

# Technical Paper on

## The Measurement of Household Joblessness in SILC and QNHS, 2004-2012:

An Analysis of the CSO Survey of Income and Living Conditions (SILC) and  
the Quarterly National Household Survey (QNHS)

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Department of Social Protection



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## **Abstract**

In most European countries there is a difference between the estimates of household joblessness coming from the European Labour Force Survey and the Survey of Income and Living Conditions, because of the different definitions of joblessness and the use of different data sources. However, the gap is much larger than elsewhere in Ireland, with the Quarterly National Household Survey (QNHS, the source of Labour Force data for Ireland) giving an estimate of 17 per cent in 2012 compared to 23 per cent in SILC. This paper investigated the reasons for the large gap in Ireland, including the role played by the different definitions and characteristics of the sample. The findings indicate that the different definitions play a relatively minor role, but that the structure of the sample is more important, specifically the percentage of adults in employment and the distribution of employment across households of different types.

**Key words:** household joblessness; very low work intensity; (quasi) jobless households; measurement; social exclusion

## Table of Contents

<b>Authors</b> .....	<b>i</b>
<b>Abstract</b> .....	<b>iii</b>
<b>Authors' Acknowledgements</b> .....	<b>viii</b>
<b>1. Introduction</b> .....	<b>1</b>
1.1. Purpose of the paper .....	1
1.2. Overview of the issues .....	3
1.3 Overview of SILC and the QNHS .....	7
1.4. Outline of paper .....	9
<b>2. Different Definitions of Joblessness</b> .....	<b>10</b>
2.1 Introduction .....	10
2.2 LFS definition of 'population in jobless households' .....	10
2.3 SILC definition.....	11
2.4 Summary of differences in definition .....	12
2.5 Adjusting joblessness rate for differences in definition.....	14
2.6 Joblessness rates by age group .....	16
2.7 Summary.....	17
<b>3. Differences between the SILC and QNHS Samples</b> .....	<b>18</b>
3.1 Introduction .....	18
3.2 Rate of employment among working-age adults .....	18
3.3 Comparing self-defined employment status to the Census .....	21
3.4 Adjustment to SILC weights for ILO employment.....	23
3.5 Adjustment to SILC weights for ILO employment and living arrangements.....	27
3.6 Summary.....	29
<b>4. Conclusions and Implications</b> .....	<b>31</b>
4.1 Introduction .....	31
4.2 Extent of the gap .....	31
4.3 Differences in measurement .....	32
4.4 Differences in the percentage of adults at work .....	32
4.5 Differences in living arrangements .....	33
4.6 Limitations.....	33
4.7 Implications .....	34
<b>Appendix</b> .....	<b>36</b>
<b>References</b> .....	<b>38</b>
<b>Glossary</b> .....	<b>40</b>

## List of Figures

Figure 1.1: Percentage of persons aged 0 to 59 in jobless households, SILC and QNHS, 2004 to 2012 .....	4
Figure 1.2: Level of joblessness estimated from EU-SILC and EU-LFS for adults aged 18 to 59 in the 28 EU Member States in 2012 .....	5
Figure 1.3: Percentage of adults aged 18 to 59 in jobless households in Ireland and the EU 15 between 2005 and 2012 from the EU-LFS and EU-SILC .....	6
Figure 2.1: SILC and LFS indicators of joblessness for Ireland and the LFS indicator calculated on the SILC data.....	14
Figure 2.2: Percentage of adults in employment and unemployed, 2004 to 2012....	15
Figure 2.3: SILC and QNHS indicators of joblessness for Ireland and the LFS indicator on the SILC data, adults and children, 2004 to 2012 .....	16
Figure 3.1: Rate of employment (ILO definition) among working-age adults in SILC and the QNHS, 2004 to 2012 .....	19
Figure 3.2: Rate of employment (self-definition) among working-age adults in SILC and the QNHS, 2004 to 2012 .....	20
Figure 3.3: Rate of employment (self-definition) among adults aged 20 to 64 in Census, SILC and the QNHS, 2006 and 2011 .....	22
Figure 3.4: SILC and QNHS indicators of joblessness, showing the impact of adjusting for the employment rate of adults, 2004 to 2012 .....	25
Figure 3.5: SILC and QNHS indicators of joblessness for adults and children, showing the impact of adjusting for the employment rate of adults, 2004 to 2012.....	26
Figure 3.6: Percentage of non-employed adults and children living in households with an employed working-age adult in SILC and QNHS, 2004 to 2012	27
Figure 3.7: SILC and QNHS indicators of joblessness, showing the impact of adjusting for the employment rate and living arrangements, 2004 to 2012 .....	28
Figure 3.8: SILC and QNHS indicators of joblessness for adults and children, showing the impact of adjusting for the employment rate and living arrangements, 2004 to 2012.....	29
Appendix Figure A1: Confidence intervals for the indicator of household joblessness in SILC and the QNHS.....	36

## List of Tables

Table 2.1: Comparing the definition of household joblessness, SILC and LFS .....	13
Table 3.1: Measuring principal economic status in SILC and the QNHS.....	19
Table 3.2: Measuring principal economic status in the Census.....	21
Table 3.3: Control totals used for re-calibration of SILC weights based on adult employment .....	24
Appendix Table A1: Control totals used for re-calibration of SILC weights based on age, work status and living arrangements .....	37

## List of Acronyms

<b>AROPE</b>	At risk of poverty and social exclusion
<b>CSO</b>	Central Statistics Office
<b>ILO</b>	International Labour Organisation
<b>LFS</b>	Labour Force Survey
<b>QNHS</b>	Quarterly National Household Survey
<b>SILC</b>	Survey on Income and Living Conditions
<b>VLWI</b>	Very Low Work Intensity

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## 1. Introduction

### 1.1. Purpose of the paper

The purpose of this technical paper is to investigate the differences in the measured level of household joblessness in Ireland between the indicators on the Quarterly National Household Survey (QNHS) and on the Survey on Income and Living Conditions (SILC) datasets for Ireland. Although the indicators are slightly different, and we would not expect the figures to be identical, the gap between the two is much larger in Ireland than in the other EU countries. This is an important issue from a policy perspective because household joblessness is one of the key indicators of social exclusion for the purpose of the EU 2020 headline targets (European Commission, 2010a). The high level of household joblessness in Ireland, as measured on the SILC survey, has prompted a Country Specific Recommendation from the European Commission for Ireland on this area (European Commission, 2014). It is also important from a technical perspective, because the divergent estimates raise questions about the reliability of the data for other purposes, including the measurement of household income, poverty and inequality.

In the Irish statistical system, SILC is designed to provide statistics on household and individual income as well as related indicators of living standards, poverty and inequality (CSO, 2012a, p. 87; 2012b). The QNHS is designed to provide reliable quarterly labour force statistics (CSO, 2012c, p.19). It has a larger sample than SILC and, since it is designed to measure employment and unemployment, its estimates of these rates are the definitive ones for Ireland.

Nevertheless, because of the European Council decision to use joblessness as an indicator of social exclusion, in conjunction with at-risk-of-poverty and material deprivation, the indicator needs to be available on the same dataset as these other two. The Europe 2020 Strategy includes five headline targets. The poverty and social exclusion target aims to lift at least 20 million people out of the risk of poverty and social exclusion (AROPE). The AROPE measure is defined as the share of the population being at risk of poverty *or* experiencing severe material deprivation *or* living in a jobless household (using the 'very low work intensity' indicator of

joblessness, described below; European Commission, 2010a, 2010b). Because the population at risk of poverty or exclusion is the population identified on any one of these three indicators, all three must be available on the same data source. In addition, the definition of ‘very low work intensity’ (VLWI) requires the detail on work history in the reference year that is available in SILC, but not on the Labour Force Survey (LFS). There has been some discussion and debate on the appropriateness of using household joblessness as an indicator of social exclusion (de Graaf-Zijl and Nolan, 2011; Ponthieux, 2014). However, it has been found to be an important risk factor for poverty and deprivation (Watson, Maître and Whelan 2012) and for dependence on welfare (Watson and Maître, 2013).

Another aspect of the policy interest in household joblessness is linked to the observation by researchers that individual levels of employment can increase without necessarily improving the level of joblessness at the household level. The employment rate is not the only important factor. Whether or not a non-employed person is in a jobless household depends also on the distribution of work across households. At various times, there has been growth in employment in many countries without a reduction in joblessness (Gregg and Wadsworth, 1996, 1998, 2008). Cantillon (2011) notes that while there was a significant increase in employment in many EU Member States since 2000, as well as increases in average incomes and in social spending, less progress was made in tackling joblessness. This can happen under a number of conditions, including: (a) where job growth benefits households where there is already someone at work rather than benefitting formerly jobless households; and (b) where social spending on training and childcare benefits those who are already at work rather than extending to those initially outside the labour market. Employment growth, in other words, could lead to a polarisation between ‘work rich’ and ‘work poor’ households with little benefit in terms of poverty reduction. The level of household joblessness in Ireland fell during the years of economic growth in the 1990s, from 15 per cent in 1992 to 8 per cent in 2000 for the 18 to 59 age group according to the EU-Labour Force Survey (EU-LFS).<sup>1</sup> Nevertheless, a significant proportion of households had experienced joblessness at

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<sup>1</sup> See Eurostat tables at [http://ec.europa.eu/eurostat/data/database?node\\_code=lfsi\\_jhh\\_a](http://ec.europa.eu/eurostat/data/database?node_code=lfsi_jhh_a)

some point between 1994 and 2000, with one fifth of households experiencing joblessness of three or more years (Russell et al, 2002).

In order to investigate the gap in estimates of the level of household joblessness in Ireland, we analyse the SILC and QNHS data for Ireland for the period 2004 to 2012.<sup>2</sup> We examine the extent to which the differences between the estimates are due to measurement as opposed to the data source. Measurement involves the definition of 'joblessness' and how the indicator is constructed. When it comes to the data source, we investigate whether the SILC and QNHS datasets differ in terms of the proportion of the working-age population that is at work and the relationship between living arrangements and work: the extent to which non-employed adults live with an employed adult and the extent to which children live with an employed adult. The specific research questions, then, are as follows:

- How much of the difference between the estimates of joblessness in SILC and the QNHS can be explained by differences of definition?
- Apart from differences in definition, are there differences between the two sources in the employment rate of adults that might account for some of the gap between the estimates of joblessness in SILC and the QNHS?
- Apart from differences in definition and in the employment rate of adults, are there differences in the distribution of employment across households of different types in the two surveys that might account for the gap between the two sources in the estimates of the joblessness rate?

## **1.2. Overview of the issues**

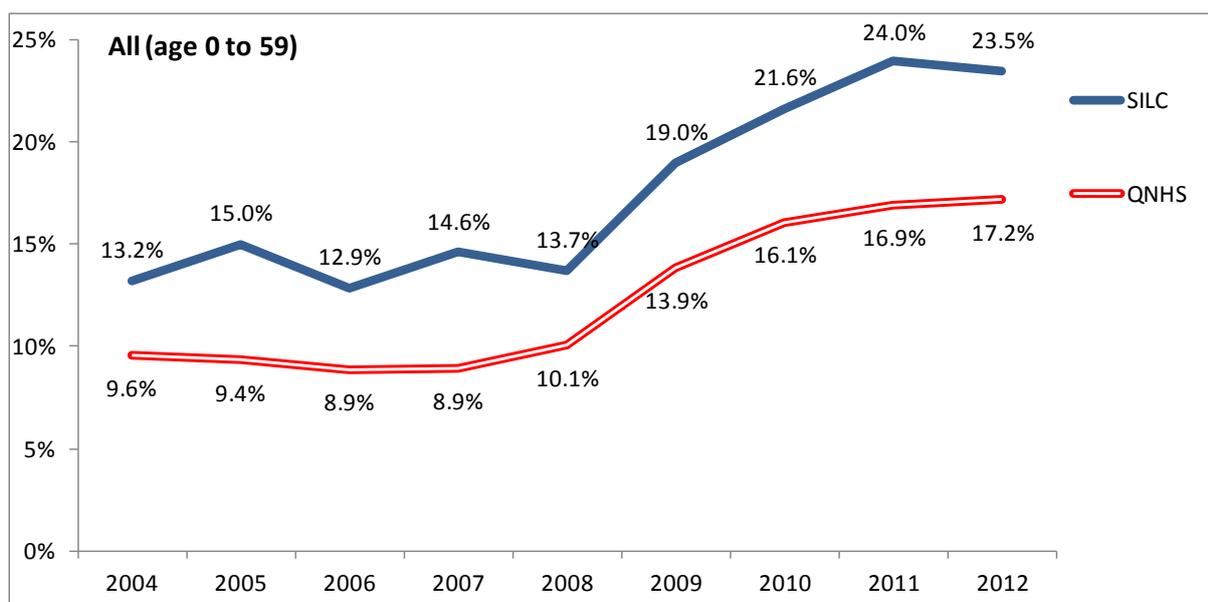
The discrepancy between the figures from SILC and the QNHS extends back to the beginning of the SILC in 2004, as shown in Figure 1.1. The figure shows the QNHS measure on the QNHS data and the SILC indicator on the SILC data. A fuller discussion of the measurement differences will be provided later. At this point, we simply note that the SILC definition takes account of hours worked and the work history of the individual over the previous 12 months while the QNHS definition is based on work status in the reference week (the week preceding the survey), irrespective of hours worked.

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<sup>2</sup> SILC began in 2003 in Ireland, but with a smaller sample, so the 2003 figures are not included here.

In 2004, about 13 per cent of persons under the age of 60 were in jobless households according to SILC, compared to just under 10 per cent in the QNHS. Both surveys show a marked rise in joblessness with the recession, reaching 23.5 per cent in the SILC data in 2012 and 17.2 per cent in the QNHS data.

