Survey on Income and Living Conditions (SILC) 2018

Background Notes

Purpose of Survey

The primary focus of the Survey on Income and Living Conditions (SILC) is the collection of information on the income and living conditions of different types of households in Ireland, in order to derive indicators on poverty, deprivation and social exclusion. It is a voluntary (for selected respondents) survey of private households. It is carried out under EU legislation (Council Regulation No 1177/2003) and commenced in Ireland in June 2003.

Reference period

Information is collected continuously throughout the year with household interviews being conducted on a weekly basis. The income reference period for SILC is the 12 months immediately prior to the date of interview. Therefore, the income referenced spans the period from January 2017 to December 2018. In 2018, the achieved sample size was 4,382 households and 11,130 individuals.

Timeliness

For 2018, the results of the SILC survey were published eleven months after the end of the reference period and ten months after the end of the data collection period. It is important to take into account a number of factors when comparing the timeliness of the Irish results with those of other countries. These factors include; the timing and duration of the data collection fieldwork and the exact reference year of the data collected. For example, most EU member states use income data from the previous year (T-1) as a proxy for current (T) annual income. As noted above, the income referenced in Ireland's 2018 SILC data spans the period from January 2017 to December 2018.

Rotational Sample Design

The SILC sample is a rotational sample. In 2018, a new sample was introduced. This means that wave 1 for the 2018 SILC comes from the 2018 sampling frame, while waves 2-4 come from the 2014 sampling frame.

There is both a cross-sectional and a longitudinal element to the SILC sample. Households interviewed for the first time are Wave 1 households. Households who are interviewed in subsequent years are Wave 2 households (2nd year in the sample), Wave 3 households (3rd year in the sample) or Wave 4 (4th and

final year in the sample). The initial sample design attempts to seed the sample with 25% for each new wave. However, due to non-response and sample attrition the waves are not evenly balanced in the sample with Wave 1 households usually tending to dominate.

The CSO has strengthened its own rules and procedures around sample implementation. One of the key improvements in sample implementation over the past number of years is the ruling out of the substitution of households by interviewers.

Response Rates

The overall response rate for the SILC survey in 2018 was 46%. The response rate is heavily influenced by the Wave 1 response rate which was 33% in 2018. The response rates tend to be a lot higher for Wave 2-4 households and in 2018 the response rate for Wave 2-4 households was 69%.

Sample design

In 2014, a new sampling methodology was introduced to improve the robustness of the SILC Sample. The sample methodology takes into account response rates and attrition rates to ensure the CSO achieves the required effective sample size required by Eurostat. In 2018, a new sample was introduced. This means that wave 1 for the 2018 SILC comes from the 2018 sampling frame, while waves 2-4 come from the 2014 sampling frame. The following is a brief overview of the revised SILC sample methodology:

- The SILC sample is a multi-stage cluster sample resulting in all households in Ireland having an equal probability of selection.
- The sample is stratified by NUTS4 and quintiles derived from the Pobal HP (Haase and Pratschke) Deprivation Index.
- In the 2018 sample the clusters are based on Census Enumeration Areas, rather than the Household Survey Collection Unit Small Areas used in the 2014 sample.
- A sample of 1,200 blocks (i.e. Census Enumeration Areas, Census 2016) from the total population of blocks is selected.
- Blocks are selected using probability proportional to size (PPS), where the size of the block is determined by the number of occupied households on Census night 2016.
- All occupied households on Census night 2016 within each block are eligible for selection in the SILC sample.
- Households within blocks are selected using simple random sampling without replacement (SRS) for inclusion in the survey sample.

Weighting

A design weight is assigned to each household which is calculated as the inverse proportion to the probability with which the household was sampled. For SILC, the probability of the selection of a household is based on two elements; the probability of the selection of a block and the probability of selection of a household within that block. The design weights were calculated separately for each wave.

