Constructing an Income-Based Measure of Economic Welfare for Waves 1 and 2 of the Negotiating the Life Course Survey

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1 Introduction

There are two main aims of this paper. First, the methods used in constructing an estimate of an income-based measure of economic welfare for Waves 1 and 2 of the Negotiating the Life Course (NLC) survey are outlined. Second, a preliminary analysis of the income data is presented, with particular focus on the importance of imputed rent to the NLC income measure, and the associated distributional impact of owner occupation.

In section 2 of this paper, there is a discussion of methodological issues relating to the construction of an income-based indicator of welfare. In section 3, a preliminary analysis of the NLC income data is presented, with particular focus on the impact of imputed rent on the distribution of income. Section 4 concludes the paper.

2 Methods for constructing an income-based welfare measure

In this section, methodological concepts relating to the construction of an income-based measure of economic welfare are presented.

2.1 Income versus consumption

The main competitor to an income-based measure of living standards is a measure based on consumption. Consumption has several advantages over income. For example, consumption is smoother than income (since households are able to fund consumption by drawing down assets) and in situations where income tends to fluctuate markedly from year to year (for example, in rural areas) consumption-based welfare measures produce more stable rankings of households compared with their income-based counterparts. There is also evidence that consumption is less susceptible to under-reporting, and hence in countries where self employment is common, consumption may present a more accurate indicator of household living standards.

The above arguments are more relevant to welfare measurement in developing countries, and in industrialised countries, living standards and poverty tend to be assessed with reference to income rather than consumption.

2.2 Whose income? Persons, households, families, and income units

In order to construct and use an income-based measure of economic welfare, it is first important to establish exactly whose income we should be measuring.[1]

The ABS defines the four following statistical units:

Person

This statistical unit comprises all people in their capacities as "private individuals". The classification of a person will depend on the context. For example, an employee is someone who is over the age of 15 years who currently has a job, while age pensioners consist men over the age of 65 and women over the age of 60 who are currently in receipt of government cash benefits.

Household

A group of people who usually reside and eat together. This may be:

- a one-person household, that is, a person who makes provision for his or her own food or other essentials for living without combining with any other person;
- a multi-person household, that is, a group of two or more persons, living within the same dwelling, who make common provision for food or other essentials for living. The persons in the group may pool their income to a greater or lesser extent; they may be related or unrelated persons or a combination of both.

Households therefore have the following characteristics:

- a household resides wholly within one physical dwelling. A group of people having all the characteristics of a household, but who live in two separate dwellings are considered to be two households. There may be several households residing in one dwelling.;
- while the notion of income pooling may be implied by the definition, it is not an essential criterion in defining a household (but it is in defining an income unit – see below);

[1] The discussion in this sub-section is based on ABS (1995).

- lodgers (those who receive accommodation only - not meals) are treated as a separate household;
- boarders (those who receive accommodation and meals) are treated as part of the household.

Family

Two or more people, one of whom is at least 15 years of age, who are related by blood, marriage (registered or de facto), adoption, step or fostering, and who usually live in the same household. A separate family is formed for each married couple, or for each set of parent-child relationships where only one parent is present. Separate families can be identified within a single household if more than one group of people satisfy the criteria for forming a family.

Income unit

One person, or a group of related persons within a household whose command over income is assumed to be shared. Income sharing is considered to take place between partners in a couple relationship, and between parents and their dependents. Dependents are defined as all persons under 15 years, and persons aged 15-24 years who are full-time students, live with a parent, guardian or other relative and do not have a spouse or offspring of their own living with them. A person living in a private dwelling who is not related to any other household member either by marriage (registered or de facto) or by the parent/dependant child relationship would be defined as an income unit.

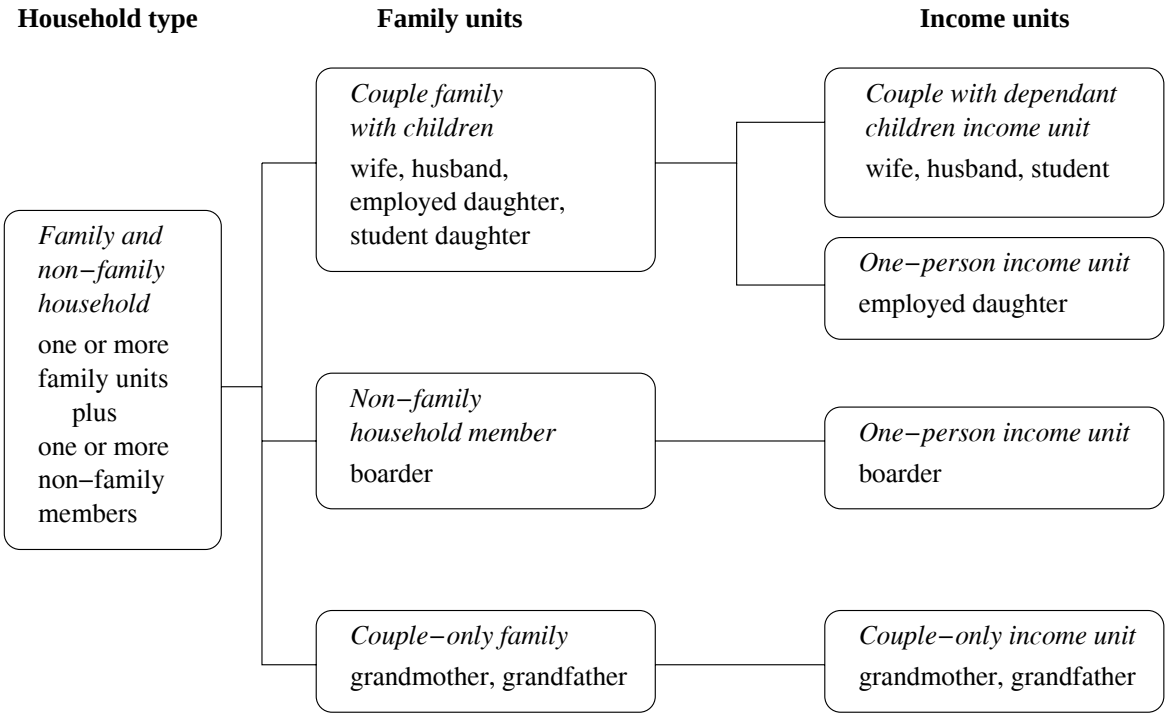
In summary, the relationship between a household, family and income unit is the following:

- household – common provision for food or other essentials for living
- family – related by blood, marriage, adoption, step or fostering
- income unit – a pooled or shared command over economic resources

Assume a household comprises a husband, wife, their employed daughter, her friend (boarder), another daughter aged 20 who is a full-time student, and the husband's mother

and father. In Figure 1, the classification of the different statistical units within this household is presented.

Figure 1: Example of multiple statistical unit household



Source: ABS (1995)

While the individual is the unit of observation in many areas of economic research (for example, the relationship between education and earnings), in analyses of economic welfare or well-being, the focus is generally on groups of people e.g. households or families. An analysis of economic welfare using groups of people such as households or families as the unit of observation relies on a key assumption that economic resources are shared within the unit. In the context of income as the economic resource, this means that all members of the unit benefit equally from the income. Note, that the above does not imply that all members of the unit have the same amount of money spent on their needs as these needs will obviously vary depending on such characteristics as age and gender [reference to equivalence scale research].

However, the problem with using households or families as the unit of analysis in welfare research is that the degree of sharing of economic resources within these groups is highly

variable. Consequently, the ABS make a further assumption that the closer the relationship between members of households or families, the more like that income will be shared. The ABS therefore currently recommends that where income is being used as the measure of economic welfare, the appropriate unit of observation is the income unit.

In certain research contexts, it may be more appropriate to use the household concept. For example, Smith and Daly (1996) argue that household income is a more reliable indicator of Indigenous income and status than family income since the concept of household is able to capture extended kin formations that are reflected in multi-family Indigenous households.[2]

For research using the NLC, the income unit approach is probably acceptable. In fact, the design of the NLC questionnaire ensures that the only *possible* unit of observation in an analysis of economic welfare is the income unit. In particular, income information is only collected for the respondent and his or partner. Therefore with the NLC, we are not able to construct a complete measure of the economic resources available to households or families unless these units also comprise a single income unit.

A related point is that while there may be more than one income units within a household or family, we are only able to measure the economic resources of the income unit of which the respondent is a member – more here.

Note that while the income unit is the preferred unit of observation for analysis of economic well-being using the NLC data, we are not able to identify *all* income units within the NLC sample. This is because the NLC does not collect information on whether children are currently in school. Thus in families where there are children aged 15-24 years, we cannot identify whether these children are dependants.

2.3 What income? Private, gross, disposable and final income

Having determined whose income we will be using as an indicator of economic welfare measuring in the analysis of the NLC data, the next step is to decide on exactly what income measure will be calculated. As shown in Figure 2, there are four main income concepts defined by the ABS.[3]

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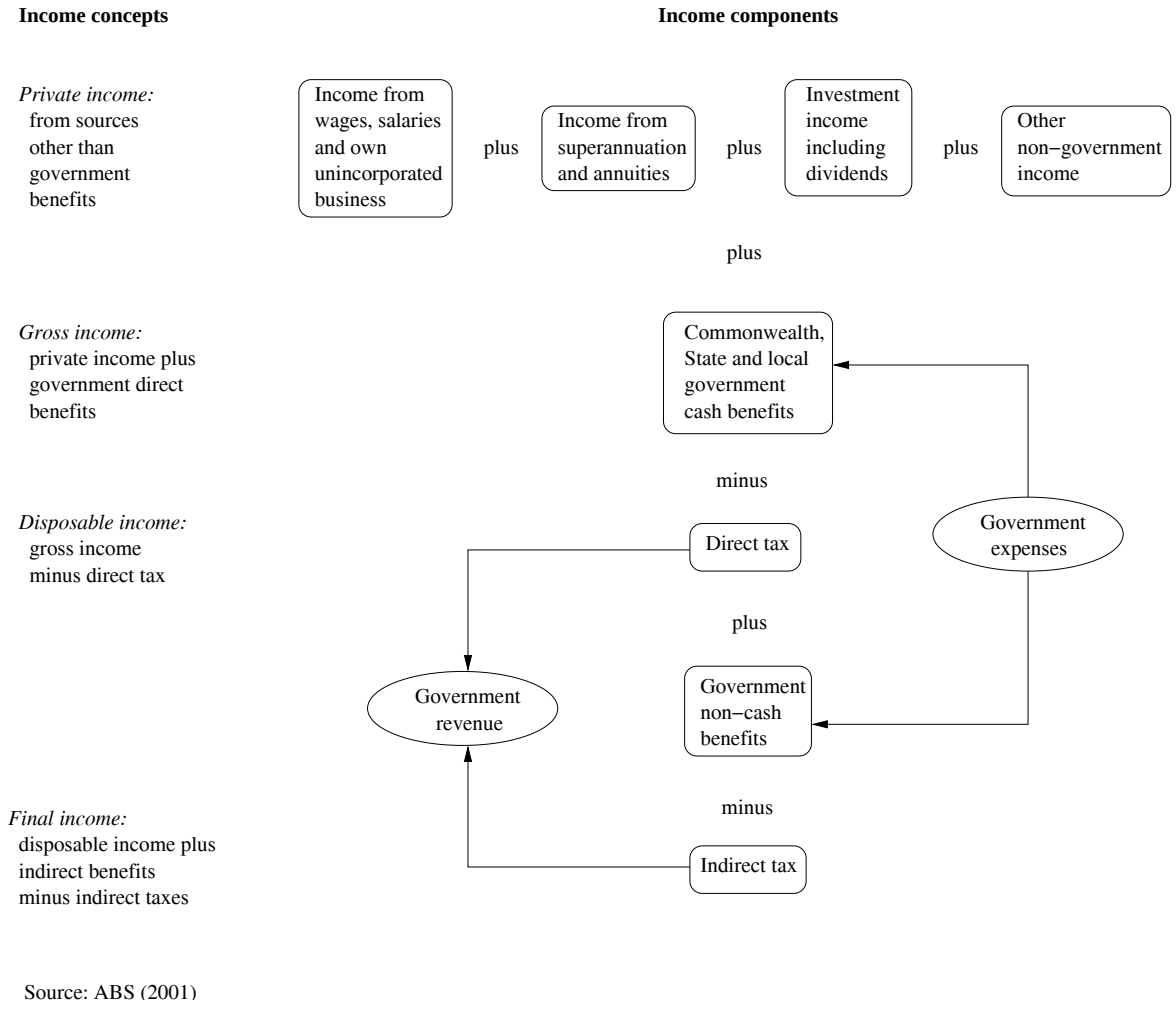
[2] Hunter, Kennedy and Smith (2001) endorse this judgement and present poverty statistics for Indigenous households, as well as statistics based on income units.

