Standard Report on Methods and Quality for the Survey on Income and Living conditions (EU-SILC) 2017

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This documentation applies to the reporting period:

2017

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1 Overview

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 households) survey of private households. It is carried out under EU legislation (Council Regulation No 1177/2003) and commenced in Ireland in June 2003.

Information is collected from households by a team of interviewers using Computer Assisted Personal Interviewing (CAPI) on tablet computers (using a Blaise application). The total annual sample is designed to be 9,600 households. The actual achieved sample varies over time depending on the level of response. The achieved sample is outlined in section 5.2.

2 General Information

2.1 Statistical Category

Primary Statistical Survey

2.3 Organisational Unit Responsible, Persons to Contact

SILC is part of the Social and Demographic Statistics Directorate, headed by Richard McMahon, Assistant Director General. The work of the SILC section is largely divided into two areas – a SILC Data Collection Unit (SDCU) and a SILC analysis/publication unit. Gerry Reilly is the senior statistician over the analysis unit and Fiona O'Riordan is the senior statistician over the SDCU. For more information on the structure of the CSO's senior management group, see:
http://www.cso.ie/en/aboutus/organisation/organisationstructure/ and
http://www.cso.ie/en/aboutus/organisation/organisationstructure/adg-socialdemographic/

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2.4 History, Objectives and Purpose

The EU-Statistics on Income and Living Conditions (EU-SILC) instrument is used as the EU reference source for comparative statistics on income distribution and social inclusion at national and European

level. It provides two types of annual data for the 28 European Union countries, Iceland, Norway, Switzerland and Turkey:

- Cross-sectional data pertaining to a given time or a certain time period with variables on income, poverty, social exclusion and other living conditions, and

- Longitudinal data pertaining to individual-level changes over time, observed periodically over a two, three and four-year period.

Across Europe, EU-SILC does not rely on a common questionnaire or a survey but on the idea of a "framework". The latter defines the harmonised lists of target primary (annual) and secondary (every four years or less frequently) variables to be transmitted to Eurostat; common guidelines and procedures; common concepts (household and income) and classifications aimed at maximising comparability of the information produced.

SILC data is collected and compiled under Regulation (EC) No 1177/2003 of the European Parliament and of the Council of 16 June 2003 concerning Community statistics on income and living conditions. Comparability of data between Member States is a fundamental objective. (See Eurostat's Income and Living Conditions homepage for more information
http://ec.europa.eu/eurostat/web/income-and-living-conditions/overview .

The official Irish Government approved poverty measure is "consistent" poverty. The Economic and Social Research Institute (ESRI) originally developed the measure of "consistent" poverty in 1987. This measure was further refined and developed in 2007. The National Action Plan for Social Inclusion was updated in February 2017 for the period 2015 – 2017. Progress towards these targets is reported in the Social Inclusion Monitor (SIM) published by the Department of Social Protection. The purpose of the SIM is to report officially on progress towards the national social target for poverty reduction, including the sub-target on child poverty and Ireland's contribution to the Europe 2020 poverty target. (For more information, see

https://www.welfare.ie/en/downloads/SIM2016.pdf

Prior to EU-SILC, from the period 1994-2004, income, poverty, social exclusion and standards of living were measured across the European Union (EU) using the European Community Household Panel (ECHP) survey as the main data source. The Living in Ireland Survey (LIS), conducted and compiled by the ESRI, served as the Irish component of the ECHP. (For a more detailed discussion on the differences between the LIS and EU-SILC approaches, see:
http://www.cso.ie/en/media/csoie/releasespublications/documents/eusilc/2003/eusilc_2003.pdf
and *Reconfiguring the measurement of deprivation and consistent poverty in Ireland*, Maitre B., Nolan B. and Whelan C.T., ESRI, Dublin, 2006).

The SILC survey was launched in 2003. Ireland was one of six member states (Belgium, Denmark, Greece, Ireland, Luxembourg and Austria) and Norway that carried out SILC in 2003. The 2003 results are based on data collected in the 6-month period from June 2003 to December 2003. The results were published in January 2005 (see
 http://www.cso.ie/en/media/csoie/releasespublications/documents/eusilc/2003/eusilc_2003.pdf).

The start date for the EU-SILC instrument under the Framework Regulation was 2004 for 12 Member States (Belgium, Denmark, Ireland, Greece, Spain, France, Italy, Luxembourg, Austria, Portugal, Finland

and Sweden), Estonia, Norway and Iceland. The first official Irish SILC statistics based on twelve months of data were published in December 2005 with 2004 as the reference year. A derogation was provided in the cases of Germany, the Netherlands, the UK and nine of the then ten new Member States (all except Estonia) permitting them to begin in 2005. Bulgaria and Turkey started the full implementation of the EU-SILC instrument in 2006 while Romania and Switzerland began to implement the instrument in 2007. Croatia conducted SILC for the first time in 2011.

CSO's SILC data and derived statistics are used nationally and internationally to also measure income, inequality and social exclusions for other official purposes, for example:

- the United Nations International Children's Emergency Fund's (UNICEF) recent report *Innocenti Report Card 14* used Irish SILC data, see

    https://www.unicef-irc.org/files/documents/d-3943-RC14_factsheet_FINAL.pdf

  - The Review of Ireland, by the United Nations Committee on the Rights of the Child Geneva – 14th January 2016, used CSO's SILC data to measure Ireland's adherence to the UN Convention on the Rights of the Child.

  - The CSO provides a number of wages and earnings related statistics for Ireland derived from SILC and other data sources to the Organisation for Economic Co-ordination and Development (OECD). These statistics include a measure of the gender wage gap, see https://data.oecd.org/earnwage/wage-levels.htm#indicator-chart for more information.

2.5 Periodicity

SILC is an annual survey. Information is collected continuously throughout the year with household interviews being conducted on a weekly basis. The income reference period for SILC is the twelve months immediately prior to date of interview. Therefore, the income reference period differs from household to household (depending on the interview date) and overall within the 2017 dataset we have income data spanning from January 2016 to December 2017. The CSO plans to change the income reference period from the 2020 SILC to the calendar year immediately preceding the SILC year. This means that the income reference period for the 2020 SILC will be from January 2019 to December 2019.

There is also a panel data element to the SILC survey. Households are included in the sample for four years. The rotational sample design adopted by the CSO is outlined in more detail in section 3.6.2. The rotational sample design results in three additional datasets consisting of:

  a) a two year panel data set that contains households and individuals that are in both the 2017 and 2016 cross-sectional data sets,
  b) a three year panel data set that contains households and individuals that are in the 2017, 2016 and 2015 cross-sectional data sets and
  c) a four year panel data set that contains households and individuals that are in the 2017, 2016, 2015 and 2014 cross-sectional data sets.

The three panel datasets are represented schematically in figures 2.5a, 2.5b and 2.5c below. The rotational group (RG) indicates the year a household was first selected for the sample. RG4 (Wave 1) households were introduced for the first time in the sample in 2017 and will remain in the sample

until 2020. In 2017 RG3 (Wave 4) represents the households that were first introduced into the sample in 2014 and these households were in the sample for the final time in 2017.

Figure 2.5a: The Two-Year Panel Dataset

Rotational Group	Observations	2017 Dataset			2016 Dataset			2015 Dataset			2014 Dataset		
		Var1	Var2	Var3	Var1	Var2	Var3	Var1	Var2	Var3	Var1	Var2	Var3
RG4	1 2 3												
RG1	4 5 6												
RG2	7 8 9	2 Year Panel Data Set (2017 and 2016)											
RG3	10 11 12												
RG4	13 14 15												
RG1	16 17 18												
RG2	19 20 21												

Figure 2.5b: The Three-Year Panel Dataset

Rotational Group	Observations	2017 Dataset			2016 Dataset			2015 Dataset			2014 Dataset		
		Var1	Var2	Var3	Var1	Var2	Var3	Var1	Var2	Var3	Var1	Var2	Var3
RG4	1 2 3												
RG1	4 5 6												
RG2	7 8 9	3 Year Panel Data Set (2017, 2016 and 2015)											
RG3	10 11 12												
RG4	13 14 15												
RG1	16 17 18												
RG2	19 20 21												

Figure 2.5c: The Four-Year Panel Dataset

Rotational Group	Observations	2017 Dataset			2016 Dataset			2015 Dataset			2014 Dataset		
		Var1	Var2	Var3	Var1	Var2	Var3	Var1	Var2	Var3	Var1	Var2	Var3
RG4	1 2 3												
RG1	4 5 6												
RG2	7 8 9												
RG3	10 11 12				4 Year Panel Data Set (2017, 2016, 2015 and 2014)								
RG4	13 14 15												
RG1	16 17 18												
RG2	19 20 21												

2.6 Client

- The public
- Income and Living Conditions Division (F4), Eurostat
- The Technical Advisory Group (TAG), established under the National Action Plan for Social Inclusion 2007-2017
- Department of Social Protection - Social Inclusion Monitor
- Department of Children and Youth Affairs
- United Nations
- Organisation for Economic Co-ordination and Development (OECD)

2.7 Users

A broad range of interested groups in society use EU-SILC statistics. The topics in SILC cover, amongst other things, income, inequality, poverty and social exclusion. It is of interest to economists, social scientists, government departments, policy advocates, central bankers, trade unions and the media. The statistics are used to compare outcomes across a number of different demographic breakdowns.

Below is a list, not exhaustive, of some of the users of SILC statistics:

- Income and Living Conditions Division (F4), Eurostat
- European Commission, primarily DG Health and Consumers (SANCO), DG Employment, Social Affairs and Inclusion (EMPL) and DG Regional Policy (REGIO).
- The Technical Advisory Group (TAG), established under the National Action Plan for Social Inclusion 2007-2017
- Department of the Taoiseach
- Department of Social Protection - Social Inclusion Monitor
- Department of Children and Youth Affairs

- Department of Finance
- Department of Health
- Department of the Environment, Community, & Local Government
- Department of Education and Skills
- Department of Justice and Equality
- Department of Public Expenditure and Reform
- Department of Agriculture, Food and the Marine
- The Central Bank of Ireland
- United Nations (International Labour Organisation)
- Organisation for Economic Co-ordination and Development (OECD)
- Euromod
- National Economic & Social Development Office
- Pobal
- Irish Human Rights and Equality Commission
- The Housing Agency
- National Disability Authority
- Focus Ireland
- Economic and Social Research Institute
- European Anti-Poverty Network Ireland
- Nevin Economic Research Institute (NERI)
- Institute of Public Health Ireland
- Health Service Executive
- TUSLA
- Teagasc
- The Irish Farmers' Association
- The Irish Cattle & Sheep Farmers' Association (ICSA)
- Irish Government Economic and Evaluation Service (IGEES)
- The Irish Social Science Data Archive (ISSDA)
- Social Justice Ireland
- Society of St. Vincent de Paul
- Simon Communities in Ireland
- Barnardos, Ireland
- Age Action Ireland
- Alone
- ICTU
- Threshold
- IBEC
- Publicpolicy.ie
- Low Pay Commission
- Pension Authority
- Members of the Oireachtas, Councillors, MEPs and other members of political parties and groupings
- County Councils
- Local, national and international media
- Other research agencies and advocacy groups interested in monitoring poverty, income and social exclusion.
- Other CSO divisions and surveys, including: Quarterly National Household Survey, Irish Health Survey, Household Budget Survey, National Accounts etc.

- Economic and social science researchers based in national and international universities and research institutes.

2.8 Legal basis

SILC is a voluntary survey of randomly selected private households. The survey is carried out to meet Ireland's commitments under specific EU legislation. The central piece of legislation, which establishes EU statistics on income and living conditions (EU-SILC), is the framework Council Regulation No 1177/2003, issued in June 2003. The purpose of the legislation was to establish a common framework for the systematic production of Community statistics on income and living conditions, encompassing comparable and timely cross-sectional and longitudinal data on income and on the level and composition of poverty and social exclusion at national and European levels. This initial regulation was amended twice:

i.   in September 2005 by Regulation (EC) 1553/2005 to account for the expansion of the EU and to outline certain derogations and

ii. in November 2006 by Council Regulation (EC) 1791/2006 to account for the accession of Bulgaria and Romania to the EU.

See http://ec.europa.eu/eurostat/web/income-and-living-conditions/legislation for more details. The survey commenced in Ireland in June 2003.

Eurostat and the member states also developed the technical aspects of the instrument. The five following Commission regulations elaborate upon the initial framework regulation:

i.   Definitions: regulation (EC) n°1980/2003 of 21 October 2003, amended by regulation (EC) n° 676/2006) of 2 May 2006;

ii. Fieldwork aspects and imputation procedures: regulation (EC) n°1981/2003 of 21 October 2003;

iii. Sampling and tracing rules: regulation (EC) n°1982/2003 of 21 October 2003;

iv. List of target primary variables: regulation (EC) n°1983/2003 of 21 October 2003;

v.   Content of intermediate and final quality reports: regulation (EC) n° 28/2004 of 5 January 2004.

Pursuant to Article 15(2)(f) of Regulation (EC) No 1177/2003, implementing measures are necessary in respect of the list of target secondary areas and variables that is to be included every year in the cross-sectional component of EU-SILC. In 2017, the list of target secondary variables is specified in the Commission Regulation COMMISSION REGULATION (EU) 2016/114 of 28 January 2016. See

https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32016R0114&from=EN

The 2017 targeted module relates to Health and Children's health. In addition, each year, additional variables are collected as part of a non-binding European Statistical System Committee (ESSC) Agreement.

Currently Eurostat is running a task force on the revision of the EU-SILC legal basis. Ireland is participating in this task force. EU-SILC revision is part of a wider process of an on-going modernisation of social statistics under the Integrated European Social Statistics (IESS) framework. For more information, see http://ec.europa.eu/eurostat/about/opportunities/consultations/iess.

Over and above our strict legal obligations, the CSO produces and disseminates key national statistics for the Department of Social Protection's SIM report and other national poverty reduction monitors. It should be noted that there is no formal legal basis for the dissemination of national statistics other than meeting Ireland's commitments under specific EU legislation outlined above.

The CSO sends summary earnings statistics to the OECD under Ireland's general commitments to supply data to the OECD as part of our membership.

3 Statistical Concepts, Methods

3.1 Subject of the Statistics

SILC is concerned with the measurement of income and living conditions of both households and individuals in Ireland. SILC collects timely cross-sectional and longitudinal data on income and on the level and composition of poverty and social exclusion nationally.

3.2 Units of Observation/Collection Units/Units of Presentation

The basic units of observation are individuals normally resident in Ireland and Irish households. Household data is collected from the nominated head of household and personal data is collected from individuals. In some cases, personal data is aggregated to household level prior to analysis. The survey population is all private households and their current members residing in the state at the time of the data collection. The initial sample is a sample of households, taken from the population of households. However, data is collected on each individual within the household. The sample excludes individuals living in institutions or communal accommodation and persons of no fixed abode.

Four main types of unit data collected are:

   i.   Variables measured at the household level. These variables are collected from the head of household;

   ii. Information on household size, household composition and the basic characteristics of household members are also collected from the head of household;

   iii. Income and other more complex variables termed 'basic variables' (education, basic labour information and second job) measured at the personal level, but normally aggregated to

construct household-level variables. These variables are collected by personal interview from all household members aged 16 and over; and

iv.   Variables collected and analysed at the person-level 'the detailed variables' (health, access to health care, detailed labour information, activity history and calendar of activities'). These variables are collected by personal interview from all household members aged 16 and over.

3.3 Data Sources

The annual SILC survey is the main data source for SILC. Information is collected from the head of household and all household members, aged 16 and over, on tablet computers by trained interviewers, using Computer-Assisted Personal Interview (CAPI) software.

In addition, the CSO has access to two primary micro data sources. These are the Department of Social Protection (DSP) social welfare data and Revenue Commissioners' employee income data. The Administrative Data Centre (ADC) division within the CSO securely manage the ownership of these data sources and SILC's DCU has only limited access to the data. The CSO works with the DSP and Revenue, on a continuing basis, to ensure good quality data is available on a timely basis.

The Department of Agriculture, Food and the Marine (DAFM) provide to the CSO Direct payments paid to farmers e.g. Common Agriculture Policy (CAP) entitlements thus enabling the CSO to capture these payments as part of the SILC income calculation. The CSO SILC DCU team applies the 'income coefficient', provided by Teagasc, together with other factors such as type of farm and soil type, to calculate farm incomes. The CSO is expanding the use of administrative data for SILC. Student Universal Support Ireland and Residential Tenancies Board administrative date is currently being assessed to determine suitability as additional micro data sources.

3.4 Reporting Unit/Respondents

All 'usual residents' in responding households are surveyed. Information on the household and certain household members' information is collected from the designated head of household.

Detailed personal information, income information and more complex information is collected from all household members aged 16 and over. Where a particular individual is not available for interview, information can be provided by another member of the household in some circumstances via a proxy interview. A proxy interview refers to data which is collected from another member of the household due to the unavailability of the specific respondent at the time of the interview.

3.5 Type of Survey/Process

The survey is a sample survey. Information is collected in the field by a team of face-to-face interviewers using Computer Assisted Personal Interviewing (CAPI) on tablet computers (using a Blaise application). The duration of the fieldwork (i.e. the period in which interviews take place) is different in Ireland from other EU member states. In Ireland, the fieldwork begins in January and runs until the end of December (often running into January of the following year). Most other EU member states conducting household surveys limit the duration of the fieldwork to six months or less. In 2020 the

CSO plans to limit the duration of the fieldwork to 6 months. This 6 month fieldwork period will run from January to June.

The Blaise dataset is available as an ASCII file and this is converted into a SAS dataset before being further processed. Certain variables are transferred into the CSO's Data Management System (DMS) where extensive editing and data cleaning is conducted. Once a full dataset is available, the cross-sectional weighting of the sample is completed around March. Revenue P35 data and payment data from the DSP are also entered into the DMS system. A key determinant of the timeliness of SILC is the availability of DSP and Revenue data.

A 'clean' dataset is provided to the SILC analysis team at the end of September and this dataset is finalised after extensive macro-editing. National SILC statistics are normally published in November or December and at the same time quality approved micro-data is forwarded to Eurostat for their purposes.

3.6 Characteristics of the Sample/Process

3.6.1 Population and Sampling Frame

The sampling frame (for the 2017 SILC) was the register of all private households occupied on the night of the 2011 Census of Population. Census forwarded to the Household Survey Collection Unit (HSCU), a copy of the 2011 Small Area Population Statistics (SAPS) boundaries. These boundaries are an amalgamation of the existing Small Areas (SA) boundaries.

The HSCU section requirement was that small areas would contain at least 60 occupied households to meet the Labour Force Survey sampling implementation requirements. Therefore, the SAPS boundaries were rebuilt to ensure that all blocks had a minimum size of 60 occupied households.

The SAs were combined under the following criteria:

1. Newly formed SAs should be as small as possible,
2. SA boundaries were to be contiguous,
3. SAs were to be joined within Electoral Districts (ED) boundary wherever possible and
4. SAs were to be joined across ED boundary only after all other avenues have been pursued.

The Census team provided a file containing a list of the adjoining SAs for each SAPS small area. This file is a list of all SAs that share a boundary with the SAPS small areas. This allowed for the building of contiguous boundary SAs. The Census SAPS file contains 18,488 SAs.

The Census team also provided a list of all the Island communities to be excluded from the sampling frame. As a result certain island communities were not included when building the HSCU SAs. The generation of HSCU SA data was performed using PHP code and a SQLITE database. The complex nature of the processing meant that SAS was not the appropriate software tool to deliver this work. The output of this work is the creation of the HSCU SA sampling file which contains 17,320 small areas (or blocks), each with a minimum size of 60 households.

This HSCU SA sampling file is linked with the Census data and An Post's Geo-Directory to provide the overall sample frame. Two variables, County/NUTS4 (the 34 administrative counties[1]) and the Pobal HP (Haase and Pratschke) Deprivation Index (aggregated to quintiles), exist on the sample frame and they form the basis for the stratification of the population adopted by SILC in its complex sample design. The sample frame also has a limited number of categorical variables available for quality-assuring the design sample. 'Level of education' was the variable used as a proxy for the SILC design variables of the 'at risk of poverty' indicator and income.

The survey population is all private households and their current members residing in the state at the time of the data collection. A sample of households is taken from the population and data is then collected on each individual within the household. The sample therefore excludes individuals living in public institution (e.g. prisons, hospitals, nursing homes, etc.), communal accommodation and persons of no fixed abode.

Although theoretically 17,320 blocks are available for selection in the SILC sample, the HSCU exclude all blocks that have been selected in any CSO household sample over the previous three years. The reasons for excluding these households are twofold:

1. To reduce response burden on individual households
2. To maintain reasonable response rates.

Therefore, the number of blocks available for selection is approximately 14,000. All offshore islands are also excluded from the sample frame with the exception of Achill, Bull, Cruit, Gorumna, Inishnee, Lettermore, Lettermullan and Valentia.

3.6.2 Sampling Design

The SILC sample is a rotational sample. In 2014, SILC introduced both a new sample and a new sampling methodology. The sample is designed to ensure every household in the target population has a known, non-zero and equal probability of being included in the sample.

There is both a cross-sectional and a longitudinal element to the SILC sample. Figure 3.6.2 illustrates the rotational sample design adopted by the CSO. 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 tending to dominate.

The rotational group (RG) indicates the year a household was first selected for the sample. In 2017 RG3 (Wave 4) represents the households that were first introduced into the sample in 2014 and these households were in the sample for the final time in 2017. RG4 (Wave 1) households were introduced for the first time in the sample in 2017 and will remain in the sample until 2020. The CSO has strengthened its own rules and procedures around sample implementation. One of the key

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[1] The 34 administrative counties as of 2011.

improvements in sample implementation over the past number of years is the cessation of the practice of substitution of households by interviewers.

Figure 3.6.2 SILC Rotational Sample Design
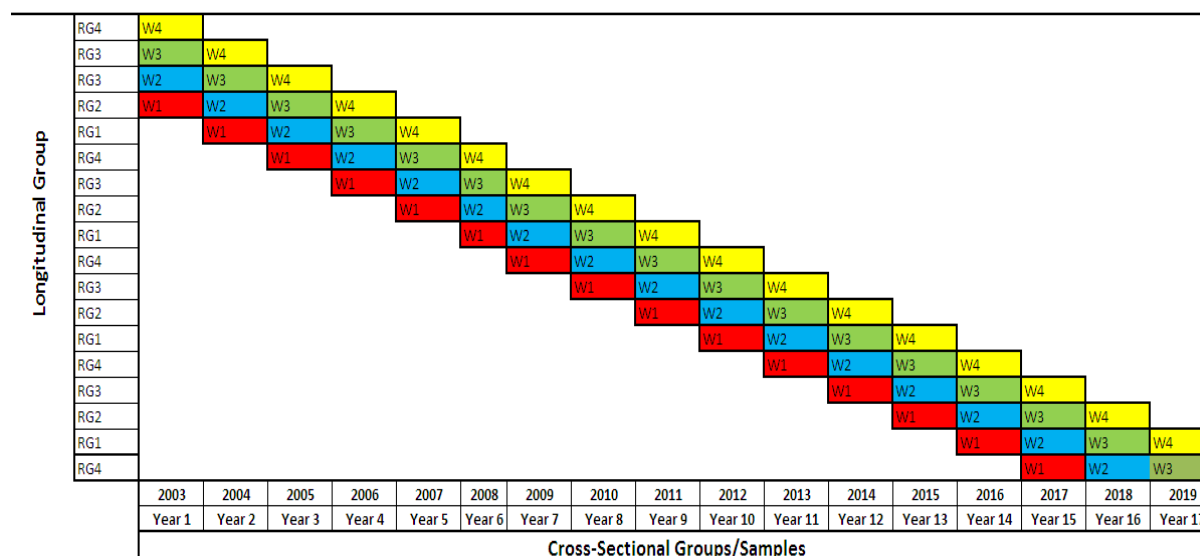
3.6.2.1 Sample design

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. The following is an overview of the revised SILC sample methodology:

- The SILC sample is a multi-stage cluster sample resulting in all occupied households in Ireland having an equal probability of selection.

- The sample is designed to meet Eurostat's cross-sectional and longitudinal effective sample size requirements. Eurostat require for Ireland a minimum effective sample size[2] of 3,750 households in the cross-sectional sample. Eurostat require for Ireland a minimum effective sample size of 2,750 households in the longitudinal sample. The overall design effect was assumed to be 1.6 and the overall response rate was assumed to be 67%.

- At the design phase, 'level of education' was assumed to be the best proxy variable available on the sample frame to benchmark the quality of the sample design.

- The sample is stratified by NUTS4 and quintiles derived from the Pobal HP Deprivation Index.

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[2] Eurostat are moving away from specifying precision requirements in terms of effective sample sizes and will in the future specify precision requirements in terms of the standard error of key variables of interest.

- The HSCU sample 1,200 blocks from the total population of blocks available using a probability proportional to size (PPS) methodology. The number of occupied households within a block on Census night 2011 determines the size of the block.

- HSCU provide a datafile containing the selected blocks and the address listing of all the households with the selected blocks to SILC DCU. SILC DCU then selects the SILC sample from the datafile from HSCU.

- All occupied households on Census night 2011 within each selected block are eligible for selection in the SILC sample. Households within the selected blocks are then selected using a simple random sampling without replacement (SRS) for inclusion in the SILC sample.

3.6.3 Sample Implementation

The data collection period spans the 12 months of the year from January to December. The sample allocation is distributed evenly throughout the year. The sample design is based on the availability of 100 permanent interviewers and 10 field coordinators/supervisors[3]. In recent years, sample implementation has suffered from a shortage of interviewers. Back-up interviewers are used whenever possible to cover areas where no permanent interviewer is available. In 2020 the CSO plans to shorten the collection period for SILC to the first 6 months of the year.

HSCU provide a datafile containing the selected blocks and the address listing of all the households within the selected blocks to SILC DCU. SILC DCU then selects the SILC sample from this datafile, where households, within each selected block, are selected using a simple random sampling without replacement (SRS). Each field co-ordinator manages 10 field interviewers.   Permanent field interviewers are allocated eight SILC interviews per month. This allocation may be reduced due to, for example, planned leave when some of the allocation may be assigned to a back-up interviewer if one is available.

To minimise non-response at least three attempts are made to contact each house to get a response. In many cases, households that are difficult to contact are revisited several times. Basic household information is collected from all sample households including non-responding households. The SILC DCU team proactively manage the sample and detailed activity reports are produced each week to monitor the progress of the sample implementation.   Each quarter detailed quality reports on the performance of the field force are generated and any issues are addressed at the individual interviewer's level.   It is proving more and more difficult to gain access to certain households in apartment blocks and gated communities. This is especially true in Wave 1 interviews when no phone or e-mail contact information is available.

Each quarter, the Field Administration Unit (FAU) organises one-day training meetings with each of the ten interviewer groups. SILC DCU and occasionally SILC Analysis participate in these training days where modifications to the questionnaire, new SILC modules and any issues around the sample implementation are discussed. These training days form part of the open communication policy that exists between the SILC interviewer field force and the SILC DCU team.

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[3] These field resources are shared with other household surveys.

3.7 Survey Technique/Data Transfer

The annual SILC survey is the main data source for SILC. Information is collected from all household members on tablet computers by trained interviewers, using Computer-Assisted Personal Interview (CAPI) software. The questionnaire is completed using the Blaise application and data is transferred to the CSO's head office in Cork via a 'secure tunnel'. To ensure security and confidentiality encrypted data is synchronised on a weekly basis using the REACH interface.

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 data is available on a timely basis.

Survey data is then processed using a number of software tools including the CSO's Data Management System (DMS) and SAS.

3.8 Questionnaire (including explanations)

The SILC questionnaire contains several hundred questions on a range of topics relating to both the household and individual respondents. The resulting Blaise datasets contains more than 1,800 variables. Topics measured in the questionnaire include:

- gender,
- nationality,
- age,
- income,
- material deprivation,
- social exclusion,
- economic status,
- industry of employment,
- employment status,
- occupation,
- education level,
- health,
- housing conditions,
- child care,
- quality of life,
- access to services,
- well-being.