**Figure 1.1: Percentage of persons aged 0 to 59 in jobless households, SILC and QNHS, 2004 to 2012**



Source: SILC and QNHS micro-data for Ireland, analysis by authors

Throughout the period, the SILC rate was about 40 per cent higher, on average, with larger gaps in 2005 and 2007. There is more year-to-year fluctuation in the SILC figures than in the QNHS, which may be related to the smaller sample size. The differences between the two sources remain statistically significant even when we take account of the rather wide confidence intervals around the SILC estimates, with margins of error in the region of plus or minus 2 per cent (see Appendix Figure A1). The much larger sample size for the QNHS means that the confidence intervals are narrower with margins of error in the region of plus or minus 0.4 per cent.

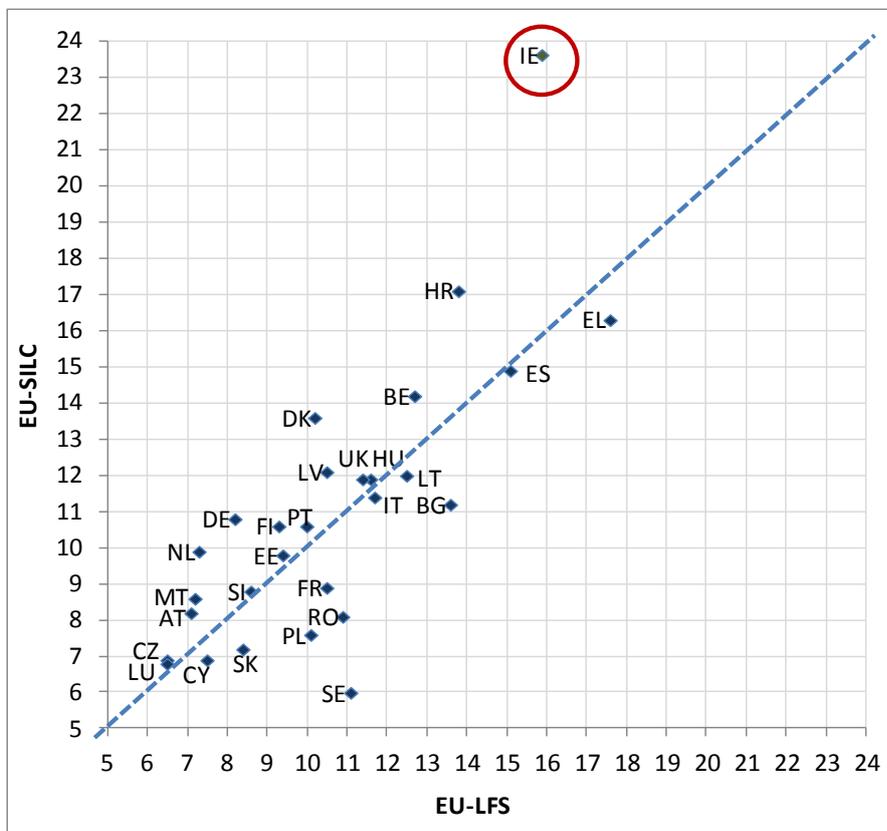
Discrepancies such as that between the QNHS and SILC data are found in most European countries, but the size of the discrepancy is particularly large in the Irish case. The QNHS produces the LFS data for the European statistical system. Previous studies have already highlighted such discrepancies between the EU-LFS

and the EU-SILC surveys across a range of European countries with Ireland having one of the largest difference (Ward and Ozdemir, 2013; de Graaf-Zijl and Nolan, 2011).

Figure 1.2 shows the association between joblessness in the EU-SILC dataset and in the EU-LFS dataset for adults aged 18 to 59 in the 28 EU Member States in 2012. The diagonal line in the chart shows where the countries would lie if the estimates were the same for the two sources. There is a slight tendency for the estimate to be higher in the EU-SILC data, with an average of 10.9 per cent across countries compared to 10.5 per cent in the EU-LFS.

There is some scatter around the line, and the average gap between the two figures is 1.7 percentage points. Ireland is an outlier, with the largest discrepancy (7.7 percentage points). Gaps of over three percentage points are also found in Sweden (5.1), Denmark (3.4) and Croatia (3.3).

**Figure 1.2: Level of joblessness estimated from EU-SILC and EU-LFS for adults aged 18 to 59 in the 28 EU Member States in 2012**

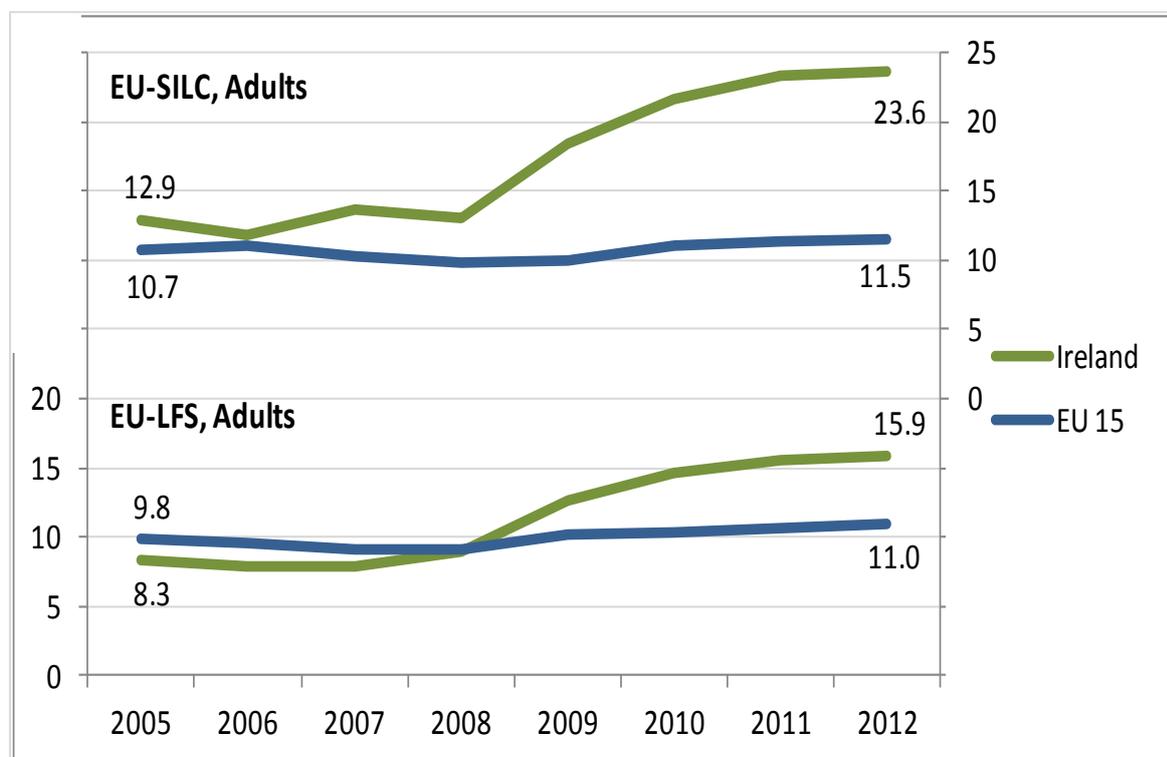


Source: Eurostat tables [ilc\_lvh11 and [lfsi\_jhh\_a], extracted on 1 Dec 2014.

It is clear from Figure 1.2 that the rate of joblessness is also very high in Ireland compared to the other EU countries, especially according to the EU-SILC data, where Ireland is a clear outlier with a rate of almost 24 per cent. The next highest figures are for Croatia and Greece at 17 per cent and 16 per cent, respectively. The EU-LFS data shows the rate for Ireland to be the second highest at 15.9 per cent, following Greece at 17.6 per cent.

Figure 1.3 shows how the gap between Ireland and the average across the EU 15 countries has changed between 2005 and 2012. The gap between Ireland and the EU 15 average is larger in EU-SILC than in the EU-LFS, particularly after the start of the recession. In 2012, for instance, the EU-LFS shows the joblessness rate among adults at 45 per cent higher in Ireland than the EU 15 average (15.9 per cent compared to 11 per cent) while the rate on EU-SILC is over 100 per cent higher (23.6 per cent compared to 11.5 per cent).

**Figure 1.3: Percentage of adults aged 18 to 59 in jobless households in Ireland and the EU 15 between 2005 and 2012 from the EU-LFS and EU-SILC**



Source: Eurostat tables [ilc\_lvh11] and [lfsi\_jhh\_a], extracted on 1 Dec 2014.

The other difference between the two sources is that the rate among adults in Ireland was slightly lower than the EU 15 average in 2005, according to the EU-LFS survey (8.3 per cent in Ireland and 9.8 per cent in the EU 15), but higher in Ireland throughout the period from 2005 to 2012 in EU-SILC. Both surveys show a much smaller gap between Ireland and the other EU 15 countries before the recession, however. The loss of employment in Ireland after 2008 had a particularly large impact on household joblessness. Ireland was one of the countries where the percentage point rise in the population in low work intensity households was greater than the percentage point fall in the employment rate of adults between 2008 and 2010 (Ozdemir and Ward, 2012, Figure 8).

### **1.3 Overview of SILC and the QNHS**

As noted above, SILC and the QNHS play different roles in the Irish statistical system. SILC is designed to provide statistics on household and individual income as well as related indicators of living standards, poverty and inequality (CSO, 2012a, p. 87). The sample is a four-year rotating panel design, with one quarter of the sample replaced by a new random sample in each year. Within each household, every adult (aged 16 and over) is interviewed face-to-face and detailed information is also collected on the household as a whole. The sample size has averaged 5,223 households per year for the period from 2004 to 2012 and 13,090 individuals.

Up until 2014, SILC involved a two-stage sample design with both stratification and clustering. The strata are eight area types based on the Census of Population. At the first stage, 1,690 'blocks' are selected to proportionately represent the eight strata. The second stage of sampling involves the random selection of a sample of households (including two substitute households) from each block. In cases where interviewers could not secure an interview from a sampled household, they approach the two substitute households in a pre-determined order (Haase and Pratschke, 2012, p.2). From 2014, the sampling for the survey has been modified, to include stratification by area characteristics such as affluence / deprivation and the substitution for non-response has been eliminated. The period covered by this report is 2004 to 2012, however, so the older sampling system was still in place.

The SILC sample is re-weighted to ensure that it is representative of the population. After re-weighting based on the inverse of the probability of household selection (design weights), the SILC sample is calibrated to population totals for age by sex (four age categories), region (eight regions) and household composition (six categories) (CSO 2012e, p. 88).

The QNHS is a nationally representative survey of private households. It was introduced in September 1997 to replace the annual LFS. It is designed to provide reliable quarterly labour force statistics (CSO, 2012c, p.19). The QNHS collects individual labour market information throughout the year on a quarterly basis (Q1 covering January to March, Q2 - April to June, Q3 - July to September and Q4 - October to December).<sup>3</sup> The QNHS is a rotating panel where every quarter 20 per cent of households are replaced. Households are included in the QNHS for five quarters, so that there are 20 per cent of households left in the survey in the same quarter the following year. In this report we combine quarters to produce annual data for comparison to the annual data in SILC.

One adult is interviewed face-to-face in each household, providing information on the labour market situation and socio-demographic characteristics of other adults and on children in the household.

The sample is a two-stage design with both clustering and stratification. The strata are eight area types based on the Census of Population. Within strata, blocks of 75 households are identified as Primary Sampling Units (PSUs). There are almost 15,000 blocks of 75 households. These are sampled systematically, with further systematic selection of subsets of 15 households within each block for each quarter of the survey (Haase and Pratschke, 2012, p.2).

Unlike SILC, the QNHS does not contain data on income or material deprivation. However, it contains detailed employment information (including sector, occupation and hours worked) and data on education and household structure and as well as gender, age and marital status.

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<sup>3</sup> Annual calendar coverage started in January 2009. Prior to this date Q1 covered December to February, Q2 - March to May, Q3 - June to August, Q4 - September to November.

The data, which includes children as well as adults, can be linked at the household level so as to identify people living in jobless households. The sample is much larger than the SILC sample. The QNHS includes data on between 28,000 and 50,000 adults in each quarter. Although at the time of writing, QNHS data are available for 2013 and early 2014, we focus on the period 2004 to 2012 as this is the time period for which SILC data are available.

#### **1.4. Outline of paper**

As noted above, the indicators of joblessness on SILC and the QNHS are slightly different. In the next section we examine the significance of these differences in measurement to the overall estimates of the rates of joblessness. As we shall see, differences in measurement, while important, explain very little of the gap. We then examine the structure of the QNHS and SILC samples, particularly differences in the percentage of adults at work. We turn our attention then to the living arrangements of persons (adults and children) not at work: the extent to which they live with an employed adult. Finally, we draw together the results to point to some implications for Ireland's statistical system.

## 2. Different Definitions of Joblessness

### 2.1 Introduction

In this section we examine the definition of joblessness in the LFS and in SILC. The indicators of joblessness from the two sources are slightly different. As we shall see, the SILC indicator is more complex, taking account of the individual's level of activity over the 12 months prior to the interview and distinguishing between full-time and part-time work. The LFS indicator is simpler. It focuses on the person's activity in the week prior to the interview. We are able to re-create the LFS indicator on the SILC data and examine the impact this would have on the assessed level of joblessness between 2004 and 2012.

Both definitions treat 'working-age' as ranging from 18 to 59. This has been criticised as setting the upper limit too low in a context where the usual definition of working-age extends to 64 and this is also the upper age implicit in the employment target in the Europe 2020 strategy (see Ward and Ozdemir, 2013, p. 8). In Ireland, there are moves towards an even higher retirement age. Since 2011, the age at which the State Pension is payable has been increased to 66 and there are plans to increase it further, reaching 68 by 2028. For present purposes, however, our goal is to compare the indicators of joblessness in SILC and the QNHS so that the most important consideration is to have the definition of 'working-age' harmonised across the two sources.

### 2.2 LFS definition of 'population in jobless households'

The LFS definition of 'population in jobless households' is one of the EU Structural Indicators.<sup>4</sup> It is calculated using the data from the EU-LFS. In Ireland, the QNHS is used to provide the LFS data.