[3] The discussion in this sub-section is based on ABS (2001).

Private income includes wages and salaries, profits and losses from unincorporated businesses, income from superannuation and annuities, investment income (including dividends and rent), and other non-government income. Government direct benefits such as pensions and unemployment benefits are added to private income to give *gross income*. Personal direct taxes (i.e. direct taxes) are deducted from gross income to give *disposable income*. *Final income* is disposable income plus the value of government indirect benefits for education, health, housing and social security and welfare minus indirect taxes such as sales tax and GST on selected commodities.

Figure 2: ABS income concepts and components



Source: ABS (2001)

In the present paper, the income aggregate used as a measure of economic welfare is gross income (plus imputed rent, as discussed below). While it should be possible to calculate disposable income using the NLC data, this would involve imputing the tax rebates that

are available to individuals with different characteristics. ABS (2001) sketches a method for imputing direct taxes which involves calculating tax rebates according to household characteristics and tax eligibility for dependent spouses, sole parents, dependent parents, residential zones, pensioners, beneficiaries, and franked dividend imputation credits. The imputation of direct taxes using the NLC data was considered to be outside the scope of the present paper.

Even if a disposable income measure were constructed using the NLC data, it would not be possible to take the next step and construct final income. Indirect benefits consist of goods and services provided free or at subsidised prices by the government. While ABS (2001) presents a method for attributing indirect benefits to households of differing characteristics, the absence of key information within the NLC would prevent this method being applied to NLC data. In particular, in order to allocate government indirect benefits relating to the primary and secondary education and student transportation it is necessary to know whether children of school age living in the household are currently attending school. As mentioned above, this information is not available in the NLC data.

With regards to indirect taxes, these cannot be imputed with the NLC data since the imputation requires information on the expenditure patterns of the different income units.

2.4 Imputed rent as income

The indicator of economic well-being proposed for poverty and welfare analysis using the NLC data is gross income plus imputed income from owner-occupied housing. The appropriateness of including imputed rent in an income-based measure of economic well-being can be illustrated using an example. Consider two identical families, with identical income, living in identical houses. The difference between the two families is that one owns the house, while the other is a renter. Since the owner-occupier family does not have to pay rent, a more accurate measure of the economic resources available to that family is found by adding to its income the amount of money that it would have to spend if it were renting the house.

In 1977, the United Nations recommended that imputed rent be included in measures of total household income used in distributional analysis (UN, 1977), and Yates (1994) provided the first Australian attempt to implement the UN recommendation using the 1988/89 Household Expenditure Survey (HES). In Yates (1994) there is a discussion of two methods for calculating imputed rent using survey data. The market rent approach

involves subtracting from an estimate of market rent (calculated by applying a gross rental rate of return to individual estimates of dwelling value provided in the HES data) the various costs of home ownership including mortgage interest, depreciation, maintenance costs and property taxes. It is not possible to use the market rent approach to calculate imputed rent with the NLC data since the NLC does not record information on housing costs.

The second method for imputing rent is the opportunity cost approach in which a rate of return is applied to estimated home equity to obtain an estimate of the income which would have been received if this equity was held in an interest bearing account. This is the approach for calculating imputed income from owner-occupied housing that is employed in the present paper (a 5% rate of return is assumed – this is what Yates used).

2.5 Summary of income components for NLC data

Details of the construction of the income components for Waves 1 and 2 of the NLC data are provided in the Annexes. In summary, total "family" income (`faminc`) is constructed as the sum of the following income components (see Table 1 for description of income components): `wage`, `businc`, `govben`, `othery`, `chmain1`, `chmain2`, `imprent`, `inc_part`.

Table 1: Summary of NLC income components

Income component	*Description*
`wage`	wage/salary income – of respondent
`businc`	self-employment/business income – of respondent
`govben`	government benefits – received by respondent
`othery`	other income (e.g. rents, dividends, interest) – of respondent
`chmain1`	child maintenance – paid to respondent
`chmain2`	child maintenance – paid to partner
`chmain`	child maintenance – total
`imprent`	imputed rent – for house owned by respondent and/or partner
`inc_part`	income of partner
`inc_resp`	sum of `wage businc govben othery chmain1 chmain2 inc_part`.

3 Preliminary analysis of the NLC income data

In this section, preliminary analysis of the NLC income data is presented. A description of the construction of the variables referred to in this section is presented in the Annexes. Most of the results reported here are in the form of Stata output.

3.1 Analysis of Wave 1 income data

3.1.1 Analysis of missing income components

First, it is important to see the extent to which we have missing data for income components. The following counts are conducted over the full set of 2231 observations.

```
. count if wage==.;
   81

. count if businc==.;
   92

. count if govben==.;
  142

. count if othery==.;
   94

. count if chmain1==.;
   62

. count if chmain2==.;
   63

. count if imprent==.;
   82

. count if inc_resp==.;
   27

. count if inc_part==.;
   86

. count if completey==1;
 1977

. count if noincome==1;
   27
```

3.1.2 Restricting the sample – complete income estimate and ABS income units

The sample of 2231 observations was first restricted to cases where a complete measure of family income is available (`completey`=1) – this left a sample of 1977 observations. It is problematic to lose approximately 11 percent of observations because of incomplete

income information. Further work needs to be done to see if some of these observations can be "recovered" (this process has already been started).

Second, the sample was restricted to observations where household type corresponds to an ABS income unit. As mentioned above, it is not possible to identify all income units within the NLC data (because we do not have information on whether or not children are currently studying and we do not know if a child of a respondent has offspring living with him/her). A subset of income units can be identified using: (`hhtype2==1 | hhtype2==2 | hhtype2==3 | hhtype2==5`) – in the analysis we are therefore excluding families where there are adult (15-24 years) children present since we cannot determine whether these children are dependants as defined by the ABS . The restricted sample consists of 1202 income units.

3.1.3 Income and per capita income

The following are the descriptive statistics for `faminc` for the restricted sample:

```
. sum faminc, det;

                     total family income
-------------------------------------------------------------
      Percentiles      Smallest
 1%         8738            323
 5%        16739            400
10%        22470           3550       Obs                1202
25%        34398           5486       Sum of Wgt.        1202

50%      53751.5                      Mean           64216.68
                        Largest       Std. Dev.      53427.11
75%      78235.4         380000
90%       112728         491120       Variance       2.85e+09
95%       139468         728667       Skewness       5.432587
99%       239854         790160       Kurtosis        57.9492
```

Per capita income was calculated as `pcinc=faminc/hhsize2.` The descriptive statistics for `pcinc` are:

```
. sum pcinc, det;
                            pcinc
-------------------------------------------------------------
      Percentiles      Smallest
 1%         3937            323
 5%       6345.6            400
10%      7831.25        2084.286       Obs                1202
25%     12292.75          2184.5       Sum of Wgt.        1202

50%        21000                       Mean           28395.51
                        Largest       Std. Dev.      28417.86
75%      35982.5         192750
90%        54577         350000       Variance       8.08e+08
95%      70405.5        364333.5       Skewness       5.557901
99%     126666.7         395080       Kurtosis       58.05429
```

3.1.4 Income components

The following are descriptive statistics for the 1202 observations in the restricted sample. Note that there are 15 income units for which we do not have information on income components (except imputed rent), because the respondent refused to answer the income questions. However, the respondent provided an estimate of overall income (excluding imputed rent), recorded in `q249`.

Variable	Obs	Mean	Std. Dev.	Min	Max
wage	1187	30015.33	43082.3	0	780000
businc	1187	3282.284	14240.51	0	220000
govben	1187	2183.058	4049.924	0	22308
othery	1187	1549.8	7232.424	0	150000
chmain	1202	168.3295	1004.193	0	19240
imprent	1200	5026.565	7067.669	0	100000
inc_resp	1202	37222.73	44797.39	0	784160
inc_ref	15	38947.6	26602.79	9344	118833
inc_part	1202	21975.75	25216.14	0	111090

The following are descriptive statistics for the income components, calculated only over those observations where a positive value was recorded.

Variable	Obs	Mean	Std. Dev.	Min	Max
wage	960	37112.71	45074.95	1	780000
businc	177	22011.7	30853.43	1	220000
govben	513	5051.248	4845.326	78	22308
othery	283	6500.399	13700.19	1	150000
chmain	52	3891	2996.33	520	19240
imprent	833	7241.151	7478.677	100	100000
inc_resp	1185	37756.73	44893.66	120	784160
inc_ref	15	38947.6	26602.79	9344	118833
inc_part	779	33908.67	24008.73	1680	111090

3.1.5 Income shares

The following are income shares for the restricted sample:

Variable	Obs	Mean	Std. Dev.	Min	Max
wage_shr	1187	45.54486	34.26512	0	100
businc_shr	1187	3.940557	13.42894	0	100
govben_shr	1187	8.51799	20.25988	0	100
othery_shr	1187	1.949196	7.371241	0	95.47739
chmain_shr	1202	.5737121	4.187056	0	100
imprent_shr	1200	8.097258	11.03624	0	100
inc_part_shr	1202	31.32586	30.0339	0	100

3.1.6 Per capita income quintiles

A per capita income quintile variable `quin` was constructed. The quintiles were constructed over individuals, rather than income units.

```
. tab quin;

       quin |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        172       14.31       14.31
          2 |        190       15.81       30.12
          3 |        202       16.81       46.92
          4 |        263       21.88       68.80
          5 |        375       31.20      100.00
------------+-----------------------------------
      Total |       1202      100.00

. tab quin [w=hhsize2];
(frequency weights assumed)

       quin |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        676       19.89       19.89
          2 |        681       20.04       39.92
          3 |        680       20.01       59.93
          4 |        681       20.04       79.96
          5 |        681       20.04      100.00
------------+-----------------------------------
      Total |       3399      100.00
```

The above shows that there are approximately 14 percent of income units in the bottom quintile (because poorer households tend to be larger, especially when per capita income is used as the welfare measure) while 31 percent of households are in the top quintile.