For Wave 1 households, the design weights were calculated as outlined above and adjusted so as to be proportional to the 2018 sample as a whole. For Wave 2-4 households, base weights were calculated by firstly adjusting the personal weights from the previous year for non-response. The Weight Share Method was then applied to calculate a base weight for the household. These design weights were then adjusted so as to be proportional to the original sample as a whole.

In accordance with Eurostat recommendation, CALMAR was used to calculate the household cross-sectional weights. Benchmark information was used to gross up the data to population estimates. The

benchmark estimates were based on:

- Age by sex: Individual population estimates are generated from population projections from census data. Age is broken down into four categories: 0-14, 15-34, 35-64 and 65 and over.
- Region: Household population estimates in each of the eight NUTS3 regions are generated using Labour Force Survey (LFS) data.
- Household composition: Household composition estimates are also generated from the LFS. The following categories are used:

¨ One adult, no children

¨ Two adults, no children

¨ Three or more adults, no children

¨ One adult, one or more children

¨ Two adults, one to three children

¨ Other households with children

Due to the "integrative" calibration method, the personal weight generated in CALMAR is equal to the household weight. Because there is no individual non-response within a household, the weights for personal cross-sectional respondents aged 16 and over are the same as the overall personal weight.

Precision estimates and statistical significance

Estimates were calculated in SAS using the Jackknife and the Taylor Linearisation methodology. For the mean equivalised net disposable income, the 'At Risk of Poverty' rate, the 'Deprivation' rate and the 'Consistent Poverty' rate, the Jackknife Method in PROC SURVEYMEANS was used. The Taylor Linearisation Method in PROC SURVEYMEANS was used to measure the precision of the quantiles.

SAS routines and macros were developed to calculate the precision of the more complex statistics, i.e. the Gini Coefficient and the Quintile Share Ratio (QSR), using the Jackknife Method. The variance of the Gini and the QSR was estimated using the methodology outlined in Lohr[1] Ch. 9 (Variance Estimation in Complex Surveys). The calculations of the precision estimates took into account the weighting, the complex structure of the sample, (i.e. the fact that the sample was a cluster sample as opposed to a simple random sample) and other complications arising from the methods adopted.

When measuring the year on year change of a statistic, we take into account both the variance of the statistic in each year (sample) and the covariance of the statistic between samples.

[1]Sampling: Design and Analysis, 2nd Edition, Sharon L. Lohr (2010).

Data collection

The annual SILC survey is the main data source for SILC. Information is collected from all household members on laptop computers by trained interviewers, using Computer-Assisted Personal Interview (CAPI) software.

In addition, the CSO has two primary micro data sources. These are the Department of Social Protection (DSP) social welfare data and Revenue Commissioners' employee income data. The CSO continues to work with DSP and Revenue to ensure good quality data is available on a timely basis.

Definitions of Income

Gross income

Income details are collected at both a household and individual level in SILC. In analysis, each individual's income is summed up to household level and in turn added to household level income components to calculate *gross household income*. The components of gross household income are:

Direct Income

Employee income

Gross employee cash or near cash income

Gross non-cash employee income

Employer's social insurance contributions

Gross cash benefits or losses from self-employment

Other direct income

- Value of goods produced for own consumption
- Pension from individual private plans
- Income from rental of property or land
- Regular inter-household cash transfers received
- Interests, dividends, profit from capital investments in unincorporated business
- Income received by people aged under 16

Social Transfers

Jobseekers related payments
Old-age payments (note that this includes all occupational pensions and other such social welfare payments to those aged 65 and over)
Family/children related allowances:

- Maternity/paternity/adoptive benefit
- Child benefit
- One-parent family payment
- Carers' payments

Housing allowances:

- Rent supplement
- Household benefit package
- Exceptional needs payments

Other Social transfers:

- Survivor's benefits
- Sickness benefits
- Disability benefits

- Education related allowances
- Social exclusion not elsewhere classified

Disposable income

Tax and social insurance contributions are also summed to household level and subtracted from the gross household income to calculate the *total disposable household income*. The components of disposable household income are gross household income *less*:

Employer's social insurance contributions

Regular inter-household cash transfer paid

Tax (including USC) on income and social insurance contributions

Tax deducted at source from individual private pension plans

Real/Nominal income figures

Both nominal and real income figures are included in this release. Real income figures have been adjusted for inflation by applying a deflator to the nominal income figures. The deflator is derived from the monthly CPI and takes into account the rolling nature of the income data collected by SILC.