The average time taken to fill out the household dimension of the questionnaire is 15 minutes. The personal interviews for those aged 16 and over take on average 13 minutes. The element of the questionnaire that relates to individuals aged under 16 (completed by the head of household) takes on average two minutes. Therefore, the overall time to complete the questionnaire is a function of the household composition. We can conclude that on average a single occupancy household will complete the SILC questionnaire in approximately half an hour.

The questionnaire is reviewed annually. As part of the review the previous module(s) is dropped and the new module is added to the questionnaire. At this stage any updates to the questionnaire are also

implemented. The CSO SILC team are planning a complete questionnaire review in 2019 to guarantee the integrity of the questionnaire, to standardise questions and answers across national household surveys and to remove any redundant questions. In 2020 the CSO plans to conduct pilot Computer Assisted Web Interviews (CAWI) for SILC in order to test the feasibility of using this mode for SILC data collection

The SILC questionnaire is available on the CSO website: http://www.cso.ie/en/silc/methodology/ . Detailed guidelines on EU-SILC are published each year by Eurostat. The guidelines are available in Doc 065 'Description of target variables' and can be found on CIRCABC: https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp

3.9 Participation in the Survey

Ireland's commitment to provide SILC data to Eurostat is governed by the regulations outlined in Section 2.8. However, it is worth noting that participation in the survey, on the part of the household, is voluntary.

3.10 Characteristics of the Survey/Process and its Results

Data is collected at both household and individual level. Income data is collected at individual level but is aggregated up to household level before being distributed evenly, based on equivalence scales (see 3.10.1.6), amongst each member of the household. See 3.10.1.7 for more details. Income, poverty and social exclusion are analysed at both household and individual level.

The primary analytical variable is income and the primary characteristic of the variable analysed is the distribution. Income is positively skewed and not normally distributed, see Figure 3.10a. Therefore, it is more appropriate to summarise the central tendency of income using the median. The mean is provided for comparison purposes. In 2017, approximately 63% of individuals had equivalised disposable incomes below the mean. Income is analysed at both real (adjusted for inflation) and nominal values.

Income statistics are primarily presented at national level but they are also broken down by year and the following demographic characteristics;

- Sex
- Age Group
- Principal Economic Status
- Highest Education Level Attained
- Household Composition
- Number of Persons at Work in the Household
- Tenure Status
- Urban/Rural Location
- Region

Average income is also broken down by the composition of income. Further distribution analysis of income is conducted through the calculation of the Gini coefficient, the quintile share ratio (QSR), quintile analysis and decile analysis.

Figure 3.10a.
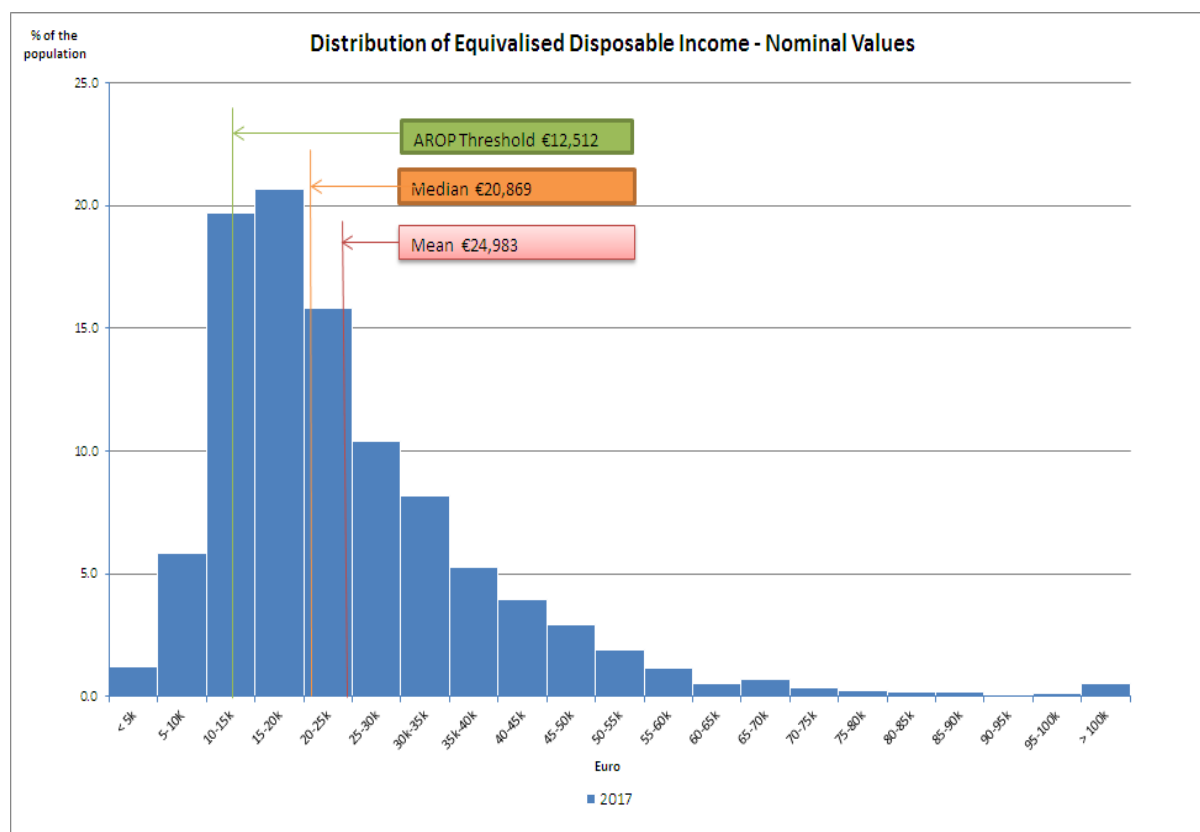
The main poverty and social exclusion statistics presented are the 'at risk of poverty' (AROP) rate, the deprivation rate and the consistent poverty rate. A number of other key national indicators of poverty and social exclusion are also presented. For full details of the results published, see the electronic release at:

http://www.cso.ie/en/releasesandpublications/er/silc/surveyonincomeandlivingconditions2017/

All previously published SILC statistics are available on the CSO's Databank:

http://www.cso.ie/px/pxeirestat/Database/eirestat/Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)/Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)_statbank.asp?SP=Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)&Planguage=0

More information and results are published at Statcentral.ie:

http://www.statcentral.ie/viewstats.asp?type=Social%20Conditions

Some national definitions of the primary variables and concepts are given below.

3.10.1 Definitions of Income

3.10.1.1 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*.

3.10.1.2 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

- Self-Employment income other than farm income
- Farm Income[4] (includes direct payments received from the DAFM e.g. Common Agriculture Policy (CAP) entitlements).

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

3.10.1.3 Social Transfers:

Unemployment benefits

Old-age benefits (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

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[4] Direct payments included in direct income as they are subject to tax.

Housing allowances:

- Rent supplement
- Household benefit package
- Exceptional needs payments

Other social transfers:

- Survivors' benefits
- Sickness benefits
- Disability benefits
- Education-related allowances
- Social exclusion not elsewhere classified

3.10.1.4 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

3.10.1.5 Real/Nominal income

Both nominal and real income figures are included in the 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.

3.10.1.6 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*.

3.10.1.7 Equivalised disposable 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.

3.10.2 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

3.10.3 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)

3.10.4 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 2011:

- 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.

3.11 Classifications used

The EU-SILC results are produced in accordance with the relevant international classification systems. The main classifications used are:

- Regional breakdown – Nomenclature of Territorial Units (NUTS)
- Level of education – International Standard Classification of Education (ISCED) - 2011
- Occupation – International Standard Classification of Occupation (ISCO)-08(COM) from 2011) and
- Economic Activity – Statistical Classification of Economic Activities (NACE) Rev. 2.

3.12 Regional Breakdown of Results

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 is 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.
The composition of the regions is set out in Table 3.12 below:

Table 3.12 NUTS 2-4 Regional Breakdown of Ireland

Northern and Western	**Southern**	**Eastern and Midland**
Border	**Mid-West**	**Dublin**
Cavan	Clare	Dublin City
Donegal	Limerick City and County	Dun Laoghaire-Rathdown
Leitrim	Tipperary	Fingal
Monaghan		South Dublin
Sligo		
West	**South-East**	**Mid-East**
Galway City	Carlow	Kildare
Galway County	Kilkenny	Meath
Mayo	Waterford City and County	Wicklow
Roscommon	Wexford	Louth
	South-West	**Midland**
	Cork City	Laois
	Cork County	Longford
	Kerry	Offaly

	NUTS 2
	NUTS 3
	NUTS 4

4 Production of the Statistics, Data Processing, Quality Assurance

4.1 Data Capture

The annual SILC survey is the main data source for SILC. Information is collected from all household members on tablet computers by trained interviewers, using Computer-Assisted Personal Interview (CAPI) software. The data is captured using Blaise software. The Blaise dataset is available as an ASCII file and this is converted into a SAS dataset before being further processed. Certain variables are transferred into the CSO's Data Management System (DMS) where extensive editing and data cleaning is conducted.

In addition, the CSO has access to two primary micro data sources. These are the Department of Social Protection (DSP) social welfare data and Revenue Commissioners' employee income data. The Administrative Data Centre (ADC) division within the CSO owns these data sources and SILC's DCU has limited access to them.   The CSO works with the DSP and Revenue, on a continuing basis, to ensure good quality data is available on a timely basis. Revenue P35 data and payments data from the DSP are entered into the CSO's DMS system.

DAFM provides the CSO with the direct payment administrative file, thus enabling the CSO to capture these payments as part of the SILC income calculation. The CSO SILC DCU team applies the 'income coefficient', provided by Teagasc, to calculate farm incomes.

Data on rents provided by the QNHS team is the main determinant of imputed rents data in SILC.

4.2 Coding

The coding of SILC variables is outlined in detail in the SILC questionnaires manual, available on the CSO website: http://www.cso.ie/en/silc/methodology/

Occupation and Industry text strings are captured and coded in the field to the relevant classifications (see Section 3.11) by interviewers using the Blaise application. The codes assigned are then subsequently checked for quality purposes. Field of education data is likewise captured and coded in the field to the relevant classification (see Section 3.11) while the region of place of work is coded using the 34 administrative counties (see Sections 3.11 and 3.12). The classification of industry is captured using NACE Rev. 1 and text strings in the field and this is subsequently mapped to NACE Rev. 2 coding in the SILC DCU section.

Detailed guidelines on the coding of EU-SILC variables are published in Eurostat's SILC guidelines, i.e. Doc 065 *'Description of target variables'* and this document can be found on CIRCABC: https://circabc.europa.eu/faces/jsp/extension/wai/navigation/container.jsp

The CSO are currently developing a detailed codebook for all SILC variables collected and derived.

4.3 Data Editing

Many questions only allow answers to be entered to a limited set of predefined categories and therefore the number of edits required is limited. Questionnaire routing is used to ensure questions are only asked to relevant respondents. In addition, invalid responses are prevented at the point of capture where appropriate and this ensures that implausible data is prevented from being captured.

Much of the income micro-data comes directly from administrative sources such as Revenue and the Department of Social Protection. The availability of such good quality micro-data considerably reduces the possibility of measurement error in the measurement of direct income and social transfers. This also reduces the burden on the SILC DCU section in micro-editing these complex variables.

Four SILC DCU staff work on editing the SILC data throughout the year. Editing of the SILC data begins at the earliest opportunity. Below is a list of the edits/checks run on live SILC data outputted by Blaise.

1. Interviews where the housing section of the questionnaire has not been marked completed
2. Interviews where personal interviews have not been marked as completed
3. Interviews where persons have been marked as household members but the skip question has been left blank
4. Records returned with the participation question not answered
5. Records in assigned blocks that have not been returned
6. Records with an appointment that has not been fulfilled
7. Records submitted with and invalid interviewer number
8. Records submitted using a dummy PPS number
9. Personal Interviews that have been skipped and are not yet completed
10. Records associated with a vacant area (no permanent interviewer assigned) that have not been returned

Full instructions are sent out to the field interviewers on how to clear the edits. The section manual outlines how these queries on the edits are to be dealt with.

The next stage of editing takes place when the data is entered in the DMS. Detailed instructions are in the section manual outlining how these edits are to be resolved. Below is a list of the DMS edits:

1. Social protection payments need to be checked for respondents
2. The PPS number needs to be checked and validated
3. Check the profit on self-employed income: Respondent has reported it is greater than one million. Supress if correct
4. Missing self-employed income
5. Maternity benefit claimed: Check age is between 15 and 50. Suppress if correct
6. Maternity benefit value is greater than €7,280
7. Check for missing soil type in the case of households with farming activity
8. Total Farmed acres is not equal to the sum of the acres owned and rented (Less any land let out to others)
9. Usable acres Less than 5: Check Suppress if correct
10. Person is under 18 and either married, widowed, divorced, separated. Suppress if correct
11. No age is entered for respondent
12. No date of birth is entered
13. Maternity benefit claimed: check gender

14. Hours worked in second occupation are greater than hours worked in primary occupation
15. Respondent has employee income but no weeks worked
16. Employee working hours not completed
17. Under 65 and receiving a retirement pension
18. Social welfare payment made to someone under 16 years old
19. Guardians payment >€10,000
20. Funeral grant >€6,000
21. Foreign social welfare: please enter currency details
22. Pension indicated but no value entered
23. Check Land rental per acre <€20 or greater than €200
24. Employee hours missing
25. Employee wage missing
26. The last wage amount paid is the same as the gross annual wage: Check the wage frequency is correct
27. The usual wage amount paid is the same as the gross annual wage: Check the wage frequency is correct
28. Employee wage amounts are missing but hours are filled in
29. Child benefit claimed but no children in the house
30. Over 65 and no pension?
31. Foreign social welfare entered but no annual amount calculated
32. Pension type coded to Semi state: Suppress edit if this is ok
33. Pension payment period not given
34. Gross pension amount is missing
35. Social protection scheme rate not entered for current year
36. Social protection scheme rate for previous year not entered
37. Respondent has self-employed hours entered but no income?
38. Over 65 and receiving unemployment payments
39. Social welfare greater than €26,000: check and confirm this is not a mis-key
40. Scheme is entered as weekly frequency. Is this correct?
41. Herd number must be added or confirmed from the Agricultural register: Change herd number status to 1 if confirmed
42. Annual P35 income >€100,000: Confirm this is not a mis-key
43. Record has been sent back for rechecking
44. Herd number is duplicated on another record
45. Social welfare code not valid
46. Check the Total calculated weeks in receipt of SW payments: Value should be between 0 and 52.18
47. Nationality has not been coded
48. NACE (Rev 2) code is not entered for respondent
49. PPS year is out of range
50. Secondary annual wage is missing
51. Social protection scheme is entered but no amount has been calculated. Check the start and end dates of the payment have been entered
52. Social protection scheme is entered but no indication of payment frequency: e.g. weekly, annual, etc.
53. Employee income >€200,000: Confirm that this is not a mis-key
54. Carer's Support Grant >€1,700
55. Check the pension type is correctly assigned
56. Proxy interview but Proxy ID has not been set
57. Country of birth not coded
58. Dual citizenship not coded

59. Occupation (SOC 2010) has not been coded based on occupation description
60. NACE Rev 2 code needs to be checked
61. Occupation code (SOC 2010) is invalid
62. Occupation code (SOC 2010) is invalid
63. Occupation code (SOC 2010) is invalid
64. Nationality code is invalid or set to 99 - Please check
65. Country of birth code is invalid or set to 99 - please check
66. Dual citizenship code is invalid or set to 99 - please check
67. PPS number not entered but STATUS set to confirmed? Check PPS number Check status
68. PPS number is entered but the status is not set to confirmed status. PPS number will not be used unless this is corrected
69. No. of weeks in receipt of occupational pension is missing
70. PPS number confirmed but no date of birth entered

Once the data is cleaned using the above edits more detailed checking of incomes is conducted using SAS. At this stage, outliers in the micro-data are reviewed and inconsistencies in the longitudinal data are further investigated. The cleaned data is then forwarded to the SILC Analysis section where extensive macro-editing is completed to benchmark SILC results against Revenue and Department of Social Protection aggregated data thus ensuring coherency with these known figures. At this final stage, any discovered anomalies in the data (or process) are reviewed and resolved where possible.

4.4 Imputation (for Non-Response or Incomplete Data Sets)

No imputation for unit non-response currently takes place for Wave 1 households in the SILC sample. For Wave 2-4 households, weights are adjusted at both the household and individual level to take account of non-response based on the characteristics of the non-respondents from the previous Wave.

Item non-response is primarily only conducted for missing direct income values. For missing private sector pay, a form of hot-decking is employed to impute missing data. In the case of public sector pay, estimation of missing pay is based on public sector pay scales utilising information on grade and years of service.

Farm income is imputed by combining the following information:

- farming related factors collected in the SILC survey,
- the 'income coefficient' provided by Teagasc and
- total direct payments data[5] provided by the DAFM.

Proxy interviews are allowed to obtain data for respondents who are not present in the house at time of interview. Up to 50% of interviews are proxy interviews where information has been provided by another resident of the household due to unavailability of the person in question. There are known issues with the quality of data for proxy responses for certain variables in particular. For example, while a proxy respondent may know the age of other residents in the household, they may not know how long they have worked with their current employer (particularly in shared households where residents are not related).

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[5] Direct payments made under CAP etc.

Imputed rent (HY030) is estimated for the use of Eurostat and other researchers. Imputed rent is calculated for households that report themselves as not paying full rent, i.e. owner-occupiers or accommodation rented at below the market price or accommodation provided rent-free.

4.5 Grossing and Weighting

4.5.1 Weighting

The calculation of the SILC weights is carried out in accordance with the Eurostat requirements outlined in Doc-065. According to the Commission Regulation on sampling and tracing rules (EC No 1982/2003, §7.4): *Weighting factors shall be calculated as required to take into account the units' probability of selection, non-response and, as appropriate, to adjust the sample to external data relating to the distribution of households and persons in the target population, such as by sex, age (five-year age groups), household size and composition and region (NUTS II level), or relating to income data from other national sources where the Member States concerned consider such external data to be sufficiently reliable.*

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 are 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 2017 population 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 population as a whole.

Separate longitudinal weights are calculated for each set of panel data, i.e. the two-year panel, the three-year panel and the four-year panel.

4.5.2 Calibration

In accordance with Eurostat recommendation, the SAS CALMAR2-macro[6], developed in the French Statistical Office (INSEE), is used to calibrate the household cross-sectional weights. The purpose of calibration is to match certain SILC auxiliary variables to known population totals, i.e. consistency with respect to known totals. This should have the advantage of comparability and may also improve precision and reduce bias. Benchmark information from the Labour Force Survey (LFS) was used to calibrate the data to known 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.

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[6] Calmar is an acronym for **CAL**ibration on **MAR**gins, an adjustment technique which adjusts the margins (estimated from a sample) of a contingency table of two or more qualitative variables to the known population margins.

- Region: Household population estimates in each of the eight NUTS3 regions are generated using LFS data.
    - Border - Margin 1
    - Midland - Margin 2
    - West - Margin 3
    - Dublin - Margin 4
    - Mid-East - Margin 5
    - Mid-West - Margin 6
    - South-East - Margin 7
    - South-West - Margin 8
- Household composition: Household composition estimates are also generated from the LFS. The following categories are used:
    - One adult, no children – Margin 1
    - Two adults, no children – Margin 2
    - Three or more adults, no children – Margin 3
    - One adult, one or more children – Margin 4
    - Two adults, one to three children – Margin 5
    - Other households with children – Margin 6

The calibration method used within CALMAR is the bounded raking Logit Method, with lower bounds for the ratio of the weights set at 0.5 and upper bounds set at 1.7. Due to the "integrative" calibration method, the personal weight generated in CALMAR2 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.

4.5.3 A statistical summary of the weights

The following is a descriptive analysis of the primary cross-sectional weight, i.e. euroweight, used for EU-SILC. The analysis is in the form of summary statistics and tables. The analysis provides evidence of the ongoing improvements in the design and implementation of the SILC sample and the associated weighting procedures. The sample size has gone from a low of 11,005 in 2011 to 14,078 in 2014, an increase of 28%. However, the sample size declined slightly in 2017 to 12,612 individuals. The distribution of the weights is a lot more compact (when compared with 2010 and 2011 distributions) as evidenced by the improvement in the standard deviation, the standard error and the inter quartile range (IQR) of the weights.

These ongoing improvements will ensure more stable and more precise estimates. If there are large variation in the weights this will have a major impact on the precision estimates of our statistics and will also results in large year on year fluctuations in our estimates.

Further improvements to the sample were expected as the new sample methodology was further rolled out in 2017 (as Wave 1, 2013 household were rotated out of the survey in 2016). However, resource constraints in the field staff resulted in a lower than expected achieved sample in 2017. Improvements in the precision estimates are expected if there will be (a) a bigger sample, (b) less variation in the weights, (c) fewer and smaller large outliers and (d) a sample structure and design based around deprivation.
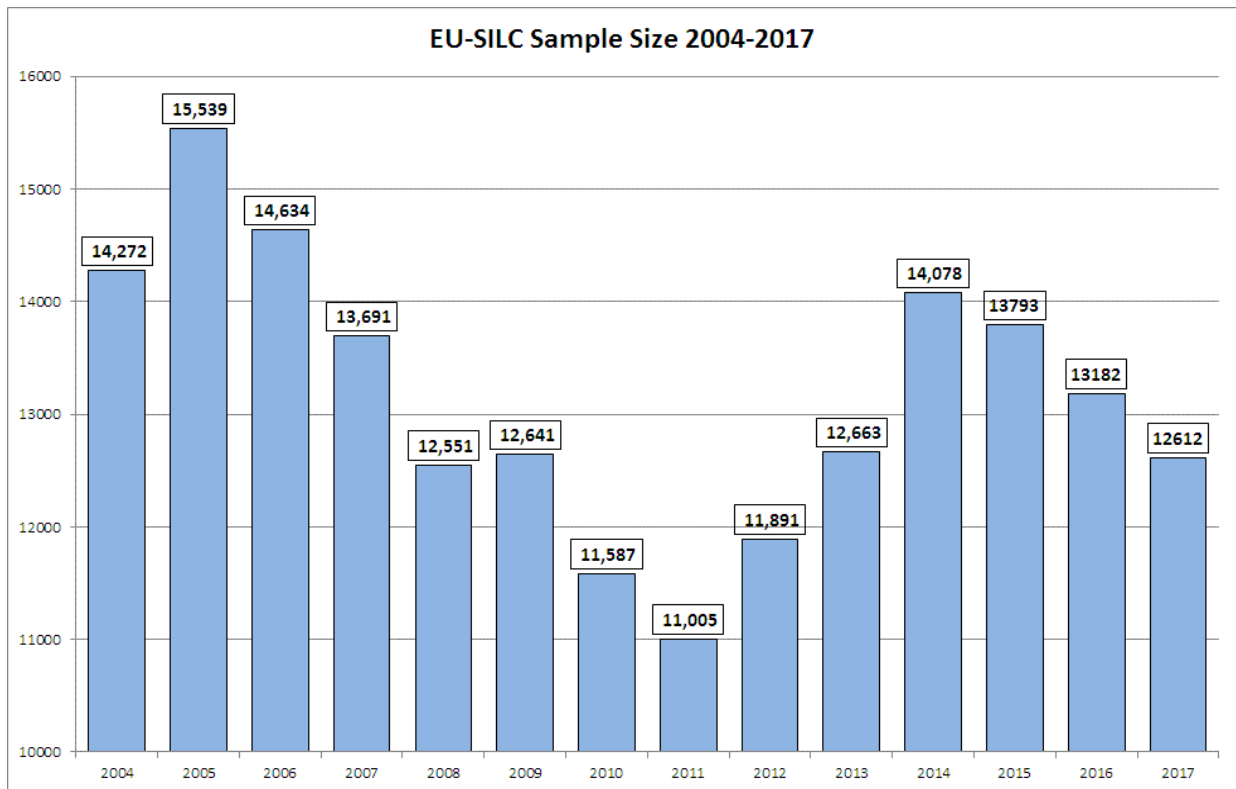
Figure 4.5.3a

EU-SILC Sample Size 2004-2017

Table 4.5.3

Euroweight (SILC) Summary Statistics 2004-2017

Year	N	Sum	Mean	StdDev	s.e.	Min	Max	Range	P1	P5	P10	Q1	Median	Q3	IQR	P90	P95	P99
2017	12,612	4,802,277	381	332	3.0	24	6,353	6,329	55	92	112	173	284	474	301	772	1,008	1,599
2016	13,182	4,747,919	360	318	2.8	29	5,671	5,642	56	86	109	165	270	450	286	716	923	1,484
2015	13,793	4,695,774	340	285	2.4	26	4,789	4,763	58	91	112	163	262	426	263	656	834	1,362
2014	14,078	4,651,529	330	252	2.1	23	3,213	3,190	61	100	123	56	96	121	174	610	773	1,281
2013	12,663	4,619,723	365	259	2.3	1	2,435	2,131	52	95	128	188	293	464	276	703	882	1,243
2012	11,891	4,595,663	386	318	2.9	1	3,407	3,406	35	80	112	185	299	495	310	741	965	1,619
2011	11,005	4,487,049	408	380	3.6	8	5,435	5,427	30	66	101	177	304	511	334	802	1,068	1,963
2010	11,587	4,475,719	386	424	3.9	12	5,049	5,036	30	50	69	130	258	477	347	835	1,161	2,143
2009	12,641	4,468,041	353	454	4.0	3	5,905	5,902	24	38	50	87	179	439	352	870	1,261	2,210
2008	12,551	4,436,762	353	388	3.5	7	4,188	4,181	30	61	83	131	236	423	292	731	1,046	2,015
2007	13,691	4,357,029	318	364	3.1	8	7,348	7,340	32	54	73	120	214	381	261	674	925	1,698
2006	14,634	4,253,340	291	269	2.2	10	2,817	2,807	32	53	68	111	197	379	268	627	822	1,323
2005	15,539	4,148,668	267	210	1.7	24	2,153	2,128	58	77	92	127	199	342	214	533	683	1,040
2004	14,272	4,059,193	284	179	1.5	53	1,563	1,510	82	109	126	167	240	339	172	488	620	1,006