3.1.7 Income shares by quintile

The following shows income shares by quintile groups. As expected, self-employment/business income is more important for richer income units, and child maintenance and government benefits are more important for poorer income units.

```
. table quin, c(mean wage_shr mean businc_shr mean govben_shr mean othery_shr)
format(%9.1f) col row;

------------------------------------------------------------------------------
     quin | mean(wage_shr)  mean(businc~r)  mean(govben~r)  mean(othery~r)
----------+-------------------------------------------------------------------
        1 |           22.6             2.3            35.2             0.5
        2 |           35.2             3.2            14.7             1.0
        3 |           40.5             4.1             4.2             1.6
        4 |           53.8             2.4             1.4             2.9
        5 |           58.4             6.0             0.4             2.6
          |
    Total |           45.5             3.9             8.5             1.9
------------------------------------------------------------------------------
```

```
. table quin, c(mean chmain_shr mean imprent_shr mean inc_part_shr)
format(%9.1f) col row;

------------------------------------------------------------
     quin | mean(chmain~r)  mean(impren~r)  mean(inc_pa~r)
----------+-------------------------------------------------
        1 |            2.1             8.5            28.5
        2 |            1.0             8.4            36.8
        3 |            0.4             9.6            39.6
        4 |            0.2             7.5            31.7
        5 |            0.0             7.4            25.1
          |
    Total |            0.6             8.1            31.3
------------------------------------------------------------
```

3.2 Analysis of Wave 2 income data

3.2.1 Analysis of missing income components

As with Wave 1, it is important to see the extent to which we have missing data for income components.

```
. count if wage==.;
  126

. count if businc==.;
   97

. count if govben==.;
   65

. count if othery==.;
   87

. count if chmain1==.;
   11

. count if chmain2==.;
   12

. count if imprent==.;
   73

. count if inc_resp==.;
    0

. count if inc_part==.;
  126

. count if completey==1;
 1448
```

3.2.2 Restricting the sample – complete income estimate and ABS income units

The sample of 1768 observations was first restricted to cases where a complete measure of family income is available (`completey`=1) – this left a sample of 1448 observations.

Nearly 18 percent of respondents did not provide complete income information – this is higher than the "incomplete income information" rate found in the Wave 1 data. Further work will need to be done to see if some of these observations can be recovered.

Second, the sample was restricted to observations where household type corresponds to an ABS income unit. As with Wave 1, it was not possible to identify all income units in the Wave 2 data (because there is no information on whether or not children are currently studying). A subset of income units was identified using: (`hhtype2==1 | hhtype2==2 | hhtype2==3 | hhtype2==5`). The restricted sample consists of 858 income units.

3.2.3 Income and per capita income

The following are the descriptive statistics for `faminc` for the restricted sample:

```
. sum faminc, det;
```

```
                      total family income
-------------------------------------------------------------
      Percentiles      Smallest
 1%         10140             0
 5%         21668          2840
10%         28100          7020       Obs                 858
25%         46108          8320       Sum of Wgt.         858

50%         68665                     Mean           85921.39
                        Largest       Std. Dev.      116370.4
75%         98036          740000
90%        143500          863690     Variance       1.35e+10
95%        189027         1252562     Skewness       14.56322
99%        333664         2660154     Kurtosis       295.4922
```

Mean total income increased by 34 percent between Waves 1 and 2 – this is looked at further below.

Per capita income was calculated as `pcinc=faminc/hhsize2`. The descriptive statistics for `pcinc` are:

```
. sum pcinc, det;
```

```
                           pcinc
-------------------------------------------------------------
      Percentiles      Smallest
 1%         4680             0
 5%         8320           710
10%     10788.57        2291.2       Obs                 858
25%     16474.25          3336       Sum of Wgt.         858

50%      27187.5                     Mean           38246.37
                        Largest       Std. Dev.      55072.81
75%      43659.8         431750
90%        69584         626281     Variance       3.03e+09
```

```
95%        90100          740000       Skewness       9.265088
99%     185823.5          886718       Kurtosis       118.2568
```

3.2.4 Income components

The following are descriptive statistics for the 858 observations in the restricted sample.

```
    Variable |      Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
        wage |      858    36599.07    63081.89          0    1248000
      businc |      858    11688.38    73800.57          0    2000000
      govben |      858    1880.121    3919.504          0      25662
      othery |      858    1703.934     5614.35          0      65000
      chmain |      858    147.2121    1079.784          0      16224
     imprent |      858    7397.686    20634.07          0     450000
    inc_resp |      858    52018.72    109591.7          0    2624000
    inc_part |      858    26504.98    29641.56          0     117899
```

The first thing to note is the large increase in mean business income between Waves 1 and 2 (256 percent), relative to the other income components, as shown in Table 2.

Table 2: Change in mean income component between Waves 1 and 2

Income component	*Percentage increase/decrease*
wage	22
businc	256
govben	-14
othery	10
chmain	-13
imprent	47
inc_resp	40
inc_part	21

There are two potential reasons why this may have occurred. First, it could be because the attrition rate for respondents running a business was much lower than the average attrition rate. Business owners are likely to be less mobile than the average person, and thus easier to keep track of between waves. It is shown below that the attrition rate for business owners was indeed lower than for the sample as a whole. However, it is unlikely that differences in attrition rates accounted for the whole increase in mean business income. The following are descriptive statistics for the income components, calculated only over those observations where a positive value was recorded.

Variable	Obs	Mean	Std. Dev.	Min	Max
wage	718	43735.38	66661.65	1	1248000
businc	181	55406.81	153283.2	1	2000000
govben	325	4963.52	5028.224	26	25662
othery	296	4939.105	8691.258	6	65000
chmain	25	5052.32	3977.283	104	16224
imprent	613	10354.35	23781.2	99.9	450000
inc_resp	850	52508.31	109989.9	26	2624000
inc_part	550	41347.77	27508.4	1744	117899

In Table 3 it is shown that even when we only look at observations where a positive value of business income was recorded, the increase in mean business income between the two waves is still 152 percent. This suggests that the most likely reason for the large increase in mean business income between the two waves is the change in the structure of the questionnaire.

Table 3: Change in mean income component between Waves 1 and 2 (conditional)

Income component	*Percentage increase/decrease*
wage	18
businc	152
govben	-2
othery	-24
chmain	30
imprent	43
inc_resp	39
inc_part	22

Note: Percentage changes of average levels of income components, where averages are calculated only over positive observations.

There was also a large increase in mean imputed rent income between Waves 1 and 2. Since the structure of the questions relating to housing did not change significantly between the two waves, it is unlikely that this is an artefact of questionnaire design. As above, the marked increase mean imputed rent income could be because of a change in the composition of the sample between the two waves. In particular, since home owners tend to be less mobile, it is likely that this group were more easily tracked between the waves, and thus included in Wave 2. Once again, this hypothesis is supported by the data (attrition rates are presented below). Another reason for the increase in mean imputed rent between the two surveys is the fact that property prices increased significantly over this period (recall that imputed rent is calculated using the net value of the property in question).

3.2.5 Income shares

The following are income shares for the restricted Wave 2 sample:

```
. sum *_shr;

    Variable |     Obs        Mean    Std. Dev.       Min        Max
-------------+--------------------------------------------------------
    wage_shr |     857    45.21241    32.10232          0        100
  businc_shr |     857     8.21314    19.35088          0        100
  govben_shr |     857    6.238779    16.73377          0        100
  othery_shr |     857    1.775988     5.06969          0   50.50505
  chmain_shr |     857    .3703276    2.924468          0   44.38326
 imprent_shr |     857    8.153995    10.24133          0   81.38021
inc_part_shr |     857    30.03536    28.64873          0   98.70238
```

Above, it was found that mean business income increased markedly between Waves 1 and 2 – this is reflected in the income shares where the average share of total income accounted for by income from business doubled from 4 to 8 percent.

3.2.6 Per capita income quintiles

A per capita income quintile variable `quin` was constructed. The quintiles were constructed over individuals, rather than income units.

```
. tab quin;

       quin |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        121       14.10       14.10
          2 |        129       15.03       29.14
          3 |        159       18.53       47.67
          4 |        194       22.61       70.28
          5 |        255       29.72      100.00
------------+-----------------------------------
      Total |        858      100.00

. tab quin [w=hhsize2];
(frequency weights assumed)

       quin |      Freq.     Percent        Cum.
------------+-----------------------------------
          1 |        481       19.99       19.99
          2 |        479       19.91       39.90
          3 |        480       19.95       59.85
          4 |        483       20.07       79.93
          5 |        483       20.07      100.00
------------+-----------------------------------
      Total |       2406      100.00
```

The above shows that there are approximately 14 percent of income units in the bottom quintile while 30 percent of household are in the top quintile.

3.2.7 Income shares by quintile

The following shows income shares by quintile groups. As expected, income from wages and self-employment/business is more important for richer income units, and child maintenance and government benefits are more important for poorer income units.

```
. table quin, c(mean wage_shr mean businc_shr mean govben_shr mean othery_shr)
format(%9.1f) col row;

------------------------------------------------------------------------------
     quin | mean(wage_shr)  mean(businc~r)  mean(govben~r)  mean(othery~r)
----------+-------------------------------------------------------------------
        1 |           31.8             3.6            28.2             0.7
        2 |           36.3             7.8             7.7             1.4
        3 |           47.2             6.8             3.9             1.9
        4 |           49.7             7.9             1.1             1.5
        5 |           51.4            11.7             0.5             2.6
          |
    Total |           45.2             8.2             6.2             1.8
------------------------------------------------------------------------------

. table quin, c(mean chmain_shr mean imprent_shr mean inc_part_shr)
format(%9.1f) col row;

----------------------------------------------------------
     quin | mean(chmain~r)  mean(impren~r)  mean(inc_pa~r)
----------+-----------------------------------------------
        1 |            1.1             8.4            26.1
        2 |            1.1             7.7            37.9
        3 |            0.2             7.8            32.2
        4 |            0.1             8.3            31.4
        5 |            0.0             8.3            25.5
          |
    Total |            0.4             8.2            30.0
----------------------------------------------------------
```

3.3 The distributional impact of owner-occupation – Wave 1

It is of interest to see the impact that owner-occupation has on the measured well-being of the income units in the NLC sample. Yates (1994) used 1988/89 HES data to show that owner-occupation has a significant distributional impact. The following analysis attempts to update the Yates (1994) analysis, although it is not possible to make a direct comparison because the NLC survey uses a sampling frame that is very different to that used in the HES. In particular, the NLC Wave 1 sample is restricted to only contain respondents under the age of 54 years. Equity in owner-occupied dwelling and housing tenure is strongly related to the life-cycle, and for this reason a comparison between the Wave 1 results and those in Yates (1994) would not be valid.

Table 4 shows wealth, tenure and income variables calculated for different per capita income deciles. Per capita income deciles were calculated over income units, rather than individuals. Values have been averaged over all income units, not just owner-occupiers.

Table 4: Owner-occupied housing wealth, tenure and imputed rent (Wave 1)

	Per capita income decile										
	1	2	3	4	5	6	7	8	9	10	total
Wealth	($)	($)	($)	($)	($)	($)	($)	($)	($)	($)	($)
value of dwelling	60,600	79,946	108,160	129,342	154,133	127,950	135,450	134,192	179,067	238,281	134,815
amount owing on dwelling	22,642	28,819	34,397	32,042	42,048	32,237	40,659	28,275	38,844	47,298	34,731
Tenure	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
outright owners	8.3	15	14.2	30	25	25.6	21.7	25	32.5	35.5	23.3
owner-purchasers	35.8	45.8	51.7	53.3	53.3	45.5	50	44.2	50.8	44.6	47.5
owner-occupiers	44.2	60.8	65.8	83.3	78.3	71.1	71.7	69.2	83.3	80.2	70.8
Income	($p.w.)	($p.w.)	($p.w.)	($p.w.)	($p.w.)	($p.w.)	($p.w.)	($p.w.)	($p.w.)	($p.w.)	($p.w.)
income	463	636	836	1,036	1,122	1,200	1,302	1,367	1,633	2,742	1,235
per capita income	113	175	233	294	365	455	567	698	893	1,660	546
imputed rent	37	49	71	94	108	92	95	102	135	184	97

[Note: Average values calculated over all income units (not just owner-occupiers). [income includes imputed rent – perhaps should use ex ante income here]

The value of the average dwelling (or gross contribution to wealth) is $134,815 (note – this average is calculated over all income units and those who do not own their house would record a zero here). The average amount owing on owner-occupied dwellings is $34, 731. Imputed rent contributes on average $97 per week to the income of the income units in the restricted NLC sample. Remember that this is a weighted average of an imputed income of $137/week for the 70.8 percent of the sample who are owner occupiers (see table below) and zero for the remainder of the sample who do not own their own homes. Table 5 clearly shows that imputed rental income is not shared evenly between owner-purchasers and outright owners. The average outright owner (from above, 34 percent of owner occupiers) enjoys almost four times the imputed rent of the average owner purchaser.