Equivalence scales

Equivalence scales are used to calculate the *equivalised household size* in a household. Although there are numerous scales, we focus on the national scale in this release. The national scale attributes a weight of 1 to the first adult, 0.66 to each subsequent adult (aged 14+ living in the household) and 0.33 to each child aged less than 14. The weights for each household are then summed to calculate the *equivalised household size*.

Equivalised disposable household Income

Disposable household income is divided by the *equivalised household size* to calculate equivalised disposable income for each person, which essentially is an approximate measure of how much of the income can be attributed to each member of the household. This *equivalised income* is then applied to each member of the household.

Household composition

For the purposes of deriving household composition, a child was defined as any member of the household aged 17 or under. Households were analysed as a whole, regardless of the number of family units within the household. The categories of household composition are:

- 1 adult aged 65+
- 1 adult aged <65
- 2 adults at least 1 aged 65+
- 2 adults, both aged <65
- 3 or more adults
- 1 adult, with children aged under 18
- 2 adults with 1-3 children aged under 18
- Other households with children aged under 18

Tenure status

Tenure status refers to the nature of the accommodation in which the household resides. The status is provided by the respondent during the interview and responses are classified into the following three categories:

- Owner-occupied
- Rented at the market rate
- Rented at below the market rate or rent free (includes Local Authority housing, rent-free lettings or rents agreed at below the market rate)

Urban/rural location

From 2014 onwards due to the new sampling methodology, areas are now classified as Urban or Rural based on the following population densities derived from Census of Population 2016:

Urban

- Population density >100,000
- Population density 50,000 – 99,999
- Population density 20,000 – 49,999
- Population density 10,000 – 19,999
- Population density 5,000 – 9,999
- Population density 1,000 – 4,999

Rural

- Population density <199 – 999
- Rural areas in counties

Prior to 2014, areas were classified as Urban or Rural based on the following population densities:

Urban

- Cities
- Suburbs of cities
- Mixed urban/rural areas bordering on the suburbs of cities
- Towns and their environs with populations of 5,000 or over (large urban)
- Mixed urban/rural areas bordering on the environs of larger towns
- Towns and their environs with a population of 1,000 to 5,000 (other urban)

Rural

- Mixed urban/rural areas
- Rural areas.

Regions

The regional classifications in this release are based on the NUTS (Nomenclature of Territorial Units) classification used by Eurostat. The NUTS boundaries were amended on 21st November 2016 under Regulation (EC) No.2066/2016 and took effect from 1st January 2018. As a result, new NUTS (regional classification) groupings have been introduced for Ireland. As the CSO weights results in the SILC using

NUTS3 groups, survey estimates have been revised for SILC years 2012-2016 to take account of these changes. This reweighted data from 2012 to 2016 inclusive was published with the SILC 2017 results and users should note that there is a break in the regional data series from 2012 as the results for the period 2004 to 2011 are published using the old NUTS groupings.