Jobless households are households where no member is in employment, i.e. all members are either unemployed or inactive. The International Labour Organisation (ILO) definition of employment is used. Employed persons are those aged 15 years and over who worked for at least one hour in the reference week. People temporarily

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<sup>4</sup> [http://ec.europa.eu/eurostat/cache/metadata/en/lfsi\\_jhh\\_a\\_esms.htm](http://ec.europa.eu/eurostat/cache/metadata/en/lfsi_jhh_a_esms.htm)

absent from work but who have a job to return to, are considered to be in employment.<sup>5</sup>

The indicator is calculated separately for adults (aged 18 to 59) and for children (aged 0 to 17). It refers to people living in households where no-one is in employment as a percentage of all persons of the relevant age group. Students aged 18 to 24 who live in households composed solely of students of the same age class are not counted in either the numerator or the denominator.

### **2.3 SILC definition**

The indicator of household joblessness on the SILC data is based on the concept of 'very low work intensity'. Work intensity refers to the proportion of available time that working-age adults in the household spend in employment. Working-age adults are those aged 18 to 59, excluding students aged 18 to 24. Time worked is calculated based on a monthly main activity record over the reference year (the 12 months preceding the interview in Ireland). If the person currently works less than 35 hours per week, their work intensity is adjusted by calculating the ratio of the hours worked to 35 hours.<sup>6</sup> For instance, if someone works 30 hours per week, their work intensity for the relevant period is  $30/35 = 0.857$ . It is assumed that their current work intensity adequately represents their hours worked over the year. If the person worked for 8 months of the reference year, then their work intensity for the year would be  $0.857 \times 8/12 = 0.571$ . The work intensity for the household as a whole is calculated over all working-age adults in the household. If our hypothetical individual lived with an adult who had worked full time for the year, the overall work intensity would be  $(1 + 0.571)/2 = 0.786$ . The household work intensity, therefore, ranges from 0 to 1, where 0 means that no working-age adults were in employment and 1 indicates that all working-age adults were in employment full-time. VLWI, the measure of household joblessness on SILC, is based on an overall work intensity less than 0.2, or 20 per cent.

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<sup>5</sup> [http://epp.eurostat.ec.europa.eu/statistics\\_explained/index.php/EU\\_labour\\_force\\_survey\\_-\\_methodology#Labour\\_force\\_status\\_definition](http://epp.eurostat.ec.europa.eu/statistics_explained/index.php/EU_labour_force_survey_-_methodology#Labour_force_status_definition)

<sup>6</sup> The threshold of 35 hours is also recommended by Ozdemir and Ward, (2009).

Note that even though the SILC work intensity indicator is based on main activity over an entire year, it does not capture all employment. Ward and Ozdemir (2013) note that about 17 per cent of adults aged 18 to 64 in workless households (i.e. work intensity of zero) have income from employment in the previous year (pp. 15-16). This can happen if the person records their main activity as something other than employment (such as 'student' or 'caring for home and family') but they also held a job for at least some of the time.

Zero work intensity households with income from employment might also be those where the earnings come from someone outside the working-age range. Since the usual retirement age is 65 or 66, this would most often be people between the ages of 60 and 64.

#### **2.4 Summary of differences in definition**

The similarities and differences between the two definitions are shown in Table 2.1. It summarises the differences in terms of population coverage, the definition of work, the reference period and how jobless households are identified. The two indicators are similar in terms of the population included: working-age adults living in private households and the children who live with them. The main differences are the reference period, the definition of joblessness and whose work is counted.

The reference period for the LFS definition is current, whereas for SILC it is the reference year. In Ireland, the reference period for the QNHS / LFS definition is the week prior to the survey while for SILC it is the twelve months prior to the survey. In practice, this means that in the SILC survey conducted in 2012, for instance, the reference period would be from January to December 2011 for someone interviewed in January and it would be from December 2011 to November 2012 for a person interviewed in December 2012. For this reason, when employment levels are changing, as they have been with the onset of the recession and the more recent beginning of recovery, we would expect to see the change sooner in the LFS indicator than in the SILC indicator.

The second difference is in the threshold for joblessness. According to the LFS definition, a household would move out of joblessness if a working-age adult began

to work for even as little as one hour per week. In SILC, the threshold is higher and is calculated based on the number of working-age adults, taking account of hours worked and of movements into and out of work in the reference year. For a two adult household, a work intensity of 20 per cent would be reached if the total hours worked by household members exceeded 14 hours per week. In practice, very few people are in employment for such a small number of hours, so that the distinction between zero work intensity and 20 per cent work intensity makes little practical difference.

**Table 2.1: Comparing the definition of household joblessness, SILC and LFS**

	<b>LFS</b>	<b>SILC</b>
<b>Population</b>	Persons aged 0 to 59 living in private households	Persons aged 0 to 59 living in private households
<b>Excluded population</b>	Persons aged 60 and over Households with nobody of working-age Households consisting solely of students aged 18 to 24	Persons aged 60 and over Households with nobody of working-age Households consisting solely of students aged 18 to 24
<b>Working-age</b>	Age 15 and over, excluding inactive students aged 18 to 24	Age 18 to 59, excluding students aged 18 to 24
<b>Definition of Employment</b>	ILO definition (worked 1 or more hours in reference week, or temporarily absent from a job). Work of all persons aged 15+ is considered (even if they are under age 18 or age 60 or over).	Work intensity is calculated based on hours and months of work in the past 12 months. Work intensity of working-age adults is calculated.
<b>Reference period</b>	Current (reference week is the previous week in Ireland)	Annual (the 12 months prior to the interview)
<b>Jobless households</b>	No member in employment in reference week, i.e. all members are either ILO unemployed or inactive	Working-age adults in employment less than 20 per cent of the available time in the reference year

Another difference is that the QNHS / LFS indicator takes account of the work of persons between the ages of 15 and 17 and over age 60. Again, this makes little difference in practice to the joblessness indicator: in only a tiny proportion of households containing people aged 0 to 59 is the only work done by people under age 18 or over age 60.<sup>7</sup>

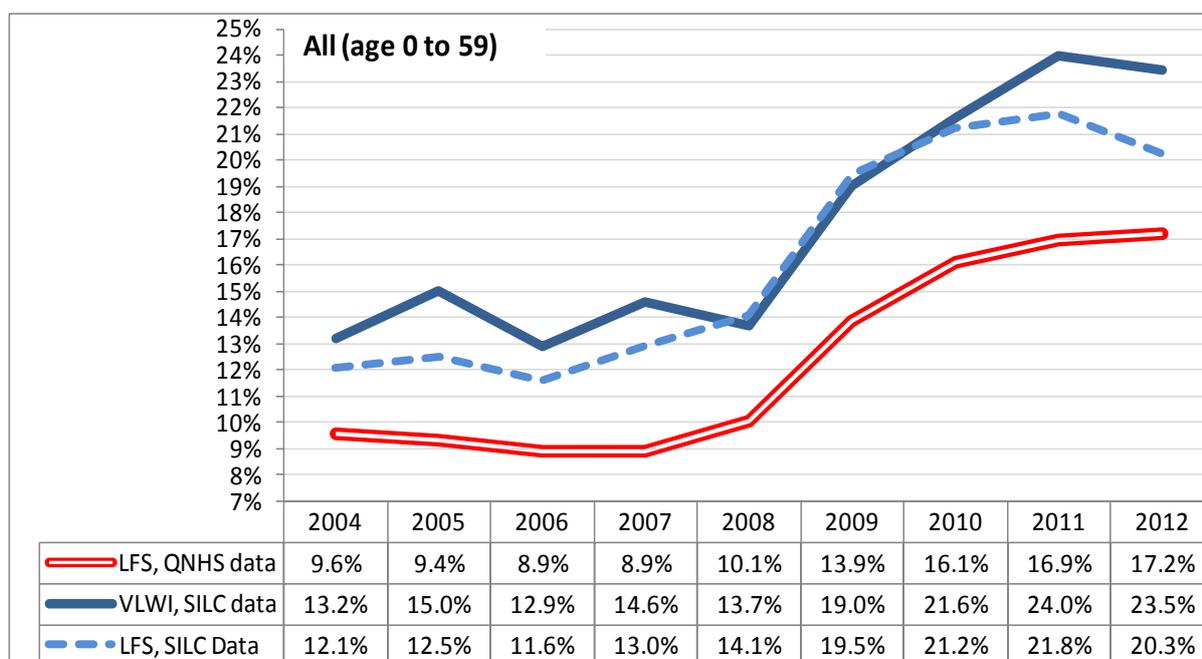
<sup>7</sup> Estimates suggested that including or excluding work done by people aged 15 to 17 or over age 60 would change the estimate of the percentage of people in jobless households by only 0.2 per cent.

## 2.5 Adjusting joblessness rate for differences in definition

At this point we ask how much of a difference is made by the two definitions of joblessness. The LFS definition is simpler and can be replicated on the SILC data. We can compare the two definitions on the SILC dataset and ask to what extent this accounts for the gap between the LFS and SILC measures.

Figure 2.1 shows the original SILC indicator of joblessness based on very low work intensity; the original LFS indicator in the QNHS data for Ireland and the LFS indicator calculated on the SILC dataset. Figures are presented for the population aged 0 to 59 for the period from 2004 to 2012.

**Figure 2.1: SILC and LFS indicators of joblessness for Ireland and the LFS indicator calculated on the SILC data**



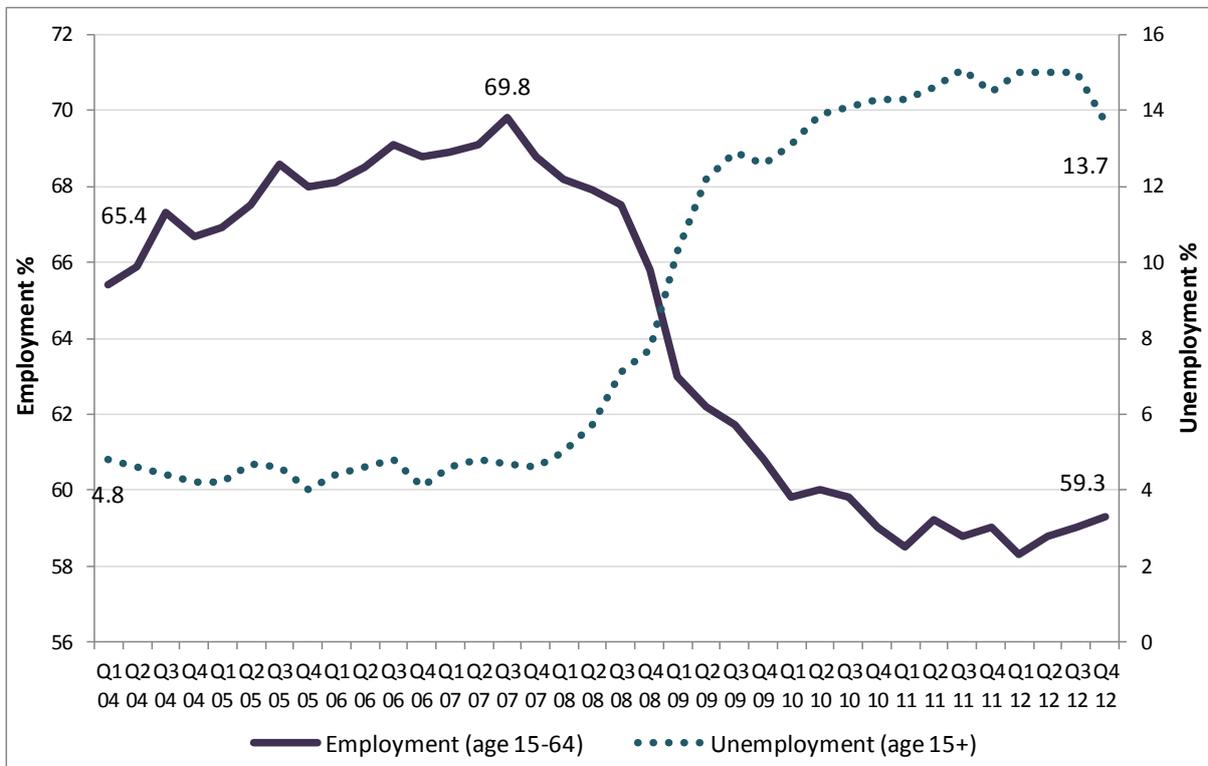
Source: SILC and QNHS micro-data for 2004 to 2012; analysis by authors.

The dashed line in the chart shows the estimates on the SILC data based on the LFS indicator. The indicator produces estimates that are somewhat lower than the SILC figures, particularly in 2012. Nevertheless, the figures tend to be closer to the SILC than to the QNHS estimates, especially from 2008 to 2010. In 2004, for instance, the LFS indicator on the SILC data yields an estimate of 12.1 per cent, compared to 13.2 per cent for the original SILC estimate and 9.6 per cent for the LFS indicator on the SILC data. In some of the years, the LFS measure on the SILC data appears to go some of the way towards accounting for the gap between the SILC

and QNHS joblessness figures. This is most pronounced in 2012, where the LFS indicator on the SILC data yields a figure of 20.3 per cent, approximately mid-way between the QNHS and SILC figures of 17.2 per cent and 23.5 per cent, respectively. In general, the estimates are closer to the SILC VLWI figures than to the QNHS figures. The average figure across the years on the QNHS data is 12.3 per cent, compared to 17.5 per cent on SILC and 16.2 per cent according to the LFS indicator on the SILC dataset. The gap between the LFS indicator on the SILC dataset and the SILC measure is 1.3 percentage points compared to a gap of 3.9 percentage points between the LFS indicator on the SILC dataset and the QNHS measure. Measurement differences, then, account for only a small part of the gap between the SILC and LFS estimates of household joblessness.

The influence of the reference period can be seen in that the LFS indicator on the SILC data increases, relative to the SILC indicator, in those years when employment was falling very quickly, especially 2008 and 2009 (see Figure 2.2).