Table 5: Imputed rent by tenure type and decile

Per capita income decile	owner-purchaser	outright owner	owner-occupiers
1	29	116	83
2	33	142	81
3	57	157	108
4	69	151	112
5	72	213	136
6	52	208	131
7	64	206	133
8	48	264	147
9	98	211	162
10	114	312	230
total	61	213	137

The distributional impact of imputed rent can be seen Table 6 which shows the decile share of two income aggregates – one excluding and one including imputed rent (note that

in both columns, income units have been re-ranked using the appropriate *per capita* income measure).

Table 6: Income shares by deciles

Per capita decile	Income excluding imputed rent	Income including imputed rent
1	3.5	3.7
2	5.0	5.1
3	6.5	6.8
4	8.3	8.4
5	9.7	9.1
6	9.8	9.8
7	10.6	10.5
8	10.7	11.1
9	13.4	13.2
10	22.6	22.3
Gini coefficient	0.42	0.42

It is apparent that income units in the bottom per capita income quintile receive 8.5 percent of income excluding imputed rent, compared with 8.8 percent of the income measure that includes imputed rent. While this may appear to not be a significant distributional impact of including imputed rent, as Yates (1994) points out, the impact of imputed income on the relative share of those in the bottom quintile is quite large when one considers changes in inequality that occur over time. The inclusion of imputed rent into the income measure has no impact on the Gini coefficient.

Table 7 shows the extent to which income unit decile rankings change as a result of including imputed rent into the income measure. Within each decile, the ranking of between 8 and 37 percent of income units is changed as a result of the inclusion of imputed rent. As Yates (1994) found, the impact on rankings is greatest for those income

units in the lower-middle part of the income distribution. Of those income units in the 3rd to5th deciles (when ranked excluding imputed rent), less than 70 percent remain in their original decile group after imputed rent is taken into account. This compares with 87 percent of income units in the bottom decile, and 92 percent of income units in the top decile.

Table 7: Cross classification of decile rankings using two income measures

	Per capita income decile (excluding imputed rent)										
Per capita income decile	1	2	3	4	5	6	7	8	9	10	Total
1	8.7	1.2									10.0
2	1.1	7.2	1.7								10.0
3	0.2	1.2	6.2	2.3						0.1	10.0
4			1.4	6.5	2.1						10.0
5		0.2	0.5	0.9	6.9	1.4					10.0
6			0.1	0.2	0.8	7.4	1.5				10.1
7		0.1			0.1	1.1	7.2	1.5			10.0
8		0.1			0.1	0.1	1.2	7.6			10.0
9						0.1	0.1	0.9	8.2	0.7	10.0
10									0.8	9.2	10.1
Total	10.0	10.0	10.0	10.0	10.0	10.1	10.0	10.0	10.0	10.1	100.0

Finally, it is of interest to see how the inclusion of imputed rent into the measure of living standards impacts on the position of different groups within the income distribution (Tables 8 and 9).

Table 8: Composition of income deciles – income measure excluding imputed rent

	Per capita income decile										
	1	2	3	4	5	6	7	8	9	10	Total
Tenure											
outright owner	15.0	17.5	21.7	26.7	23.3	24.0	19.2	23.3	30.0	32.2	23.3
owner purchaser	40.0	45.8	44.2	50.8	55.8	49.6	52.5	40.8	49.2	46.3	47.5
renter	45.0	36.7	34.2	22.5	20.8	26.4	28.3	35.8	20.8	21.5	29.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age of respondent											
Under 25	7.5	6.7	6.7	4.2	5.0	5.8	9.2	5.0	3.3	1.7	5.5
25-44	79.2	83.3	80.8	85.8	81.7	74.4	69.2	69.2	69.2	68.6	76.1
45 and over	13.3	10.0	12.5	10.0	13.3	19.8	21.7	25.8	27.5	29.8	18.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Family type											
lone	7.5	10.8	9.2	3.3	6.7	20.7	27.5	37.5	37.5	44.6	20.5
couple, no kids	3.3	5.0	6.7	10.8	15.8	26.4	37.5	44.2	47.5	43.0	24.0
sole parent, kids	23.3	19.2	6.7	9.2	6.7	6.6	1.7	1.7	0.0	4.1	7.9
couple, kids	65.8	65.0	77.5	76.7	70.8	46.3	33.3	16.7	15.0	8.3	47.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 9: Composition of income deciles – income measure including imputed rent

	Per capita income decile										
	1	2	3	4	5	6	7	8	9	10	Total
Tenure											
outright owner	8.3	15.0	14.2	30.0	24.2	26.4	21.7	25.0	32.5	35.5	23.3
owner purchaser	35.8	45.8	51.7	53.3	53.3	45.5	50.0	44.2	50.8	44.6	47.5
renter	55.8	39.2	34.2	16.7	22.5	28.1	28.3	30.8	16.7	19.8	29.2
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Age of respondent											
Under 25	8.3	5.8	7.5	4.2	5.8	6.6	7.5	5.0	2.5	1.7	5.5
25-44	82.5	84.2	84.2	85.0	79.2	73.6	72.5	65.0	67.5	67.8	76.1
45 and over	9.2	10.0	8.3	10.8	15.0	19.8	20.0	30.0	30.0	30.6	18.4
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Family type											
lone	5.0	9.2	9.2	3.3	13.3	20.7	27.5	32.5	37.5	47.1	20.5
couple, no kids	2.5	3.3	5.8	10.8	16.7	26.4	37.5	47.5	48.3	41.3	24.0
sole parent, kids	25.8	17.5	7.5	7.5	6.7	7.4	0.8	1.7	0.0	4.1	7.9
couple, kids	66.7	70.0	77.5	78.3	63.3	45.5	34.2	18.3	14.2	7.4	47.5
	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

3.4 Constructing a panel using Waves 1 and 2

In this section, there is a brief description of the process of constructing a panel of the NLC data for use in living standards and poverty analysis. The following criteria were used to identify the panel:

- The respondent was present in both waves (obviously). There were 2231 observations in Wave 1. Of these 2231 observations, only 1768 are present in Wave 2 (an thus the attrition rate for the whole sample was 20.8 percent).

- The respondent was a part of an ABS-defined income unit in both waves. This selection criteria reduces the panel from 1768 observations to 820 observations.
- The respondent provided complete income information in both waves. This selection criteria reduces the panel from 820 observations to 638 observations.

It is apparent that the above criteria used for identifying a panel are too stringent: too much information is being lost. On a practical level, most econometric analysis cannot be adequately conducted using a panel of only 638 observations. As previously discussed, there needs to be an attempt to "salvage" some of the observations that have been omitted because of incomplete income information. Relatedly, the criterion for deciding whether complete income information has been provided may need to be relaxed so that a respondent who provided the "most important" income information will remain in the panel. Also, in Wave 3 of the NLC, the questionnaire needs to be modified so that the schooling status of children can be identified (this will mean more families in the NLC will be able to be classified as ABS income units and thus included in the analysis).

Table 10 shows the percentage of respondents in Wave 1 who were not present in Wave 2 of the NLC. As discussed above, respondents with business and imputed rent income have lower attrition rates than average. Respondents who were identified as living in ABS-defined income units had attrition rates similar to that found with the whole sample.

Table 10: NLC attrition rates

	Whole sample	Respondents in income unit in Wave 1
All respondents	20.8	20.9
Respondents with business income	15.1	15.2
Respondents with imputed rent income	15.2	16.1

4 Conclusions

In this paper, the process of the construction of an income-based measure of well-being for the NLC data was described. Preliminary analysis of the income data was presented for both waves, and a more detailed study of the distributional impact of imputed rent was conducted using the Wave 1 data.

Several issues relating to the NLC data were raised. These include the following:

- The percentage of income units with a complete income response is small. The percentage of respondents giving incomplete income information in Wave 1 was 11 percent, while in Wave 2 it had increased to 18 percent. The process of salvaging some of these observations (by trying to reconstruct income information using responses to other questions) is already underway. In the present paper, only observations with complete responses to all income questions were included in the analysis. In future analysis, it may be preferable to keep those observations where responses were given to the most important income questions (e.g. wages) and be more lenient to cases where less important income information is missing.
- A major problem with the NLC data is that the absence of a question relating to the schooling status of children means that it is impossible to identify all ABS income units within the data. In particular, children aged 15-24 years must be full-time students for them to be included in an income unit. In the third wave of the NLC it will be important to include a question on current schooling status of children, and also retrospective questions so that the schooling status of children at the time of the previous two waves can be determined.
- There is a question regarding the accuracy of the business/self employment income data – there was a large increase in this income component between waves. This needs to be looked at further.
- Depending on the demand by NLC researchers, there may need to be further work on constructing a disposable income measure.

5 References

Australian Bureau of Statistics (1995), *A Provisional Framework for Household Income, Consumption, Saving and Wealth (1995)*, Cat. no. 6549.0, ABS, Canberra.

---------- (2001), *Government Benefits, Taxes and Household Income, Australia*, Cat. no. 6537.0, ABS, Canberra.

Hunter, B.H., Kennedy, S. and D. Smith (2001), "Sensitivity of Australian income distributions to choice of equivalence scale: Exploring some parameters of Indigenous incomes," Centre for Aboriginal Economic Policy Research Working Paper No. 11/2001, ANU, Canberra.

Smith, D. and A.E. Daly (1996), "The economic status of Indigenous Australian households: A statistical and ethnographic analysis," Centre for Aboriginal Economic Policy Research Discussion Paper No. 109, ANU, Canberra.

Yates, J. (1994), "Imputed Rent and Income Distribution," Review of Income and Wealth, 40(1), 43-66.

Annexes

The purpose of the following annexes is to outline the methods used in constructing an estimate of family income for Waves 1 and 2 of the Negotiating the Life Course (NLC) survey. This annexes describe the contents of the Stata (version 7) do files that were used to construct family income (this paper is included in a zip file which contains Stata do files, raw NLC data files for Wave 1 and 2 and constructed data files). Users of the constructed data sets are advised to read the annexes so that they are aware of the decisions made in constructing the income data and any inherent limitations in the estimates. It is also suggested that users look carefully at the Stata do files.

It should be noted that these Stata do files are provided to NLC researchers so that they can see exactly how each constructed variable has been created. It is the responsibility of every researcher who uses these data to check that the variable they are using is what they want. While every attempt has been made to ensure the accuracy of these Stata do files, they are essentially provided "as is" and without warranty of any kind. If a researcher finds an error in the Stata do files, or believes that a variable should be created in a different way, please contact the author.

Annex 1 Data construction for Wave 1

There are 2231 observations in the Wave 1 data set `nlc97.dta`. The data were collected between November 1996 and April 1997.