Figure 4.5.3b

Mean and Standard Deviation of SILC Euroweight
2004-2017

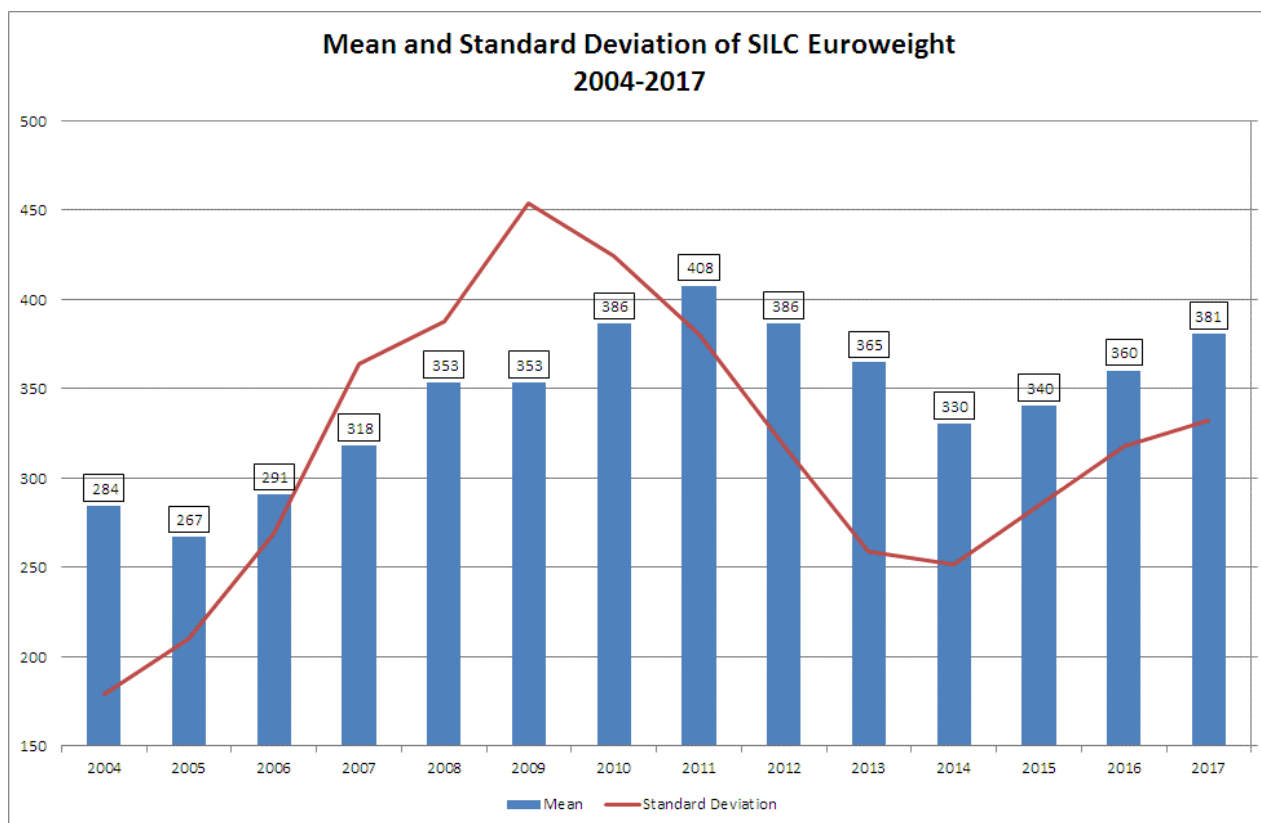**Figure 4.5.3c**

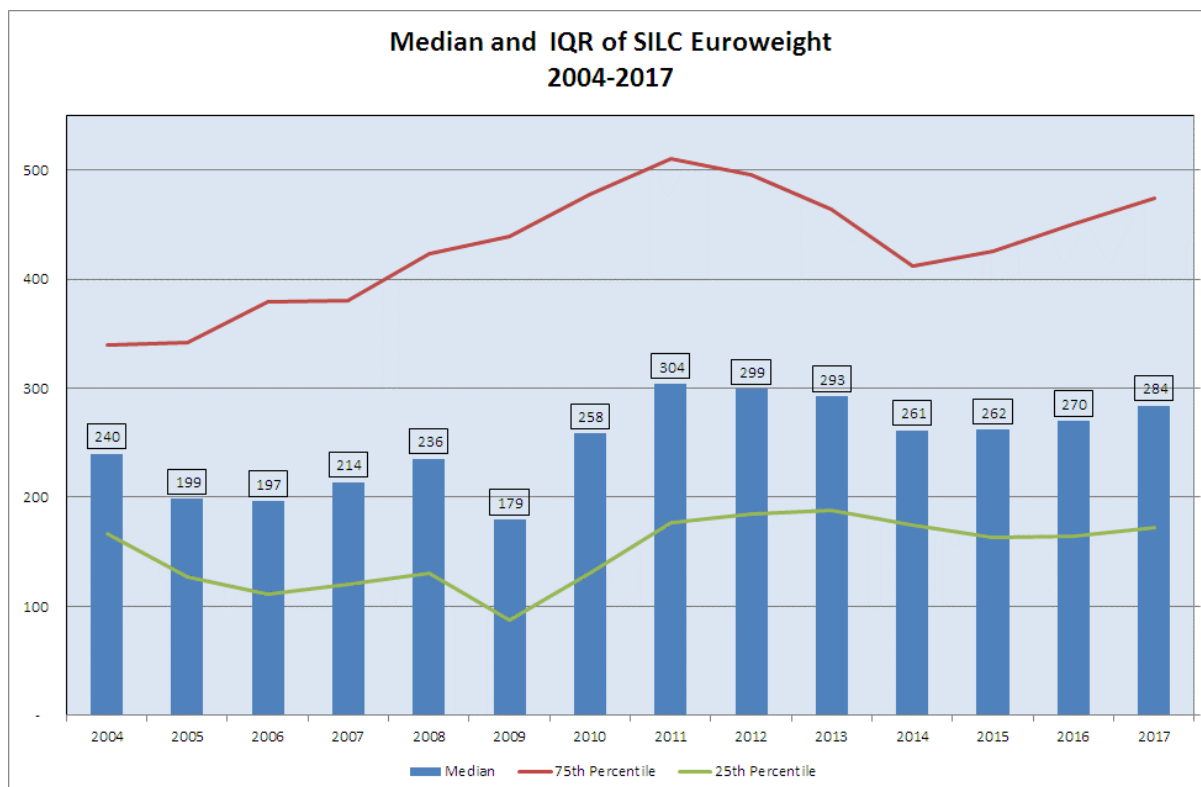Median and IQR of SILC Euroweight
2004-2017

Figure 4.5.3d
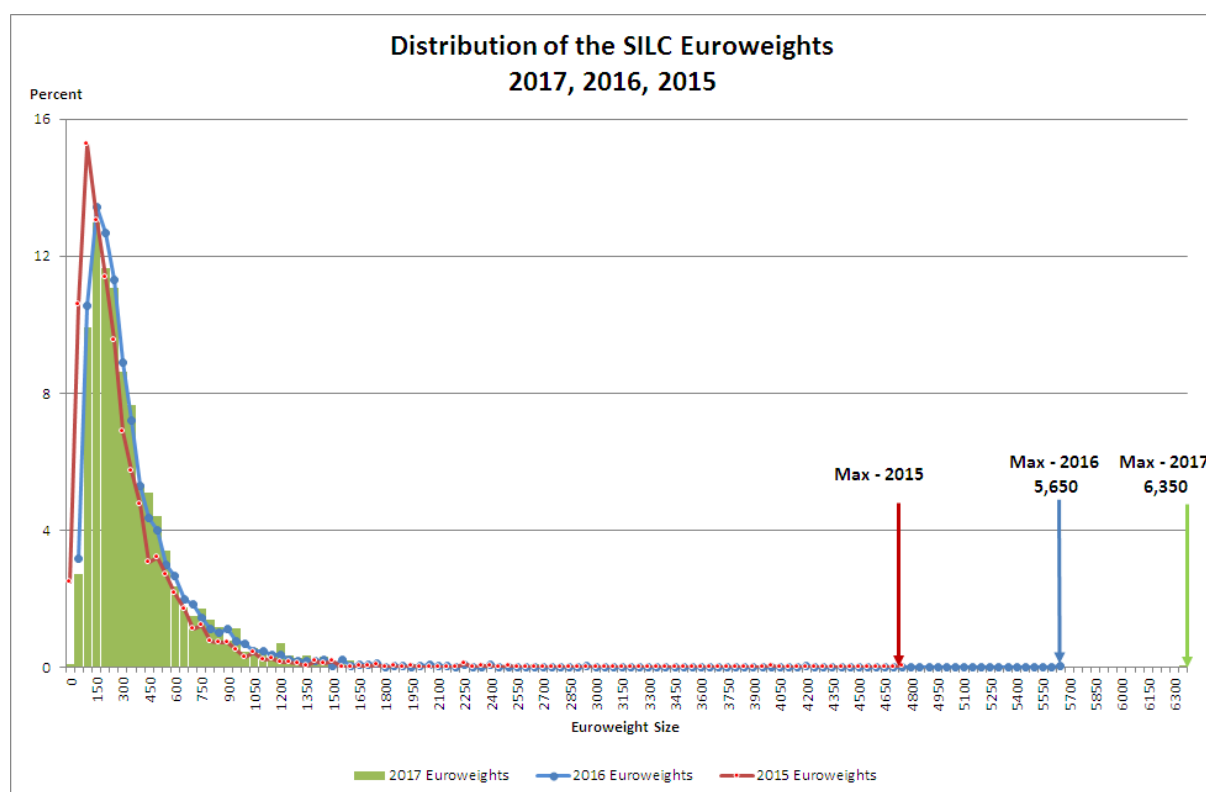
4.6 Computation of Outputs, Estimation Methods Used

For detailed descriptions of the derived SILC statistics and their calculation methodology see, 'The Laeken indicators: Detailed Calculation methodology' published by Eurostat and available to download:

http://www.cso.ie/en/media/csoie/methods/surveyonincomeandlivingconditions/Laeken_Indicators_-_calculation_algorithm.pdf

4.6.1 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.*

4.6.2 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.

4.6.3 Consistent poverty

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

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

4.6.4 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 itself, 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.

4.6.5 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 to be at risk of poverty before social transfers (i.e. the same threshold is used for calculating the rate before and after social transfers).

4.6.6 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.

4.6.7 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. Figure 4.6.7 shows the Lorenz curve before and after social transfers. 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. The Gini coefficient in 2017 was 30.6%.

Figure 4.6.7
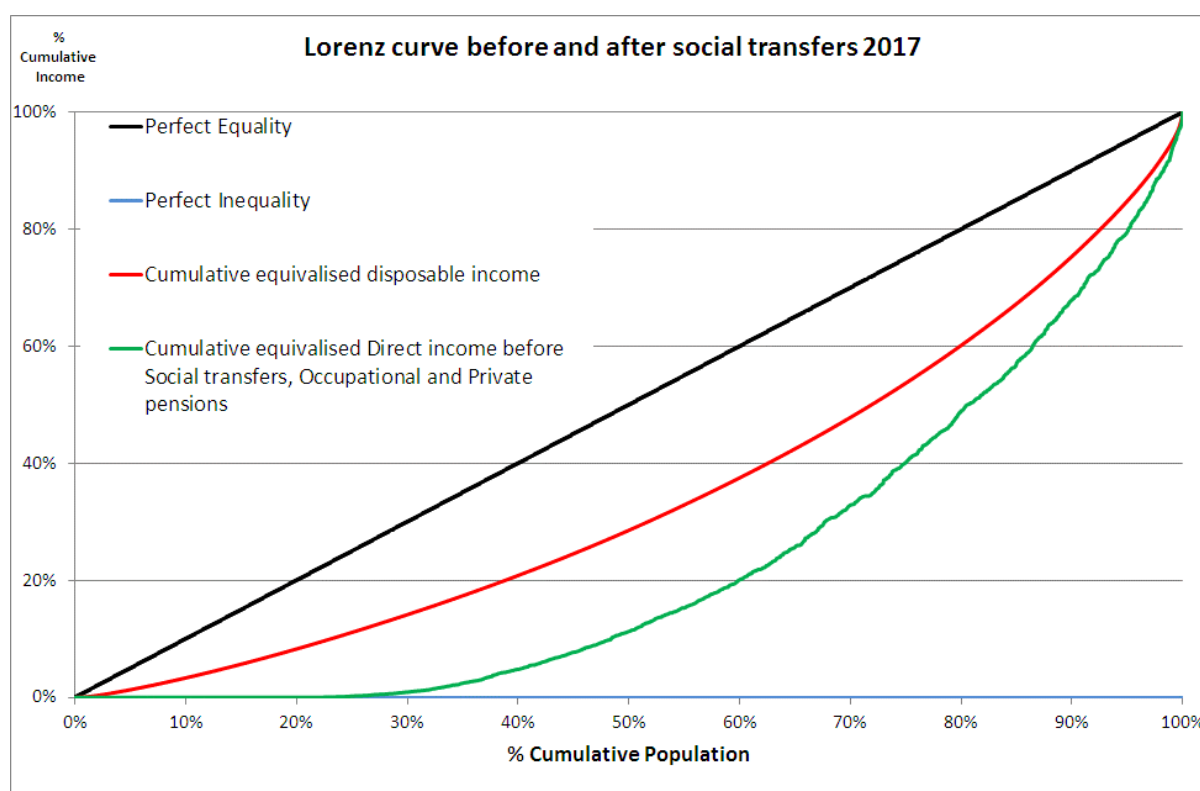
Calculation of the Gini Coefficient

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

Wgt_i = Final calibrated weight per individual

Eq_Inc_i = Equivalised disposable income

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

4.6.8 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).

4.6.9 OECD Statistics from EU-SILC - Gender wage gap, age wage gap, education wage gap (annual).

The gender wage gap is calculated as the difference between median earnings of men and women relative to median earnings of men, http://stats.oecd.org/Index.aspx?QueryId=64160. The age wage gap is calculated as the difference between mean earnings of 25-54 year-olds and that of 15-24 year-olds (respectively 55-64 year-olds) relative to mean earnings of 25-54 year-olds.

4.7 Other Quality Assurance Techniques Used

A Review of the Sampling and Calibration Methodology of the Survey on Income and Living Conditions (SILC) 2010-2013 was published in 2014 by the CSO's Methodological Division. This paper is available on the CSO's website at:
http://www.cso.ie/en/media/csoie/methods/surveyonincomeandlivingconditions/Reviewsamplingc alibrationmethodologySILC2010-2013.pdf
A standard level agreement (SLA) exists between the analysis section and the DCU sections of SILC to enable clear communication and ensure the smooth transfer of data from DCU. Similarly, the CSO has established a Memorandum of Understanding with Revenue and a Memorandum of Agreement with the Department of Social Protection to ensure the efficient and more importantly secure availability of administrative data.

Detailed documentation in the form of a section manual exists in the SILC DCU outlining the routine tasks, duties and responsibilities of section members. This document deals with issues as diverse as the CSO's confidentiality protocols to running weekly quality reports to handling edits on the DMS system. A detailed methodology and quality manual also exists for both the DCU and Analysis section on Lotus Notes, the CSO's document management system.

Process maps for both the DCU and Analysis section were first created in 2011 as part of the initial Lean Six Sigma project in the SILC area. Updated versions were created during 2017. A second Lean Six Sigma project was completed in 2012 that looked specifically at the SILC DCU code. This resulted in code that was more streamlined, reliable and transparent. The SAS code in the Analysis section has also been streamlined and most previous statistics can now be repeated by the application of simplified SAS macros.

Each quarter the Field Administration Unit (FAU) organises one-day training meetings with each of the ten interviewer groups. SILC DCU and occasionally SILC Analysis participate in these training days where modifications to the questionnaire, new SILC modules and any issues around the sample implementation are discussed. These training days form part of the open communication policy that exists between the SILC interviewer field force and the SILC DCU team. Detailed management reports are used to monitor and improve (if necessary) the performance of the interviewer field force. Level of completion payments are also linked to the response rates achieved by interviewers.

The only incentives SILC offers interviewees are token gifts, branded with the CSO logo and the words "Household Surveys" such as:

- Foldable shopping bag
- Biro
- Key ring with a shopping trolley token
- Pack of 12 colouring pencils for households with children
- Sticky note pads

Some of the other household surveys such as Household Budget (HBS) and Programme for International Assessment of Adult Competencies (PIAAC) offer a monetary reward for completion of the survey. For HBS in 2015, it was €30 per person in the household aged over 16 years who completes the interview and maintains the diary for two weeks. For PIAAC, the respondent was given €30 on completion of the interview/assessment. These amounts were issued in the form of vouchers.

5 Quality

5.1 Relevance

SILC provides a wealth of information in the areas of income, poverty, inequality, well-being and social exclusion. A wide range of individuals and organisations in society and politics use the data in the form of statistics and micro-data. The relevance of the information is greatly enhanced by the CSO's impartiality and independence as an organisation.

The main users of EU-SILC are:

- Institutional users like other Commission services, other European institutions (such as the ECB), national administrations (mainly those in charge of the monitoring of social protection and social inclusion), or other international organisations;
- Statistical users in Eurostat or in Member States National Statistical Institutes to feed sectoral or transversal publications such as the Annual Progress Report on the Lisbon Strategy (structural indicators), the Sustainable Development Strategy monitoring report, the Eurostat yearbook and various pocketbooks, among other reports;
- Researchers having access to microdata;
- End users - including the media - interested in living conditions and social cohesion in the EU.

For a more detailed description of users of CSO's SILC data see section 2.7 and for a more detailed description of the legal basis for EU-SILC see section 2.6.

Two important statistics usually presented when measuring income, poverty and social exclusion are not included in the national release, namely

- Persistent Poverty
- Transition of the population between income deciles – Income mobility.

The reason these measures have been excluded from the national release is that the longitudinal sample has not been robust enough to provide reliable estimates of the statistics at national level.

The relevance of SILC data does however suffer somewhat from issues of timeliness. Overcoming these timeliness failings is one of the main driving forces behind Eurostat's current Task Force on the revision of the EU-SILC legal basis.

5.2 Accuracy and Reliability

5.2.1. Sampling effect & representivity

5.2.1.1 Precision estimation

The precision estimates and the confidence intervals for SILC were calculated formally for the first time in 2013. The 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[7] Ch. 9 (Variance Estimation in Complex Surveys).

The calculations of the precision estimates took into account the weighting, the 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 complex nature of the methods adopted. The precision estimates for 2017 are provided in Table 5.2.1.1.

The methods used to calculate the precision estimates for the main SILC statistics are based on a methodology approved by the Income and Living Conditions Division (F4), Eurostat. However there is a possibility that the variance is being over-estimated as the weights are not being re-calibrated after each replication of the Jackknife method. It is worth noting that in 2016 2,059 replications were completed as part of the Jackknife method. Eurostat's requirements with regard to precision estimates in SILC are detailed in their 2013 working paper '*Standard error estimation for the EU–SILC indicators of poverty and social exclusion*' which is available to download at,

 http://ec.europa.eu/eurostat/documents/3888793/5855973/KS-RA-13-024-EN.PDF/cfef2973-4675-4df4-bf6d-e15ef1d3c060

5.2.1.2 Design Effect

Cluster sampling is adopted to reduce the financial cost of sampling. However, cluster sampling does have a statistical cost in terms of a loss in precision. In SILC, a two-Stage cluster sample is used with the initial stratification of the sample actually providing a gain in precision. However, the subsequent clustering erodes these gains. The overall loss or gain in precision when adopting a particular sampling method other than a simple random sample (SRS) is measured using *design effect*.

The design effect is a basic quality assurance metric used to measure the efficiency of a sampling plan. In SILC it is measured as:

$$d_{effect} = \frac{\text{the variance achieved using the cluster sample of size k}}{\text{the variance achieved using a simple random sample of size k}}$$

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

Table 5.2.1.1: 2017 Precision Estimates *

	Estimate	95% Conf Int		CV	Design Effect	Standard Error	Variance	Sample Number
		LowerCL	UpperCL					
Mean	24,983	24,246	25,720	0.015026	4.64	375.4	140,918	12,612
Quartile 1	14,684	14,284	15,084	0.013878		203.8	41,528	12,612
Median	20,869	20,081	21,657	0.01924		401.5	161,208	12,612
Quartile 3	30,793	29,699	31,887	0.0181		557.4	310,659	12,612
Not AROP	84.3	82.6	85.9	0.0	6.79	0.8	0.71	12,612
AROP	15.7	14.1	17.4	0.1	6.79	0.8	0.71	12,612
Not Deprived	81.2	79.4	83.0	0.0	7.09	0.9	0.86	12,612
Deprived	18.8	17.0	20.6	0.0	7.09	0.9	0.86	12,612
Not in Consistent P	93.3	92.2	94.4	0.0	6.50	0.6	0.32	12,612
Consistent Poverty	6.7	5.6	7.8	0.1	6.50	0.6	0.32	12,612
Gini	31.5	30.3	32.8	0.0		0.7	0.43	12,612
QSR	4.8	4.5	5.2	0.0		0.2	0.03	12,612

*Mean, Median, etc. refer to equivalised disposable income.

The design effect for SILC, in 2017, was found to be in the range of 4.6 to 7.1 - depending on the statistic being investigated. A design effect of 4.6 means that 4.6 times as many observations were needed in the SILC 2017 cluster sample to achieve the same level of precision than from a similarly sized simple random sample. The Irish SILC design effects are not unusual when compared with those of other member states with similar sampling methodologies. The design effects for years 2010-2017 are illustrated in Figure 5.2.1.2 below.

Figure 5.2.1.2: Design Effects for Mean Equivalised Income and Consistent Poverty
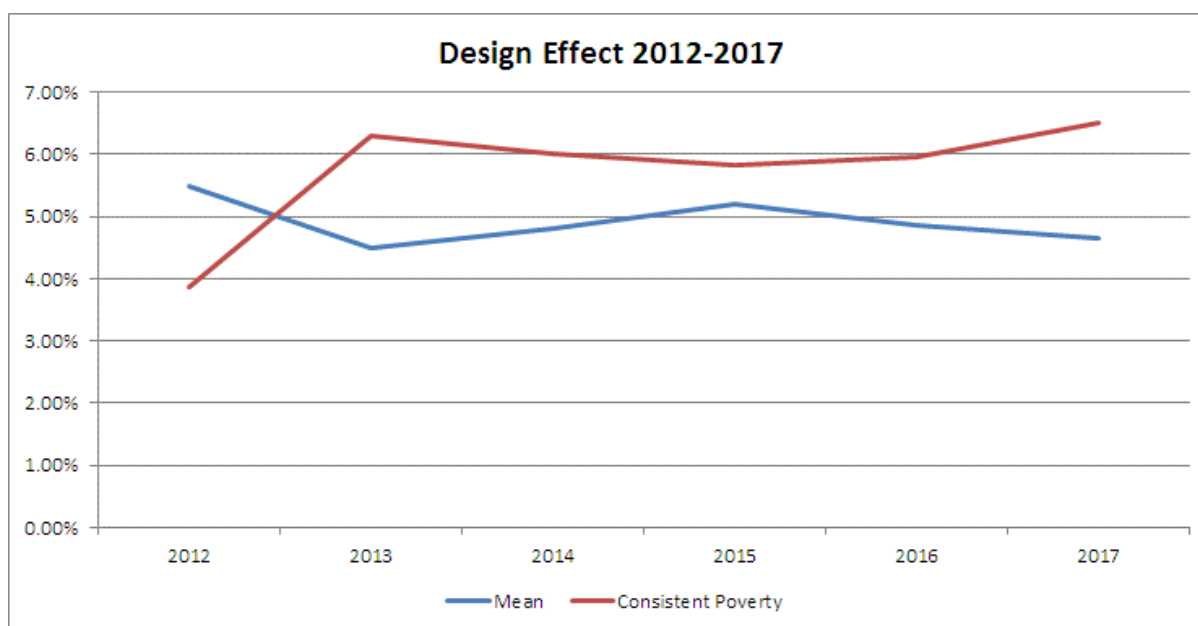
In 2019, the CSO's Methodology unit will conduct a review of the sample design to try to improve the design effect of the SILC sample.

5.2.1.3 Measuring the precision of a year-on-year change

Precision estimates have also being calculated for 2010-2017. When measuring whether the year-on-year change for a particular statistic in SILC is statistically significant the matter is complicated by the fact the samples are not independent. The sample design is a 4 wave rotational sample. Therefore, when measuring the year on year change of a statistic consideration must be given to the variance of the statistic in each year (sample) and the covariance of the statistic between samples. We measure the change in a statistic (Y) simply as:

$$\Delta Y = Y_T - Y_{T-1} \qquad (1)$$

The variance of the change is:

$$VAR(\Delta Y) = VAR(Y_T) + VAR(Y_{T-1}) - 2COV(Y_T, Y_{T-1}) \qquad (2)$$

To see if the change is significant, the 95% confidence interval (CI) for the change can be calculated using the formula:

$$95\%CI = \Delta Y \pm 1.96\sqrt{VAR(\Delta Y)} \qquad (3)$$

If the 95% CI (i.e. a range) contains 0 then we can conclude that the year on year difference is statistically no different than 0 (or the change is not *statistically significant*).

The covariance was more difficult to estimate because the samples were dependent. In fact, a further complication is that they were only partially dependent as each sample contained observations that are not present in the other sample due to new observations moving onto the sample and older observations dropping off. Therefore, to measure the variance of the change taking into account covariance, an approximation was used based on the Office of National Statistics (ONS) methods used in such circumstances (ONS: Labour Force Survey User Guide Volume 1 – LFS Background and Methodology 2011, p. 51 eq(1)). Therefore, the following approximation of equation 2 above was used as follows:

$$VAR(\Delta Y) = [VAR(Y_T) + VAR(Y_{T-1})][1 - r.k] \qquad (4)$$

Where r is the correlation coefficient between the matched portion of the sample and k is the sample overlap (0.73 in 2015/2017).

Table 5.2.1.3 presents the year-on-year changes in (2016-2017) along with the relevant confidence intervals. The statistics showing a statistically significant year-on-year change were; mean equivalised income, median equivalised income, equivalised income quartiles 1 and, deprivation.

