments
  Rent from property
  Other regular allowances
  Maintenance payments
  Educational grants or scholarship
  Any other sources
- ***Do not deduct:***
  - ***Taxes***
  - ***National Insurance contributions***
  - ***Superannuation payments***
  - ***Health insurance payments***

Per week	**or**	**Per year (approximately)**
Nil	□1	Nil
Up to £99	□2	Up to £5,199
£100 to £199	□3	£5,200 to £10,399
£200 to £299	□4	£10,400 to £15,599
£300 to £399	□5	£15,600 to £20,799
£400 to £499	□6	£20,800 to £25,999
£500 to £599	□7	£26,000 to £31.999

Annex 11 - Income Question used in CSOs 2004 Census Pilot

32 What is your total current gross income from all sources?

Do not deduct Income Tax, PRSI, Superannuation, VHI or other health contributions.

Count all income including:

- Earnings
- Pensions
- Social Welfare Benefits
- Interest from savings and investments
- Rent from property
- Other (for example, maintenance payments, grants, child benefit)

Per year	or	Weekly equivalent (approx.)
Nil	1 ☐	Nil
Less than €6,000	2 ☐	Less than €120
€6,000 to €7,999	3 ☐	€121 to €154
€8,000 to €9,999	4 ☐	€155 to €190
€10,000 to €14,999	5 ☐	€191 to €290
€15,000 to €19,999	6 ☐	€291 to €385
€20,000 to €24,999	7 ☐	€386 to €480
€25,000 to €29,999	8 ☐	€481 to €580
€30,000 to €39,999	9 ☐	€581 to €770
€40,000 to €49,999	10 ☐	€771 to €960
€50,000 to €59,999	11 ☐	€961 to €1155
€60,000 and over	12 ☐	€1155 and over