A1.1 Missing value codes in Wave 1

-3 – pulled out during the survey? Codes: -9, -8, -2, -1

A1.2 Household demography variables

The file `hhdemog.do` constructs basic household demography variables and outputs them to the constructed (household-level) data set `hhdemog.dta`. The following variables are contained in `hhdemog.dta`:

```
Contains data from hhdemog.dta
  obs:         2,231
 vars:            53                          4 Apr 2002 21:31
 size:       129,398 (97.9% of memory free)
------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
------------------------------------------------------------------------------
id              int    %8.0g
yearint         byte   %9.0g                  year of interview
monthint        byte   %9.0g                  month of interview
ager            byte   %8.0g                  age of respondent (from d1015)
ager2           byte   %9.0g                  age of respondent
ch_n            byte   %9.0g                  # children (<15 yrs) at home
adch_n          byte   %9.0g                  # adult children at home
ch1_age         byte   %9.0g                  age of child -1-
ch2_age         byte   %9.0g                  age of child -2-
ch3_age         byte   %9.0g                  age of child -3-
ch4_age         byte   %9.0g                  age of child -4-
ch5_age         byte   %9.0g                  age of child -5-
ch6_age         byte   %9.0g                  age of child -6-
ch7_age         byte   %9.0g                  age of child -7-
ch8_age         byte   %9.0g                  age of child -8-
ch9_age         byte   %9.0g                  age of child -9-
ch10_age        byte   %9.0g                  age of child -10-
ch11_age        byte   %9.0g                  age of child -11-
ch1_gen         byte   %9.0g                  gender of child -1-
ch2_gen         byte   %9.0g                  gender of child -2-
ch3_gen         byte   %9.0g                  gender of child -3-
ch4_gen         byte   %9.0g                  gender of child -4-
ch5_gen         byte   %9.0g                  gender of child -5-
ch6_gen         byte   %9.0g                  gender of child -6-
ch7_gen         byte   %9.0g                  gender of child -7-
ch8_gen         byte   %9.0g                  gender of child -8-
ch9_gen         byte   %9.0g                  gender of child -9-
ch10_gen        byte   %9.0g                  gender of child -10-
ch11_gen        byte   %9.0g                  gender of child -11-
ch1_hom         byte   %9.0g                  child -1- at home?
ch2_hom         byte   %9.0g                  child -2- at home?
ch3_hom         byte   %9.0g                  child -3- at home?
ch4_hom         byte   %9.0g                  child -4- at home?
ch5_hom         byte   %9.0g                  child -5- at home?
ch6_hom         byte   %9.0g                  child -6- at home?
ch7_hom         byte   %9.0g                  child -7- at home?
ch8_hom         byte   %9.0g                  child -8- at home?
ch9_hom         byte   %9.0g                  child -9- at home?
ch10_hom        byte   %9.0g                  child -10- at home?
ch11_hom        byte   %9.0g                  child -11- at home?
childmiss       byte   %9.0g                  missing info on age child(ren)
relat2          byte   %22.0g      relat      relat. of person -2- to resp.
relat3          byte   %22.0g      relat      relat. of person -3- to resp.
relat4          byte   %22.0g      relat      relat. of person -4- to resp.
relat5          byte   %22.0g      relat      relat. of person -5- to resp.
relat6          byte   %22.0g      relat      relat. of person -6- to resp.
relat7          byte   %22.0g      relat      relat. of person -7- to resp.
relat8          byte   %22.0g      relat      relat. of person -8- to resp.
relat9          byte   %22.0g      relat      relat. of person -9- to resp.
hhsize          byte   %8.0g       q280       household size (from d1015)
hhsize2         byte   %9.0g                  household size
hhtype          byte   %8.0g       hhtype     household type (from d1015)
hhtype2         byte   %23.0g      hhtype2f   household type
```

```
-------------------------------------------------------------------------------
Sorted by:  id
```

Variable	Obs	Mean	Std. Dev.	Min	Max
id	2231	1306.146	738.2013	1	2574
yearint	2231	96.6329	.4821221	96	97
monthint	2231	5.900941	3.321158	2	11
ager	2230	36.38341	9.589258	18	55
ager2	2231	36.06768	9.564902	18	55
ch_n	2231	.8924249	1.1537	0	6
adch_n	2231	.2487674	.6037752	0	4
ch1_age	1489	13.76897	8.806863	0	43
ch2_age	1207	12.77382	8.389129	0	39
ch3_age	618	12.84304	8.140956	0	42
ch4_age	262	13.58397	9.082351	0	44
ch5_age	104	14.58654	9.621588	0	36
ch6_age	43	15.39535	8.818648	2	32
ch7_age	18	13.72222	9.712367	0	27
ch8_age	3	17	7.937254	11	26
ch9_age	0				
ch10_age	0				
ch11_age	0				
ch1_gen	1490	1.513423	.4999876	1	2
ch2_gen	1210	1.506612	.500163	1	2
ch3_gen	622	1.490354	.5003093	1	2
ch4_gen	263	1.513308	.5007758	1	2
ch5_gen	107	1.551402	.4996913	1	2
ch6_gen	44	1.545455	.5036862	1	2
ch7_gen	18	1.388889	.5016313	1	2
ch8_gen	3	1.666667	.5773503	1	2
ch9_gen	1	1	.	1	1
ch10_gen	1	1	.	1	1
ch11_gen	1	1	.	1	1
ch1_hom	1491	.6814219	.4660813	0	1
ch2_hom	1213	.7098104	.4540369	0	1
ch3_hom	623	.682183	.4660021	0	1
ch4_hom	264	.625	.4850424	0	1
ch5_hom	107	.5233645	.5018042	0	1
ch6_hom	44	.4318182	.501056	0	1
ch7_hom	19	.3157895	.4775669	0	1
ch8_hom	3	.3333333	.5773503	0	1
ch9_hom	1	0	.	0	0
ch10_hom	1	0	.	0	0
ch11_hom	1	0	.	0	0
childmiss	2231	.0004482	.0211714	0	1
relat2	1965	3.05598	2.689824	2	15
relat3	1456	3.858516	2.422525	2	15
relat4	962	3.857588	2.33141	2	15
relat5	385	4.093506	2.521075	2	15
relat6	124	5.08871	3.748197	2	15
relat7	30	5.666667	4.365486	3	15
relat8	9	4.555556	3.678013	3	14
relat9	6	3.5	1.224745	3	6
hhsize	2231	3.212909	1.4309	1	9
hhsize2	2231	3.212909	1.4309	1	9
hhtype	2231	4.212909	1.685319	1	8
hhtype2	2231	4.542806	2.064831	1	7

The structure of `hhdemog.do` is as follows.

A1.2.1 Age of respondent

- `yearint` (year of interview) and `monthint` (month of interview) were constructed from the string variable `date`.
- `ager2` (age of respondent) created as `ager2` = `yearint` – `q26` (year of birth of respondent).
- Using `q25` (month of birth of respondent), an adjustment to `ager2` was then made if the respondent had not yet had birthday in the year of interview (note: it was assumed that if birthday was in same month as interview, then respondent would have had birthday).
- `ager2` differs from `ager` (age of respondent variable contained in `d1015.dta`) by one year for 715 respondents.

A1.2.2 Demographic information on children (living at home and otherwise)

- Some adjustments were first made to raw data where year of birth, month of birth and gender of children were missing in Wave 1 but supplied in Wave 2.
- `ch*_gen` (gender of child), where "*" ranges from 1 to 11 was constructed using `q8a*`.
- `ch*_age` (age of child) was constructed using `q9a*` and `q10a*`. As for age of respondent, an adjustment was made where child had not yet had birthday in year of interview. Note that month of birth was not supplied for some children – this was estimated assuming a uniform distribution.
- `ch*_hom` (dummy variable = 1 if child lives at home) was constructed using `q11a*`.
- A dummy variable `childmiss` (=1 if age of child(ren) living at home not supplied) was created. One household was identified as not providing information on the age of child(ren) living at home.

A1.2.3 Fixing some inconsistencies in the data on children

There were some inconsistencies between the household roster data and the data on the presence of children in the household – these were fixed.

A1.2.4 Calculate number of children and adult children living at home

- `ch_n` is the number of children (under 15 years old) living at home.
- `adch_n` is the number of children (15 years and older) living at home.

A1.2.5 Find relationship of household members to respondent

`relat*` (where * ranges from 2 to 9) gives the relationship of household member * to the respondent and is constructed using `q282a*`. `relat*` has the following categories:

2 "partner"
3 "child/step-child"
4 "Father/father-in-law"
5 "Mother/mother-in-law"
6 "Brother/brother-in-law"
7 "Sister/sister-in-law"
8 "Grandfather"
9 "Grandmother"
10 "Other male rel."
11 "Other female rel."
12 "Other male"
13 "Other female"

There were no cases of missing household roster information (therefore the variable `rostermiss`, which appears in Wave 2, is not present in Wave 1).

A1.2.6 Inconsistencies in the data comparison between `q20` and roster are noted

Several inconsistencies between the information in `q20` (partnership status of respondent) and the household roster variables (`q282a*`) were noted but have not been fixed at this stage.

A1.2.7 Household size

Household size (`hhsize2`) was calculated using the `relat*` variables. `hhsize2` is identical to `hhsize` (household size constructed variable contained in `d1015.dta`). Note: there has been no check of the consistency between `hhsize2`, `ch_n` and `adch_n`.

A1.2.8 Household type/composition

Household type (`hhtype2`) was created using `relat*`, `ch_n` and `adch_n`. It has the following categories:

1 "lone"

2 "couple, no kids"

3 "sole parent, kids"

4 "sole parent, adult kids"

5 "couple, kids"

6 "couple, adkids"

7 "other"

There are several instances of inconsistencies between `hhtype2` and `hhtype` (household type constructed variable contained in `d1015.dta`).

A1.3 Family income variables

The file `income.do` constructs family income variables and outputs them to the constructed (household-level) data set `income.dta`. The overall aim of the code in `income.do` is to construct an estimate of gross (before tax) family income for the 1995/96 financial year.

The following variables are contained in `income.dta`:

```
Contains data from income.dta
  obs:         2,231
 vars:            15                          5 Apr 2002 00:37
 size:       107,088 (99.0% of memory free)
-------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
-------------------------------------------------------------------------------
id              int    %8.0g
wage            float  %9.0g                  wages
businc          float  %9.0g                  self-employment/business income
govben          int    %9.0g                  government benefits
othery          float  %9.0g                  other income
chmain          int    %9.0g                  child maintenance - total
chmain1         int    %9.0g                  child maintenance - respondent
chmain2         int    %9.0g                  child maintenance - partner
imprent         float  %9.0g                  imputed rent
inc_resp        float  %9.0g                  total income - respondent
havepart        byte   %9.0g                  dummy - living with partner
inc_part        float  %9.0g                  income of partner
inc_ref         float  %9.0g                  income (from q249)
faminc          float  %9.0g                  total family income
completey       byte   %9.0g                  dummy - complete est. of faminc
noincome        byte   %9.0g                  dummy - no income information
-------------------------------------------------------------------------------
Sorted by:  id
```

Variable	Obs	Mean	Std. Dev.	Min	Max
id	2231	1306.146	738.2013	1	2574
wage	2150	27025.33	40332.22	0	832000
businc	2139	3373.117	15915.87	0	250000
govben	2089	2078.693	3886.414	0	22308
othery	2137	1371.699	7049.351	0	150000
chmain	2204	169.9201	1104.113	0	21580
chmain1	2169	156.7192	1079.834	0	21580
chmain2	2168	15.95018	262.973	0	7800
imprent	2149	4840.716	8789.333	0	250000
inc_resp	2204	33628.48	42492.83	0	832000
havepart	2204	.6302178	.4828552	0	1
inc_part	2145	19261.05	24973.71	0	111090
inc_ref	33	34829.67	23843.74	0	118833
faminc	2204	57093.83	52748.24	0	835750
completey	2231	.8861497	.3177006	0	1
noincome	2231	.0121022	.1093668	0	1

A1.3.1 People who refused to give detailed income information

Sixty people refused to answer q236 (wages) – these people were skipped to q249 (estimated grouped income) and 33 of the 60 gave a response to this question. It is impossible to give an income estimate for the 27 people who refused to answer both q236 and q249 and it is recommended that these people be dropped from analysis that involves the use of family income. The dummy variable noincome (=1 if respondent refused to answer both q236 and q249) identifies these 27 people.