Table 5.2.1.3 Measuring the statistical significance year on year change

	Change 2016/17							
	Match 2016 2017						95% CI	
	Overlap	k	Corr	Diff	Var_Diff	SE_Diff	LCL	UCL
Mean	8,958	0.71	0.74	1,301	114,656	339	638	1,965
Quartile 1	8,958	0.71	0.74	706	36,505	191	331	1,080
Median	8,958	0.71	0.74	541	144,354	380	-204	1,286
Quartile 3	8,958	0.71	0.74	2,031	218,636	468	1,114	2,947
AROP	8,958	0.71	0.63	-0.50	0.77	0.88	-2.22	1.23
Deprivation	8,958	0.71	0.61	-2.16	0.96	0.98	-4.08	-0.25
Consistent Poverty	8,958	0.71	0.53	-1.45	0.43	0.66	-2.73	-0.16
Gini	8,958	0.71	0.74	0.84	0.37	0.61	-0.35	2.02
QSR	8,958	0.71	0.74	0.15	0.03	0.17	-0.18	0.47

	YOY Change is not significant

Below are a series of graphs representing the principal statistics and their associated confidence intervals for the period 2010-2017.
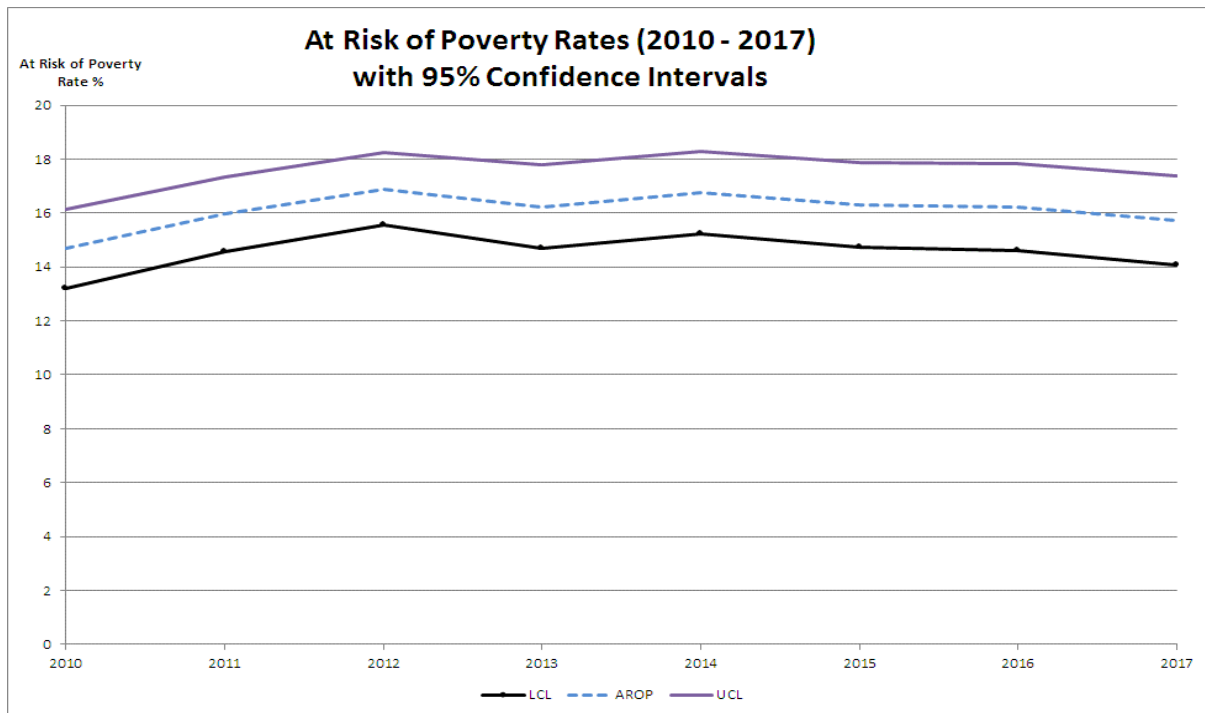
Figure 5.2.1.3a
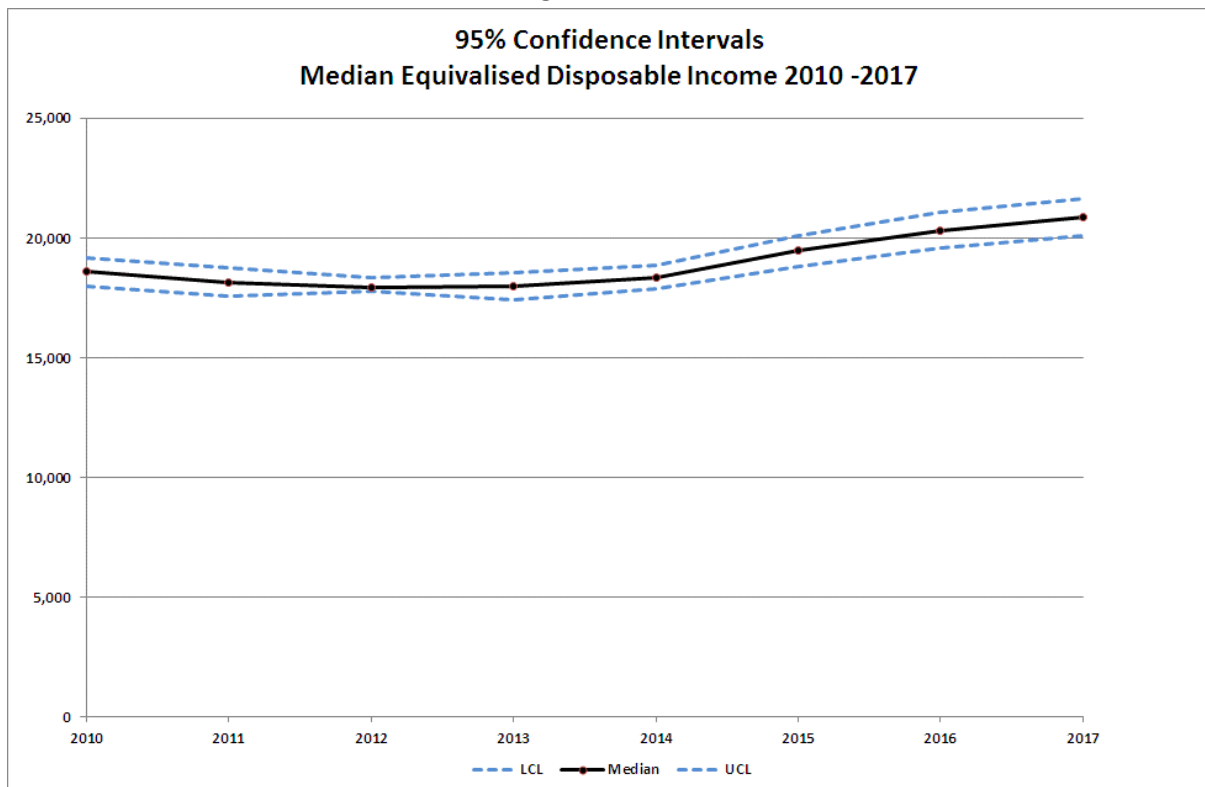

Figure 5.2.1.3b

Figure 5.2.1.3c

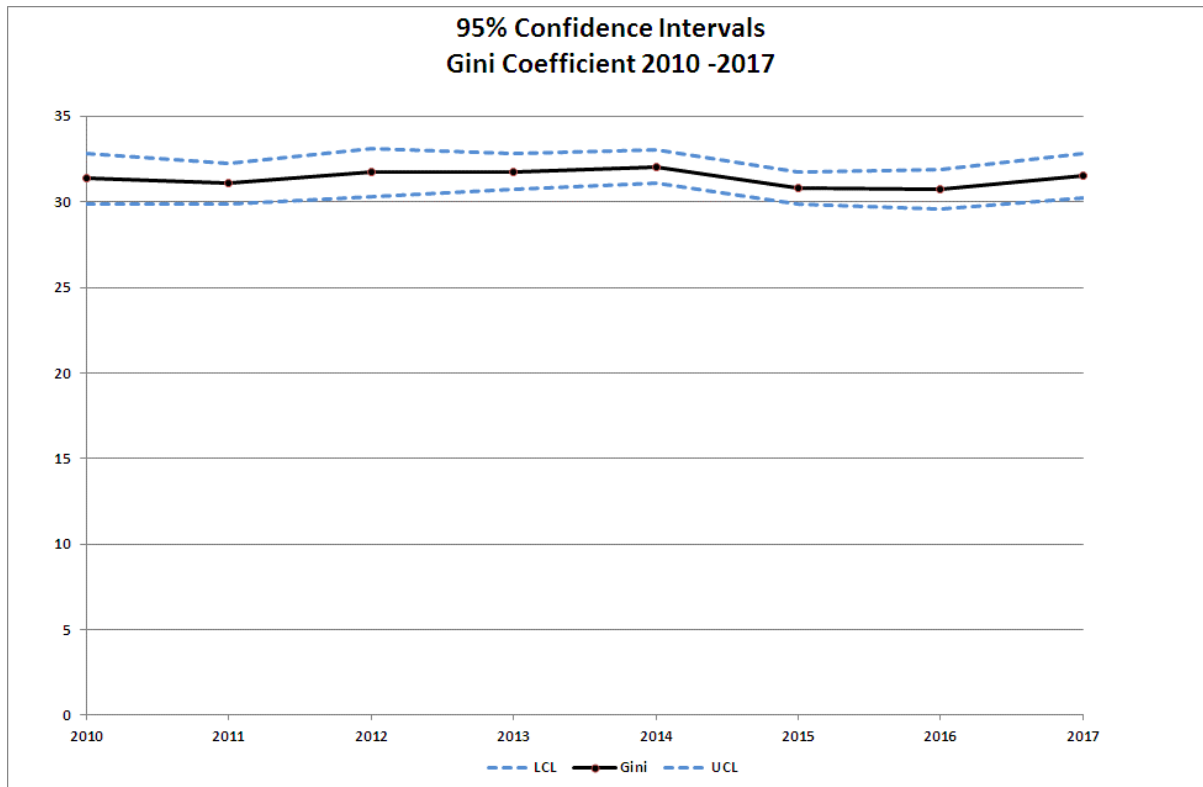### 5.2.1.4 Coefficient of Variation

The coefficient of variation (CV) is a relative measure of precision. The statistic is calculated as follows:

$$CV = \frac{standard\ error}{statistic}$$

Figure 5.2.1.4 a The CVs for the Gini coefficient and the QSR over the period 2010-2017.
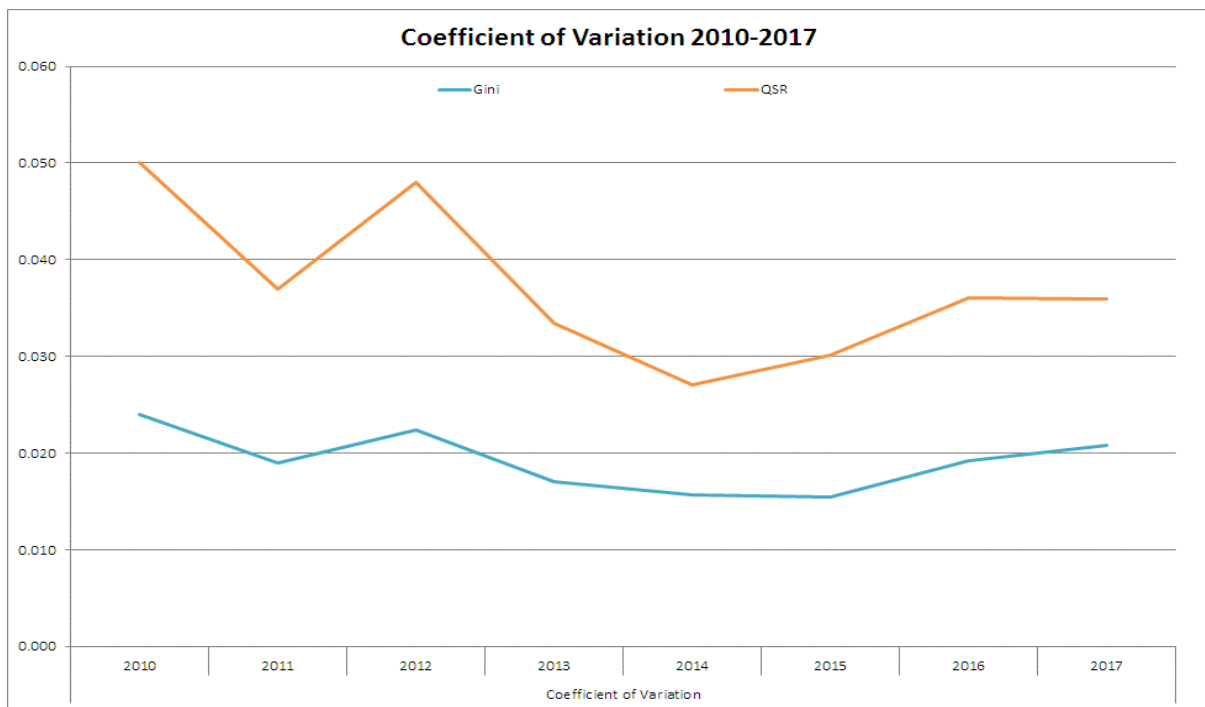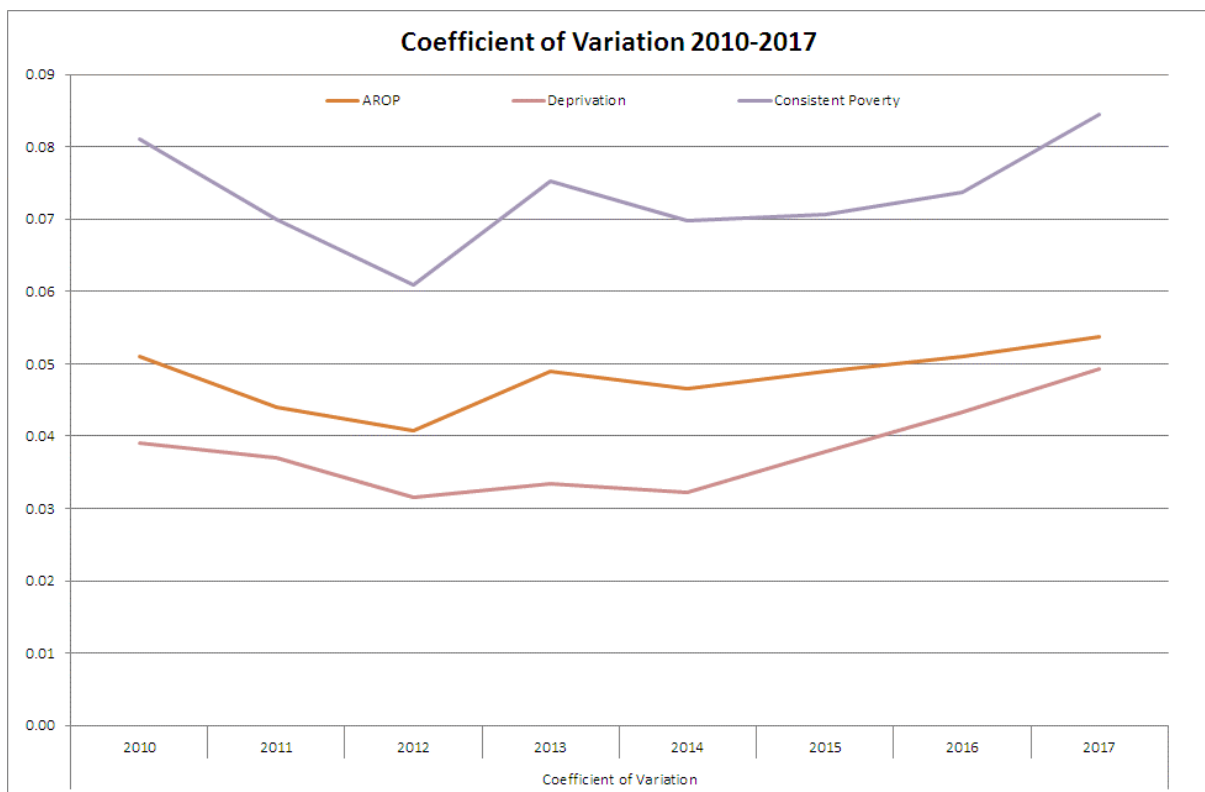

Figure 5.2.1.4 b The CVs for AROP, Deprivation and Consistent Poverty over the period 2010-2017.

5.2.1.5 Comparing the SILC Sample size with other CSO household samples

- To get an idea of the level of precision and robustness possible from the SILC sample, it is worth comparing the achieved SILC sample with some other household samples conducted by the CSO, see Figure 5.2.1.5 below. By far the largest household sample conducted by the CSO is the Labour Force Survey (LFS) sample. The LFS is a quarterly sample and each quarter 80% of the households were in the sample the previous quarter. This level of overlap ensures that the quarter-on quarter changes in the LFS are measured with increased precision due to the covariance of the sample in a quarter compared to the previous one.

The Household Budget Survey (HBS) sample, 2015 achieved a sample of 6,850 households and the Household Finance and Consumption Survey (HFCS), 2013, achieved a sample of 5,545 households. In 2017, the achieved SILC sample is slightly smaller at 5,029 households. All of these samples are cluster samples and size alone is not a good measure of precision. Other factors to consider are the homogeneity of the clusters (within), the benefits from stratification and the variables being measured. Furthermore, see figure 4.5.3a to see how the SILC sample has changed in recent years.

Figure 5.2.1.5
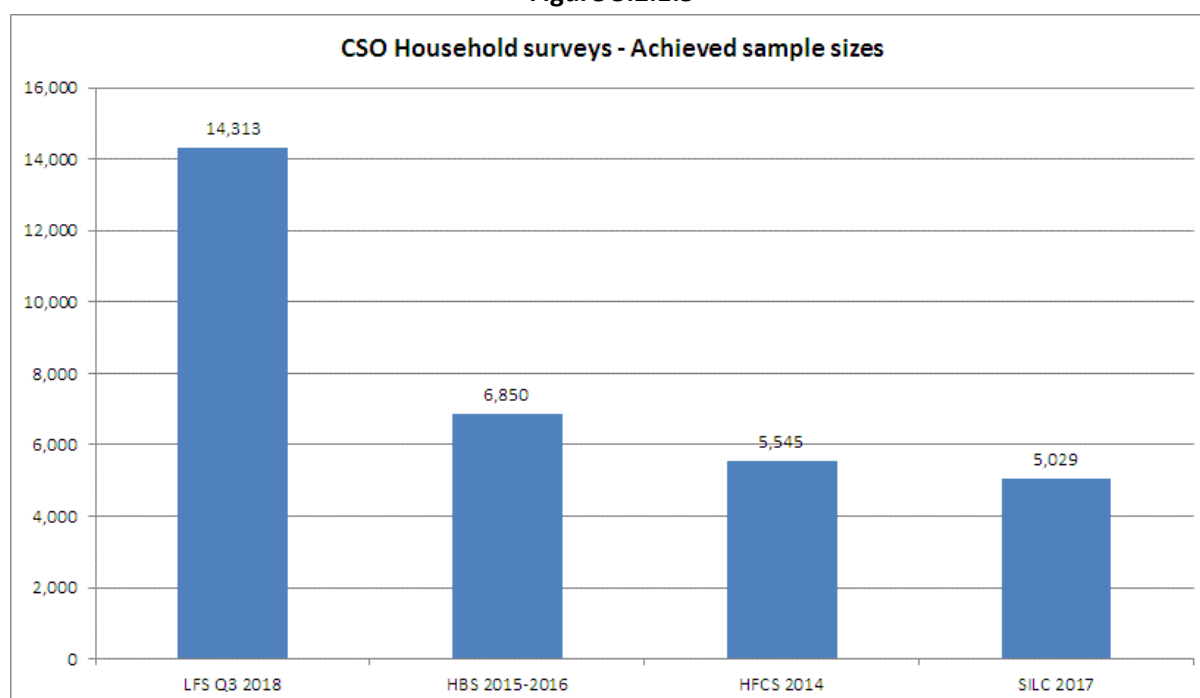
5.2.1.6. Representivity

The sample is designed to be a randomly selected cluster sample with each household in the target population having an equal and known probability of selection. Non-response has the potential to introduce bias into the sample. SILC sample implementation procedures are designed to minimise non-response. The sample is designed for a full-time field force of 100 interviewers.   Adequate monitoring and management of the field-force availability is critical in assuring a high quality representative sample. An on-going issue with all CSO household samples is the availability of field

interviewers. When any of the interviewers are not available due to holidays, sickness or retirement, the interviewers are replaced by temporary interviewers (back-ups) whenever possible.

5.2.1.6a Achieved Sample Numbers

classification	Households in the Sample				Individuals in the Sample			
	2015	2016	2017	Change 2017-2016	2015	2016	2017	Change 2016-2015
State	5,452	5,218	5,029	-189	13,793	13,182	12,612	-570
a Male	2,440	2,323	2,264	-59	6,798	6,509	6,168	-341
b Female	3,012	2,895	2,765	-130	6,995	6,673	6,444	-229
0-17	6	2	.		3,629	3,389	3,172	-217
18-64	3,763	3,491	3,316	-175	7,674	7,229	6,901	-328
65+	1,683	1,725	1,713	-12	2,490	2,564	2,539	-25
a At work	2,461	2,318	2,327	9	4,948	4,743	4,719	-24
b Unemployed	373	306	279	-27	756	654	570	-84
c Student	80	69	77	8	856	881	899	18
d Home duties	913	871	716	-155	1,524	1,383	1,152	-231
e Retired	1,223	1,268	1,275	7	1,737	1,831	1,835	4
f Ill/disabled	343	320	317	-3	578	565	539	-26
a No formal education/primary	1,154	1,121	1,069	-52	1,830	1,774	1,672	-102
b Lower secondary	807	759	733	-26	1,827	1,801	1,712	-89
c Higher secondary	924	853	812	-41	2,239	2,092	2,036	-56
d Post leaving cert	745	711	635	-76	1,340	1,299	1,192	-107
e Third level non degree	802	757	754	-3	1,407	1,355	1,323	-32
f Third level degree or above	944	955	972	17	1,740	1,732	1,765	33
a1 1 adult aged 65+,no children under 18	831	848	858	10	831	848	858	10
a2 1 adult aged <65,no children under 18	750	679	651	-28	750	679	651	-28
b1 2 adults, at least 1 aged 65+, no children under 18	797	832	819	-13	1,594	1,664	1,638	-26
b2 2 adults, both aged <65, no children under 18	691	626	595	-31	1,382	1,252	1,190	-62
c 3+ adults, no children under 18	498	510	507	-3	1,683	1,727	1,739	12
d 1 adult, 1+ children under 18	284	244	229	-15	788	695	678	-17
e 2 adults, 1-3 children under 18	1,192	1,088	1,013	-75	4,640	4,273	4,009	-264
f Other households with children under 18	409	391	357	-34	2,125	2,044	1,849	-195
No person at work in household	2,290	2,215	2,073	-142	4,109	3,980	3,631	-349
One person at work in the household	1,629	1,519	1,463	-56	4,184	3,873	3,649	-224
Two people at work in the household	1,331	1,269	1,275	6	4,654	4,429	4,421	-8
Three or more people at work in the household	202	215	218	3	846	900	911	11
Owned	4,021	3,931	3,787	-144	10,011	9,681	9,285	-396
Rented at the market rate	646	485	437	-48	1,829	1,480	1,273	-207
Rented at below the market rate or rent free	785	802	805	3	1,953	2,021	2,054	33
1 Urban	3,310	3,224	3,108	-116	8,573	8,391	8,098	-293
2 Rural	2,142	1,994	1,921	-73	5,220	4,791	4,514	-277
Northern and Western	1,047	1,022	1,003	-19	2,450	2,399	2,278	-121
Southern	2,108	1,991	1,886	-105	5,196	4,875	4,615	-260
Eastern and Midland	2297	2205	2140	-65	6147	5908	5719	-189

5.2.1.6b Achieved Sample Composition

classification	Households in the Sample			Individuals in the Sample		
	2015	2016	2017	2015	2016	2017
State	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%
a Male	44.8%	44.5%	45.0%	49.3%	49.4%	48.9%
b Female	55.2%	55.5%	55.0%	50.7%	50.6%	51.1%
0-17	0.1%	0.0%		26.3%	25.7%	25.2%
18-64	69.0%	66.9%	65.9%	55.6%	54.8%	54.7%
65+	30.9%	33.1%	34.1%	18.1%	19.5%	20.1%
a At work	45.1%	44.4%	46.3%	35.9%	36.0%	37.4%
b Unemployed	6.8%	5.9%	5.5%	5.5%	5.0%	4.5%
c Student	1.5%	1.3%	1.5%	6.2%	6.7%	7.1%
d Home duties	16.7%	16.7%	14.2%	11.0%	10.5%	9.1%
e Retired	22.4%	24.3%	25.4%	12.6%	13.9%	14.5%
f Ill/disabled	6.3%	6.1%	6.3%	4.2%	4.3%	4.3%
a No formal education/primary	21.2%	21.5%	21.3%	13.3%	13.5%	13.3%
b Lower secondary	14.8%	14.5%	14.6%	13.2%	13.7%	13.6%
c Higher secondary	16.9%	16.3%	16.1%	16.2%	15.9%	16.1%
d Post leaving cert	13.7%	13.6%	12.6%	9.7%	9.9%	9.5%
e Third level non degree	14.7%	14.5%	15.0%	10.2%	10.3%	10.5%
f Third level degree or above	17.3%	18.3%	19.3%	12.6%	13.1%	14.0%
a1 1 adult aged 65+,no children under 18	15.2%	16.3%	17.1%	6.0%	6.4%	6.8%
a2 1 adult aged <65,no children under 18	13.8%	13.0%	12.9%	5.4%	5.2%	5.2%
b1 2 adults, at least 1 aged 65+, no children under 18	14.6%	15.9%	16.3%	11.6%	12.6%	13.0%
b2 2 adults, both aged <65, no children under 18	12.7%	12.0%	11.8%	10.0%	9.5%	9.4%
c 3+ adults, no children under 18	9.1%	9.8%	10.1%	12.2%	13.1%	13.8%
d 1 adult, 1+ children under 18	5.2%	4.7%	4.6%	5.7%	5.3%	5.4%
e 2 adults, 1-3 children under 18	21.9%	20.9%	20.1%	33.6%	32.4%	31.8%
f Other households with children under 18	7.5%	7.5%	7.1%	15.4%	15.5%	14.7%
No person at work in household	42.0%	42.4%	41.2%	29.8%	30.2%	28.8%
One person at work in the household	29.9%	29.1%	29.1%	30.3%	29.4%	28.9%
Two people at work in the household	24.4%	24.3%	25.4%	33.7%	33.6%	35.1%
Three or more people at work in the household	3.7%	4.1%	4.3%	6.1%	6.8%	7.2%
Owned	73.8%	75.3%	75.3%	72.6%	73.4%	73.6%
Rented at the market rate	11.8%	9.3%	8.7%	13.3%	11.2%	10.1%
Rented at below the market rate or rent free	14.4%	15.4%	16.0%	14.2%	15.3%	16.3%
1 Urban	60.7%	61.8%	61.8%	62.2%	63.7%	64.2%
2 Rural	39.3%	38.2%	38.2%	37.8%	36.3%	35.8%
Northern and Western	19.2%	19.6%	19.9%	17.8%	18.2%	18.1%
Southern	38.7%	38.2%	37.5%	37.7%	37.0%	36.6%
Eastern and Midland	42.1%	42.3%	42.6%	44.6%	44.8%	45.3%

5.2.2. Non-Sampling Effects

In addition to known sampling errors, any survey will be subject to other non-sampling errors; for example measurement errors arising from questions not capturing the desired information accurately. Non-sampling error is far more difficult to measure than sampling error and no formal estimate of non-sampling error is available in SILC.

Information on the interviews is collected and analysed to help minimise non-sampling effects (including, for example, when interviews were conducted and their duration). This information is compared across the interview team to ensure no unusual variation in interviewer performance exists. Co-ordinators, as an additional check on the quality of the interviewer's work, call back to some households to check the quality of the collected data on an ad-hoc basis (this practice is currently under review in an attempt to formalise these call-back procedures and to stipulate a minimum percentage of call-backs).

No formal evaluation of sources of error is available, although measures are in place to minimise error. The quality of the data collected is improved using regular field staff training (including the use of video recording of training interviews) and debriefings – for example, suggestions are invited from field staff regarding the wording of certain questions. Proxy responses are not allowed for certain questions (for example some personal deprivation items). Comprehension errors - most of the terms used by the survey are readily understood, although some issues occasionally arise.

5.2.2.1 Quality of the Data Sources used (other than survey register)

The availability of administrative data from the Revenue and the DSP has greatly improved the reliability of SILC data. Measurement errors in the overall income levels of individual respondents have greatly reduced and the reliability of the overall social welfare income for each individual on the dataset has also greatly improved. The variable that allows all of this data to be linked is the PPSN[8]. Anomalies may still arise in these data sources and these are identified and resolved using SILC DCU's comprehensive micro-editing system.

Plausibility checks are carried out on the survivor's pension payments, the old age pension and the disability payments where any anomalies uncovered are addressed. Any social welfare payments in excess of €26,000 are also queried. Pro-active checking (and imputing if necessary) of the PRSI class variable for each individual in the revenue data file also takes place.

A major issue for SILC with these two data sources is the timely availability of the data. This issue is not unique to Ireland and a resolution to this problem is one of the main driving forces behind Eurostat's current task force on the review of the EU-SILC legal basis. Timeliness is also a key concern with the Farm Payment Scheme data provided by the Department of Agriculture, Food and the Marine (DAFM).

5.2.2.2 Register Coverage

The sampling frame is not a household register. The sampling frame is a combination of the 2011 Census file and An-Post's GeoDirectory (see https://www.geodirectory.ie/). The sample based on this sample frame was introduced in 2014 and was fully in effect in 2017.

5.2.2.3 Non-response (Unit and Item)

The unit response rates for 2017 are:

- 56% overall
- 31% Wave 1 (cross-sectional)
- 84% Wave 2-4 (longitudinal)

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[8] The CSO assigns an unique number derived from the PPSN to link data. This number is derived and managed by the ADC section to ensure added security and confidentiality around individual's data.

Table 5.2.2.3 provides a summary of the response rates for the years 2014-2017. The 2017 figures are provisional. The final response rates are calculated by using the issued sample (minus the vacant dwellings) as the denominator.

Table 5.2.2.3

	Wave 1 Households			Wave 2-4 Households			Total Households		
	2015	2016	2017	2015	2016	2017	2015	2016	2017
Issued Sample	5,109	4,759	5,159	4,593	4,721	4,302	9,702	9,480	9,461
Interview	1,797	1,424	1,488	3,655	3,794	3,541	5,452	5,218	5,029
Refusal	1,297	1,105	1,197	357	338	263	1,654	1,443	1,460
Entire Household temporarily absent	69	73	65	67	46	43	136	119	108
Household unable to respond (illness, incapacity, …)	127	83	129	79	67	59	206	150	188
Vacant	402	396	406	96	102	83	498	498	489
Other	1,417	1,678	1,874	339	374	313	1,756	2,052	2,187
% Interviewed	35.2%	29.9%	28.8%	79.6%	80.4%	82.3%	56.2%	55.0%	53.2%
% Refused	25.4%	23.2%	23.2%	7.8%	7.2%	6.1%	17.0%	15.2%	15.4%
% Temporarily Absent	1.4%	1.5%	1.3%	1.5%	1.0%	1.0%	1.4%	1.3%	1.1%
% Unable to respond (illness, incapacity, …)	2.5%	1.7%	2.5%	1.5%	1.4%	1.4%	2.1%	1.6%	2.0%
% Vacant	7.9%	8.3%	7.9%	2.1%	2.2%	1.9%	5.1%	5.3%	5.2%
% Other	27.7%	35.3%	36.3%	7.4%	7.9%	7.3%	18.1%	21.6%	23.1%

To minimise non-response every household is revisited at least three times to get some response from occupied household. In many cases, households that are difficult to contact are revisited several more times. Basic household information is collected from all sample households including non-responding households. The SILC DCU team proactively manage the sample and detailed quality reports are produced each week to monitor the progress of the sample implementation. Each quarter, detailed feedback in the form of a report on each interviewer's progress is generated and circulated for discussion. Level of completion payments are also linked to the response rates achieved by interviewers.