**Figure 2.2: Percentage of adults in employment and unemployed, 2004 to 2012**



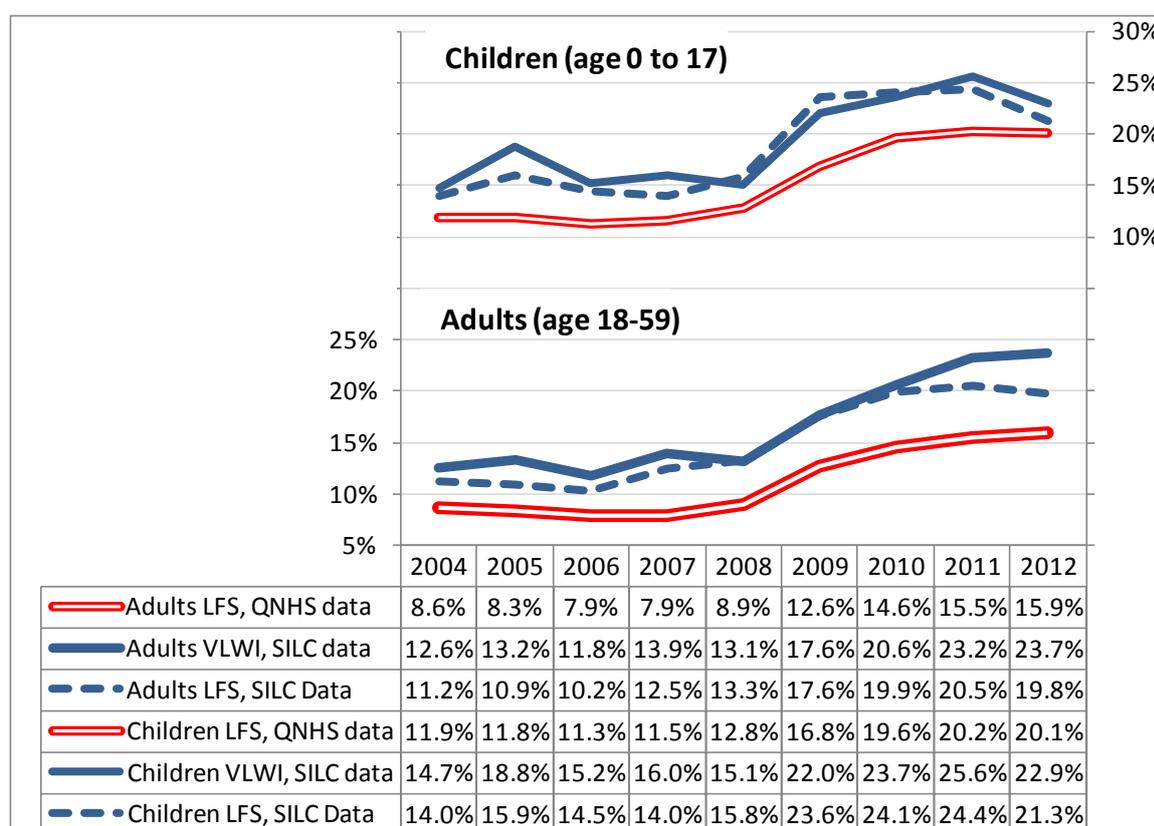
Source: CSO QNHS, Ireland. See StatBank Tables QNQ21 and QNQ37

Since the SILC measure was based on employment over the full reference year, it did not respond as quickly to these changes in employment. There is also a drop in joblessness, according to the LFS indicator, on the SILC data for 2012. Figure 2.2 shows that employment levels had begun to rise in 2012, though quite slowly. The impact on joblessness, as noted above, would depend on whether the increase benefitted households that previously had nobody in employment.

## 2.6 Joblessness rates by age group

Figure 2.3 shows the SILC and LFS estimates of joblessness for adults and children separately. It also demonstrates the impact of differences in measurement on the estimates. Again, the dashed line in the chart shows the estimates on the SILC data based on the LFS indicator.

**Figure 2.3: SILC and QNHS indicators of joblessness for Ireland and the LFS indicator on the SILC data, adults and children, 2004 to 2012**



Source: SILC and QNHS micro-data for 2004 to 2012; analysis by authors.

For both adults and children, the QNHS data shows a lower level of joblessness than the SILC data. For both groups, the LFS measure on the SILC data is closer to the

SILC VLWI measure of joblessness on the SILC data than to the LFS indicator on the QNHS data. In other words, the differences between the measures account for only a small proportion of the differences between the two estimates.

Of interest is the fact that the temporary rise in joblessness in 2005, which we saw earlier in the VLWI indicator on the SILC data, is seen here for children but not for adults. The joblessness rate on SILC is 4 percentage points higher for children in 2005 than in 2004 (18.8 per cent and 14.7 per cent, respectively), but drops back again by 2006 (to 15.2 per cent). The fact that this increase is also found with the LFS measure on the SILC data – although it is much less pronounced – suggests that it is associated with the data source as well as with the way joblessness is measured.

## **2.7 Summary**

In this section we examined the extent to which the different definitions of joblessness accounted for the gap between the SILC and QNHS joblessness figures for Ireland. We found that the definition of joblessness did play a role, but only a relatively minor one. When we reproduced the LFS indicator on the SILC data, the gap between the two data sources remained. In the next section, we look in more detail at the differences between the data sources that might account for the gap.

In general, we took the definition of joblessness as given in both sources. It is worth noting, however, that several aspects of the definition of joblessness in terms of ‘very low work intensity’ have been criticised. These include the definition of ‘working-age’ as ranging from 18 to 59; the choice of the 20 per cent threshold for the VLWI definition and the exclusion of students altogether rather than treating them as potentially available for work in those months they are not actively studying (Ward and Ozdemir, 2013).

### 3. Differences between the SILC and QNHS Samples

#### 3.1 Introduction

Since the differences in measurement account for very little of the gap between the joblessness figures in SILC and the QNHS, we now turn to differences between the two surveys in the rate of employment and the distribution of employment across households. We focus in particular on the ILO measure of employment. This is a relatively straightforward measure. A person is considered to be ‘in employment’ if they worked for payment or profit in the reference week or if they had a job from which they were temporarily absent. If there are differences in the employment rate between the two sources, this will have an impact on the measures of joblessness.

As noted in Section 1, the issue of the distribution of jobs across households is also important to the rate of joblessness. This means that we need to look at the extent to which non-employed adults are living with an adult in employment and also at the extent to which children live with employed or non-employed adults.

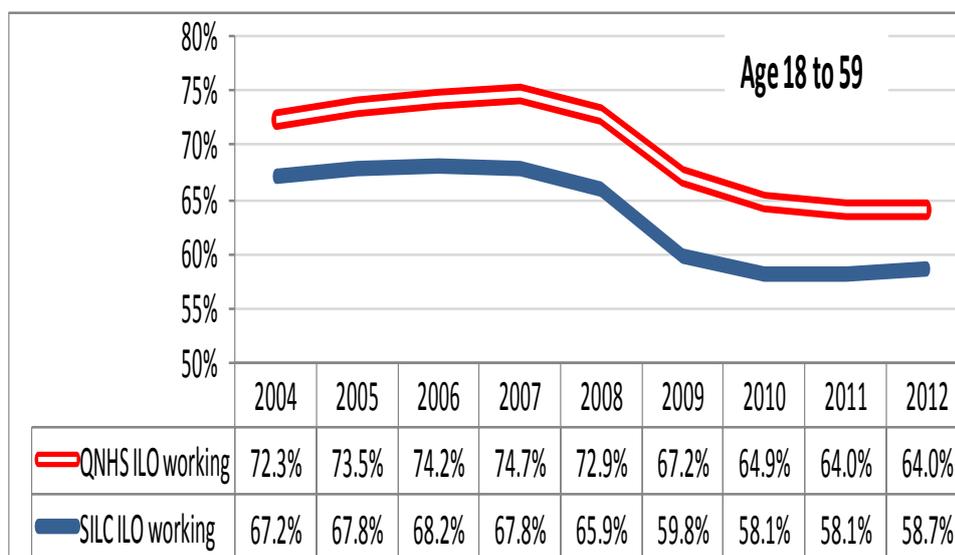
#### 3.2 Rate of employment among working-age adults

We begin by examining the rate of employment among working-age adults, according to the SILC and QNHS surveys. Figure 3.1 shows the percentage of adults aged 18 to 59 who are employed in both surveys from 2004 to 2012. The definition of employment is the ILO definition. Someone is considered ‘in employment’ if they worked for payment or profit in the reference week (usually the week preceding the survey) or if they were temporarily absent from a job.<sup>8</sup>

Figure 3.1 shows the percentage of adults at work, according to the ILO definition, in the 18 to 59 age group in both surveys. Throughout the period, the employment rate is higher according to the QNHS than according to SILC. On average, the QNHS figure is 6 percentage points higher than the SILC figure. The figures follow the same general trend in both surveys, however, with a fall after 2007.

<sup>8</sup> In the SILC dataset, someone is considered to be ‘in employment’ if they answer ‘yes’ to the question “In the past week, did you do any work for payment or profit, even if it was for one hour?” (‘Paidwork’) or chose the answer “Working (including unpaid work in a family business or currently not at work due to maternity, parental, sick leave or holidays)” in response to the follow-up question “How would you define your current economic status?” (Wrk\_Stus). From 2004 to 2012, 60.2 per cent of adults aged 18 to 59 had worked in the previous week and an additional 3.2 per cent had a job from which they were temporarily absent.

**Figure 3.1: Rate of employment (ILO definition) among working-age adults in SILC and the QNHS, 2004 to 2012**



Source: SILC and QNHS micro-data for 2004 to 2012; analysis by authors.

An alternative indicator is principal economic status. Principal economic status refers to the respondent's own definition of their main situation at present. We introduce this indicator here because it is also available on the Census of Population and we can compare the SILC and QNHS figures to those from the Census. Table 3.1 shows the question wording used in SILC and the QNHS to capture this definition.

**Table 3.1: Measuring principal economic status in SILC and the QNHS**

	QNHS	SILC
<b>Question Wording</b>	"At the moment, are you...? 1. Working for payment or profit; 2. Looking for 1 <sup>st</sup> regular job; 3. Unemployed, having lost / given up previous job; 4. Actively looking for work after voluntary interruption of working life (for 12 months or more) for personal or domestic reasons; 5. Student or pupil; 6. Engaged on home duties; 7. Retired from employment; 8. Unable to work - permanent sickness / disability; 9. Other	"How would you define your current economic status?" 1. Working (including unpaid work in a family business or currently not at work due to maternity, parental, sick leave or holidays); 2. Out of work (i.e. unemployed or not yet at work); 3. Other (e.g. in education, retired, disabled or engaged in home duties)

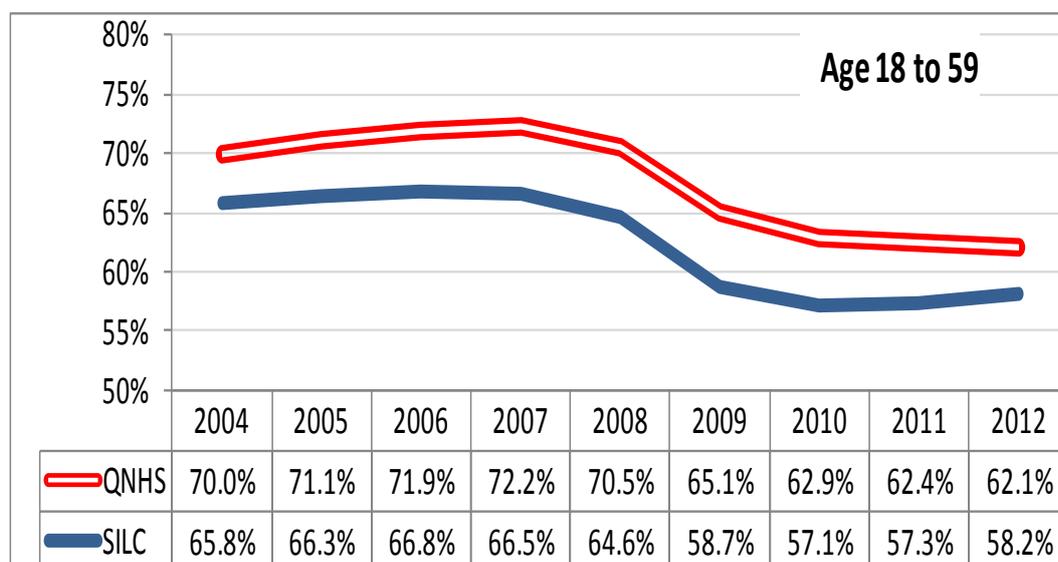
	QNHS	SILC
<b>Population</b>	Persons aged 15 and over	Persons aged 16 and over
<b>Additional Instructions</b>	“This question relates to the respondents usual employment situation. If on maternity leave, unpaid leave, holidays or other leave from a job, code 1.”	“This is a self-perception question, i.e. the person classifies himself / herself according to how he / she sees his / her situation.”

Source: CSO, *Survey on Income and Living Conditions (SILC) Questionnaire Manual Quarters 3&4 2012*, <http://www.cso.ie/en/media/csoie/eusilc/documents/silcmanual2012.pdf>; CSO, *Quarterly National Household Survey 2012 Questionnaire Manual*. <http://www.cso.ie/en/media/csoie/qnhs/documents/QNHSManual2012.pdf> (Downloaded Dec 2 2014).

The SILC questionnaire goes on to probe whether those not at work are unemployed, engaged on home duties, retired, students and so on. The fact that the wording of the items differ between the two surveys – in particular the fact that the response options immediately presented to the respondent are different – means that it should not be surprising to find differences in the percentage of people who report their main status as ‘working’.

Figure 3.2 shows the percentage of adults aged 18 to 59 whose current main economic status is ‘working’ in both sources. The pattern is similar to that seen for the ILO definition of employment. Throughout the period, the level is higher for the QNHS by about 5 percentage points, on average.

**Figure 3.2: Rate of employment (self-definition) among working-age adults in SILC and the QNHS, 2004 to 2012**



Source: SILC and QNHS micro-data for 2004 to 2012; analysis by authors.