For the 33 people who answered q249, it was necessary to convert from an income group (e.g. $15,600 - $20,799) to an income amount within the range. The conversion from income group to a quasi-continuous measure was done by fitting a log-normal distribution to the grouped data (see explanatory note by T. Breusch). The quasi-continuous income value (based on q249) is called inc_ref, and it is only defined for the 33 individuals who refused q236 but answered q249.

A1.3.2 Wages

The construction of an annual wage variable (wage) involved q236 (wage/salary earned), q237 (frequency of receipt of income), q238 (income - gross [before tax] or net [after tax])..

The following decisions were made:

- q236=9 and q236=99, while unusual values, were treated as legitimate (30 cases)
- if q236=-8, then wage=0 (4 cases). Note that in general, the missing value code –8 was treated exactly the same as missing value codes –2, –1 when we have reason (based on other questions) to expect that there should have been a legitimate value given for an income component. Only with wages was –8 treated differently to –2, -1 (because we are not able to construct a dummy variable indicating whether or not wages were received).
- if q236=-1, then wage=. (20 cases)
- if q237=-3 (this is not a valid missing code for Wave 1), then wage=. (1 case)

One problem encountered was the fact that while the majority of individuals reported gross wages, 393 reported net wages. It was decided to convert net wages to gross wages – this was done using the tax scales that applied in 1995/96. Implicit in the conversion of net to gross wages is the assumption that [XX – get argument from Trevor again]

A1.3.3 Self-employment/business income

The construction of the annual self-employment/business income variable (businc) involved: q239 (did you receive income from self-employment or business?) and q240 (amount of business income, before tax but after expenses).

- A variable indicating receipt of business income (businc_r) was created with businc_r=1 if q239=1 (“yes”), businc_r=0 if q239=2 (“no”), businc_r=. if q239=-1|q239=-2.
- if businc_r=0 then businc=0 (note: all these people skipped q240, as expected)
- if businc_r=. then businc=. (4 cases – all skipped q240)
- if businc_r=1 then businc=q240
- if businc_r=1&(q240=-1|q240=-2|q240=-8) then businc=. (28 cases)
- q240=99, while an unusual value, was treated as legitimate (2 cases)

A1.3.4 Government benefits

The construction of annual government benefits income (govben) involved: q241_* (21 variables indicating receipt of particular types of benefits), q242_* (4 variables checking whether family or child benefits received), q243 (total amount of benefits received per fortnight).

- A person was considered to be in receipt of some type of benefit if answered: "yes" to q241_1 (are you receiving any government pensions, benefits or allowances) OR "yes" to any of q241_2-q241_21 (receipt of particular types of benefits) OR "yes" to q242_1 (checking question about receipt of child or family payments) OR "yes" to any of q242_2-q242_4 (checking question about receipt of particular types of child or family payments)
- There were some coding inconsistencies. Two people said yes to q241_1, but no to all payment categories (q241_2-q241_21) – both of these people answered q243=-9, so it was decided to classify them as not being in receipt of government benefit. Five people (including 3 new people i.e. different to the two identified above) said yes to q242_1, but no to all family and child payment categories (q242_2-q242_4) – of the 3 new people, 2 answered q243=-9 and they were classified as not being in receipt of government benefit. However, one person answered q243=60 – it was decided to classify this person as being in receipt of government benefit.
- If a person was considered to *not* be in receipt of some type of benefit, then govben=0
- if a person was considered to be in receipt of some type of benefit, but (q243=-1|q243=-2|q243=-8) then govben=. (78 cases)
- q243=99, while an unusual value, was treated as legitimate (1 case)
- A value of q243=999 was considered suspicious and set to missing (2 cases)

A1.3.5 Other income

The construction of annual other income earned (othery) involved q244 (variable indicating whether other income such as rents, dividends or interest earned) and q245 (amount of other income earned).

- A variable indicating receipt of other income (othery_r) was created with othery_r=1 if q244=1 ("yes"), othery_r=0 if q244=2 ("no"), othery_r=. if q244=-1|q244=-2
- if othery_r=0 then othery=0
- if othery_r=. then othery=. (3 cases – all skipped q245)
- if othery_r=1 then othery=q245
- q245=99, while an unusual value, was treated as legitimate (2 cases)
- if a person was considered to be in receipt of other income, but (q245=-1|q245=-2|q245=-8) then othery=. (31 cases)

A1.3.6 Child maintenance – received by respondent

The construction of child maintenance income paid to respondent (chmain1) involved q246 (variable indicating whether child maintenance received by respondent, partner or both) and q247 (amount received by respondent per week).

- A variable indicating whether respondent receives child maintenance (chmain1r) was created with chmain1r=1 if q246=1 ("yes, I do") or q246=3 ("yes, we both do"), chmain1r =0 if q246=4 ("no"), chmain1r =. if q246=-3
- if chmain1r=0 then chmain1=0
- if chmain1r=. then chmain1=. (2 cases – both skipped q247)
- if chmain1r=1 then chmain=q247*52

A1.3.7 Child maintenance – received by partner

The construction of child maintenance income paid to partner (chmain2) involved q246 (variable indicating whether child maintenance received by respondent, partner or both) and q248 (amount received by partner per week).

- A variable indicating whether partner receives child maintenance (chmain2r) was created with chmain2r=1 if q246=2 ("yes, my partner does") or q246=3 ("yes, we both do"), chmain2r =0 if q246=4 ("no"), chmain2r =. if q246=-3
- if chmain2r=0 then chmain2=0

- if chmain2r=. then chmain2=. (2 cases – both skipped q248)
- if chmain2r=1 then chmain2=q248*52
- if chmain2r=1 but q248=-1, then chmain2=. (1 case)

A1.3.8 Partner's income

Parner's annual income (inc_part) was created using q250 (partner's annual income in income groups) and q20 (partner status).

- A variable indicating whether the respondent is living with a partner was created with havepart=1 if q20==3 (not married but living with partner) | q20==4 (living with husband/wife)
- inc_part=0 if havepart=0. Note – one person for whom havepart=0, gave q250=7 and one person gave q250=-2
- inc_part=. if havepart==1&(inc_part==-1|inc_part==-2|inc_part==-9) – 59 cases
- for those respondents with havepart=1 and a legitimate response to q250, inc_part was found using the estimation approach outlined above (where grouped data converted to quasi-continuous variable using method proposed by T. Breusch)

A1.3.9 Imputed rent

Annual imputed rent (imprent) was calculated using q252 (whether own house), q253 (whether fully own house), q255 (amount owing on house), q256 (estimated market value of house).

- A dummy variable indicating ownership of home was created with ownhouse=1 if q252=1
- A dummy variable indicating full ownership of home was created with ownfull=1 if q253=1
- The amount owing on home (owing) is equal to q255. Note that owing=0 if ownfull=1. Note that owing=. when ownhouse!=1. Note that owing=. for 35 cases with ownhouse=1 but did not give a legitimate answer to q255

- The market value of the house (value) is equal to q256. Note that value=. if ownhouse!=1. Note that value=. for 27 cases with ownhouse=1 but did not give a legitimate answer to q256
- Equity in the home was calculated with equity=value-owing. Note that for 55 cases with ownhouse=1, equity=. because either value or owing was missing. For 15 cases with equity<0, equity was set to 0
- Imputed rent (imprent) was calculated as imprent=0.05*equity [XX – need to give rationale for this calculation]

A1.3.10 Respondent's total income

Respondent's income (inc_resp) was calcuated as the sum of wage, businc, govben, othery, chmain1, and chmain2. Note that inc_resp=inc_ref for the 33 people who refused to answer detailed income questions but answered q249.

A1.3.11 Family income

Family income (faminc) was calculated as the sum of inc_resp, inc_part and imprent.

A1.3.12 Accuracy of income estimate

Note –the Stata command used to calculate family income – rsum() – converts missing values to zeros. Thus it is possible that a respondent giving missing values for all income compenents records faminc=0, rather than faminc=.. It is therefore important that users of the constructed income data identify the households for which there is a legitimate estimate of family income available.

If there is a missing value for any of the compenents of family income, then we do not have a complete estimate of family income. The dummy variable completey indicates whether the estimate of family income is complete with completey=1 if (wage!=. & businc!=. & govben!=. & othery!=. & chmain1!=. & chmain2!=. & inc_part!=. & imprent!=.).

A dummy variable noincome with noincome=1 if the respondent refused to give any income information (this applied to 27 cases).

A1.4 Dataset containing "core" constructed variables

The file `core.do` merges `income.dta` and `hhdemog.dta` and outputs a constructed (household-level) data set of "core" variables called `core.dta`. The following variables are contained in `core.dta`:

```
Contains data from C:\statawrk\nlc\wave1\core.dta
  obs:         2,231
 vars:            18                          5 Apr 2002 00:45
 size:       107,088 (98.9% of memory free)
-------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
-------------------------------------------------------------------------------
id              int    %8.0g
ager2           byte   %9.0g                  age of respondent
hhtype2         byte   %23.0g      hhtype2f   household type
hhsize2         byte   %9.0g                  household size
childmiss       byte   %9.0g                  missing info on age child(ren)
wage            float  %9.0g                  wages
businc          float  %9.0g                  self-employment/business income
govben          int    %9.0g                  government benefits
othery          float  %9.0g                  other income
chmain          int    %9.0g                  child maintenance - total
chmain1         int    %9.0g                  child maintenance - respondent
chmain2         int    %9.0g                  child maintenance - partner
imprent         float  %9.0g                  imputed rent
inc_resp        float  %9.0g                  total income - respondent
inc_part        float  %9.0g                  income of partner
completey       byte   %9.0g                  dummy - complete est. of faminc
noincome        byte   %9.0g                  dummy - no income information
faminc          float  %9.0g                  total family income
-------------------------------------------------------------------------------
Sorted by:  id

. sum

    Variable |     Obs        Mean   Std. Dev.       Min        Max
-------------+--------------------------------------------------------
          id |    2231    1306.146   738.2013          1       2574
       ager2 |    2231    36.06768   9.564902         18         55
     hhtype2 |    2231    4.542806   2.064831          1          7
     hhsize2 |    2231    3.212909     1.4309          1          9
   childmiss |    2231    .0004482   .0211714          0          1
        wage |    2150    27025.33   40332.22          0     832000
      businc |    2139    3373.117   15915.87          0     250000
      govben |    2089    2078.693   3886.414          0      22308
      othery |    2137    1371.699   7049.351          0     150000
      chmain |    2204    169.9201   1104.113          0      21580
     chmain1 |    2169    156.7192   1079.834          0      21580
     chmain2 |    2168    15.95018    262.973          0       7800
     imprent |    2149    4840.716   8789.333          0     250000
    inc_resp |    2204    33628.48   42492.83          0     832000
    inc_part |    2145    19261.05   24973.71          0     111090
   completey |    2231    .8861497   .3177006          0          1
    noincome |    2231    .0121022   .1093668          0          1
      faminc |    2204    57093.83   52748.24          0     835750
```

Annex 2 Data construction for Wave 2

There are 1768 observations in the Wave 2 data set `nlc00.dta`. The data were collected between April and September 2000.