The sample design is based on the availability of 100 permanent interviewers and 10 field coordinators/supervisors. In recent years, sample implementation has suffered from a shortage of interviewers. Back-up interviewers are used whenever possible to cover areas where no permanent interviewer is available.

Certain households in apartment blocks and gated communities are proving more and more difficult to access. This is especially true in Wave 1 interviews when no contact information is available.

5.2.2.5 Processing Errors

Data capture errors are minimised by logic checks and limits on values that are keyed for each question in the electronic questionnaire at the data collection point. Checks are in place to minimise these coding errors, particularly with respect to occupational coding. The coding is initially performed in the field (interviewers using the Blaise application) with checks on this work then performed in the survey area.

On-going process improvements are reducing the possibility of any major process errors and extensive macro-editing is ensuring process errors are being highlighted and resolved.

5.2.2.6 Model-related Effects

Does not apply.

## 5.3 Timeliness and Punctuality

5.3.1 Provisional Results

No provisional outputs are published.

5.3.2 Final Results

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, the availability of administrative data and the exact reference year of the data collected. For example, most EU member states' SILC fieldwork is completed by July of the reference year. Also, most EU member states use income data from the previous year (T-1) as a proxy for current (T) annual income. As noted earlier, the income referenced in Ireland's 2017 SILC data is a function of the date of the household interview and therefore income data in the dataset covers a period from January 2016 (for those interviewed in January 2017) to December 2017 (for those interviewed in December 2017).

Figure 5.3.2 presents the history of the time lag (in months) between the reference period and the publication date for SILC.

Figure 5.3.2
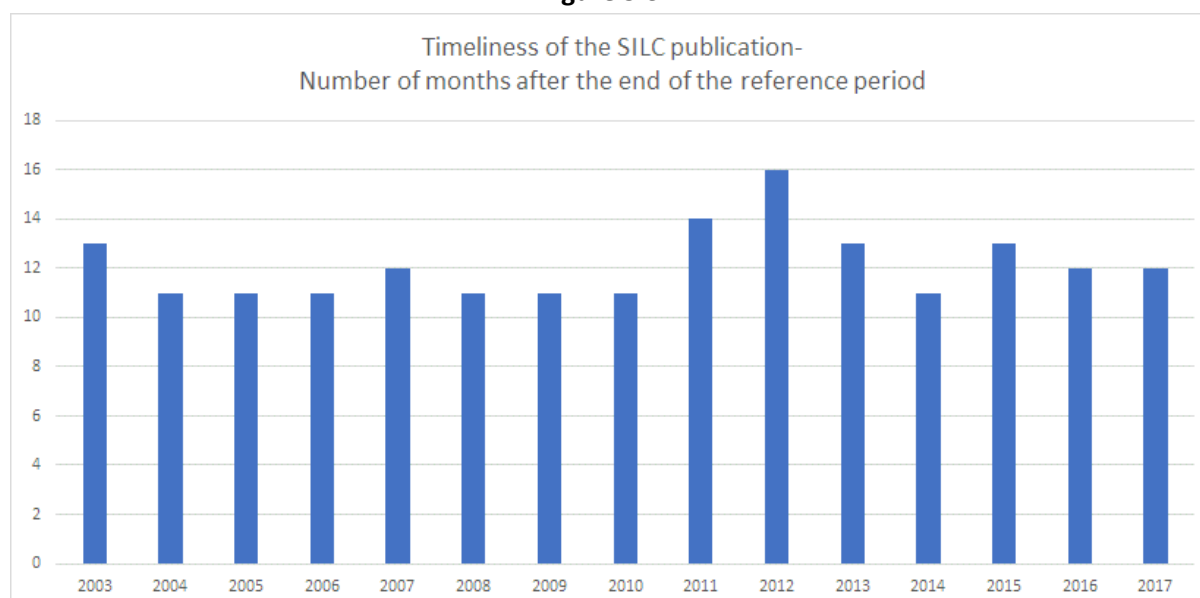
5.4 Coherence

Much of the income micro-data comes directly from administrative sources such as Revenue and the Department of Social Protection. This has reduced the burden of data editing considerably. However, extensive macro-editing is completed when the initial process is completed to benchmark SILC results against Revenue and Department of Social Protection macro-data to ensure coherency with these known figures.

The Jobless household figures derived from SILC are high in comparison to those figures derived from the QNHS and internationally. It should be noted that the LFS is the official source of data for the jobless household indicator. The CSO advises that because of differences in sampling and collection practices, the use of the LFS jobless household indicator in conjunction with the SILC poverty indicators should be done with great caution. Further discussion on this issue may be found in the CSO publication: '*A Review of the Sampling and Calibration Methodology of the Survey on Income and Living Conditions (SILC) 2010-2013'*. The CSO's Methodological Division published this paper in 2014. This paper is available on the CSO's website at
http://www.cso.ie/en/media/csoie/methods/surveyonincomeandlivingconditions/ReviewsamplingcalibrationmethodologySILC2010-2013.pdf

5.4.1 SILC social protection transfers coherence with published Department of Social Protection statistics

The income reference period for a household interviewed as part of the SILC survey is the 12 month period immediately preceding the interview date. This means that the income reference period depends on the interview date and the reported SILC incomes in year N covers Year N and N-1. For example if a household was interviewed in SILC 2017 on January 1st 2017 the income reference period for this household was 2016. If another 2017 SILC household was interviewed on December 31st 2017 then that household's income reference period was effectively 2016. When comparing the weighted SILC social transfer for year N with DSP published statistics, we compare SILC with the DSP average for Year N and Year N-1.

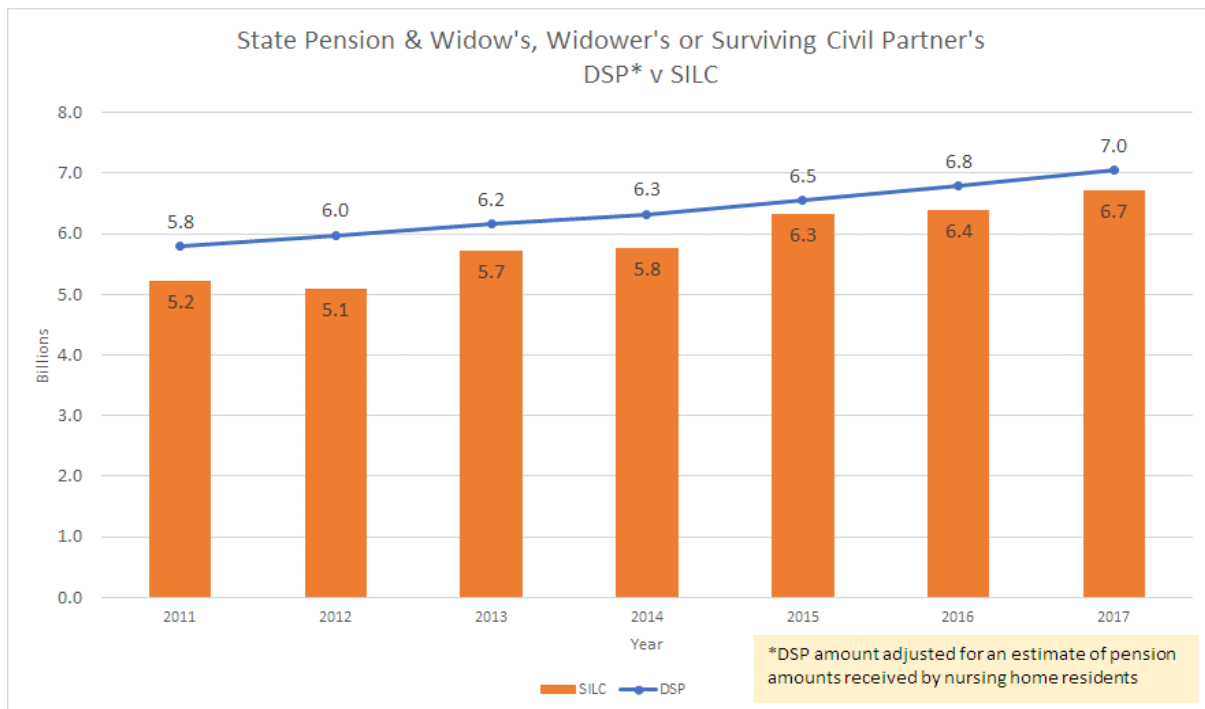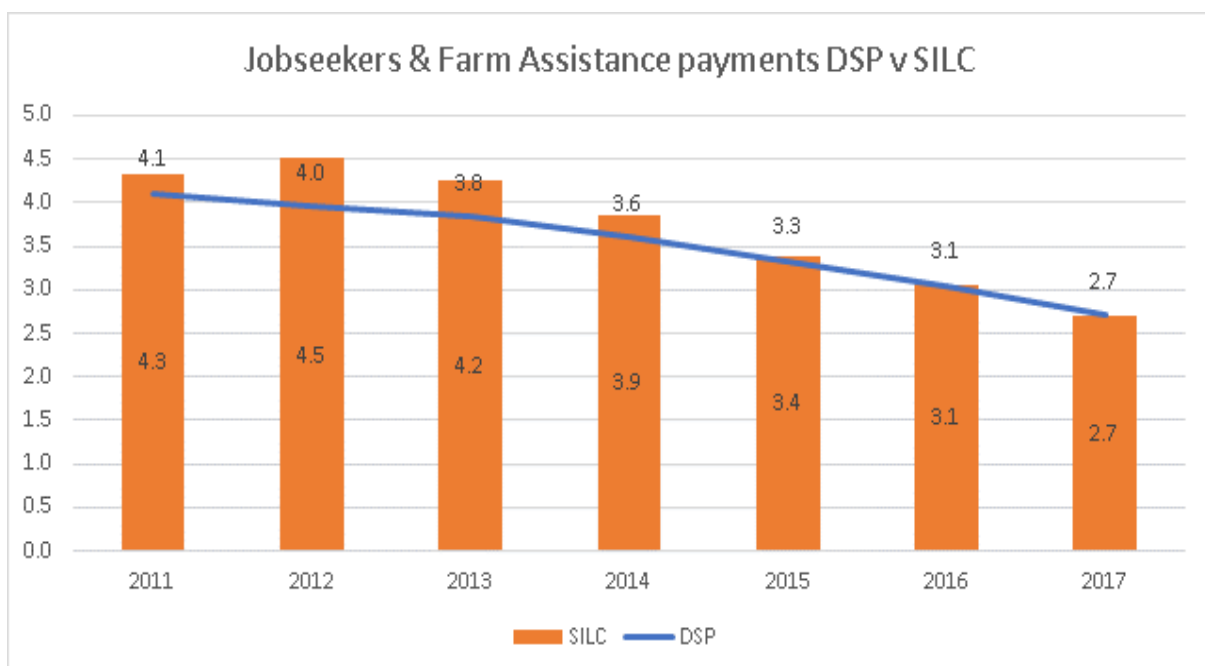In the figure below SILC weighted family, illness, pension and jobseeker supports social transfers are compared with published DSP statistics https://www.welfare.ie/en/Pages/Annual-SWS-Statistical-Information-Report.aspx

Figure 5.4.1a

Figure 5.4.1b

Figure 5.4.1C

One Parent, Child Benefit & Family Income Supplement
DSP V SILC

Figure 5.4.1D

Illness Benefit, Invalidity Pension, Disability Allowance & Carers
DSP v SILC

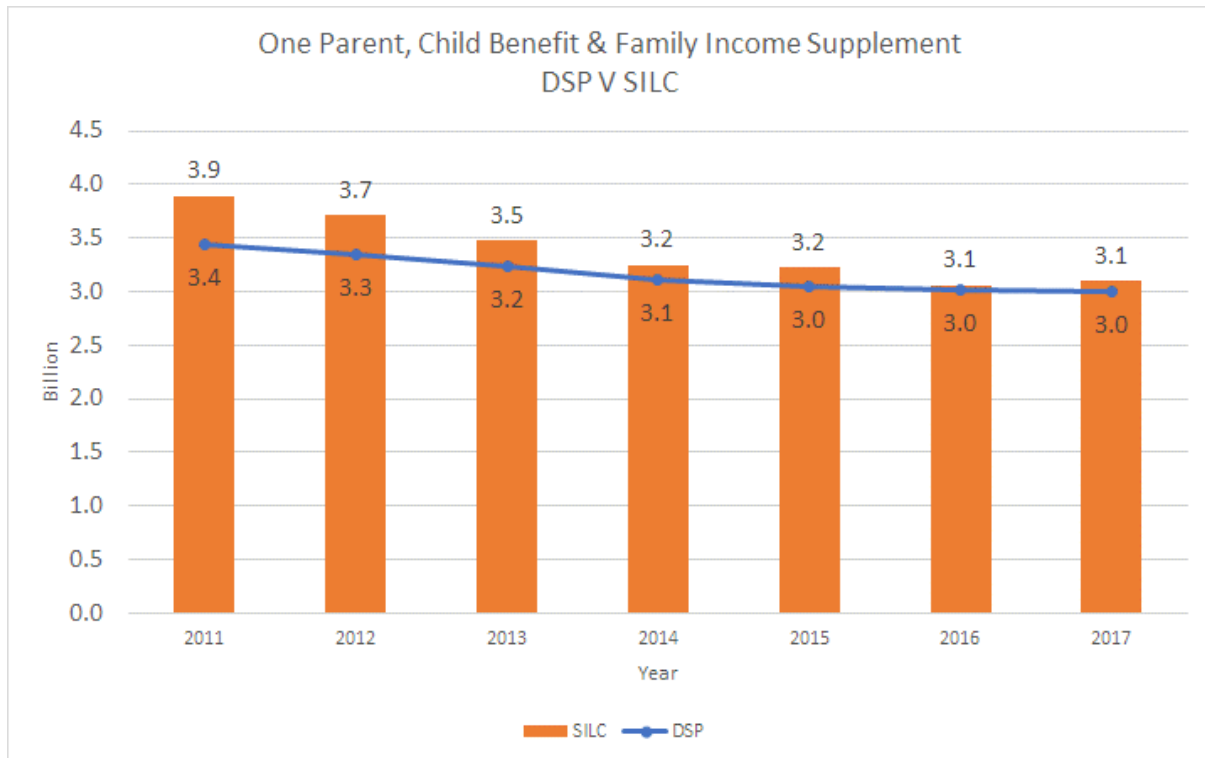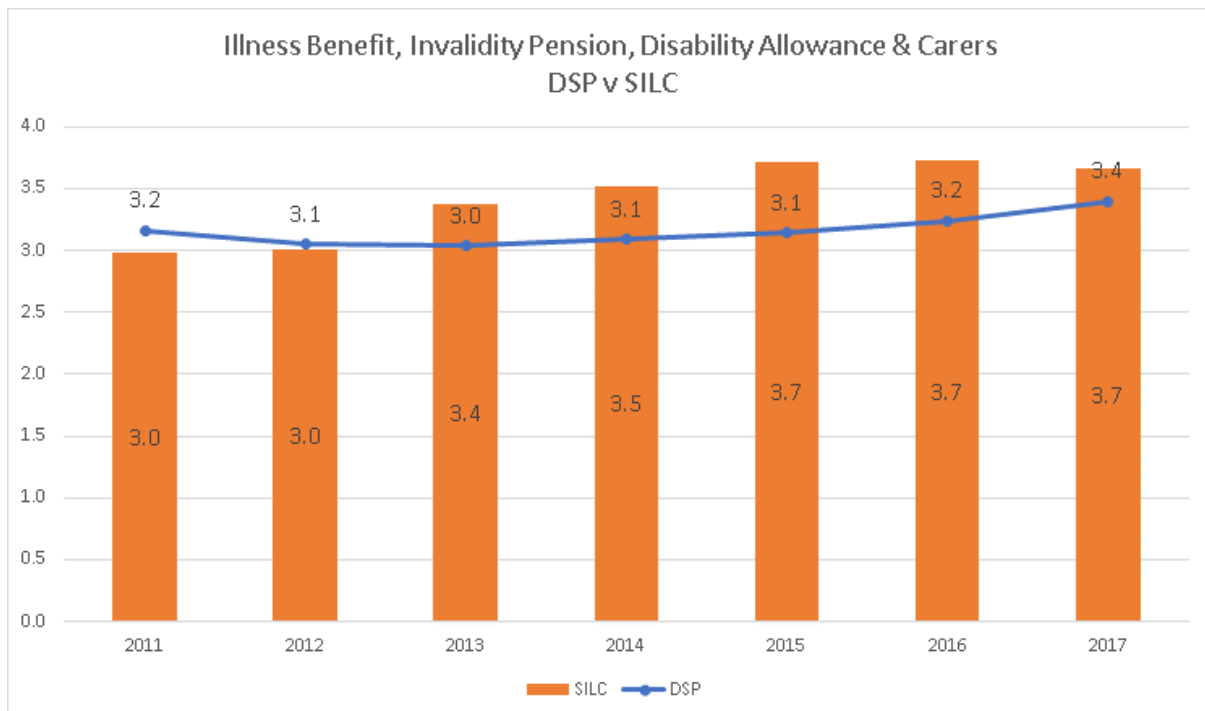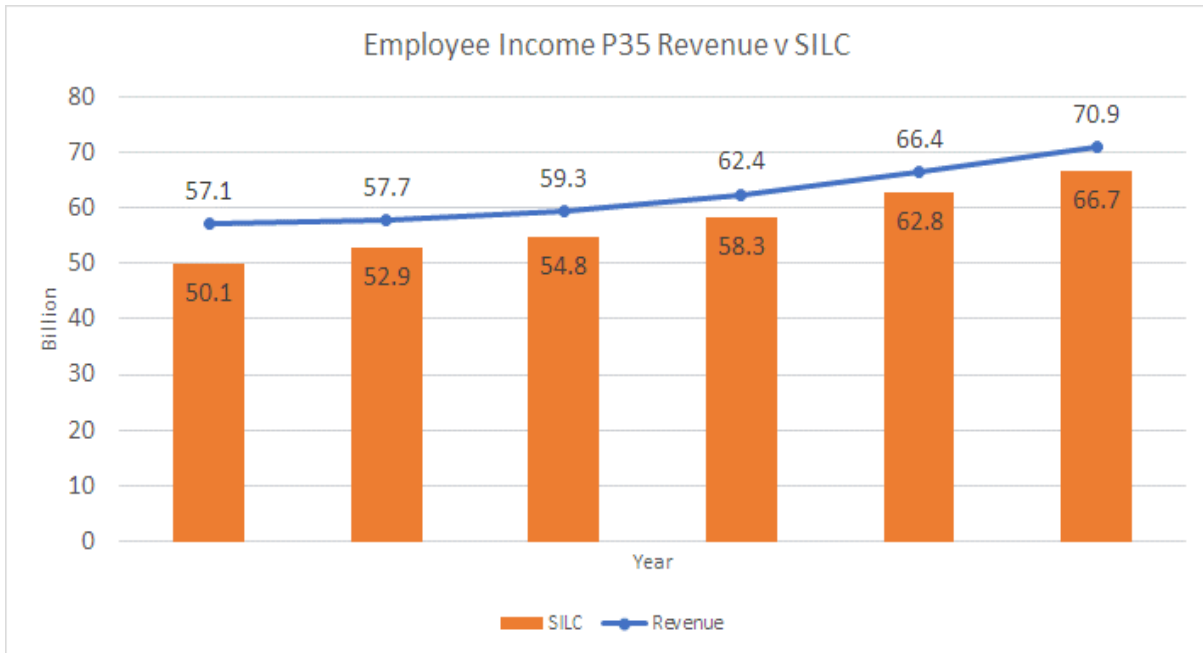**5.4.2 SILC employee income compared with Revenue P35 income**

Figure 5.4.2a

When comparing revenue P35 income with Revenue P35 administrative income, the Revenue variable used in the comparison was the Gross Pay (for USC purposes). SILC income for Year N was compared to the average P35 income from Year N and N-1. Revenue Income where the Class of PRSI paid was S,K or M classes was not considered when comparing SILC employee income with Revenue administrative P35 income.
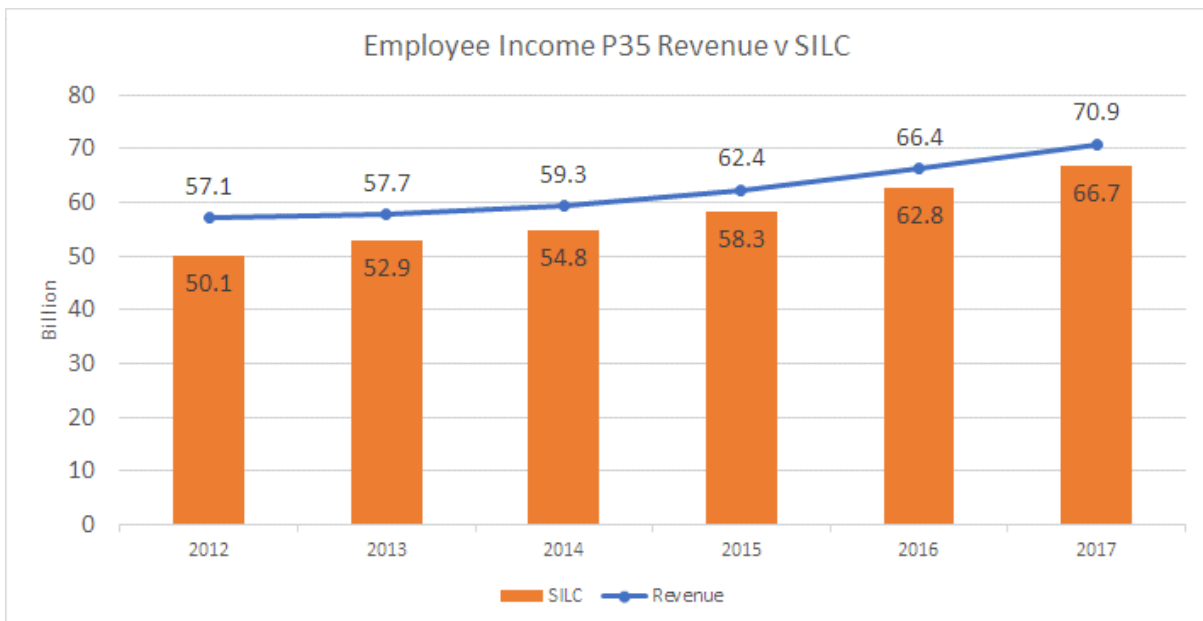
5.5 Comparability

5.5.1 Comparing national SILC statistics over time

All SILC publications are available on the CSO website in publication format. In addition data is made available via the CSO's main databank dissemination tool and is also hosted on the CSO website in Excel format: All previously published SILC statistics are available on the CSO's Databank http://www.cso.ie/px/pxeirestat/Database/eirestat/Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)/Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)_statbank.asp?SP=Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)&Planguage=0

