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Technical Paper on the Measure of Basic Deprivation and Consistent Poverty in Ireland.

An Analysis of the Central Statistics Office (CSO) Survey on Income and Living Conditions (SILC), 2019

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Technical Paper on the Measure of Basic Deprivation and Consistent Poverty in Ireland

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Abstract

In this technical paper, we use Irish SILC data for 2019 to assess the validity of the existing deprivation and consistent poverty measures. Currently, the Central Statistics Office, the Irish Government, and researchers use an 11-item indicator to capture deprivation and consistent poverty in Ireland. We test the validity of this measure by running the original 2006 analysis (based on SILC 2004) using 2019 SILC data and comparing the results. We find that, in terms of reliability, a 15-item measure is a slight improvement on the 11-item measure proposed in 2006. However, we also find that the original 11-item measure captures deprivation well and has reliable internal consistency and validity. The differences between the 11-item measure and our proposed 15-item measure are minor and hardly sufficient to justify loss of continuity over time. Researchers should continue using the 11-item measure.

Key words: material deprivation, consistent poverty, social risk group, social exclusion, poverty, SILC, Ireland

Table of Contents

Authors ..... **i**
Abstract ..... **iii**
Authors' Acknowledgements ..... **vii**
Chapter 1: Introduction **8**
1.1 Purpose of the Paper 8
1.2 Literature Review 10
1.3. Outline of the Paper 14
Chapter 2: Methodology and SILC's Deprivation Measures **15**
2.1 Introduction 15
2.2 Data and Measurement 15
2.3 Dimensions of Deprivation 17
Chapter 3: Dimensionality of Deprivation **23**
3.1 Introduction 23
3.2 Reliability 23
3.3 Validity 322
3.4 Consistent Poverty 37
3.5 Material Deprivation in Ireland in a European Context 41
Chapter 4: Vulnerable Groups and Deprivation **44**
4.1 Introduction 44
4.2 Risk of Deprivation and Socio-demographic Characteristics 44
4.3 Risk of Consistent Poverty and Socio-demographic Characteristics 47
Chapter 5: Conclusions **511**
5.1 Introduction 511
5.2 Limitations 522
5.3 Policy Implications 533
References **555**
Appendix **588**
Glossary **622**

List of Tables

Table 3.1: Rotated Factor Loadings with Oblique Rotation, 2019 25
Table 3.2: Cronbach's Alpha over Basic Deprivation with 20 Items, 2019 28
Table 3.3: Cronbach's Alpha over Basic Deprivation with 16 Items, 2019 29
Table 3.4: Cronbach's Alpha over Dimensions of Deprivation, 2019 300
Table 3.5: Correlations between Deprivation Dimensions..... 311
Table 3.6: Percentage of People Deprived by Deprivation Measure, 2019..... 32
Table 3.7: Percentage of People Experiencing Financial Difficulties by Deprivation level, 2019 333
Table 3.8: Percentage of people experiencing financial difficulties by deprivation Level, 2019 36
Table 3.9: Percentage of Financial Difficulty by Definition of Deprivation, 2019..... 37
Table 3.10: Percentage of People Deprived by AROP at 60% Median Equivalised Income, 2019..... 38
Table 3.11: Percentage of People AROP by Deprivation, 2019 38
Table 3.12: Consistent Poverty by Deprivation Measure, 2019..... 39
Table 3.13: Overlap between Consistent Poverty Measures (%), 2019 39
Table 3.14: Basic Deprivation and Consistent Poverty Trends (2016-2019)..... 40
Table 3.15: Age and Region Differences in Consistent Poverty Measures, 2019 40
Table 4.1: Deprivation by Social Risk Groups (%), 2019..... 45
Table 4.2: Deprivation by Social Class Groups of Head of Household (%), 2019 .. 455
Table 4.3: Deprivation by Education Attainment of Head of Household (%), 2019 .. 46
Table 4.4: Deprivation by Household Joblessness (%), 2019 47
Table 4.5: Consistent Poverty by Social Risk Groups (%), 2019..... 48
Table 4.6: Consistent Poverty by Social Class Groups of Head of Household (%), 2019..... 48
Table 4.7: Consistent Poverty by Education Attainment of Head of Household (%), 2019..... 49
Table 4.8: Consistent Poverty by Household Joblessness (%), 2019 49
Table A1: Social Risk Groups and Deprivation Composition (%), 2019 588
Table A2: Social Class Groups and Deprivation Composition (%), 2019 588
Table A3: List of Abbreviations for the 15-item Basic Deprivation..... 599