### 3.3 Comparing self-defined employment status to the Census

The self-definition of economic status is useful because we can compare the responses on SILC and the QNHS to that on the Census of Population. The Census form is completed by the householder in April of the Census year. Table 3.2 shows the wording of the question on principal economic status and the response options provided. The question wording and response options remained the same between the 2006 and 2011 Census.

**Table 3.2: Measuring principal economic status in the Census**

	2011
<b>Question Wording</b>	<p>“Question 27 - How would you describe your present principal status?”</p> <ol style="list-style-type: none"> <li>1. Working for payment or profit;</li> <li>2. Looking for first regular job;</li> <li>3. Unemployed;</li> <li>4. Student or pupil;</li> <li>5. Looking after home / family;</li> <li>6. Retired from employment;</li> <li>7. Unable to work due to permanent sickness or disability;</li> <li>8. Other, write in</li> </ol>
<b>Population</b>	Persons aged 15 and over
<b>Additional Instructions</b>	You should mark one box only to select the category which you feel best describes your present principal status. If you are on sick leave or maternity leave and intend to return to work at some stage you should mark box 1 (Working)

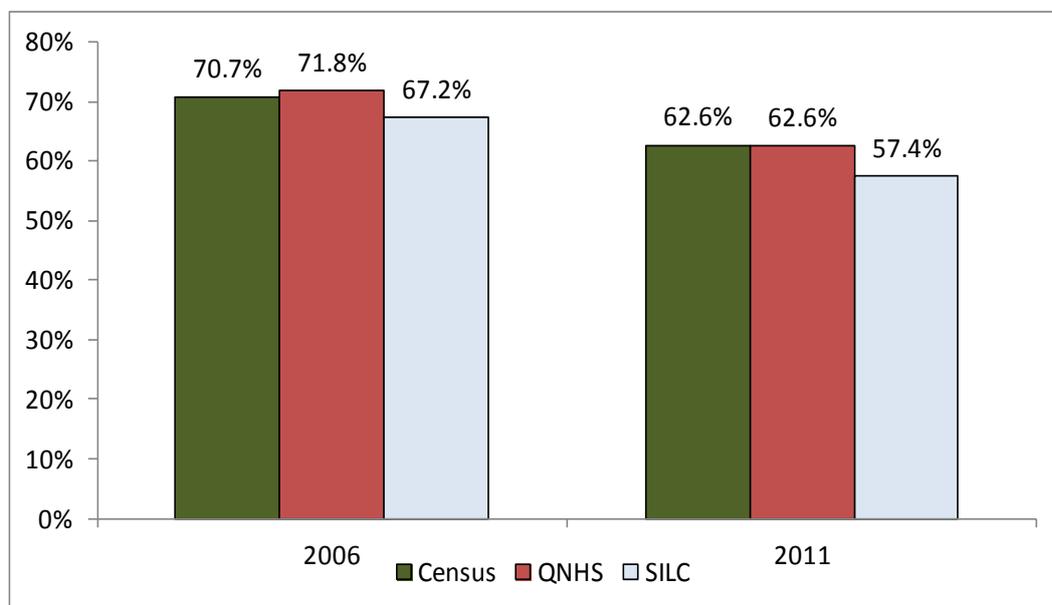
Source: [http://www.census.ie/uploads/documents/English\\_Household\\_form\\_with\\_do\\_not\\_complete\\_stamp\\_-\\_2011.pdf](http://www.census.ie/uploads/documents/English_Household_form_with_do_not_complete_stamp_-_2011.pdf); <http://www.cso.ie/en/census/censusforms/> (retrieved Dec 2 2014).

Figure 3.3 shows the self-defined economic status for persons aged 20 to 64 on the Census and the corresponding figures from SILC and the QNHS for the two Census years covered by the data examined here. The age range 20 to 64 was chosen because figures for this age group are available in the published Census tables.

The Census figures are within one percentage point of the QNHS figures in 2006 and are identical in 2011, while the SILC figures are several percentage points lower, with a larger difference in 2011 than in 2006. The QNHS data are re-weighted in line with the demographic data from the Census (age, gender and region), with an

additional adjustment for nationality following the 2011 Census (CSO, 2012d). There is no specific adjustment to the person's economic status, so we would not necessarily expect this to be identical in the Census and QNHS.<sup>9</sup>

**Figure 3.3: Rate of employment (self-definition) among adults aged 20 to 64 in Census, SILC and the QNHS, 2006 and 2011**



Source: Census table CDS02 for 2011 and Table 3 from Census Volume 3 for 2006; downloaded from CSO website 2 December 2014.

There are a number of reasons why the employment rate may differ between the two sources. One is related to measurement: the level of detail and probing in the questions on employment can result in lower or higher proportions of employed. The second issue relates to aspects of the survey design. The lengthy and demanding nature of the SILC survey may have resulted in a higher rate of non-response among those in working households, who might be expected to be busier. The use of substitution at the fieldwork stage may have exacerbated this problem if the substituted households were more likely than the non-responding households to be jobless.

<sup>9</sup> In fact, the QNHS percentage in employment is affected very little by the weights.

### 3.4 Adjustment to SILC weights for ILO employment

At this point we investigate the extent to which the employment rate accounts for the remaining gap between the QNHS and SILC joblessness figures. We do this by re-calibrating the SILC weights so that the same proportion of adults aged 18 to 59 are in employment as in the QNHS for that year. Since the LFS indicator of joblessness is based on employment as defined by the ILO, we re-calibrate based on this indicator. This exercise is intended to demonstrate the impact on household joblessness of the differences in employment rate. It is not meant as a replacement for the detailed and careful work that would be needed to investigate whether re-calibration is the appropriate solution to the issue.

Table 3.3 shows the figures used, which are based on an analysis of the QNHS micro-data.<sup>10</sup> The totals for children and for adults over age 60 are included to ensure that the distribution of the population across broad age categories is consistent with the QNHS.

The re-calibration is conducted using the ReGenesees programme in R, developed at the Italian National Institute of Statistics.<sup>11</sup> This is an open-source programme for design-based and model-assisted analysis of complex sampling surveys, which incorporates a sub-routine for calibration of samples (Zardetto, 2014). The re-calibration took the initial SILC weights and modified them to meet the additional constraints, using the ‘logit’ distance function and constraining the weights to be equal within household. This was necessary in order to ensure that the weights for children in the household were adjusted and to ensure that working and non-working adults in the same household had equal weights.

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<sup>10</sup> The QNHS longitudinal datafile updated March 2013 is used, with the grossing factor provided. Since the grossing factor sums to the total population within each quarter, it is divided by 4 to produce an annual figure.

<sup>11</sup> ReGenesees was developed as an open-source substitution for the SAS-based version of GENESEES, to calibrate sample observations and to calculate sampling variance. It has been used at ISTAT since 2007. ReGenesees is available at JOINUP — the European Commission open source software repository <https://joinup.ec.europa.eu/software/regeneeses/description>. Further information can be found at: <http://www1.unece.org/stat/platform/display/msis/ReGenesees>.

**Table 3.3: Control totals used for re-calibration of SILC weights based on adult employment**

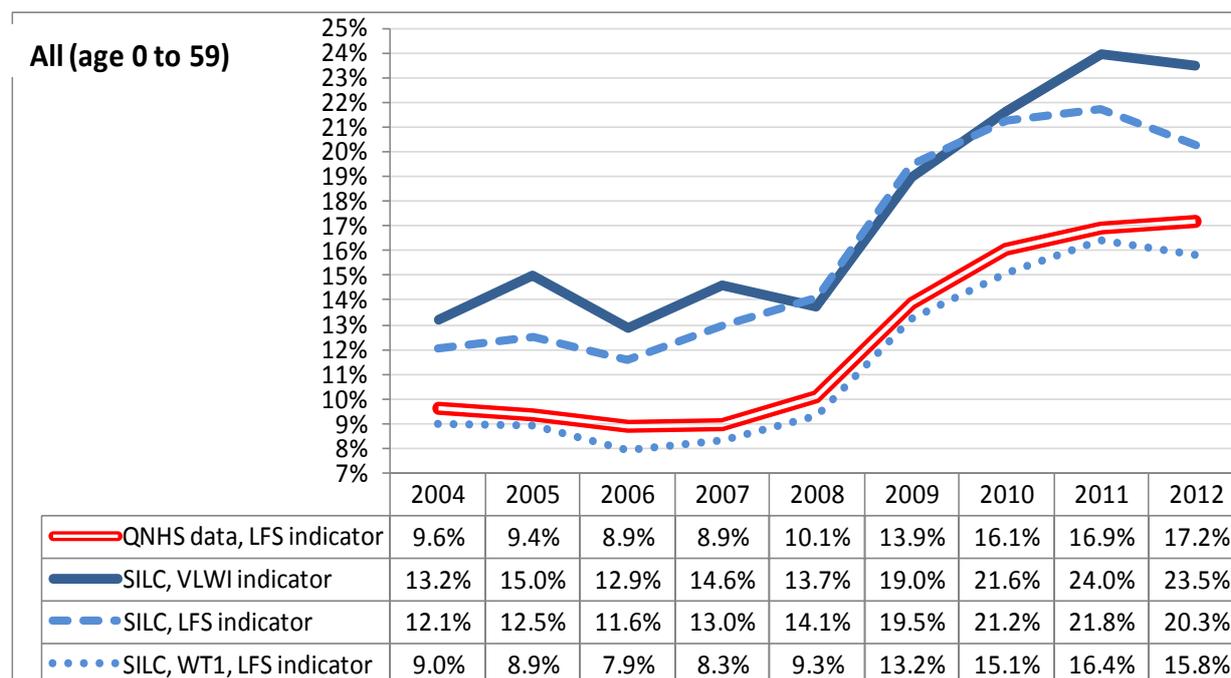
	2004	2005	2006	2007	2008
<b>Age 18-59, ILO not in employment</b>	670339	659820	663809	672361	733951
<b>Age 18-59, ILO in employment</b>	1748414	1830120	1912055	1989363	1971987
<b>Under 18</b>	1029159	1034478	1045168	1071594	1100747
<b>Over 60</b>	619430	635586	648790	666865	689353
	2009	2010	2011	2012	
<b>Age 18-59, ILO not in employment</b>	888055	945011	962964	953381	
<b>Age 18-59, ILO in employment</b>	1819727	1743917	1710301	1696385	
<b>Under 18</b>	1119939	1138540	1152209	1167658	
<b>Over 60</b>	711425	732305	751682	772748	

Source: QNHS micro-data for 2004 to 2012; analysis by authors.

Note that the re-calibration is intended to be illustrative only. No constraints were imposed to ensure that the existing controls in the SILC weights were preserved. The existing controls were age by sex (four age categories), region (eight regions) and household composition (six categories) (CSO 2012e, p. 88).

Figure 3.4 shows the result of the adjustment to the weights. The dotted line shows the estimate of joblessness on the SILC data, using the LFS indicator and the weights adjusted for the percentage of adults at work (ILO definition). The joblessness figures are very close to the QNHS estimates, though slightly lower. The gap is under one percentage point, on average, at about 0.8 per cent.

**Figure 3.4: SILC and QNHS indicators of joblessness, showing the impact of adjusting for the employment rate of adults, 2004 to 2012**



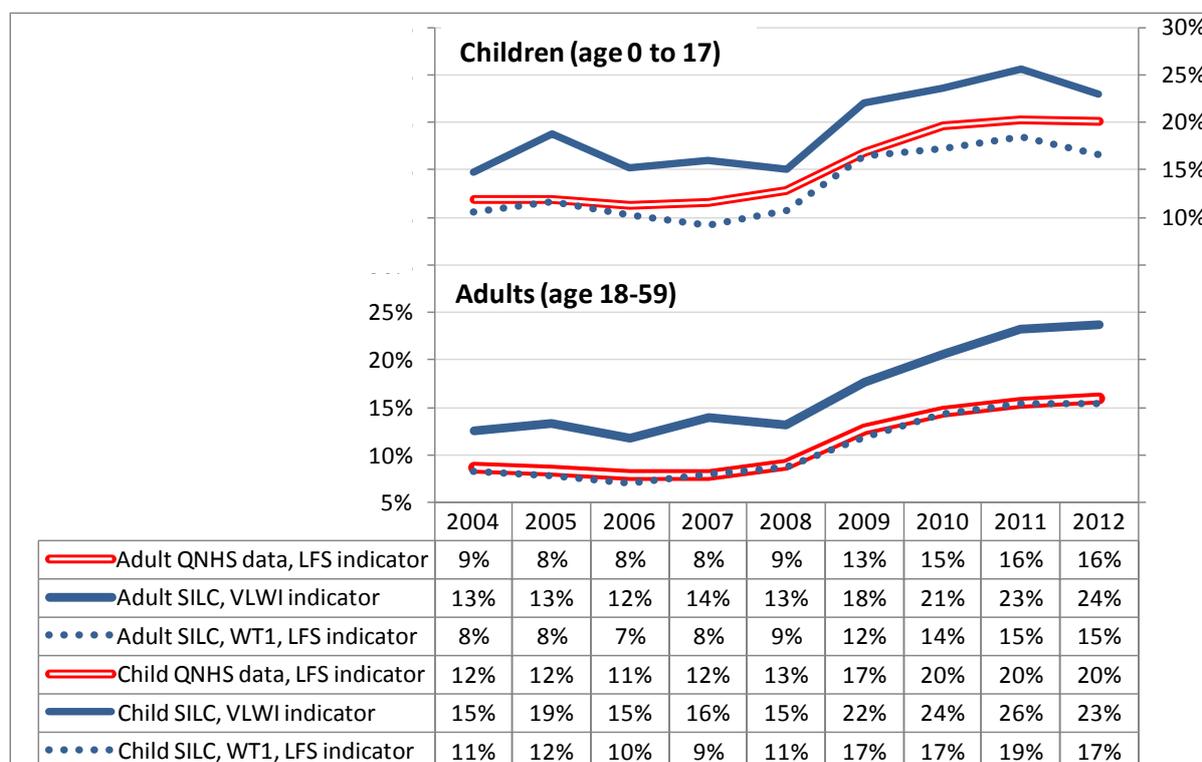
Source: SILC QNHS micro-data for 2004 to 2012; analysis by authors. 'WT1' is the sample weight adjusted for the employment rate of adults aged 18 to 59.