Indicators

At risk of poverty rate

This is the share of persons with an equivalised income below a given percentage (usually 60%) of the national median income. It is also calculated at 40%, 50% and 70% for comparison. The rate is calculated by ranking persons by equivalised income from smallest to largest and then extracting the median or middle value. Anyone with an equivalised income of less than 60% of the median is considered *at risk of poverty at a 60% level.*

Deprivation rate

Households that are excluded and marginalised from consuming goods and services which are considered the norm for other people in society, due to an inability to afford them, are considered to be deprived. The identification of the marginalised or deprived is currently achieved on the basis of a set of eleven basic deprivation indicators:

1. Two pairs of strong shoes
2. A warm waterproof overcoat
3. Buy new (not second-hand) clothes
4. Eat meal with meat, chicken, fish (or vegetarian equivalent) every second day
5. Have a roast joint or its equivalent once a week
6. Had to go without heating during the last year through lack of money
7. Keep the home adequately warm
8. Buy presents for family or friends at least once a year
9. Replace any worn out furniture
10. Have family or friends for a drink or meal once a month
11. Have a morning, afternoon or evening out in the last fortnight for entertainment

Individuals who experience two or more of the eleven listed items are considered to be experiencing enforced deprivation. This is the basis for calculating the deprivation rate.

Consistent poverty

The consistent poverty measure looks at those persons who are defined as being at risk of poverty and experiencing enforced deprivation (experiencing two or more types of deprivation).

An individual is defined as being in 'consistent poverty' if they are

- Identified as being at risk of poverty and
- Living in a household deprived of two or more of the eleven basic deprivation items listed above

Relative at risk of poverty gap

This is the difference between the median equivalised income of persons below the at-risk-of-poverty threshold and the at-risk-of-poverty threshold, expressed as a percentage of the at-risk-of-poverty threshold. The purpose of the indicator is to measure how far below the poverty threshold the median income of people at risk of poverty is. The closer the median income of those at risk of poverty is to the at risk of poverty threshold the smaller the percentage will be.

At risk of poverty rate before social transfers

This indicator is calculated based on two alternative measures of equivalised income. The first calculates equivalised income as the total disposable household income including old-age and survivors' benefits but excluding all other social transfers. The second excludes all social transfers. Any person with an equivalised income before social transfers of less than 60% of the median **after** social transfers is considered at risk of poverty before social transfers (i.e. the same threshold is used for calculating the rate before and after social transfers).

At risk of poverty rate anchored at a moment in time

For a given year, the "at risk of poverty rate anchored at a moment in time" is the share of the population whose income in a given year is below the at risk of poverty threshold calculated in the standard way for a previous base year and then adjusted for inflation. The purpose of this indicator is to get some indication of the changes in 'absolute poverty' over time. The deflator is derived from the monthly CPI and takes into account the rolling nature of the income data collected by SILC.

Gini coefficient

This is the relationship between cumulative shares of the population (ranked according to the level of income from lowest to highest) and the cumulative share of total income received by them, i.e. the Lorenz Curve. If there was perfect equality (i.e. each person receives the same income) the Gini coefficient would be 0%. A Gini coefficient of 100% would indicate there was total inequality and the entire national income was in the hands of one person.

Calculation of the Gini Coefficient

$$Gini = \frac{2\left(\sum_{i=1}^{n} Wgt_i * Eq\_inc_i * \sum_{j=1}^{i} Wgt_j\right) - \sum_{i=1}^{n}(Wgt_i)^2 * Eq\_inc_i}{\left(\sum_{i=1}^{n} Wgt_i\right) * \sum_{i=1}^{n}(Wgt_i * Eq\_inc_i)} - 1$$

Wgti = Final calibrated weight per individual

Eq_Inci= Equivalised disposable income

$$\sum_{j=1}^{i} Wgt_j = Cumulative\ Income$$

Inequality of income distribution (S80/S20) quintile share ratio

This is the ratio of the average equivalised income received by the 20% of persons with the highest income (top quintile) to that received by the 20% of persons with the lowest income (lowest quintile).

Acknowledgement

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> Contact Details

Contact:

Central Statistics Office
Skehard Road, Cork T12 X00E, Ireland

Tel: (+353) 21 453 5000

E-Mail: information@cso.ie

Central Statistics Office
Skehard Road, Cork T12 X00E, Ireland

Tel: (+353) 21 453 5000

E-Mail: information@cso.ie