The graphs below show the main national SILC statistics from 2004 to 2017.
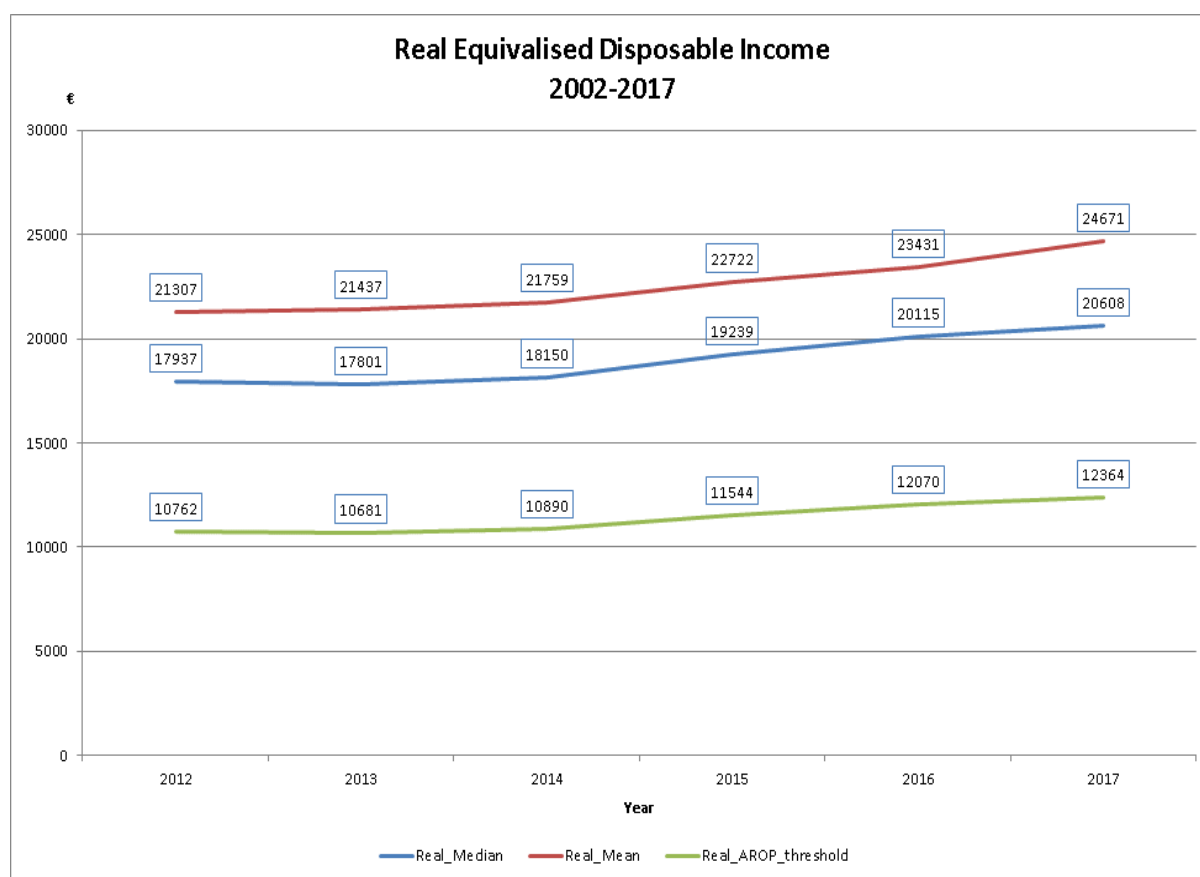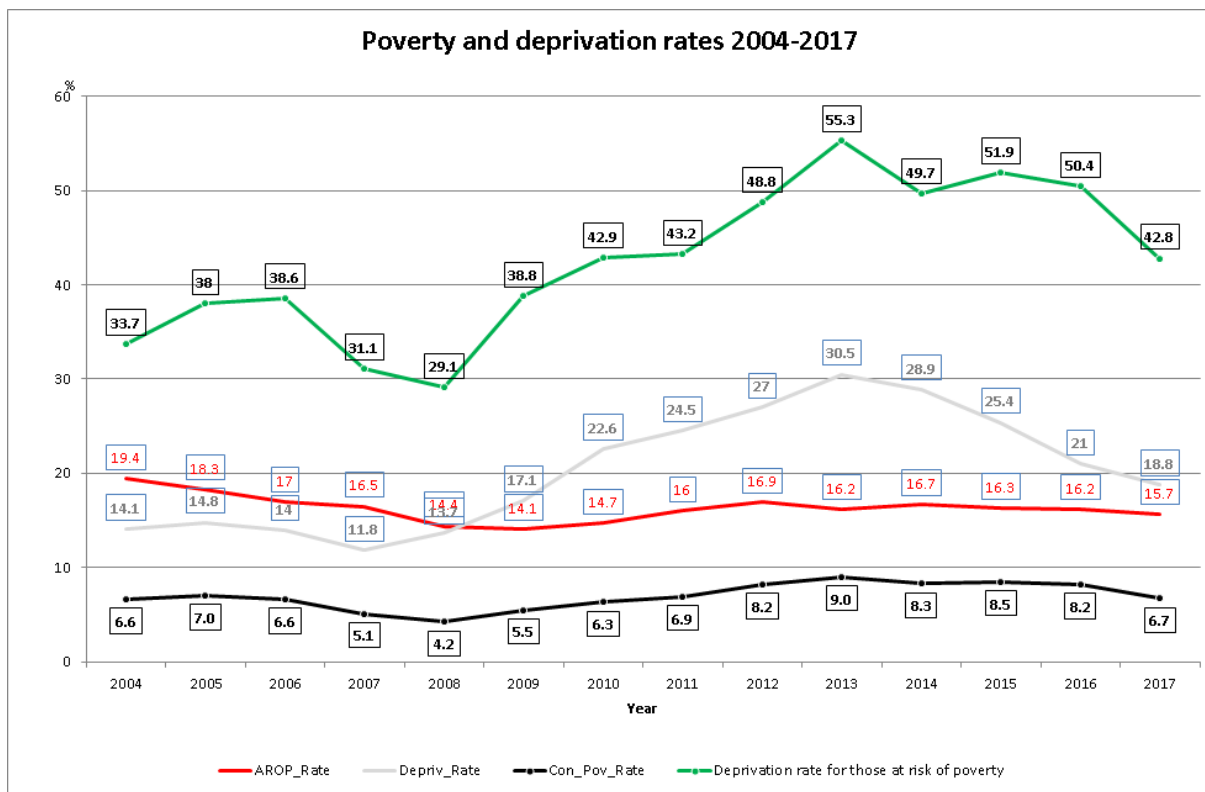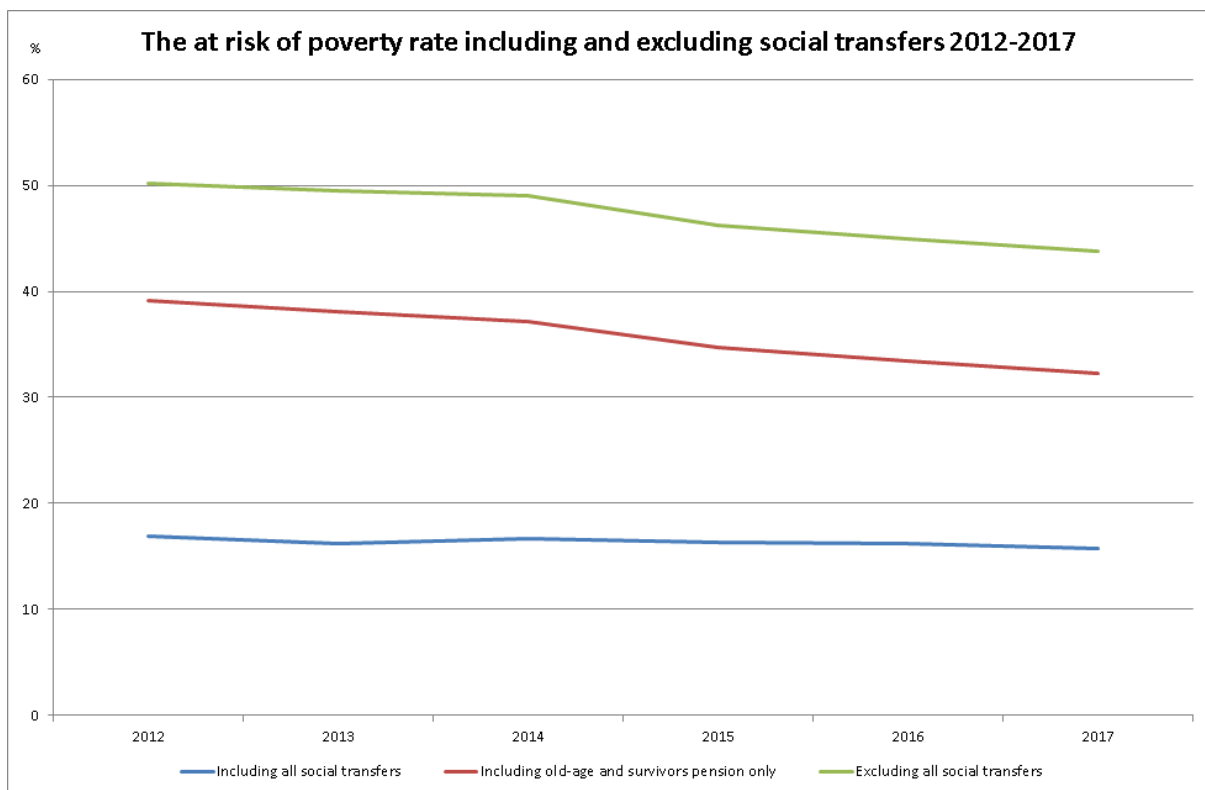
Figure 5.5.1a

Figure 5.5.1b

Figure 5.5.1c

Figure 5.5.1d

Gini Coefficent 2012-2017

Figure 5.5.1e

Quintile Share Ratio 2012-2017

Figure 5.5.1f

Share of Income by Quintile 2012-2017

Year	Quintile 1	Quintile 2	Quintile 3	Quintile 4	Quintile 5
2017	8.26	12.56	16.69	22.62	39.87
2016	8.34	12.78	17.12	22.75	39.01
2015	8.27	12.70	16.98	22.98	39.07
2014	7.79	12.64	16.71	22.86	40.00
2013	7.99	12.59	16.72	22.85	39.85
2012	7.76	12.73	16.90	22.99	39.62
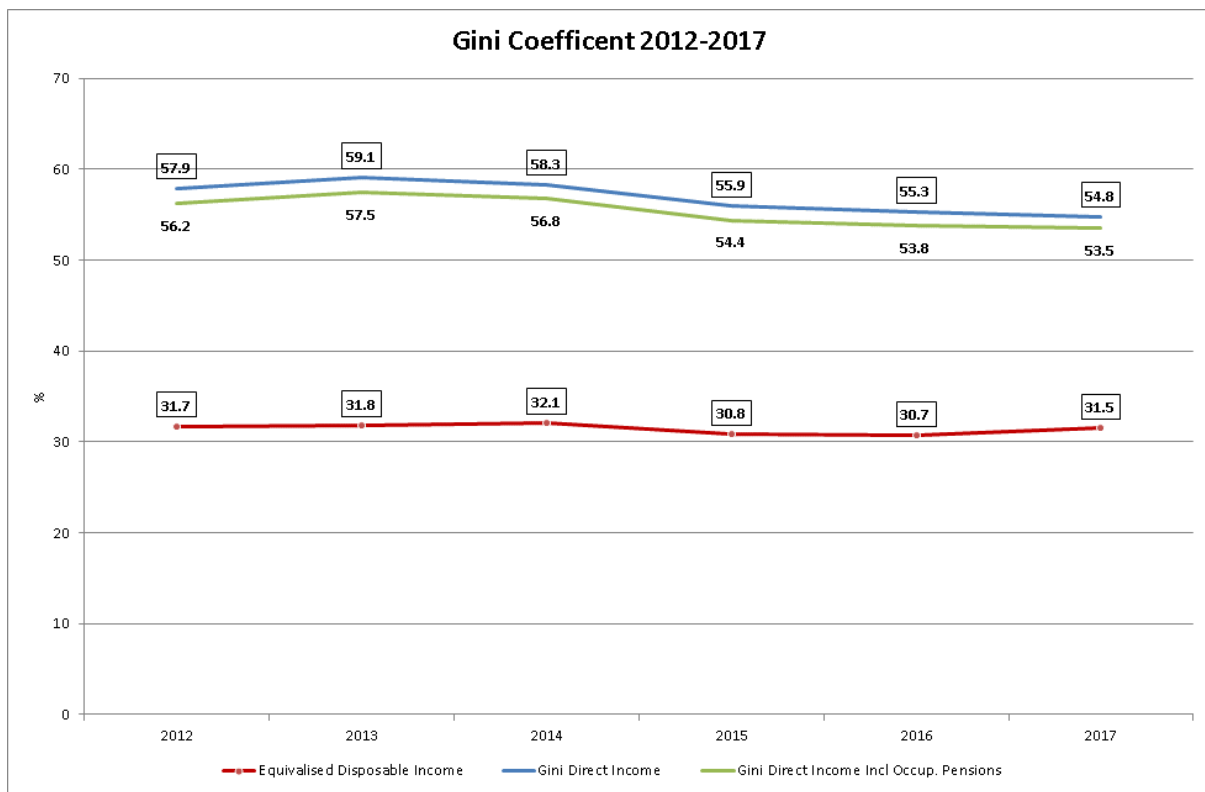
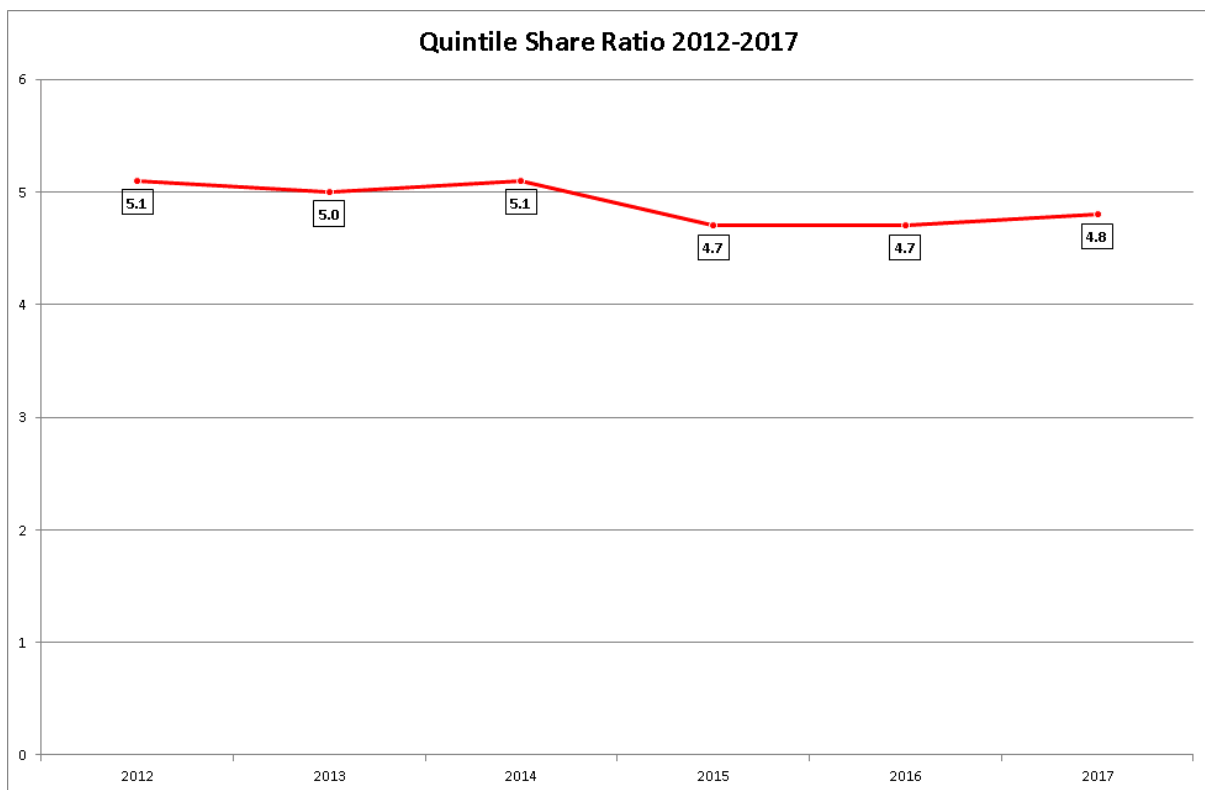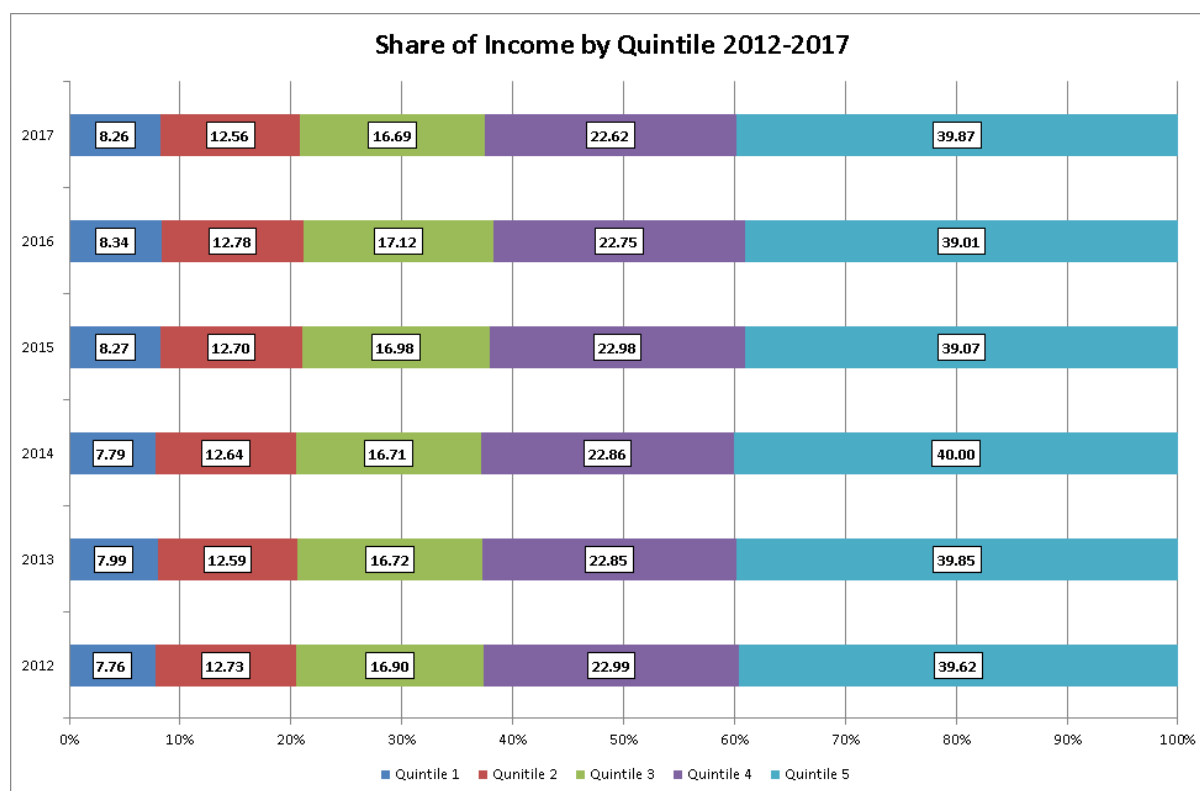## 5.5.2 Comparing Irish SILC statistics with other European countries

Eurostat disseminate their own statistics using SILC data. The definitions adopted by Eurostat differ slightly from national definitions and concepts. Therefore when making international comparisons to ensure consistency Eurostat SILC statistics should be used. The central repositories for Eurostat information and data are located at:

http://ec.europa.eu/eurostat/web/income-and-living-conditions/overview

http://ec.europa.eu/eurostat/web/income-and-living-conditions/data/main-tables

5.5.3 A consistency check between five EU-SILC indicators compiled from EU-SILC 2010 and HBS 2010

5.5.3.1 Introduction

This note provides a comparison between five EU-SILC indicators compiled from two independent data sources, i.e. the 2010 EU-SILC data and the 2010 HBS data. The SILC analysis/publication unit in 2018 will compare these indicators using 2017 EU-SILC and 2017 HBS data. The aim of this comparison is to evaluate the reliability and validity of the 2010 indicators compiled from Ireland's EU-SILC data and to evaluate the performance of Ireland's EU-SILC data in comparison with our peers in other European countries.

The data sources are independent in the sense they are taken from two separately selected random samples. The samples are not necessarily comparable in terms of size and other quality measures.

It is worth noting that the main focus of the HBS is consumption expenditure and the main focus of EU-SILC is the measurement of income, poverty, social exclusion and living conditions. Although the HBS is not designed to provide estimates of the five indicators examined in this study, it is possible to derive estimates based on the HBS data. The comparisons are for 25 European countries. For more information on the data sources see: Household Budget Survey - 2010 Wave – EU Quality Report Doc. LC/142/15/EN Eurostat (2015).

Earlier in 2015 the Central Statistics Office (CSO) conducted a similar type of comparison between the 2013 Household Finance and Consumption data and 2013 EU-SILC data (CSO, 2015a). This comparison between the two data sources found an average gross weekly equivalised household income of €538.06 for the HFCS while the corresponding figure for SILC 2013 was €537.66, a difference of only 40 cents. In other countries which have conducted both the HFCS and SILC survey, estimates of HFCS gross income per household as a percentage of SILC income per household range from 81% for Slovenia to 112% for Belgium but most countries are reasonably close to 100%.

5.5.3.2 At risk of poverty threshold:

At risk of poverty threshold: This is 60% of the national median income. The threshold is calculated by ranking persons by income[9] from smallest to largest and the median value is extracted. Anyone with an income of less than 60% of the median is considered at risk of poverty at a 60% level.

Figure 5.5.3.2 plots the HBS estimate of the 'at risk of poverty threshold' versus that of EU-SILC for 25 European countries. The black line is the line of equality (if a country's estimate from HBS is exactly equal to the estimate from EU-SILC the data point will fall on this line). Countries below the line of equality produced a HBS figure that underestimates the EU-SILC figure. Similarly, countries above the line of equality produced a HBS figure that overestimates the EU-SILC figure. The red trend line is the least square regression line and represents the average consistency achieved across the 25 countries.

It is clear from the figure below that the difference between the two survey estimates for Ireland is very similar to those experienced by other European countries, on average. Denmark and Hungary are clear outliers; in the case of Denmark, the HBS estimate is much higher than that of EU-SILC and the opposite is true for Hungary.

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[9] Income and other variables are defined in accordance with Eurostat requirements and these may differ slightly from national definitions.

Figure 5.5.3.2
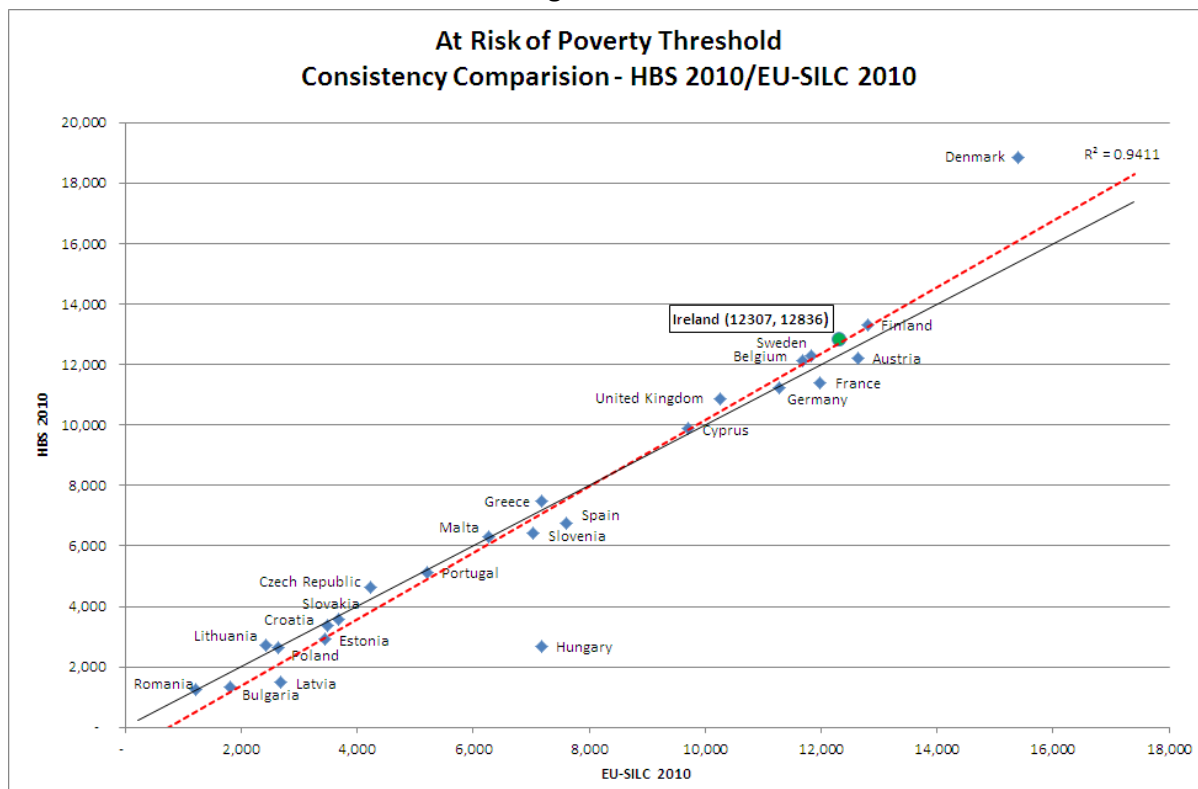
5.5.3.3 At risk of poverty rate:

At risk of poverty rate: This is the share of persons with an income below a given percentage (usually 60%) of the national median income.

Figure 5.5.3.3 plots the HBS estimate of the 'at risk of poverty rate' versus that of EU-SILC for 25 European countries.   The interpretation is similar to that of the previous graph.

Again, the difference for Ireland between the EU-SILC estimate and that from the HBS is similar to the differences observed in most other countries. However, for a number of countries the estimates diverge considerably (e.g. Czech Republic and Slovakia).

Figure 5.5.3.3
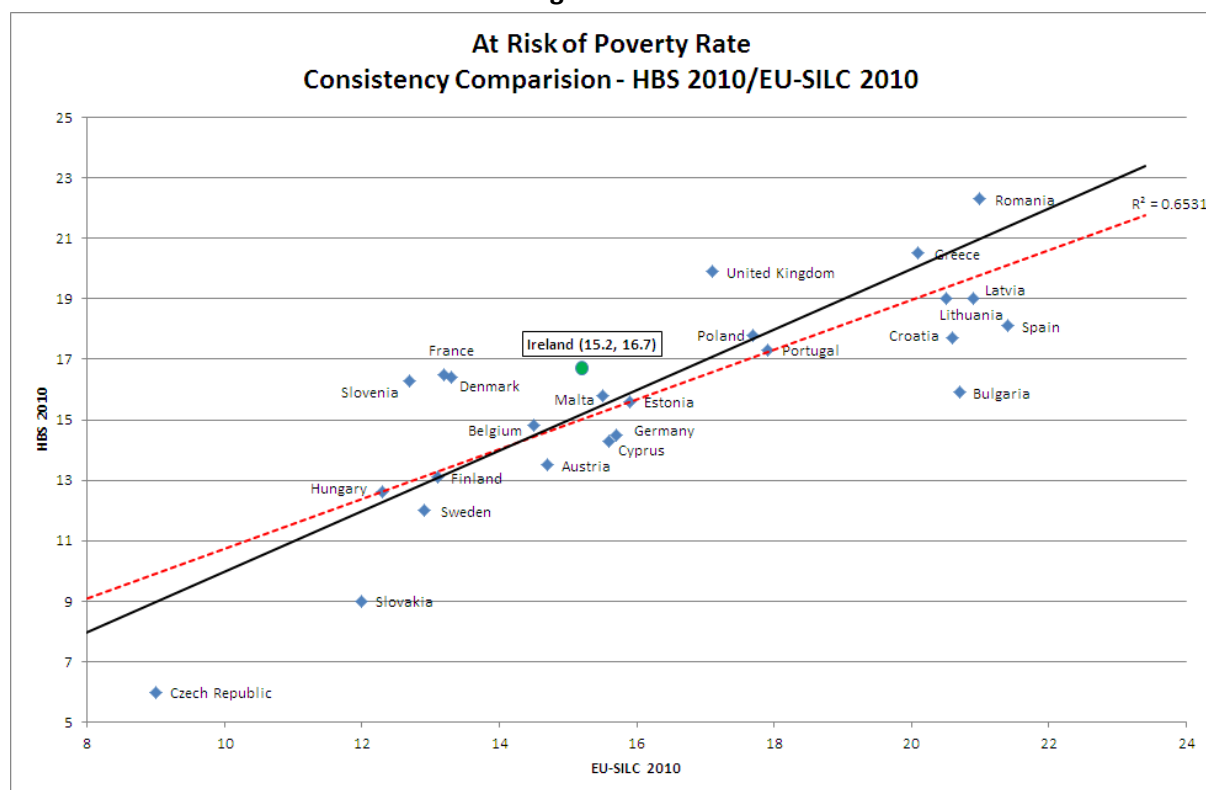
5.5.3.4 Relative at risk of poverty gap:

Relative at risk of poverty gap: This is the difference between the median 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.

Figure 5.5.3.4 plots the HBS estimate of the 'relative at risk of poverty gap' versus that of EU-SILC for 25 European countries.   The interpretation is similar to that of the previous graphs. The overall consistency between the two surveys is more evident for the 'at risk of poverty threshold' and the 'at risk of poverty rate' than for 'relative at risk of poverty gap'.

In comparison to many other European countries, Ireland performs particularly well in providing a consistent measure of the 'relative at risk of poverty gap' using the HBS and EU-SILC 2010 datasets.

Figure 5.5.3.4
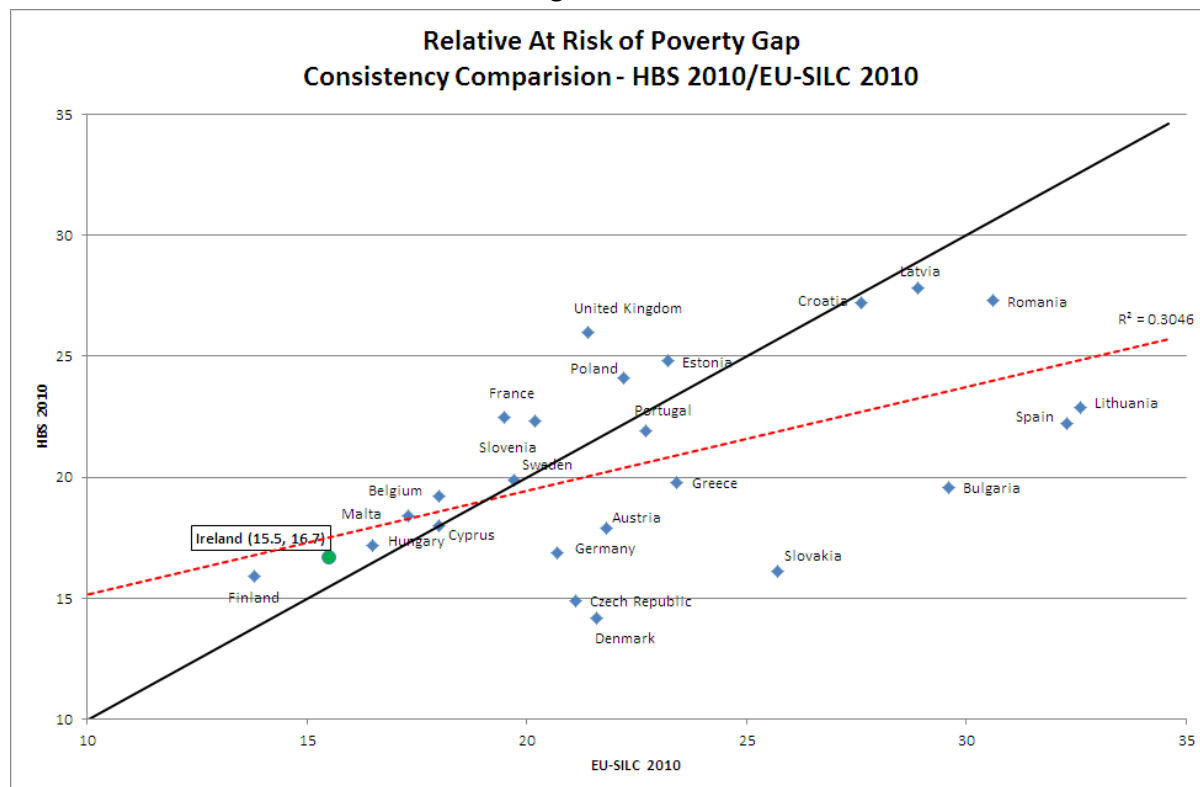
5.5.3.5 Inequality of income distribution (S80/S20 quintile share ratio):

Inequality of income distribution (S80/S20 quintile share ratio): This is the ratio of total income received by the 20% of persons with the highest income (top income quintile) to that received by the 20% of persons with the lowest income (lowest income quintile).