Figure 3.5 shows the estimates separately for adults and children. It is clear that the estimates on the re-weighted SILC data are very close to the QNHS estimates for adults, but are lower than the QNHS estimates for children. The gap between the estimates on the QNHS and re-weighted SILC data is 0.4 percentage points, on average, for adults and 1.6 percentage points, on average, for children. For both adults and children, the estimates on the QNHS data are higher than the estimates on the SILC data. The remaining difference between the two sources must be due to differences in the extent to which children are living with employed or non-employed adults. The fact that the estimates are lower in SILC with the revised weight suggests that children in the SILC survey are more likely to live with employed adults (or employed adults are likely to have more children), once we make an adjustment for the employment rate.

The other factor which may influence the rates of household joblessness in both surveys, then, is the living arrangements of non-employed adults and children. This refers to the extent to which children and non-working adults live in households where someone works. Alternatively, we could see this as a matter of the distribution

of work across households: whether households with children are as likely to have someone at work as households without children.

**Figure 3.5: SILC and QNHS indicators of joblessness for adults and children, showing the impact of adjusting for the employment rate of adults, 2004 to 2012**

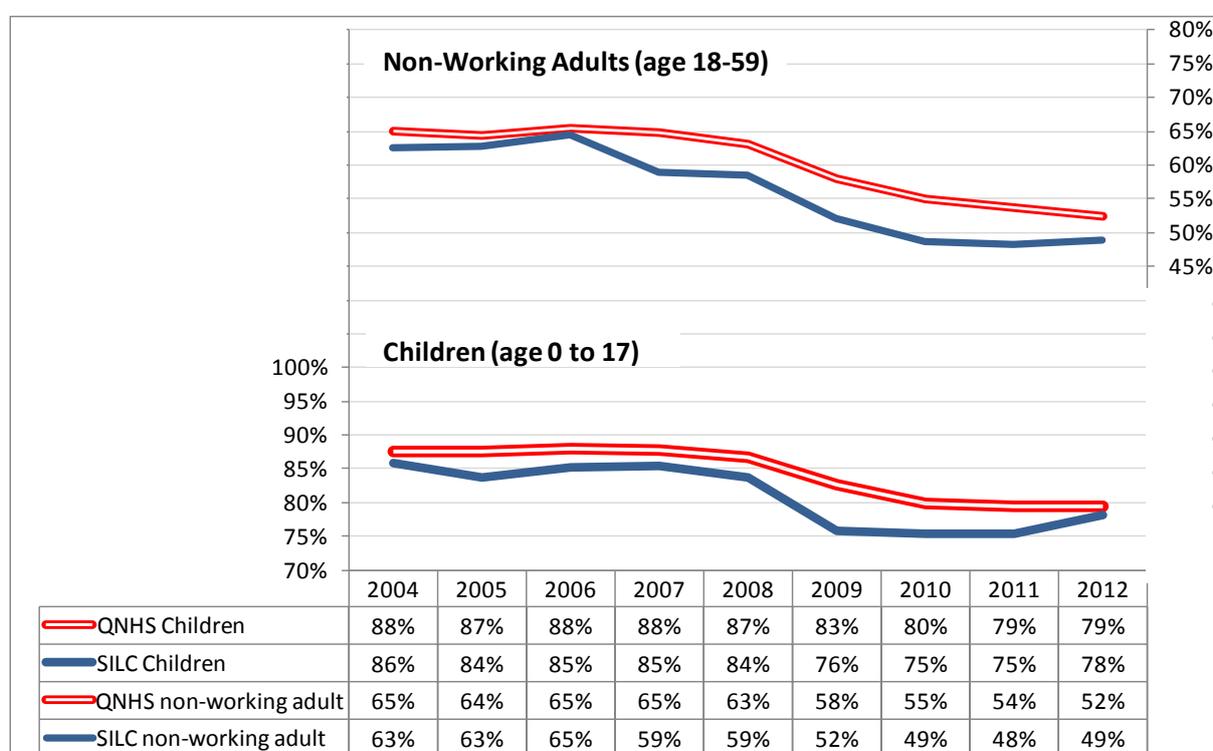


Source: SILC QNHS micro-data for 2004 to 2012; analysis by authors. 'WT1' is the sample weight adjusted for the employment rate of adults aged 18 to 59.

This is explored in Figure 3.6 which shows the percentage of children and of non-employed adults who are living with at least one employed adult aged 18 to 59. In the case of adults, we focus on those aged 18 to 59 in households that might or might not also include children. Turning first to children, we see that children in the SILC dataset are less likely to be living with employed adults, with a gap of about 3 percentage points over the period. The gap is widest in 2009, with figures of 83 per cent and 76 per cent, respectively, for the QNHS and SILC. The fall in employment in households containing children was much sharper in SILC than in the QNHS between 2008 and 2009. The gap has narrowed to just one percentage point in 2012 (79 and 78 per cent, respectively).

In the case of non-employed adults, we see that this group is also less likely to be living with employed adults in SILC than in the QNHS. The gap is about four percentage points, on average, over the 2004 to 2012 period. In the case of both children and non-employed adults, then the SILC survey suggests that a smaller proportion could be pulled out of joblessness by virtue of the work of another adult in the household. As well as the differences between the two samples in the proportion of adults at work, the samples differ in the living arrangements of non-employed adults and of children.

**Figure 3.6: Percentage of non-employed adults and children living in households with an employed working-age adult in SILC and QNHS, 2004 to 2012**



Source: SILC and QNHS micro-data for 2004 to 2012; analysis by authors. The original weights are used. For adults, we exclude those who are the only adult aged 18-59 in the household.

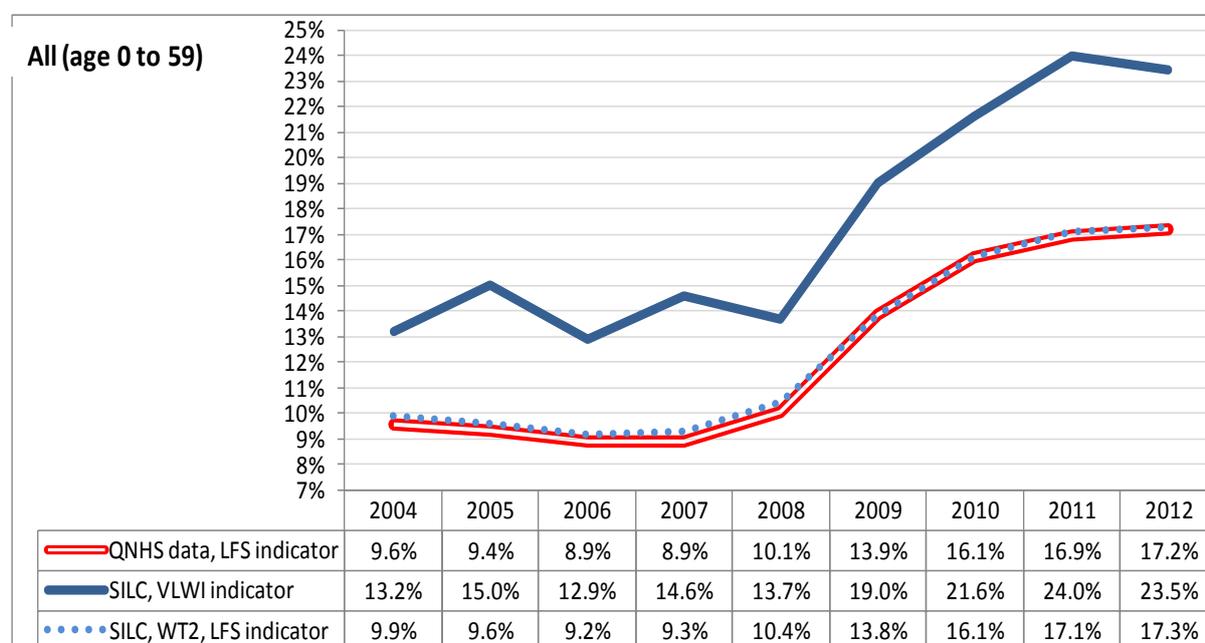
### 3.5 Adjustment to SILC weights for ILO employment and living arrangements

Given the differences between the QNHS and SILC in the propensity of children and non-employed adults to live with an employed adult, we make a further adjustment to the SILC weight to take account of these differences. Using the same procedure as in the previous section, we use control totals obtained from the QNHS micro-data, to re-calibrate the SILC weights. The totals distinguish between employed adults, non-employed adults and children, and between those living with no (other) employed

adult and those living with an (or another) employed adult (See Appendix Table A1). Again, the re-calibration is intended to be illustrative only: the constraints by gender, age, region and household type in the existing SILC weights may not be maintained under the re-calibration.

Figure 3.7 shows that when we combine a control for the ILO employment rate of adults aged 18 to 59 with a control for the living arrangements of adults and children, the gap between the joblessness indicators on SILC and the QNHS is virtually closed. The remaining gap is only 0.2 percentage points.

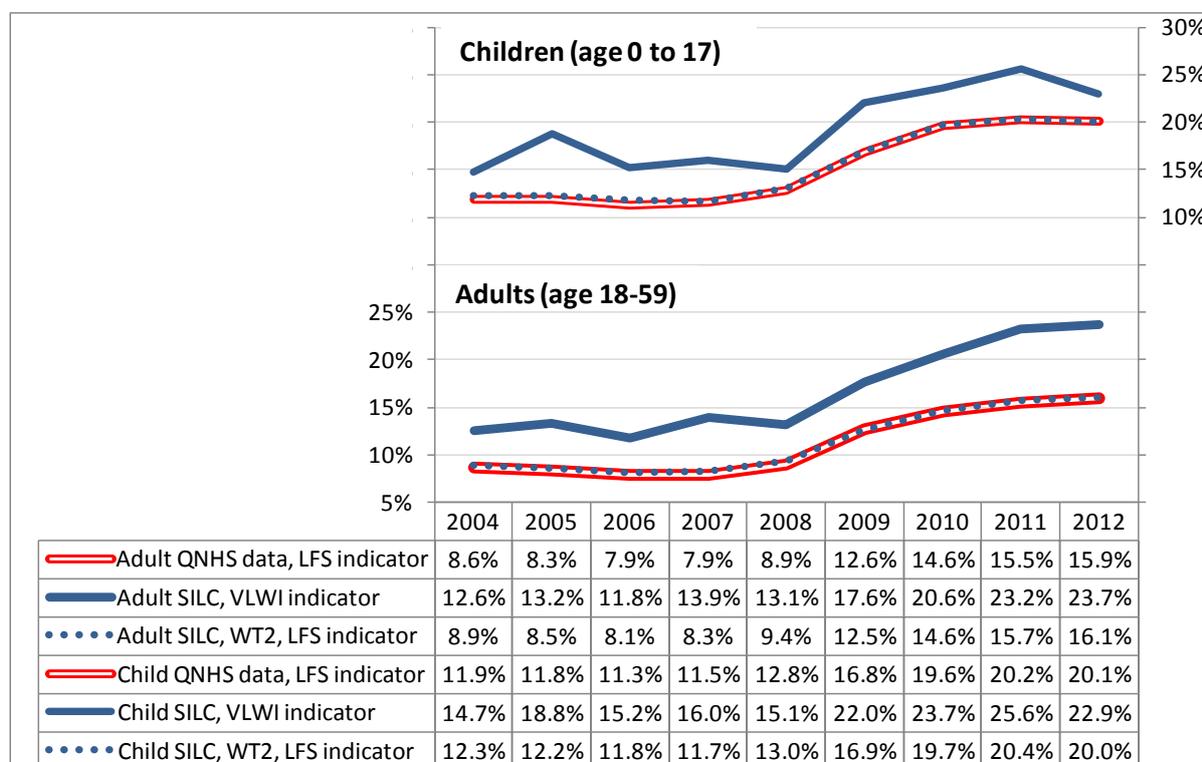
**Figure 3.7: SILC and QNHS indicators of joblessness, showing the impact of adjusting for the employment rate and living arrangements, 2004 to 2012**



Source: SILC QNHS micro-data for 2004 to 2012; analysis by authors. 'WT2' is the sample weight adjusted for the employment rate of adults aged 18 to 59 and for the living arrangements of both adults and children.

Figure 3.8 shows the pattern separately for adults aged 18 to 59 and for children under the age of 18. The adjustment for the employment rate on its own reduced the joblessness estimate on the SILC data below the level found in the QNHS. When we incorporate the adjustment for the living arrangements of children – whether they live with employed or non-employed adults – the gap is closed, as can be seen from Figure 3.8. The remaining very small gap is due to small differences in the percentage of adults outside the target age range (i.e. under 18 or over 60) who are at work according to the ILO definition.

**Figure 3.8: SILC and QNHS indicators of joblessness for adults and children, showing the impact of adjusting for the employment rate and living arrangements, 2004 to 2012**



Source: SILC QNHS micro-data for 2004 to 2012; analysis by authors. 'WT2' is the sample weight adjusted for the employment rate of adults aged 18 to 59 and for the living arrangements of both adults and children.

### 3.6 Summary

In this section we examined the differences between the SILC and QNHS samples in terms of the employment rate and the living arrangements of non-employed adults and children. In order to highlight the significance of employment rate and living arrangements, we held the definition of joblessness constant. We focused throughout on the LFS definition of joblessness based on no working-age adult in the household being currently in employment.

The employment rate of working-age adults was higher in QNHS than in the SILC by about 6 percentage points (ILO definition). To illustrate the significance of this difference for the estimate of joblessness, we adjusted the weights in the SILC dataset so that the employment rate would be identical to that in the QNHS. This was done for illustrative purposes only and no constraints were applied to maintain the existing distribution of the sample by age, gender, region and household type.