A2.1 Missing value codes in Wave 2

-3 – pulled out during the survey? Codes: -9, -8, -2, -1 [xx finish this]

A2.2 Household demography variables

The file `hhdemog.do` constructs basic household demography variables and outputs them to the constructed (household-level) data set `hhdemog.dta`. The following variables are contained in `hhdemog.dta`:

```
Contains data from hhdemog.dta
  obs:         1,768
 vars:            53                          12 Apr 2002 12:23
 size:       102,544 (97.3% of memory free)
------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
------------------------------------------------------------------------------
id              int    %8.0g
yearint         byte   %9.0g                  year of interview
monthint        byte   %9.0g                  month of interview
ager2           byte   %9.0g                  age of respondent
ch_n            byte   %9.0g                  # children (<15 yrs) at home
adch_n          byte   %9.0g                  # adult children at home
ch1_age         byte   %9.0g                  age of child -1-
ch2_age         byte   %9.0g                  age of child -2-
ch3_age         byte   %9.0g                  age of child -3-
ch4_age         byte   %9.0g                  age of child -4-
ch5_age         byte   %9.0g                  age of child -5-
ch6_age         byte   %9.0g                  age of child -6-
ch7_age         byte   %9.0g                  age of child -7-
ch8_age         byte   %9.0g                  age of child -8-
ch9_age         byte   %9.0g                  age of child -9-
ch10_age        byte   %9.0g                  age of child -10-
ch1_gen         byte   %9.0g                  gender of child -1-
ch2_gen         byte   %9.0g                  gender of child -2-
ch3_gen         byte   %9.0g                  gender of child -3-
ch4_gen         byte   %9.0g                  gender of child -4-
ch5_gen         byte   %9.0g                  gender of child -5-
ch6_gen         byte   %9.0g                  gender of child -6-
ch7_gen         byte   %9.0g                  gender of child -7-
ch8_gen         byte   %9.0g                  gender of child -8-
ch9_gen         byte   %9.0g                  gender of child -9-
ch10_gen        byte   %9.0g                  gender of child -10-
ch1_hom         byte   %9.0g                  child -1- at home?
ch2_hom         byte   %9.0g                  child -2- at home?
ch3_hom         byte   %9.0g                  child -3- at home?
ch4_hom         byte   %9.0g                  child -4- at home?
ch5_hom         byte   %9.0g                  child -5- at home?
ch6_hom         byte   %9.0g                  child -6- at home?
ch7_hom         byte   %9.0g                  child -7- at home?
```

```
ch8_hom         byte    %9.0g                 child -8- at home?
ch9_hom         byte    %9.0g                 child -9- at home?
ch10_hom        byte    %9.0g                 child -10- at home?
childmiss       byte    %9.0g                 missing info on age child(ren)
relat2          byte    %22.0g      relat     relat. of person -2- to resp.
relat3          byte    %22.0g      relat     relat. of person -3- to resp.
relat4          byte    %22.0g      relat     relat. of person -4- to resp.
relat5          byte    %22.0g      relat     relat. of person -5- to resp.
relat6          byte    %22.0g      relat     relat. of person -6- to resp.
relat7          byte    %22.0g      relat     relat. of person -7- to resp.
relat8          byte    %22.0g      relat     relat. of person -8- to resp.
relat9          byte    %22.0g      relat     relat. of person -9- to resp.
relat10         byte    %22.0g      relat     relat. of person -10- to resp.
relat11         byte    %22.0g      relat     relat. of person -11- to resp.
relat12         byte    %22.0g      relat     relat. of person -12- to resp.
relat13         byte    %22.0g      relat     relat. of person -13- to resp.
relat14         byte    %22.0g      relat     relat. of person -14- to resp.
hhsize          byte    %8.0g       q266      household size (from nlc03jul)
hhsize2         byte    %9.0g                 household size
hhtype2         byte    %13.0g      hhtype2f  household type
rostermiss      byte    %9.0g                 dummy - missing roster info
-------------------------------------------------------------------------------
Sorted by:  id
```

Variable	Obs	Mean	Std. Dev.	Min	Max
id	1768	1316.134	735.2395	1	2574
yearint	1768	100	0	100	100
monthint	1768	5.424208	.7634268	4	9
ager2	1768	39.92477	9.447589	21	59
ch_n	1768	.8438914	1.115034	0	6
adch_n	1768	.3535068	.7081298	0	5
ch1_age	1281	15.94223	9.284552	0	38
ch2_age	1061	14.52498	8.933749	0	36
ch3_age	489	13.86912	8.455237	0	34
ch4_age	181	12.65746	7.901042	0	32
ch5_age	51	11.82353	7.706376	0	29
ch6_age	14	8.928571	6.207493	1	20
ch7_age	6	10.16667	7.782459	3	22
ch8_age	1	3	.	3	3
ch9_age	1	14	.	14	14
ch10_age	0				
ch1_gen	1285	1.522957	.4996671	1	2
ch2_gen	1067	1.501406	.5002325	1	2
ch3_gen	492	1.512195	.50036	1	2
ch4_gen	183	1.497268	.5013643	1	2
ch5_gen	52	1.519231	.5045046	1	2
ch6_gen	14	1.571429	.5135526	1	2
ch7_gen	6	1.333333	.5163978	1	2
ch8_gen	1	1	.	1	1
ch9_gen	1	2	.	2	2
ch10_gen	0				
ch1_hom	1292	.6571207	.4748553	0	1
ch2_hom	1074	.6880819	.4634924	0	1
ch3_hom	501	.6986028	.4593235	0	1
ch4_hom	192	.65625	.4762006	0	1
ch5_hom	60	.6833333	.4691018	0	1
ch6_hom	22	.5909091	.5032363	0	1
ch7_hom	14	.2857143	.4688072	0	1
ch8_hom	9	0	0	0	0
ch9_hom	8	0	0	0	0
ch10_hom	7	0	0	0	0
childmiss	1768	.0011312	.0336241	0	1
relat2	1558	3.105905	3.289454	2	17
relat3	1137	4.595427	4.052896	2	17
relat4	790	4.458228	3.83039	2	17
relat5	318	4.63522	3.995141	2	17
relat6	99	4.939394	4.323213	3	17

```
     relat7 |      20         6.4   5.413434          2         17
     relat8 |       7    6.428571   5.883795          3         16
     relat9 |       2         9.5   9.192388          3         16
    relat10 |       1          16          .         16         16
    relat11 |       1          16          .         16         16
    relat12 |       1          16          .         16         16
    relat13 |       1          16          .         16         16
    relat14 |       1          17          .         17         17
     hhsize |    1750    3.249143   1.440525          1         14
    hhsize2 |    1750    3.249143   1.440525          1         14
    hhtype2 |    1750    4.529143   2.052486          1          7
 rostermiss |    1768     .010181   .1004144          0          1
```

The structure of `hhdemog.do` is as follows.

A2.2.1 Age of respondent

- `yearint` (year of interview) was set to 100 (all interviews were conducted in 2000) and `monthint` (month of interview) was constructed from the string variable `e_`.
- `ager2` (age of respondent) created as `ager2` = `yearint` – `q1y` (year of birth of respondent).
- Using `q1m` (month of birth of respondent), an adjustment to `ager2` was then made if the respondent had not yet had birthday in the year of interview (note: it was assumed that if birthday was in same month as interview, then respondent would have had birthday).

A2.2.2 Demographic information on children (living at home and otherwise)

- Some adjustments were first made to raw data where year of birth, month of birth and gender of children were missing in Wave 2 but supplied in Wave 1 (or, in the case of month of birth estimated using a uniform distribution, as described above).
- `ch*_gen` (gender of child), where "*" ranges from 1 to 10 was constructed using `q146a*`.
- `ch*_age` (age of child) was constructed using `q147a*` and `q148a*`. As for age of respondent, an adjustment was made where child had not yet had birthday in year of interview. Note that month of birth was not supplied for some children (and could not be found using Wave 1 data) – this was estimated assuming a uniform distribution.
- `ch*_hom` (dummy variable = 1 if child lives at home) was constructed using `q149a*`.

- A dummy variable `childmiss` (=1 if age of child(ren) living at home not supplied) was created. Two households were identified as not providing information on the age of child(ren) living at home.

A2.2.3 Fixing some inconsistencies in the data on children

At this stage, no inconsistencies between the household roster data and the data on the presence of children in the household have been found.

A2.2.4 Calculate number of children and adult children living at home

- `ch_n` is the number of children (under 15 years old) living at home.
- `adch_n` is the number of children (15 years and older) living at home.

A2.2.5 Find relationship of household members to respondent

`relat*` (where * ranges from 2 to 14) gives the relationship of household member * to the respondent and is constructed using `q267a*`. `relat*` has the following categories:

2 "partner"
3 "child/step-child"
4 "Father/father-in-law"
5 "Mother/mother-in-law"
6 "Brother/brother-in-law"
7 "Sister/sister-in-law"
8 "Grandfather"
9 "Grandmother"
10 "Other male rel."
11 "Other female rel."
12 "Other male"
13 "Other female"

There were 18 cases where there is missing household roster information – these are identified with the dummy variable `rostermiss`.

A2.2.6 Inconsistencies in the data comparison between q27 and roster are noted

There were many instances of inconsistencies between the information in q27 (partnership status of respondent) and the household roster variables (q267a*). These have not been fixed at this stage.

A2.2.7 Household size

Household size (hhsize2) was calculated using the relat* variables. hhsize2 is identical to hhsize which is equal to q266 (number of people living in household). Note: there has been no check of the consistency between hhsize2, ch_n and adch_n.

For the 18 cases where rostermiss==1, non-legitimate answers were given for q266. In all such cases, hhsize and hhsize2 are set to missing.

A2.2.8 Household type/composition

Household type (hhtype2) was created using relat*, ch_n and adch_n. It has the following categories:

1 "lone"
2 "couple, no kids"
3 "sole parent, kids"
4 "sole parent, adult kids"
5 "couple, kids"
6 "couple, adkids"
7 "other"

For the 18 cases where rostermiss==1, hhtype2 is set to missing.

A2.3 Family income variables

The file income.do constructs family income variables and outputs them to the constructed (household-level) data set income.dta. The overall aim of the code in income.do is to construct an estimate of gross (before tax) family income for the 1998/99 financial year.