Figure 5.5.3.5 plots the HBS estimate of the quintile share ratio versus that of EU-SILC for 25 European countries.   The interpretation is similar to that of the previous graphs.

For many countries, the HBS consistently underestimates the quintile share ratio. However, once again, Ireland seems to be providing consistent measures across both data sources.

Figure 5.5.3.5
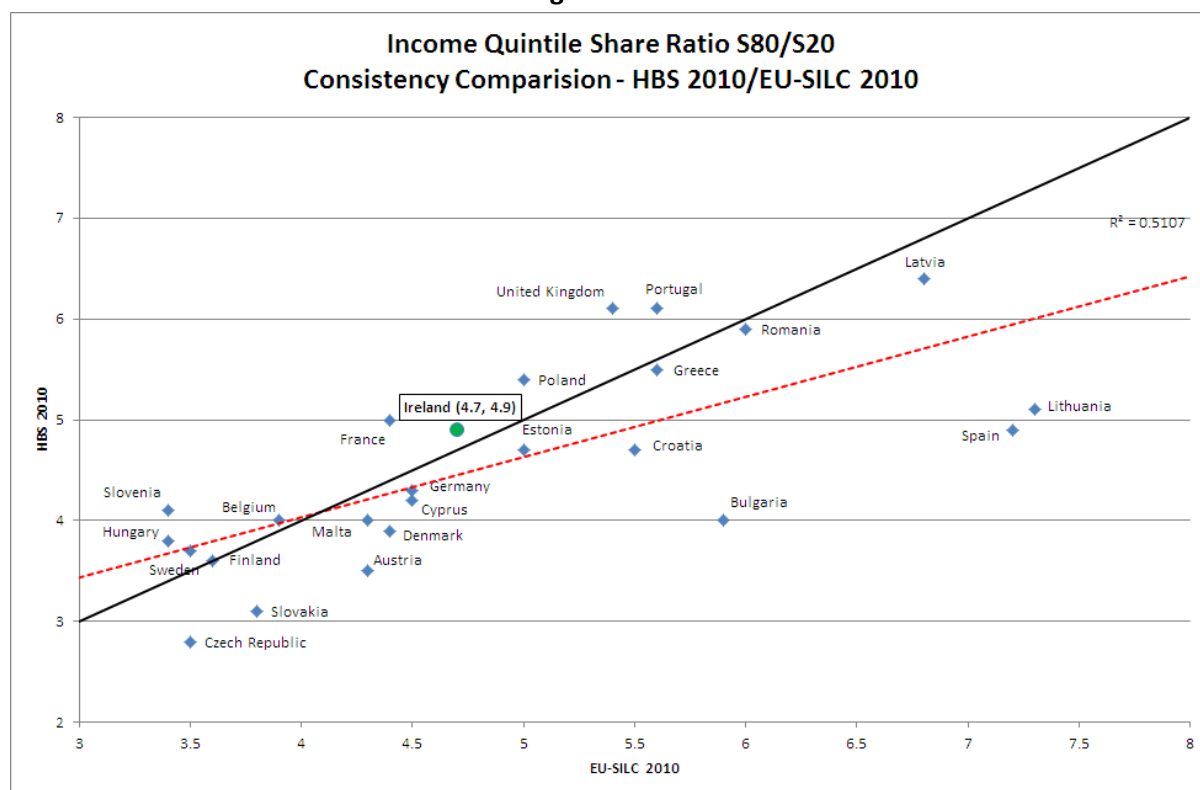
5.5.3.6 Gini coefficient:

Gini coefficient: This is the relationship between cumulative shares of the population arranged according to the level of income and the cumulative share of total income received by them. 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 income was in the hands of one person.

Figure 5.5.3.6 plots the HBS estimate of the Gini coefficient versus that of EU-SILC for 25 European countries.   The interpretation is similar to that of the previous graphs.

Ireland provides a very consistent measure of the Gini coefficient across both data sources. In some countries such as the UK and Portugal, the HBS overestimates the Gini coefficient. In many countries, most notably in the Czech Republic, Slovakia, Austria, Bulgaria and Lithuania, the HBS underestimates the Gini coefficient.

Figure 5.5.3.6

Gini Coefficient
Consistency Comparision - HBS 2010/EU-SILC 2010
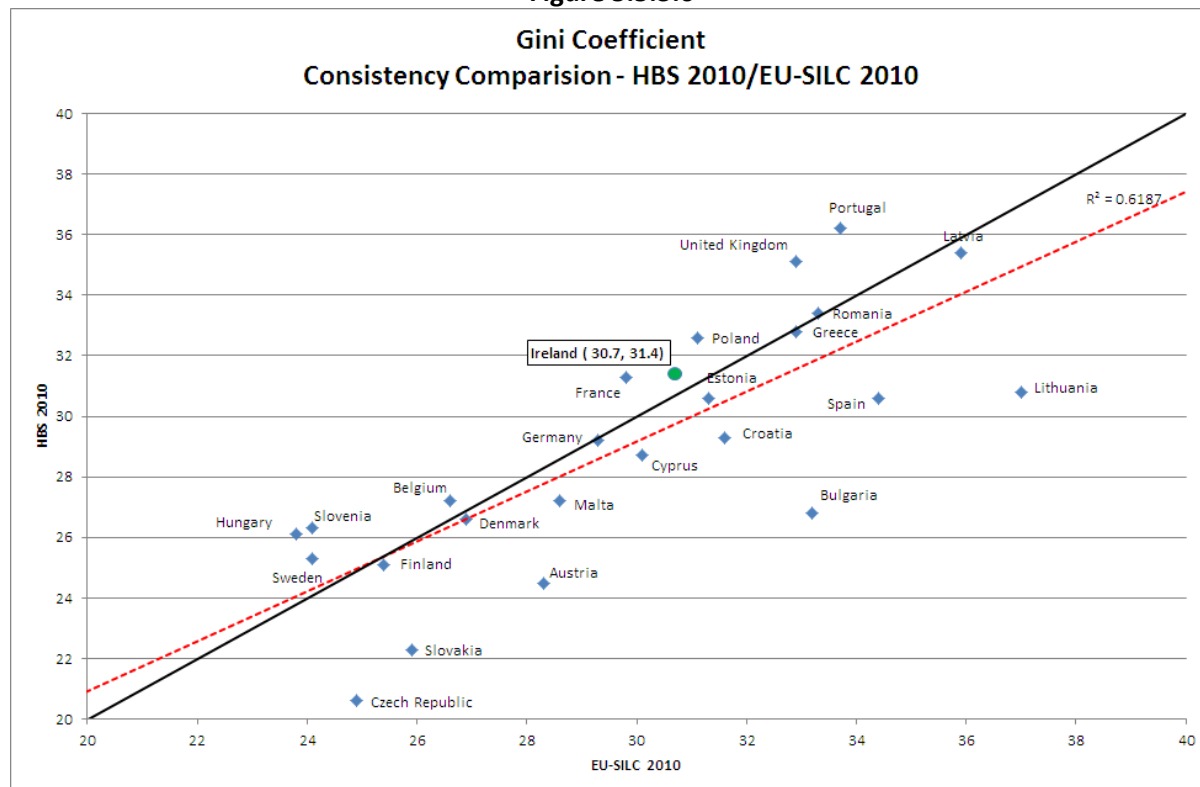
5.5.3.7 Conclusion:

The comparisons outlined in section 5.5.3 provide evidence that in Ireland's case EU-SILC data yields robust and reliable measures of income, poverty, social exclusion and living conditions. When compared to its European peers Ireland's performance is reassuring. The information outlined in section 5.5.3 is taken from a Eurostat study and when coupled with the results from the earlier comparison conducted between the 2013 Household Finance and Consumption and 2013 EU-SILC data sources, there appears to be growing evidence that in Ireland's case EU-SILC data is coherent, reliable and robust.

Table A: Comparison HBS 2010/EU-SILC 2010

	At-risk-of-poverty		At-risk-of-poverty		Relative at-risk-of		Income quintile		Gini Coefficient	
	EU-SILC	HBS	EU-SILC	HBS	EU-SILC	HBS	EU-SILC	HBS	EU-SILC	HBS
Austria	12,635	12,213	14.7	13.5	21.8	17.9	4.3	3.5	28.3	24.5
Belgium	11,678	12,129	14.5	14.8	18	19.2	3.9	4	26.6	27.2
Bulgaria	1,810	1,326	20.7	15.9	29.6	19.6	5.9	4	33.2	26.8
Cyprus	9,708	9,881	15.6	14.3	18	18	4.5	4.2	30.1	28.7
Germany	11,278	11,211	15.7	14.5	20.7	16.9	4.5	4.3	29.3	29.2
Denmark	15,401	18,836	13.3	16.4	21.6	14.2	4.4	3.9	26.9	26.6
Czech Rep	4,235	4,626	9	6	21.1	14.9	3.5	2.8	24.9	20.6
Estonia	3,436	2,914	15.9	15.6	23.2	24.8	5	4.7	31.3	30.6
Spain	7,600	6,732	21.4	18.1	32.3	22.2	7.2	4.9	34.4	30.6
Finland	12,809	13,305	13.1	13.1	13.8	15.9	3.6	3.6	25.4	25.1
France	11,976	11,395	13.2	16.5	19.5	22.5	4.4	5	29.8	31.3
Greece	7,178	7,486	20.1	20.5	23.4	19.8	5.6	5.5	32.9	32.8
Croatia	3,486	3,358	20.6	17.7	27.6	27.2	5.5	4.7	31.6	29.3
Hungary	7,178	2,678	12.3	12.6	16.5	17.2	3.4	3.8	24.1	26.3
Ireland	**12,307**	**12,836**	**15.2**	**16.7**	**15.5**	**16.7**	**4.7**	**4.9**	**30.7**	**31.4**
Lithuania	2,418	2,698	20.5	19	32.6	22.9	7.3	5.1	37	30.8
Latvia	2,682	1,486	20.9	19	28.9	27.8	6.8	6.4	35.9	35.4
Malta	6,261	6,299	15.5	15.8	17.3	18.4	4.3	4	28.6	27.2
Poland	2,643	2,623	17.7	17.8	22.2	24.1	5	5.4	31.1	32.6
Portugal	5,207	5,132	17.9	17.3	22.7	21.9	5.6	6.1	33.7	36.2
Romania	1,222	1,254	21	22.3	30.6	27.3	6	5.9	33.3	33.4
Sweden	11,825	12,303	12.9	12	19.7	19.9	3.5	3.7	24.1	25.3
Slovenia	7,042	6,412	12.7	16.3	20.2	22.3	3.4	4.1	23.8	26.1
Slovakia	3,670	3,586	12	9	25.7	16.1	3.8	3.1	25.9	22.3
United Ki	10,263	10,875	17.1	19.9	21.4	26	5.4	6.1	32.9	35.1

Source: Eurostat 'Household Budget Survey 2010 Wave EU Quality Report'. Doc. LC/142/15/EN

5.5.4 Comparing SILC income statistics to Gross Household Disposable Income as calculated in the Institutional Sector Accounts

It is internationally recognised that there exists a gap between disposable household income as measured under the national accounts framework and as measured in micro sources such as SILC. At the centre of this measurement gap is the concept of household income. In the national account concept, disposable income takes into account additional income in the form of social transfers in kind (STik). STiK are expenditures on individual goods and services of general government and Non-Profit Institutions Serving Households that directly benefit households. Examples of STiKs include the provision of healthcare and education. SILC on the other hand is concerned more with 'spendable' income as outlined in section 3.10.1. For further information see the joint OECD Eurostat publication 'A cross-country comparison of household income, consumption and wealth between micro sources and national accounts aggregates' - http://ina.bnu.edu.cn/docs/20140604155637336452.pdf

The graphs below highlight the similarities and differences of the competing measures of household disposable income.

Figure 5.5.4.1

Total Household Disposable Income
SILC Vs. Institutional Sector Accounts

Figure 5.5.4.2

Household disposable income expressed as an index: Index 2008=100
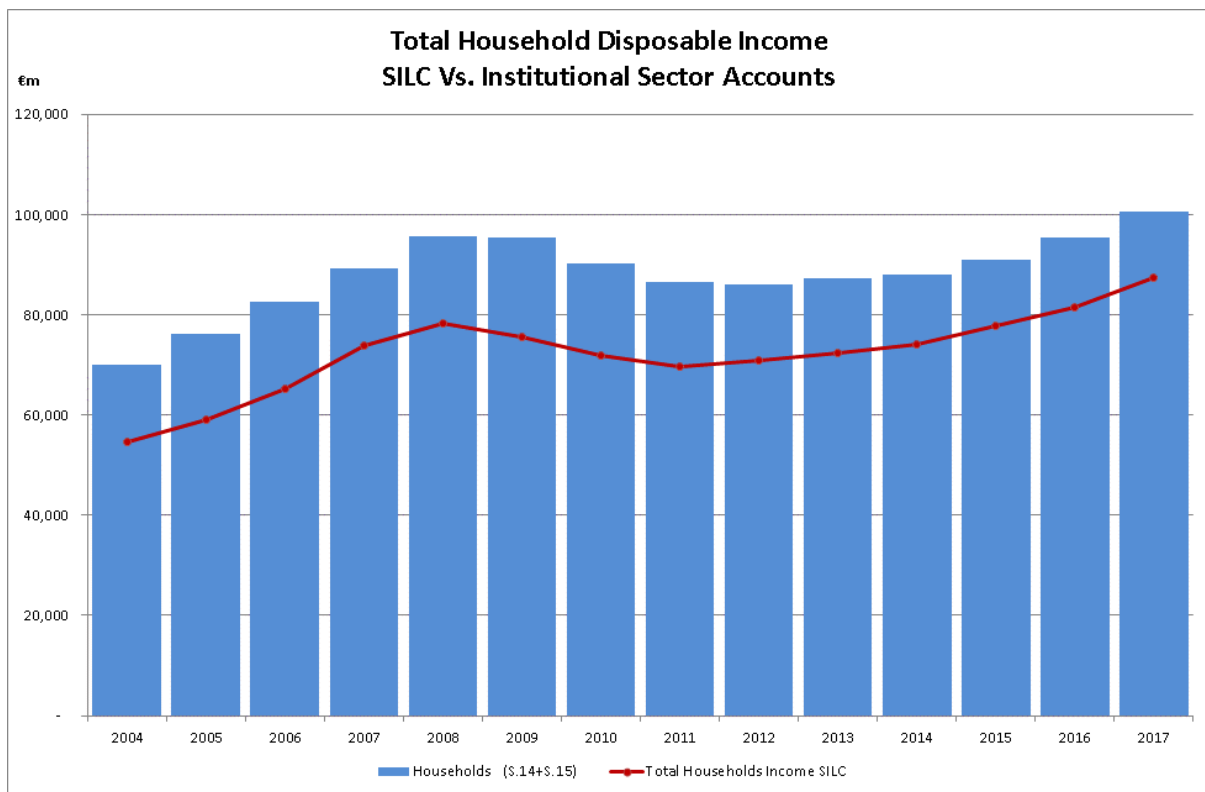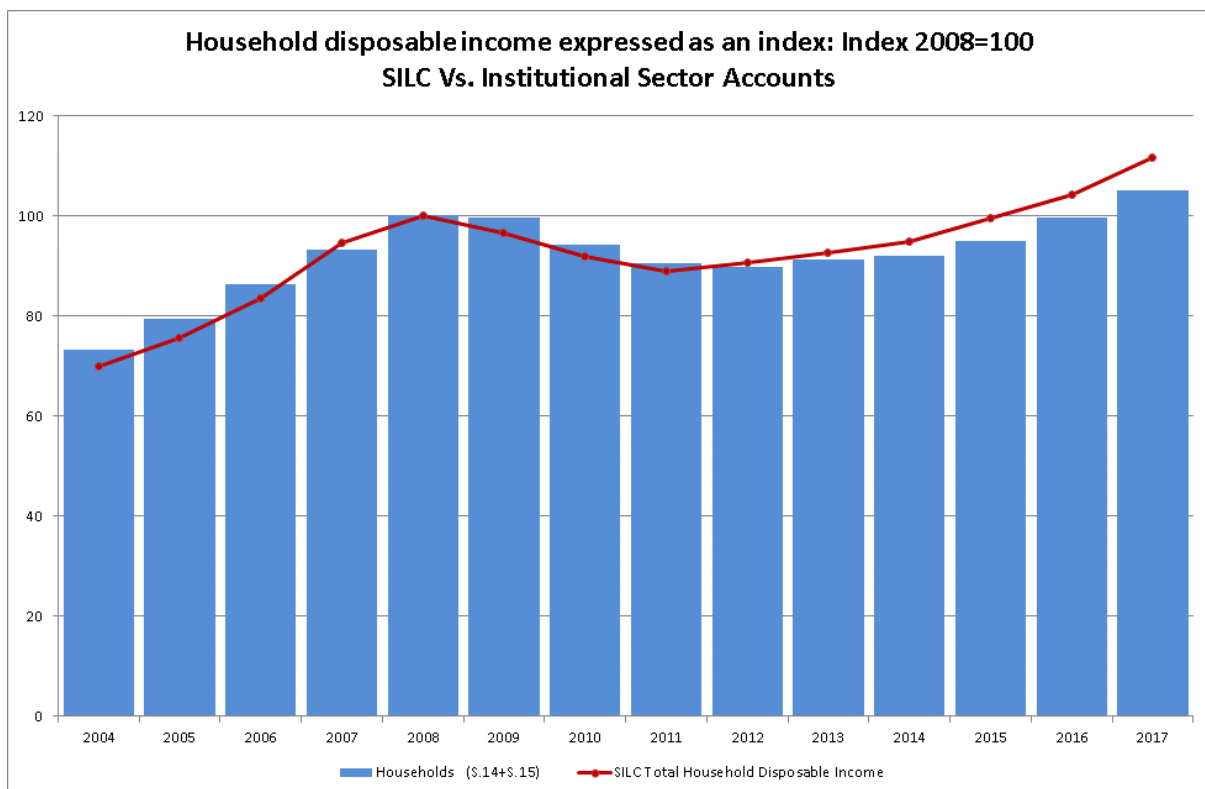SILC Vs. Institutional Sector Accounts

5.6 Accessibility and Clarity

5.6.1 Assistance to Users, Special Analyses

All publications are available on the CSO website. Information on methodology is also available on the website. The background notes on the publication provide some detail on the survey. For the SILC publication, a press conference is held annually to coincide with the release to enable users and commentators to fully understand the data or seek further clarification. Ad-hoc analysis is also produced on request.

Anonymised microdata for each year is made available to researchers via the Irish Social Science Data Archive (ISSDA). Such data is accessible by researchers applying directly to the ISSDA. For further information see: https://www.ucd.ie/issda/

Access to a Research Microdata Files (RMFs) can be requested from the CSO under the CSO's microdata access policy.   The research community makes extensive use of this facility. See http://www.cso.ie/en/aboutus/dissemination/accesstomicrodatarulespoliciesandprocedures/   for more information.
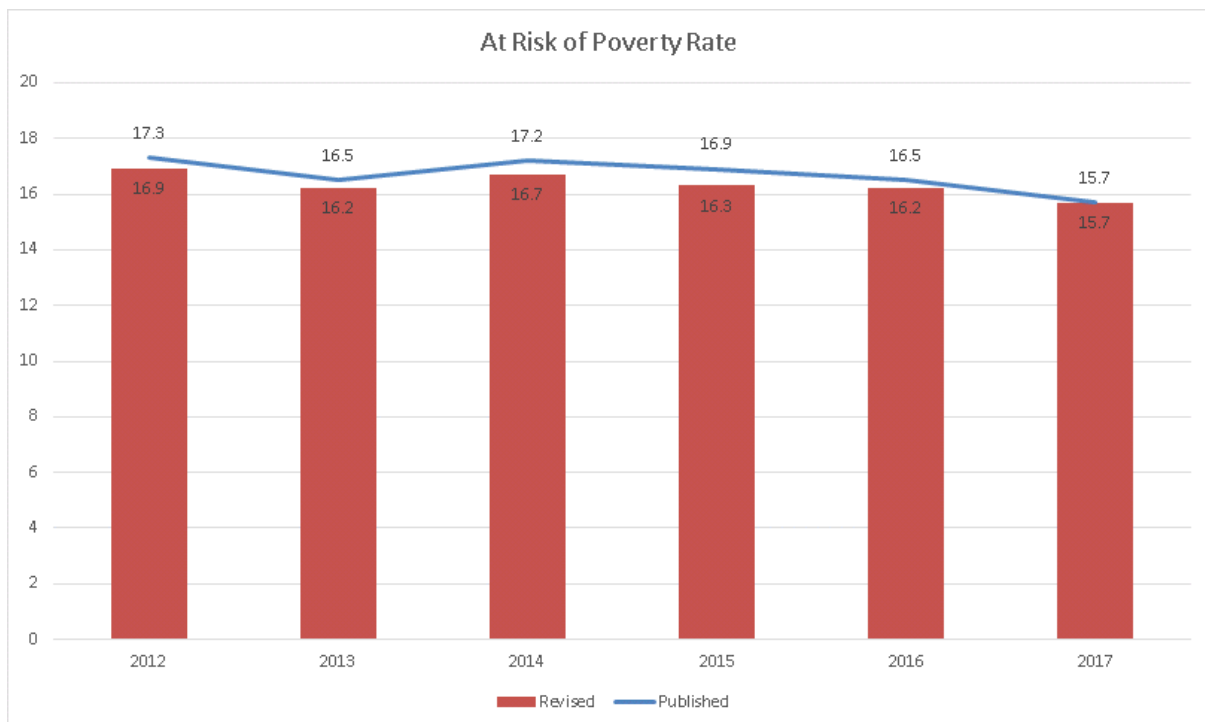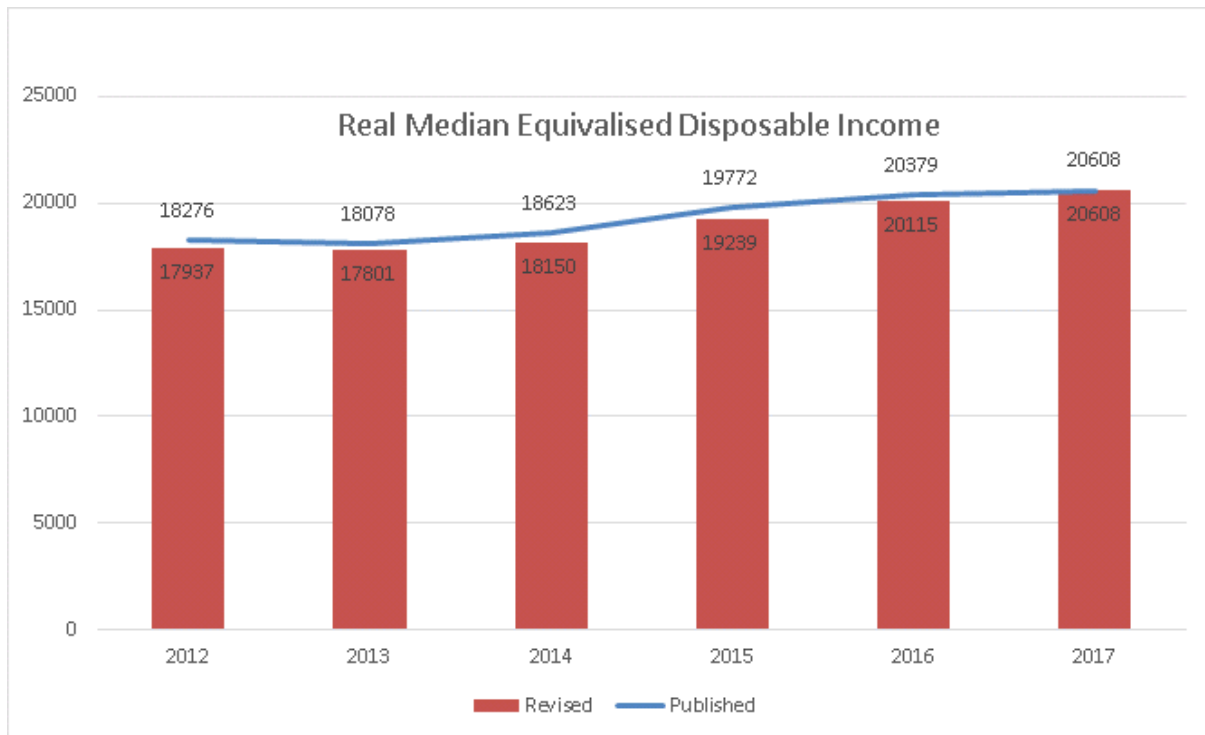
5.6.2 Revisions

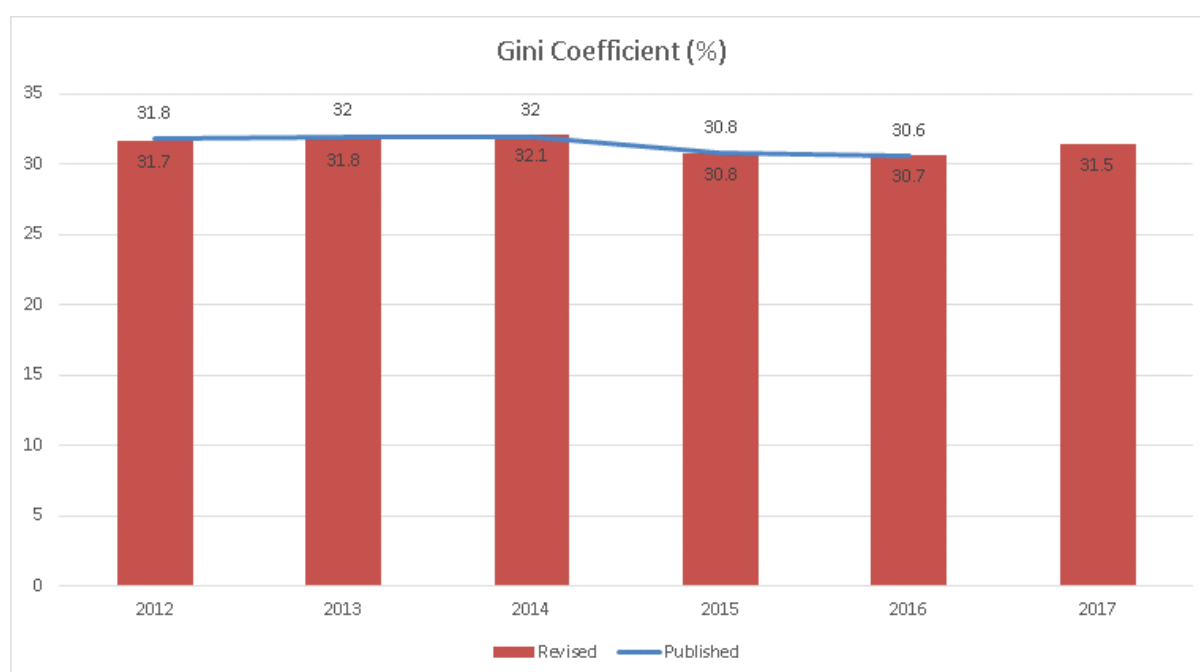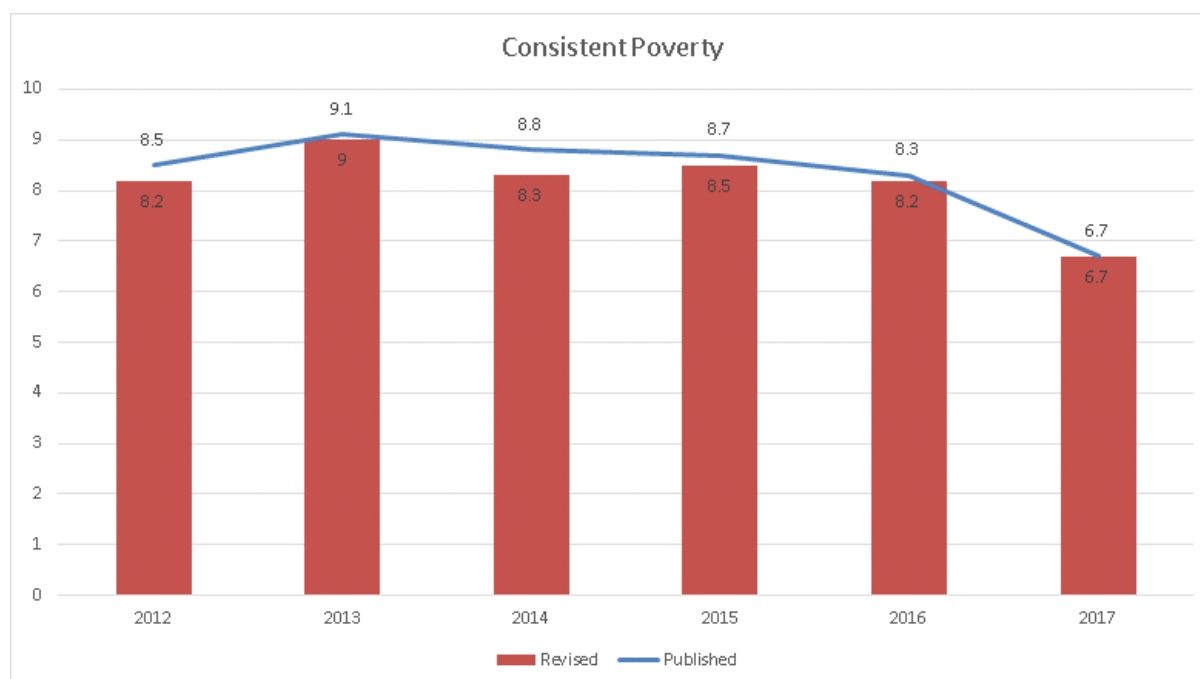5.6.2.1 Revision to the 2012, 2013, 2014 and 2015 SILC data

The NUTS boundaries were amended on 21st November 2016 under Regulation (EC) No.2066/2016 and took effect from 1st January 2018*. As the CSO weight results in the SILC using NUTS3 groups, survey estimates have been revised to take account of these changes. The reweighted data from 2012 to 2016 inclusive is 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.