Once we adjusted for differences in employment, through re-calibration, the gap between the LFS joblessness indicator on SILC and on the QNHS was reduced from 3.9 percentage points to 0.8 percentage points. When we added a further adjustment to the sample weights in SILC for the living arrangements of non-employed adults and children, the gap between the estimates of joblessness in SILC and the QNHS was virtually eliminated (0.2 percentage points).

## 4. Conclusions and Implications

### 4.1 Introduction

The purpose of the analysis in this technical paper was to investigate the reasons for the gap between the figures on household joblessness from the Quarterly National Household Survey (QNHS) and Survey on Income and Living Conditions (SILC) data sources. Both sources are used to provide European structural indicators. Within the Irish statistical system, the QNHS is the survey that is designed to provide reliable labour market statistics and is the preferred source for estimating the level of household joblessness.

However, one of the headline indicators identified in the Europe 2020 strategy adopted by the European Council on 17 June 2010 is the population at risk of poverty or social exclusion. This requires that the VLWI indicator of household joblessness be available on the same data source as the indicators of at-risk-of-poverty and severe material deprivation, which are based on the SILC data.

Given the importance of household joblessness as a policy issue, the gap between the levels as measured by the LFS indicator on the QNHS data and the VLWI indicator on the SILC data is a matter for concern.

### 4.2 Extent of the gap

We began by outlining the extent of the gap between the two sources, which is particularly large for Ireland and extends back to the start of the SILC survey in 2004. Throughout the period, the household joblessness indicator in SILC was 5.2 percentage points higher on average than the rate in the QNHS data.

While discrepancies between the household joblessness rates in SILC and the LFS are found across Europe, the gap is particularly large in Ireland. In 2012, for instance the gap between the two figures for adults was 7.7 percentage points in Ireland compared to 5.1 percentage points for the next largest gap.

### **4.3 Differences in measurement**

The indicators of household joblessness differ between the SILC and the LFS. According to the LFS definition, a person is in a jobless household if they live in a household where no member aged 15 or over is currently in employment for even one hour per week. The SILC definition is based on the working-age adults (aged 18 to 59) in the household having been in employment for less than one fifth of the available time over the reference year. The measures differ in terms of the reference period (current or annual) and the threshold for household joblessness (no employment at all versus less than one fifth of the available time).

We replicated the LFS indicator on the SILC data and compared it to the LFS indicator on the QNHS data. The gap was narrowed, particularly towards the beginning of the 2004 to 2012 period and in 2012, but remained at 3.9 percentage points, on average. This represented a reduction of about one quarter compared to the gap of 5.2 percentage points between the VLWI indicator on SILC and the LFS indicator on the QNHS. This means that only a small proportion of the gap was due to differences in measurement.

### **4.4 Differences in the percentage of adults at work**

Since the measurement differences accounted for only part of the gap between the estimates, we investigated whether the structure of the samples differed between SILC and the QNHS. Of particular relevance from the perspective of the household joblessness indicator was the employment rate. We focused on the ILO definition of employment, which involves the person either having worked for at least one hour in the reference week or having a job from which they were temporarily absent for reasons such as holidays, maternity leave or sick leave. We found that the employment rate in the 18 to 59 age group was higher in the QNHS than in SILC throughout the period, by about 6 percentage points, on average.

Checking an alternative indicator of employment, based on the person's self-definition of their main activity, we found a similar gap (of about 5 percentage points) between the two sources. Census figures on main activity for 2006 and 2011 were much closer to the QNHS than the SILC rates. This suggested that the SILC survey was under-estimating the percentage of people at work.

To investigate the significance of the employment rate for the indicator of household joblessness, we adjusted the SILC sample weights, re-calibrating the adult employment rate for each year based on the QNHS data. This was done for illustrative purposes only and was not intended to substitute for a more comprehensive assessment of the re-calibration strategy for SILC. When we re-calculated the LFS indicator on the SILC data with the revised weights, the gap between this indicator and the same indicator on the QNHS data was dramatically reduced, from an average of 3.9 percentage points with the original weights to 0.8 percentage points with the revised weights. The gap remained somewhat larger for children, however, at 1.6 percentage points.

#### **4.5 Differences in living arrangements**

The remaining gap between the two sources in the rate of household joblessness must be due to the extent to which non-employed adults and children live with someone in employment. To confirm this, we adjusted the SILC weights to take account of living arrangements as well as the employment rate. Again, we used the QNHS figures to estimate the percentage of non-employed adults and children living with employed adults. With this adjustment, the remaining gap between the estimates of household joblessness from the QNHS and SILC was virtually eliminated (reduced to 0.2 percentage points for both adults and children).

#### **4.6 Limitations**

This technical paper had a very particular focus. It was concerned with the gap in the rate of household joblessness between SILC and the QNHS in Ireland in the period from 2004 to 2012. The emphasis was on employment, living arrangements insofar as they are relevant to the indicator of household joblessness and on the age group for whom the household joblessness indicator is calculated (those under the age of 60).

We were able to check the self-definition of employment status against the Census for 2006 and 2011 and found some support for the employment level as measured by the QNHS. We also checked the differences between the surveys in the distribution of work across household types (households with children, households

with non-employed adults), but a validation of the QNHS pattern in this respect was not possible on the basis of published data from the Census.

The calibration undertaken for the purpose of this exercise should not be regarded as definitive. It involved taking the original weight on the SILC micro-data and adjusting it to account for differences in employment and in living arrangements. No constraints were applied to ensure conformity to the original control totals for age, sex, region and household type. The purpose of the re-calibration was to illustrate the impact on estimates of household joblessness of certain differences in sample structure between SILC and the QNHS, not to provide an alternative set of sample weights.

#### **4.7 Implications**

The analysis in this technical paper demonstrated that the main factor accounting for the different estimates of household joblessness between the QNHS and SILC was the lower employment rate in the SILC survey. Differences in definition between the SILC 'very low work intensity' and the LFS 'household joblessness' indicators were of secondary importance, accounting for about one quarter of the gap. Living arrangements – specifically the percentage of non-employed persons living with someone in employment – also played a role but were more important for children than for adults.

Checks against the Census for 2006 and 2011 provided support for having greater confidence in the employment rate as measured by the QNHS. The implication of this is that working households are under-represented in SILC.

This has potentially serious consequences, not only for the indicator of household joblessness calculated on the SILC data, but also because it raises questions about the adequacy of the SILC data in representing the income distribution in Ireland. Since the bulk of household income comes from employment, if working households are under-represented, then the median level of household income, which is used for the calculation of at-risk-of-poverty, is likely to be understated.

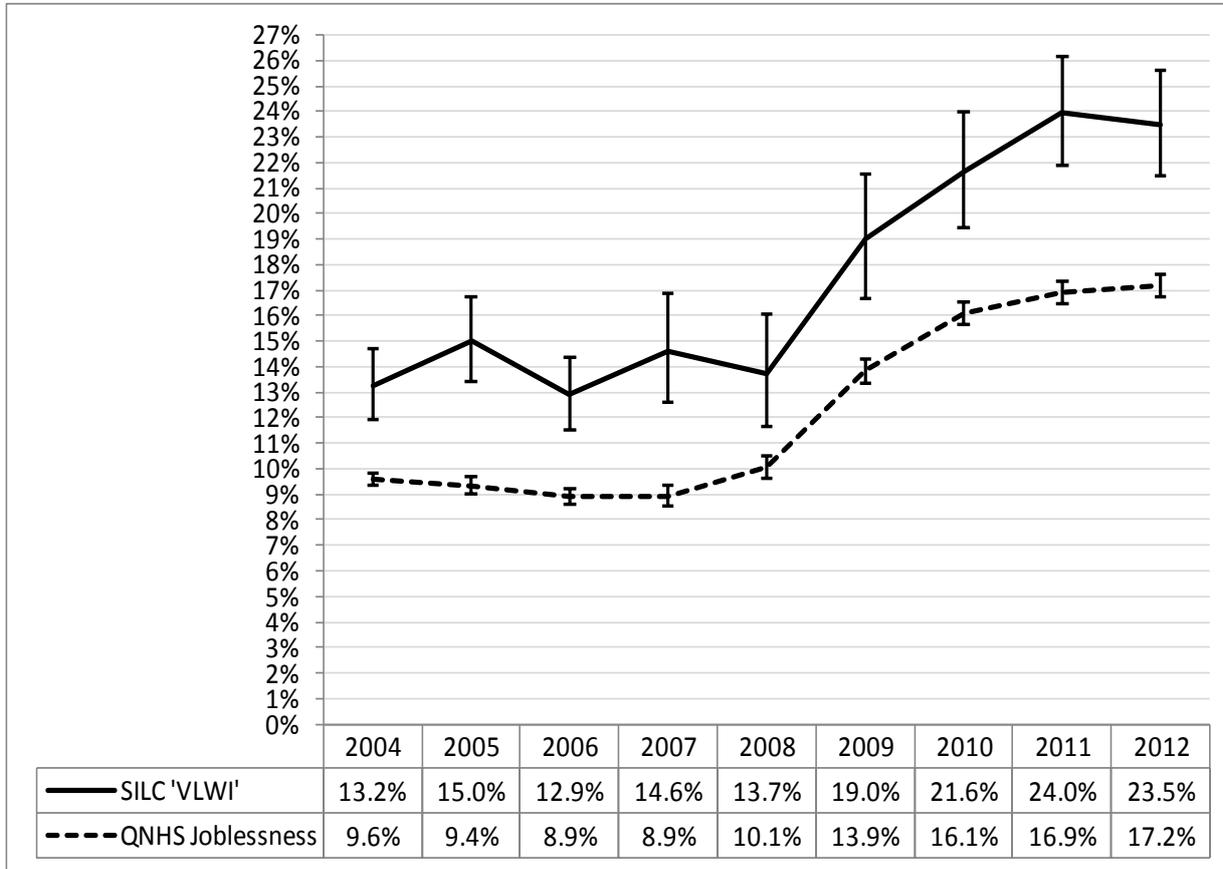
Addressing this issue involves actions on two fronts. The CSO has a project underway to address the issues in both areas. The first issue is to determine whether there are factors that might result in an under-representation of working households in SILC. Possible factors include the sampling strategy, aspects of fieldwork such as the substitution of households in the event of non-response and the impact of the length of the questionnaire on non-response. The QNHS questionnaire is much shorter than the SILC questionnaire. It is possible that the length of the SILC questionnaire results in differential non-response, such that more working households are lost from SILC due to time pressure than are lost from the QNHS. It is not clear why this occurs in Ireland to a greater extent than in other European countries, however.

Another factor that may have been important up until 2013 is sample substitution in the event of non-response (CSO, 2012b, pp. 7-8). If 'difficult to access' households are substituted, this may result in a greater under-representation of busy working households than would be the case if additional resources were devoted to call-backs to non-respondents. We understand that substitution for non-response has already been discontinued from the 2014 round of SILC.

The second means of addressing the issue is to investigate whether employment rates from the much larger QNHS sample might be used to re-calibrate the estimates of employment on the SILC dataset. At present, after re-weighting based on the inverse of the probability of household selection (design weights), the SILC sample is calibrated to population totals for age by sex (four age categories), region (eight regions) and household composition (six categories) (CSO 2012e, p. 88). Given the importance of employment, not only to the calculation of the household joblessness indicator but also to household income more generally, consideration should be given to calibration of the SILC sample based on the QNHS estimates of the proportion of the population at work. The issue of the distribution of work across households would also need to be considered as part of this exercise, but the results here suggest that this was less important than the employment rate. As part of a broader project examining the re-calibration of SILC data, the CSO is currently examining these issues.

## Appendix

**Appendix Figure A1: Confidence intervals for the indicator of household joblessness in SILC and the QNHS**



Source: SILC and QNHS micro-data for Ireland, analysis by authors. Confidence intervals are shown by the error bars. Confidence intervals are calculated for SILC taking account of sample design information provided in the dataset (using the Stata 'svy' routine). Confidence intervals for the QNHS are approximate and are calculated on the assumption that, since the sample design is similar for SILC and the QNHS, the design effects are also similar. Information on the design effect in SILC is used to adjust the standard errors from the QNHS to obtain approximate confidence intervals (Kreuter and Valliant, 2007, p. 9). The margin of error for the SILC estimate is plus or minus 2 per cent, on average, while the margin of effort for the QNHS estimate is plus or minus 0.4 per cent, on average.

**Appendix Table A1: Control totals used for re-calibration of SILC weights based on age, work status and living arrangements**

	2004	2005	2006	2007	2008
<b>1 adult, non-employed</b>	107322	109134	110764	116976	125463
<b>Adult, non-employed, with no employed adult</b>	127661	125409	119340	119053	145380
<b>Adult, non-employed, with employed adult</b>	435356	425277	433705	436332	463108
<b>1 adult, employed</b>	206690	215922	228991	241267	238081
<b>Adult, W, with no employed adult</b>	238132	229629	234896	238045	253162
<b>Adult, W, with employed adult</b>	1303592	1384569	1448168	1510051	1480744
<b>Under 18, with no employed adult</b>	128622	129318	125903	130886	147296
<b>Under 18 with employed adult</b>	900537	905160	919265	940708	953451
<b>Over 60 with no employed adult</b>	453735	468409	479795	494358	525175
<b>Over 60 with employed adult</b>	165695	167177	168995	172507	164178
	2009	2010	2011	2012	
<b>1 adult, non-employed</b>	148207	165418	171436	172781	
<b>Adult, non-employed, with no employed adult</b>	224866	260353	274208	280553	
<b>Adult, non-employed, with employed adult</b>	514982	519240	517320	500047	
<b>1 adult, employed</b>	230936	228308	220444	222364	
<b>Adult, W, with no employed adult</b>	291360	300904	301710	294640	
<b>Adult, W, with employed adult</b>	1297431	1214705	1188147	1179381	
<b>Under 18, with no employed adult</b>	194457	228469	237716	240043	
<b>Under 18 with employed adult</b>	925482	910071	914493	927615	
<b>Over 60 with no employed adult</b>	562626	589894	604367	631122	
<b>Over 60 with employed adult</b>	148799	142411	147315	141626	

Source: QNHS micro-data for 2004 to 2012; analysis by authors. 'Adult' refers to adults aged 18 to 59.