The following variables are contained in income.dta:

```
Contains data from income.dta
```

```
  obs:         1,768
 vars:            14                          12 Apr 2002 12:50
 size:        77,792 (99.2% of memory free)
-------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
-------------------------------------------------------------------------------
id              int    %8.0g
wage            float  %9.0g                 wages
businc          float  %9.0g                 self-employment/business income
govben          int    %9.0g                 government benefits
othery          float  %9.0g                 other income
chmain          int    %9.0g                 child maintenance - total
chmain1         int    %9.0g                 child maintenance - respondent
chmain2         int    %9.0g                 child maintenance - partner
imprent         float  %9.0g                 imputed rent
inc_resp        float  %9.0g                 total income - respondent
havepart        byte   %9.0g                 dummy - living with partner
inc_part        float  %9.0g                 income of partner
faminc          float  %9.0g                 total family income
completey       byte   %9.0g                 dummy - complete est. of faminc
-------------------------------------------------------------------------------
Sorted by:  id
```

Variable	Obs	Mean	Std. Dev.	Min	Max
id	1768	1316.134	735.2395	1	2574
wage	1642	36851.9	118077.9	0	4000000
businc	1671	10669.89	56528.08	0	2000000
govben	1703	1851.679	3927.537	0	25662
othery	1681	1563.186	7179.262	0	200000
chmain	1768	182.9706	1291.855	0	21528
chmain1	1757	178.6409	1292.61	0	21528
chmain2	1756	5.47836	101.2641	0	2340
imprent	1695	7803.913	21952.88	0	450000
inc_resp	1768	47762.9	131771.3	0	4002834
havepart	1768	.7053167	.4560292	0	1
inc_part	1642	24741.43	30411.07	0	117899
faminc	1768	78222.78	138828.6	0	4022834
completey	1768	.8190045	.3851234	0	1

A2.3.1 People who refused to give detailed income information

Unlike Wave 1, in Wave 2 if the respondent refused to answer `q244` (wages) he/she was not skipped to an estimated grouped income question. Thus, it is possible that a person refused to give wage information (or reported "don't know"), but gave information on other income components.

A2.3.2 Wages

The construction of an annual wage variable (`wage`) involved `q244a1` (gross [before tax] wage/salary earned annually) and `q244a2` (gross [before tax] wage/salary earned fortnightly).

- A problem with the wage data is that zeros have been used rather than missing values for wage for the frequency that does not apply to a particular respondent – e.g., it is

possible to have q224a2=0 even if q224a1>0 (i.e. should have q224a2=.). The Stata code allows for this.

- Dummy variables indicating the receipt of wages either annually (`ann_dum`) or fortnightly (`fort_dum`) were created. As with Wave 1, if the respondent answered –8 "n.a." to `q244a1` and `q244a2`, then this was taken that the respondent did not receive wage income.
- `wage` was set equal to `q244a1` when the respondent earned wages annually and `q244a2*26` when the respondent earned wages fortnightly.
- If there was evidence that the respondent did earn wage income, but supplied one of the missing value codes (other than –8), then `wage` was set to missing.

A2.3.3 Self-employment/business income

The construction of the annual self-employment/business income variable (`businc`) involved: `q222` (did you receive income from self-employment or business including a partnership or trust?) and `q223a2` (amount of business income, before tax but after expenses).

- A variable indicating receipt of business income (`businc_r`) was created with `businc_r`=1 if `q222`=1 ("yes"), `businc_r`=0 if `q222`=2 ("no"), `businc_r`=. if `q239`=-1|`q239`=-2|`q239`=-3|`q239`=-5. There was one respondent who answered `q222`=-8 ("n.a.") – for this person, `businc_r`=0.
- if `businc_r`=0 then businc=0 (note: all these people skipped `q223a2`, as expected)
- if `businc_r`=. then `businc`=. (18 cases – none gave legitimate answer to `q223a2`)
- if `businc_r`=1 then `businc`=`q223a2`
- if `businc_r`=1&(`q223a2`=-1|`q223a2`=-2|`q223a2`=-8) then `businc`=. (79 cases). What does it mean if respondent has said earn business income, and then answer "n.a." when asked for the amount?
- There were 71 cases where wage and business income were identical – `wage`=`businc`. Andrea Lanyon (UQCATI) was asked about this, and she recommended that this was case of double counting the same income and so an

adjustment is made to the 71 cases to reflect this: wage was set to 0 if wage=businc.

A2.3.4 Government benefits

The construction of annual government benefits income (govben) involved: q225 ("Are you receiving any government pensions, benefits or allowances?") and q227 (total regular fortnightly payment from government pensions, benefits or allowances).

- A variable indicating receipt of government benefits (govben_r) was created with govben_r=1 if q225=1 ("yes"), govben_r=0 if q225=2 ("no") and govben_r=. if (q225==-1|q225==-2|q225==-3|q225==-5).
- If govben_r=1 then govben=q227*26.
- If govben_r=0 then govben=0.
- If govben_r=. then govben=. – 15 cases.
- If govben_r=1 but didn't provide legitimate answer to q227 then govben=. – 50 cases.

A2.3.5 Other income

The construction of annual other income earned (othery) involved q228 (variable indicating whether other income such as rents, dividends or interest earned) and q229 (amount of other income earned in financial year).

- A variable indicating receipt of other income (othery_r) was created with othery_r=1 if q228=1 ("yes"), othery_r=0 if q228=2 ("no"), othery_r=. if q228=-2|q228=-3|q228=-5.
- if othery_r=0 then othery=0
- if othery_r=. then othery=. (18 cases – none gave legitimate answer to q228)
- if othery_r=1 then othery=q229
- if othery_r=1, but (q229=-1|q229=-2|q229=-8) then othery=. (69 cases) What does it mean if respondent has said earned other income, and then answer "n.a." when asked for the amount?

A2.3.6 Child maintenance – received by respondent

The construction of child maintenance income paid to respondent (chmain1) involved q231 (variable indicating whether child maintenance received by respondent, partner or both) and q232 (amount received by respondent per week).

- A variable indicating whether respondent receives child maintenance (chmain1r) was created with chmain1r=1 if q231=1 ("yes, I do") or q231=3 ("yes, we both do"), chmain1r =0 if q231=4 ("no"), chmain1r =. if q231=-3|q231=-5 (treating 1 case of q231=-8 as "no")
- if chmain1r=0 then chmain1=0
- if chmain1r=. then chmain1=. (10 cases – none gave legitimate answer to q232)
- if chmain1r=1 then chmain=q232*52
- if chmain1r=1 but q232=-2 then chmain=. (1 case)

A2.3.7 Child maintenance – received by partner

The construction of child maintenance income paid to partner (chmain2) involved q231 (variable indicating whether child maintenance received by respondent, partner or both) and q233 (amount received by partner per week).

- A variable indicating whether partner receives child maintenance (chmain2r) was created with chmain2r=1 if q231=2 ("yes, my partner does") or q231=3 ("yes, we both do"), chmain2r =0 if q231=4 ("no"), chmain2r =. if q231=-3|q231=-5 (treating 1 case of q231=-8 as "no")
- if chmain2r=0 then chmain2=0
- if chmain2r=. then chmain2=. (10 cases – none gave legitimate answer to q233)
- if chmain2r=1 then chmain2=q233*52
- if chmain2r=1 but q233=-1, then chmain2=. (2 cases)

A2.3.8 Partner's income

Parner's annual income (inc_part) was created using q234 (partner's annual income in income groups) and q27 (partner status).

- A variable indicating whether the respondent is living with a partner was created with havepart=1 if q27==3 (not married but living with partner) | q27==4 (living with husband/wife)
- for one person, q27=-3 and havepart=0, even though a legitimate answer was given for q234
- inc_part=0 if havepart=0. Note – one person mentioed above for whom havepart=0, gave q234=9
- inc_part=. if havepart==1&(q234==-1|q234==-2|q234==-5|q234==-8|q234==-9) – 126 cases
- for those respondents with havepart=1 and a legitimate response to q234, inc_part was found using the estimation approach outlined above (where grouped data converted to quasi-continuous variable using method proposed by T. Breusch)

A2.3.9 Imputed rent

Annual imputed rent (imprent) was calculated using q242 (whether own house), q243 (whether fully own house), q245 (amount owing on house), q246 (estimated market value of house). See discussion in section on Wave 1 for description of method for calculating imputed rent.

- A dummy variable indicating ownership of home was created with ownhouse=1 if q242=1, ownhouse =. if q242 ==-5|q242 ==-3|q242 ==-2|q242 ==-1 and zero otherwise
- A dummy variable indicating full ownership of home was created with ownfull=1 if q243=1
- The amount owing on home (owing) is equal to q245. Note that owing=0 if ownfull=1. Note that owing=. when ownhouse!=1. Note that owing=. for 20 cases with ownhouse=1 but either did not give a legitimate answer to q243 or q245
- The market value of the house (value) is equal to q256. Note that value=. if ownhouse!=1. Note that value=. for 49 cases with ownhouse=1 but did not give a legitimate answer to q256

- Equity in the home was calculated with `equity=value-owing`. Note that for 56 cases with `ownhouse`=1, `equity`=. because either value or owing was missing. For 12 cases with `equity`<0, `equity` was set to 0
- Imputed rent (`imprent`) was calculated as `imprent`=0.05*`equity`.

A2.3.10 Respondent's total income

Respondent's income (`inc_resp`) was calcuated as the sum of `wage`, `businc`, `govben`, `othery`, `chmain1`, and `chmain2`.

A2.3.11 Family income

Family income (`faminc`) was calculated as the sum of `inc_resp`, `inc_part` and `imprent`.

A2.3.12 Accuracy of income estimate

If there is a missing value for any of the compenents of family income, then we do not have a complete estimate of family income. The dummy variable `completey` indicates whether the estimate of family income is complete with `completey`=1 if (`wage`!=. & `businc`!=. & `govben`!=. & `othery`!=. & `chmain1`!=. & `chmain2`!=. & `inc_part`!=. & `imprent`!=.).

A2.4 Dataset containing "core" constructed variables

The file `core.do` merges `income.dta` and `hhdemog.dta` and outputs a constructed (household-level) data set of "core" variables called `core.dta`. The following variables are contained in `core.dta`:

```
Contains data from core.dta
  obs:         1,768
 vars:            19                          12 Apr 2002 15:44
 size:        86,632 (99.3% of memory free)
------------------------------------------------------------------------------
              storage  display     value
variable name   type   format      label      variable label
------------------------------------------------------------------------------
id              int    %8.0g
ager2           byte   %9.0g                  age of respondent
hhtype2         byte   %13.0g      hhtype2f   household type
hhsize2         byte   %9.0g                  household size
childmiss       byte   %9.0g                  missing info on age child(ren)
rostermiss      byte   %9.0g                  dummy - missing roster info
wage            float  %9.0g                  wages
businc          float  %9.0g                  self-employment/business income
```

```
govben          int    %9.0g                 government benefits
othery          float  %9.0g                 other income
chmain          int    %9.0g                 child maintenance - total
chmain1         int    %9.0g                 child maintenance - respondent
chmain2         int    %9.0g                 child maintenance - partner
imprent         float  %9.0g                 imputed rent
inc_resp        float  %9.0g                 total income - respondent
havepart        byte   %9.0g                 dummy - living with partner
inc_part        float  %9.0g                 income of partner
faminc          float  %9.0g                 total family income
completey       byte   %9.0g                 dummy - complete est. of faminc
-------------------------------------------------------------------------------
Sorted by:  id
```

Variable	Obs	Mean	Std. Dev.	Min	Max
id	1768	1316.134	735.2395	1	2574
ager2	1768	39.92477	9.447589	21	59
hhtype2	1750	4.529143	2.052486	1	7
hhsize2	1750	3.249143	1.440525	1	14
childmiss	1768	.0011312	.0336241	0	1
rostermiss	1768	.010181	.1004144	0	1
wage	1642	36851.9	118077.9	0	4000000
businc	1671	10669.89	56528.08	0	2000000
govben	1703	1851.679	3927.537	0	25662
othery	1681	1563.186	7179.262	0	200000
chmain	1768	182.9706	1291.855	0	21528
chmain1	1757	178.6409	1292.61	0	21528
chmain2	1756	5.47836	101.2641	0	2340
imprent	1695	7803.913	21952.88	0	450000
inc_resp	1768	47762.9	131771.3	0	4002834
havepart	1768	.7053167	.4560292	0	1
inc_part	1642	24741.43	30411.07	0	117899
faminc	1768	78222.78	138828.6	0	4022834
completey	1768	.8190045	.3851234	0	1