As the SILC is a sample survey, independent estimates of population and numbers of households are required each year to provide a weighting basis for the statistics produced from the SILC. When the results from a new Census of Population are published, the quarterly population estimates back to the previous Census of Population are revised. The results published for the SILC 2017 incorporate the new population estimates (as calculated from the Census of Population 2016) for each year from 2012 onwards into the weighting methodology.

As results for the SILC from 2012 through to 2016 are being revised due to the new NUTS3 region classifications and the post Census 2016 population and household estimates, the Income, Consumption and Wealth (ICW) division in the CSO took the opportunity to increase the use of administrative data in the SILC process. The process changes mostly relate to increased usage of administrative data for employee income variables and this has improved the quality of the data from 2012 onwards. While applying the process changes to the periods in question a number of corrections were made to further improve the quality of the data. The revised estimates for 'at risk of poverty', 'consistent poverty', 'enforced deprivation', Gini coefficient and quintile share ratio are not statistically significantly different from the pre-revision estimates

Please see http://ec.europa.eu/eurostat/web/nuts/history for further details

Real Median Equivalised Disposable Income

Year	Revised	Published
2012	17937	18276
2013	17801	18078
2014	18150	18623
2015	19239	19772
2016	20115	20379
2017	20608	20608

At Risk of Poverty Rate

Year	Revised	Published
2012	16.9	17.3
2013	16.2	16.5
2014	16.7	17.2
2015	16.3	16.9
2016	16.2	16.5
2017	15.7	15.7

Consistent Poverty

Gini Coefficient (%)

5.6.2.1 Revision to the 2012, 2013 and 2014 SILC data

Before the 2017 revisions to SILC reference years 2012 to 2014, the results for these years had already been revised. These revisions arose following the identification of a processing error during the production of data for 2015. This processing error related to the method used to calculate Universal Social Charge (USC) and Pay Related Social Insurance (PRSI). The error resulted in disposable income being under estimated over the period (2012-2014). However, trends observed in the revised series mirror those of the previously published data. Earlier years are not affected. See Figures 5.6.1 to 5.6.5 below.

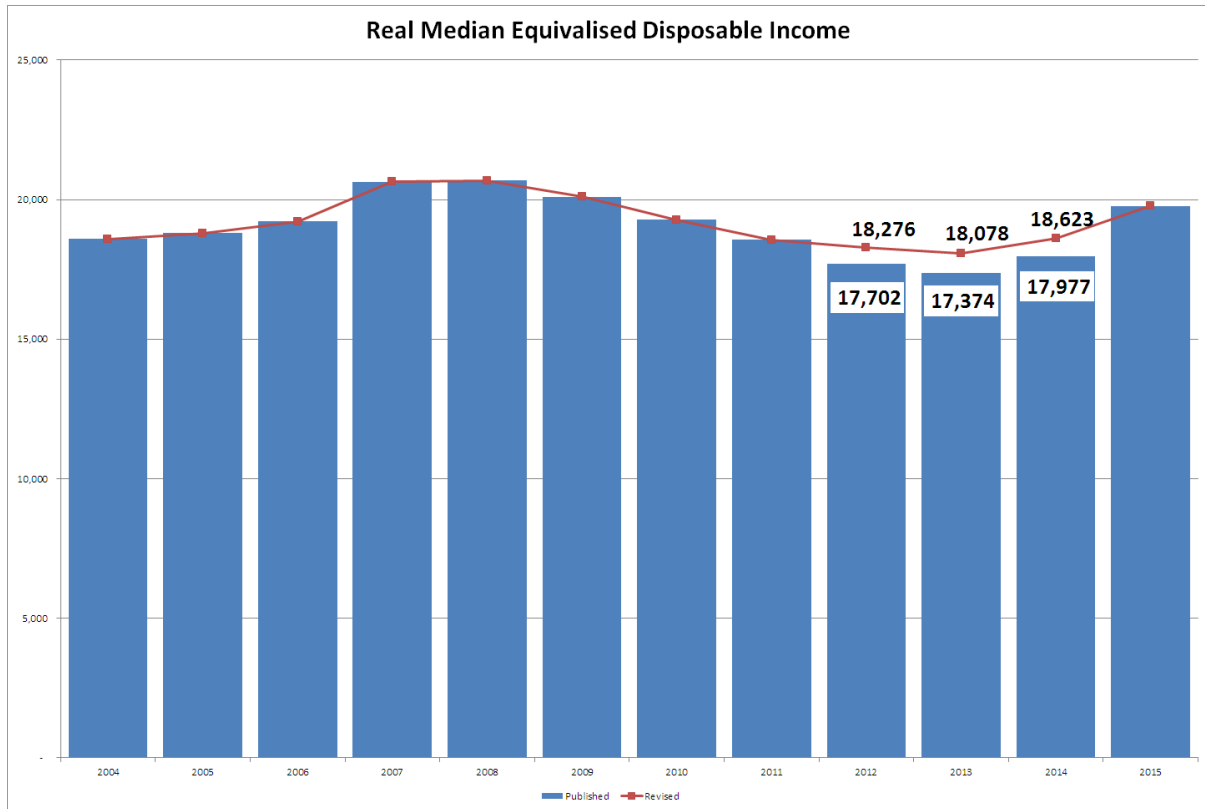**Figure 5.6.1: Revisions to Real Median Equivalised Income**

Real Median Equivalised Disposable Income

Figure 5.6.2: Revisions to the At Risk of Poverty Rate
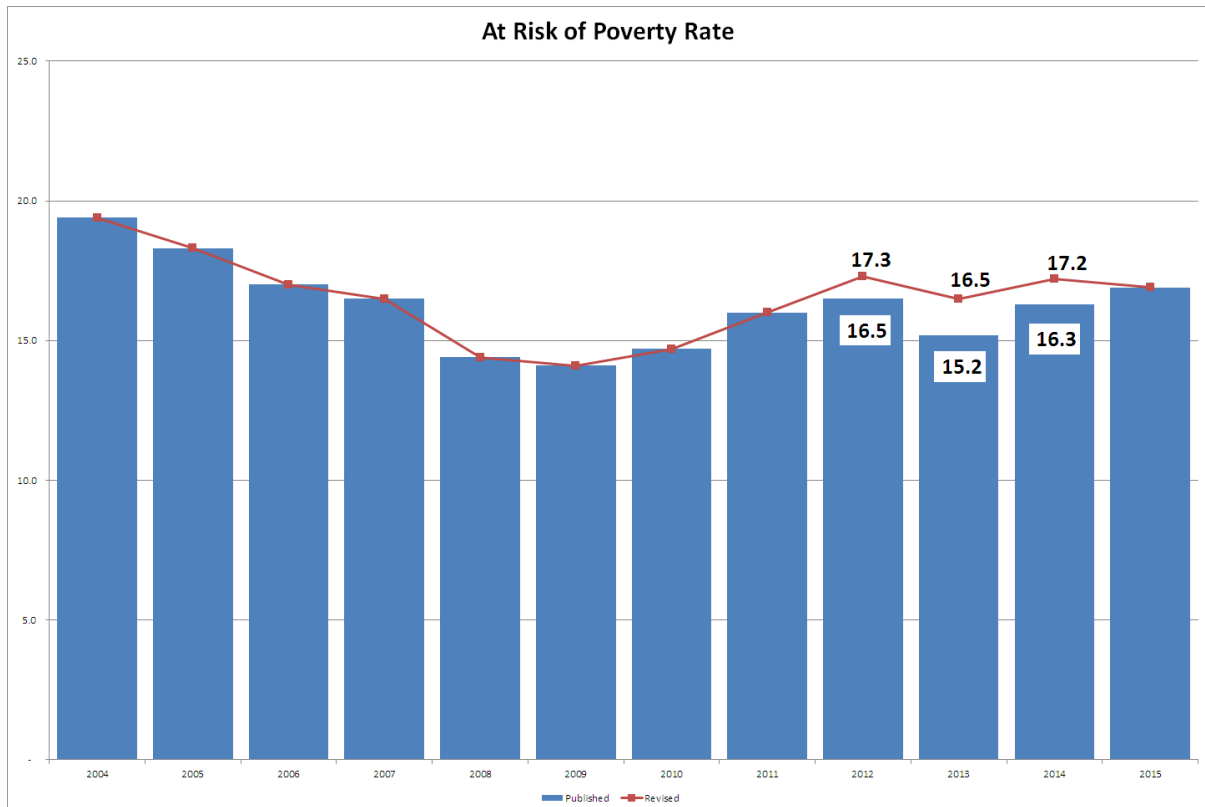

At Risk of Poverty Rate

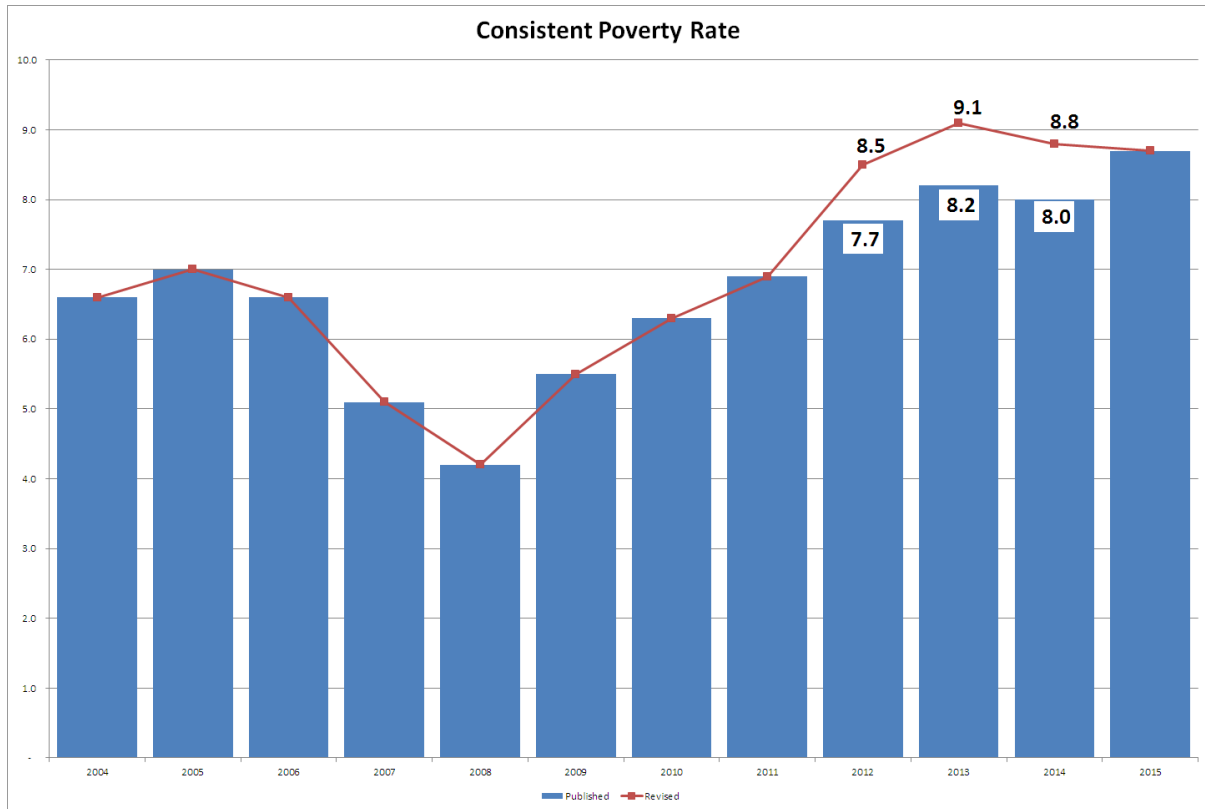**Figure 5.6.3: Revisions to the Consistent Poverty Rate**

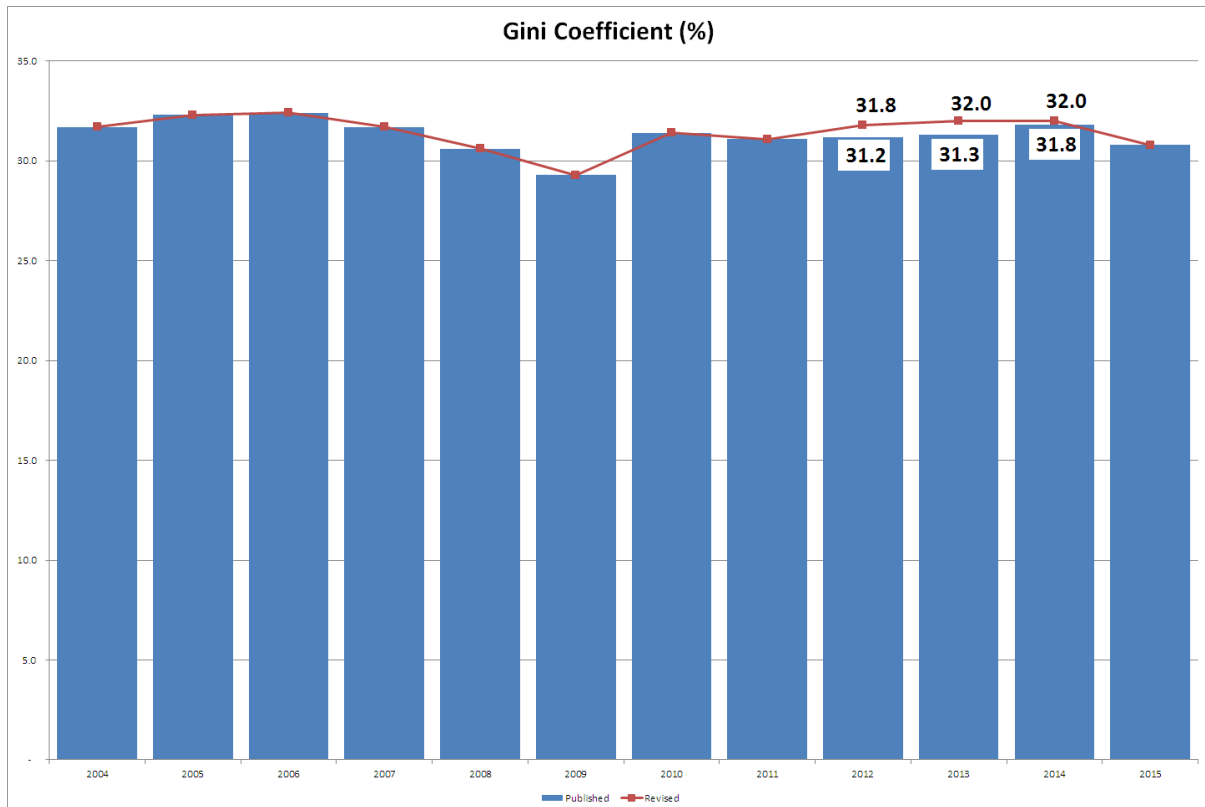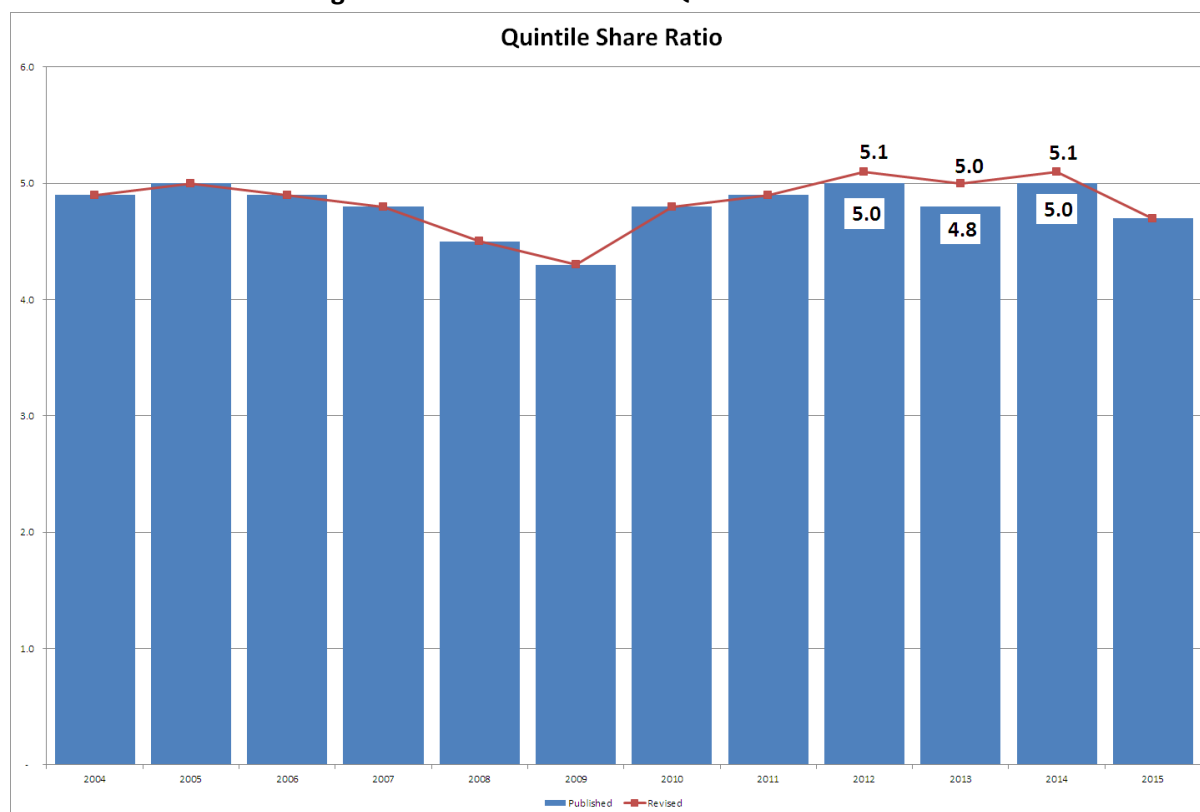**Figure 5.6.4: Revisions to the Gini Coefficient**

Figure 5.6.5: Revisions to the Quintile Share Ratio

5.6.2.2 Revision to the 2010 SILC data

The 2010 SILC results were amended following extensive investigation of anomalies in the data. In 2010, changes had been made to the processing of the data which resulted in an incorrect treatment in some cases of tax, income and pension contributions. This became clear when unusual trends in certain categories between 2010 and 2011 were further analysed. The revisions were carried out as a result of a processing error. The main effects of the amendment was a change in the 'at risk of poverty threshold' and in the 'at risk of poverty rate' (15.8% to 14.7%). There was no significant change in the deprivation and consistent poverty rates. Indicators of income inequality decreased e.g. the Gini coefficient went from 33.9% to 31.6%. Earlier years were not affected. The changes in the main indicators are shown in Table 5.6.2 below.

Table 5.6.2: Revisions to the Main SILC 2010 Results

	Original 2010	Amended 2010
Income	€	€
Annual average household disposable income (per household)	43,333	43,151
Annual average equivalised disposable income (per individual)	22,168	22,138
At risk of poverty threshold (60% of median income)	10,831	11,155
Income inequality		
Gini coefficient	33.9%	31.6%
Quintile share ratio	5.5	4.9
Poverty & deprivation rates	%	%
At risk of poverty rate	15.8	14.7
Deprivation rate[1]	22.5	22.6
Consistent poverty rate	6.2	6.3

[1] Experienced two or more types of enforced deprivation

5.6.2.3 Revision to the 2003 SILC data

The first SILC results from the CSO were for the reference year 2003 and were published in January 2005. These results were revised following the application of improved re-weighting and calibration methods in line with EU recommendations. The effect of the revisions were to lower both the risk of poverty (from 22.7% to 19.7%) and consistent poverty (from 9.4% to 8.8%) measures. The comparability of year on year changes were affected in some cases by some adjustments to the survey procedures (see background notes of
http://www.cso.ie/en/media/csoie/releasespublications/documents/eusilc/2004/eusilc_2004.pdf

for more information). This was particularly the case with estimates for relatively small sub-populations, where relatively large sampling errors should be taken into account in interpreting trends.

5.6.2.4 Regular inter-censal revisions

Inter-censal revisions had not been completed for SILC after the 2006 and 2011 Census of Population. Tests were run to see if the revised population totals had any effect on the main SILC statistics and it was found they remained unchanged. However, the fact that these revisions have not taken place means that population and sub-population totals in SILC cannot be published as they do not correspond with the official CSO estimates. This is most notable when comparing year-on-year numbers.

5.6.3 Publications

5.6.3.1 Releases, Regular Publications

The revision to the 2012-2014 data resulted in a delay of 2 months in the publication of the 2015 SILC results. For 2014, 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, many EU member states use income data from the previous year (T-1) as a proxy for current year (T) annual income. As noted above, the income referenced in Ireland's 2015 SILC data spans the period from January 2015 to December 2015. For full details of the results published, see the electronic release at
http://www.cso.ie/en/releasesandpublications/er/silc/surveyonincomeandlivingconditions2015/

5.6.3.2 Statistical Reports

SILC contributes data to a number of statistical releases in the office such as 'Men and Women in Ireland', 'Measuring Ireland's Progress' and the CSO Yearbook.

Eurostat uses SILC data to produce their own statistics and publications. Many of these additional publications are based on the annual modules in SILC. See http://ec.europa.eu/eurostat/web/income-and-living-conditions/publications for a full list of Eurostat's SILC publications.

5.6.3.3 Internet

All SILC publications are available on the CSO website in publication format. In addition, data is made available via the CSO's main databank dissemination tool and is also hosted on the CSO website in Excel format. All previously published SILC statistics are available on the CSO's Databank
http://www.cso.ie/px/pxeirestat/Database/eirestat/Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)/Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)_statbank.asp?SP=Survey%20on%20Income%20and%20Living%20Conditions%20(SILC)&Planguage=0

More information and results are published at Statcentral.ie

http://www.statcentral.ie/viewstats.asp?type=Social%20Conditions

5.6.4 Confidentiality

The confidentiality of all information provided to the CSO by individual respondents is guaranteed by law under the 1993 Statistics Acts. All CSO office and field personnel become "Officers of Statistics" on appointment and are liable to penalties under this Act if they divulge confidential information to any outside person or body. Extreme precautions are taken to ensure that there are no violations of this principle throughout the survey process. The laptops on which the data was collected are encrypted and contain several layers of password protection. Data are only published in aggregate form and care is taken to ensure that the data are aggregated to avoid the indirect identification of respondents. Confidentiality is also ensured within the anonymised micro-data by using coded variables instead of original values for key characteristics. For example, age groupings are provided instead of single year of age.

To ensure confidentiality, SILC DCU does not have direct access to the complete Revenue or DSP files. The ownership of these files rest with the CSO's Administrative Data Centre (ADC). Only selected variables are made available to the SILC DCU and these variables are only provided for those individuals on the SILC sample. The CSO assigns a unique number derived from the PPSN to link data. This number is derived and managed by the ADC section to ensure added security and confidentiality around individuals' data. Furthermore, when SILC DCU transfer data to the SILC Analysis section, any information that would allow an individual to be identified is stripped from the final data sets to provide added security.

6 Additional documentation and publications

6.1 CSO Publications

The main CSO SILC homepage can be found at the following link:

http://www.cso.ie/en/statistics/socialconditions/

More information and results are published at Statcentral.ie

http://www.statcentral.ie/viewstats.asp?type=Social%20Conditions

6.2 Eurostat Publications

Eurostat issue releases and statistics that use SILC data. The central repositories for Eurostat information and data are located at:

http://ec.europa.eu/eurostat/web/income-and-living-conditions/overview

http://ec.europa.eu/eurostat/web/income-and-living-conditions/data/main-tables

6.3 OECD Publications

Earnings from SILC data is regularly published in the Statistical Annex of the *OECD Employment Outlook* (Earnings dispersion, incidences of low and high pay – Table O – and Gender/Age/Education wage gaps

– Table P –), see OECD-employment-outlook-2017, pages 290 and 291. Earnings (Tables N, O and P) data is published in the Statistical Annex in *OECD Employment Outlook*.

In-house dissemination for the *OECD Earnings Distribution Database* is available through www.oecd.org/employment/emp/employmentdatabase-earningsandwages.htm, but particularly: http://stats.oecd.org/Index.aspx?DatasetCode=DEC_I for the Distribution of gross earnings of full-time employees (annual). This dataset contains three earnings-dispersion measures – ratio of 9th-to-1st, 9th-to-5th and 5th-to-1st – where *ninth*, *fifth* (or median) and *first* deciles are upper-earnings decile limits, unless otherwise indicated, of gross earnings of full-time dependent employees.

For Incidence of low pay and incidence of high pay (annual) see http://stats.oecd.org/Index.aspx?QueryId=64195. The *incidence of low pay* refers to the share of workers earning less than two-thirds of median earnings; the *incidence of high pay* refers to the share of workers earning more than one-and-a-half times median earnings. The gender wage gap is calculated as the difference between median earnings of men and women relative to median earnings of men, http://stats.oecd.org/Index.aspx?QueryId=64160. The age wage gap is calculated as the difference between mean earnings of 25-54 year-olds and that of 15-24 year-olds (respectively 55-64 year-olds) relative to mean earnings of 25-54 year-olds.

6.4 DSP Publications

The Department of Social Protection publish the Social Inclusion Monitor annually. The purpose of the Social Inclusion Monitor is to report officially on progress towards the National Social Target for Poverty Reduction, including the sub-target on child poverty and Ireland's contribution to the Europe 2020 poverty target. This annual Monitor uses the latest statistical data available from the SILC and from Eurostat (SILC micro-data) to analyse trends in official poverty measures and other supporting indicators.

See https://www.welfare.ie/en/downloads/SIM2016.pdf for more information.