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## Glossary

**At-risk-of-poverty thresholds:** income thresholds derived as proportions of median income. These are based on the household income adjusted for household size and composition (referred to as equivalised income). A household at-risk-of-poverty has an adjusted (or equivalised) income below 60% of the median adjusted household income. The at-risk-of-poverty rate takes account of household income from all sources, number of adults and number of children in the household. There are some minor differences in the income concept and the equivalence scale between the Irish and EU measures of at-risk-of-poverty.

**At-risk-of-poverty:** a term used at EU level to denote whether a household's income falls below the 60% of median income threshold.

**At risk of poverty or exclusion:** this EU measure combines the number of people who experience at-risk-of-poverty or severe material deprivation or low work intensity. This measure is the basis for the Europe 2020 poverty target. In cases where people experience more than one of these indicators, they are counted only once. The Irish version of this measure is the combination of at-risk-of-poverty and basic deprivation.

**At-risk-of-poverty anchored at a moment in time:** the proportion of people with an equivalised disposable income below the at-risk-of-poverty threshold calculated in survey year N, adjusted by inflation over subsequent years. It essentially measures the percentage of the population falling below an at-risk-of-poverty threshold of an earlier year, after accounting for the effects of inflation. This indicator is also referred to as an absolute measure of poverty which reflects changes in fixed living circumstances, as distinct from changes in relative living standards.

**Basic deprivation:** people who are denied – through lack of income – at least **two items or activities on this index / list of 11** are regarded as experiencing relative deprivation. This is enforced deprivation as distinct from the personal choice not to have the items. Eleven basic items are used to construct the deprivation index:

- unable to afford two pairs of strong shoes
- unable to afford a warm waterproof overcoat
- unable to afford new (not second-hand) clothes
- Unable to afford a meal with meat, chicken or fish (vegetarian equivalent) every second day
- unable to afford a roast joint or its equivalent once a week
- without heating at some stage in the last year through lack of money
- unable to afford to keep the home adequately warm
- unable to afford to buy presents for family or friends at least once a year
- unable to afford to replace any worn out furniture
- unable to afford to have family or friends for a drink or meal once a month
- unable to afford a morning, afternoon or evening out in the last fortnight for entertainment.

The indicator of **basic deprivation** was developed by the Economic and Social Research Institute using data from the *Survey on Income and Living Conditions*. See Maître B., Nolan B. and Whelan C. (2006) *Reconfiguring the Measurement of Deprivation and Consistent Poverty in Ireland*, Dublin: ESRI, for further information on the indicator.

**Confidence interval:** whenever we use data from a probability sample to draw conclusions about the population, there is a degree of uncertainty around our estimates. This is often reported as a confidence interval. This is the range within which we can be 95 per cent confident that the population figures lies. For instance, recent calculations of the persistent at-risk-of-poverty rate show a rate of 9.5 per cent (Confidence Interval  $\pm 1.7$  per cent). This means that we can be 95 per cent confident that the

'true' rate in the population lies between 7.8 per cent and 11.2 per cent (i.e. between 9.5-1.7 per cent and 9.5+ 1.7 per cent). In general, for a smaller sample size the confidence interval will be wider.

**Consistent poverty:** this is a measure of poverty used in the *National Action Plan for Social Inclusion 2007-2016 (NAPinclusion)* that takes account of the household's living standards as well as the household size, composition and total income. A household is consistently poor if the household income is below the at-risk-of-poverty threshold (see above) and the household members are deprived of **at least 2 out of the 11 items** on the basic deprivation list.

**Correlation:** a correlation between two variables refers to a statistical relationship of dependence between these two variables. This relationship of dependence can be measured by a correlation coefficient and there are many of them. There are many correlation coefficients and the most known is the Pearson correlation coefficient which measures the strength of the linear relationship between two variables.

**Cronbach's alpha:** a measure of reliability (i.e. internal consistency). It informs us how closely related a set of items are as a group.

**Deprivation:** see definition for basic deprivation above for measure of deprivation used in the *NAPinclusion*.

**Discrimination:** generally used to refer to unfair treatment of a person on the basis of his/her membership of a particular group, in terms of, for example, gender, nationality, disability or race.

**Economic Stress:** Economic stress is measured using four items: difficulty in making ends meet, being in arrears on housing or utility bills, finding housing costs a heavy burden and having to borrow in order to meet everyday living expenses. High economic stress involves experiencing two or more of these difficulties

**Economic vulnerability:** a measure of the economic situation of a household based on whether it is at-risk-of-poverty, experiences enforced basic deprivation and has difficulty making ends meet.

**Employment rate:** the employment rate is the proportion of the working-age population that is employed. The International Labour Organisation (ILO) definition of employed persons are those aged 15 years and over who have worked for payment or profit in the reference week (usually the week preceding the survey) or who had a job from which they were temporarily absent for reasons such as holidays, maternity leave or sick leave.

**Equivalence scales:** a set of relativities between the needs of households of differing size and composition, used to adjust household income to take into account the greater needs of larger households. In Ireland the national scale attributes a weight of one to the first adult (aged 14+) and 0.66 to each subsequent adult and a weight of 0.33 to each child. International comparisons such as the one done by Eurostat uses the modified OECD scale which attributes a weight of one to the first adult (aged 14+) and 0.5 to each subsequent adult and a weight of 0.3 to each child.

**Equivalised Income:** This refers to household income from all sources adjusted for differences in household size and composition (number of adults and children). It is calculated by dividing total disposable (i.e. after tax) household income by the equivalence scale value. It can be interpreted as income per adult-equivalent.

**EU-LFS:** *European Union Labour Force Survey* is based on harmonised national surveys carried out across the EU and designed to provide data on labour force status of people aged 15 and over. In Ireland the QNHS produces the labour force data for the EU-LFS. Any data as compiled by Eurostat and any reference to the EU definitions is here referred to as 'EU-LFS'.

**EU-SILC:** *European Union Statistics on Income and Living Conditions*; this is a voluntary household survey carried out annually in a number of EU Member States allowing comparable statistics on income and living conditions to be compiled. In Ireland, the Central Statistics Office (CSO) have been conducting the survey since 2003. The results are reported in the Survey on Income and Living

Conditions (SILC). Any data as compiled by Eurostat and any reference to the questions or questionnaire in the household survey is here referred to as 'EU-SILC'.

**EU 15:** Member States of the EU prior to the accession of 10 new Member States on 1 May 2004, i.e. Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden and the United Kingdom.

**EU 25:** Member States of the EU after the accession of 10 new Member States on 1 May 2004, i.e. EU 15 plus Cyprus, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Slovakia and Slovenia.

**EU 27:** Member States of the EU since 1 January 2007, i.e. EU 25 plus Bulgaria and Romania.

**EU 28:** Member States of the EU since 1 July 2013, i.e. EU 27 plus Croatia.

**European Socio-Economic Classification (ESeC):** the ESeC is an occupationally based classification but has rules to provide coverage of the whole adult population. The information required to create ESeC is:

- occupation coded to the minor groups (i.e. 3-digit groups) of EU variant of the International Standard Classification of Occupations 1988 (ISCO88 (COM))
- details of employment status, i.e. whether an employer, self-employed or employee
- number of employees at the workplace
- whether a worker is a supervisor
- economic sector (agriculture or other industries).

**Factor analysis:** a statistical technique to see whether a number of variables of interest (such as deprivation items) are linearly related to a smaller number of unobservable factors (such as dimension of deprivation).

**Household:** a household is usually defined for statistical purposes as either a person living alone or a group of people (not necessarily related) living at the same address with common housekeeping arrangements – that is, sharing at least one meal a day or sharing a living room or sitting room.

**Household equivalent (or equivalised) income:** household income adjusted to take account of differences in household size and composition by means of equivalence scales.

**Inactive:** the inactive population is the working-age population that is not in the labour force.

**In-work poverty:** is measured as the risk of income poverty for individuals who were employed for more than half the income reference period. It is calculated at the individual level for adults who are at work either full-time or part-time. The indicator captures being at work and, at the same time, being in a household 'at-risk-of-poverty'.

**Labour force participation:** the labour force participation rate is a measure of the proportion of the working-age population that engages actively in the labour market, either by working or looking for work.

**LFS:** in Ireland, the Central Statistics Office (CSO) is responsible for produces the required data for EU-LFS from the Quarterly National Household Survey (QNHS). They produce reliable quarterly labour force statistics.

**Life expectancy:** the number of years that a person could expect to live on average, based on the mortality rates of the population in a given year.

**LIIS:** the Living in Ireland Survey, a household survey carried out by the Economic and Social Research Institute between 1994 and 2001.

**Lone parent:** a parent who has primary custody of a dependent child and is not living with the other parent.

**Material deprivation (EU):** this indicator is one of the European Commission's common indicators on social protection and social inclusion. It measures the proportion of the population lacking at least three out of the following nine items:

- arrears on mortgage or rent payments, utility bills, hire purchase instalments or other loan payments
- capacity to afford paying for one week's annual holiday away from home
- capacity to afford a meal with meat, chicken, fish (or vegetarian equivalent) every second day
- capacity to face unexpected financial expenses (set amount corresponding to the monthly national at-risk-of-poverty threshold of the previous year)
- household cannot afford a telephone (including mobile phone)
- household cannot afford a colour TV
- household cannot afford a washing machine
- household cannot afford a car
- ability of the household to pay for keeping its home adequately warm.

**Mean:** the average value (for example, the average income in a sample obtained via household survey).

**Median:** the value that divides a sample in half (e.g. the income level above and below which half the people in a sample fall).

**Planning region:** the eight regions into which Ireland has been divided for certain planning and administrative purposes.

**Poverty gap:** the shortfall in incomes for those who fall below the at-risk-of-poverty threshold.

**Poverty and Social Exclusion:** these terms are defined broadly in the *National Action Plan for Social Inclusion 2007-2016 (NAPinclusion)* as follows:

'People are living in poverty if their income and resources (material, cultural and social) are so inadequate as to preclude them from having a standard of living which is regarded as acceptable by Irish society generally. As a result of inadequate income and resources people may be excluded and marginalised from participating in activities which are considered the norm for other people in society.'

The two concepts are very similar when used in Irish policymaking but poverty is sometimes used in the narrower context to refer to low income (or wealth). On the other hand, social exclusion is almost always used in the broader sense, to refer to the inability to participate in society because of a lack of resources that are normally available to the general population.

**QNHS:** *Quarterly National Household Survey*; this is large-scale a nationally representative survey of private households. It was introduced in September 1997 to replace the annual Labour Force Survey. It is designed to provide reliable quarterly labour force statistics and is carried out by the Central Statistics Office. Any data or analysis in this paper that is sourced specifically from the CSO is here referred to as 'QNHS'.

**Quintile:** One-fifth of a sample divided into five equal parts to show how income, for example, is spread throughout the population; each quintile represents where a person's or household's income is located, ranging from the bottom quintile (lowest fifth or 20 per cent) to the top quintile (highest fifth or 20 per cent).

**Re-calibration:** this is a technique used to adjust sample weights to ensure they are representative of the population.

**Risk-of-poverty:** a term used at EU level to denote whether a household falls below the 60% of median income threshold.

**Severe material deprivation:** this EU indicator measures the proportion of the population lacking at least four of the nine items listed in the EU index of material deprivation (see definition above).

**SILC:** in Ireland, the Central Statistics Office (CSO) is responsible for carrying out the EU-SILC survey. They produce analysis in accordance with Irish national poverty targets, indicators and related issues. These results are reported in the Survey on Income and Living Conditions (SILC). Any data or analysis that is sourced specifically from the CSO is here referred to as 'SILC'.

**Social welfare transfers:** cash receipts paid from various social welfare schemes received by the individual or household.

**Urban/rural location:** in EU-SILC each country is divided into eight levels based on population density. These areas are further grouped into urban and rural areas as follows:

- **Urban:** cities, suburbs of cities, mixed urban/rural areas bordering on the suburbs of cities, towns and surrounding areas with populations of 5,000 or over (large urban); mixed urban/rural areas bordering larger towns; and towns and surrounding areas with a population of 1,000 to 5,000 (other urban)
- **Rural:** mixed urban/rural areas, and rural areas.

**Validity:** the extent to which a measure is identifying the construct we are interested in. Sometimes a distinction is made between:

- face validity (the items appear, on the 'face' of it) to measure the construct we are interested in and
- construct validity: the measure is related to other characteristics in the way we would expect. This is sometimes divided into:
  - **convergent validity:** the measure is positively associated with things we would expect it to be associated with (e.g. deprivation is associated with low income);
  - **discriminant validity:** the measure is distinct from other indicators that may be related but are not the same, e.g. at-risk-of-poverty is distinct from economic stress – they are related, but not identical.

**Very low work intensity (VLWI)** This is the EU measure of joblessness at the household level. It consists in the adult members of the household working for less than 20 per cent of the potential working time in the reference year. (See also 'Work intensity, below).

**Vulnerable to consistent poverty:** This is a group who experience the same level of basic deprivation as the consistently poor (lack two or more of the 11 basic items), but who have a slightly higher household income: their incomes (after adjusting for size and composition) are above the 60% income poverty threshold but below the 70% income poverty threshold.

**Work intensity:** This is an indicator of the amount of available work time the working-age adults in a household actually spend at work. It is calculated as the proportion of person-months over the reference year that working-age adults (18 to 59) actually spend in employment. An adjustment is made to the calculation for those who work part-time. Work intensity is often presented in five categories:

- Very low work intensity: Less than 20 per cent
- Low work intensity = 20 per cent to less than 45 per cent
- Medium work intensity = 45 per cent to 55 per cent
- High work intensity = over 55 per cent to 85 per cent

- Very high work intensity= over 85 per cent to 100 per cent.

**Working poor:** the population below the at-risk-of-poverty threshold (typically 60% of median equivalised income) containing some household members who are in paid work.