List of Acronyms

AROPE	At Risk of Poverty or Exclusion
CSO	Central Statistics Office
ESRI	Economic and Social Research Institute
EU	European Union
EU2020	Europe 2020
EU-SILC	European Union Statistics on Income and Living Conditions
LIS	Living in Ireland Survey
NESC	National Economic and Social Council
OECD	Organisation for Economic Co-operation and Development
QNHS	Quarterly National Household Survey
SILC	Survey on Income and Living Conditions
VLWI	Very Low Work Intensity

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Chapter 1: Introduction

1.1 Purpose of the paper

The purpose of this paper is to explore whether Ireland's current measures of deprivation and consistent poverty are fit for purpose. Previous reports have found that measures of deprivation need reviewing and reconfiguring, especially when used to measure consistent poverty in Ireland (Whelan 2007; Maître et al., 2006). Researchers in Ireland have tested and updated these measures before. In this technical paper we reassess the current 11-item measure using the most recent data available, while considering new living standards and expectations. This data is taken from the 2019 Survey on Income and Living Conditions which monitors income poverty and deprivation in Ireland.

Poverty exists when people's *"…resources are so seriously below those commanded by the average individual or family that they are, in effect, excluded from ordinary living patterns, customs and activities"* (Townsend 1979). This definition also aligns with Ireland's national anti-poverty strategies, including the Roadmap for Social Inclusion 2020-2025, which includes the definition adopted in 1997 that states:

> *"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 other resources people may be excluded and marginalised from participating in activities, which are considered the norm for other people in society"* (Roadmap for Social Inclusion 2020-2025).

Further, rather than focusing on the concept of poverty, the recent Roadmap for Social Inclusion 2020-2025 focuses on the terminology of social inclusion defined as follows "*Social Inclusion is achieved when people have access to sufficient income, resources and services to enable them to play an active part in their communities*

and participate in activities that are considered the norm for people in society generally."

Since the current measure of deprivation was adopted in 2007 there have been significant changes in the Irish economy and society, not least the Great Recession (2008-2012) and subsequent recovery (2013 onwards). Therefore, it is timely to reconsider the current measure of deprivation and assess whether the indicators used need to be supplemented or changed in order to better capture those most exposed to the risk of poverty and social exclusion in Ireland.

The initial basic deprivation index used in national poverty monitoring in Ireland contained eight items and relied on the Living in Ireland Survey (LIS) (Nolan et al., 2002). This measure had a threshold of lacking one item or more. In 2006, ESRI researchers proposed an 11-item indicator using the SILC dataset, showing that the updated measure was more consistent and better able to capture those at risk of poverty and social exclusion (Whelan, 2007; Maître et al., 2006). This measure had a threshold of lacking two items or more. The 11-item measure retained six items from the initial measure and added five new items (Whelan, 2007; Maître et al., 2006).

In the current report we analyse 47 potential indicators of deprivation contained in the SILC. We identify a 15-item measure with a threshold of lacking three items or more that offers a slight improvement on the 11-item measure, in terms of internal consistency.[1] However, we find that the difference between the 11-item and 15-item measure is minor, and that the previous 11-item measure is still accurately capturing deprived households and deprived people.

The report also investigates how the alternative 15-item measure relates to income poverty and the implications for the measure of consistent poverty.

[1] Internal consistency (or reliability) measures the homogeneity of the items in measuring the same concept in a constructed scale (Henson, 2001) supporting our confidence in the interpretation of the scale measured.

1.2 Literature review

Poverty has two core elements, a lack of resources and a general inability to participate in society to a normal standard (Whelan, 2007; Nolan and Whelan, 2010; Maître et al., 2006; Townsend 1979). While much research focuses only on income thresholds to distinguish poor households and individuals (Kus et al., 2017; Förster and Pearson, 2002; Bradshaw and Chen,1996), others have combined these with non-monetary measures which capture low socioeconomic status and deprivation (Tomlinson and Walker, 2009; Maître et al., 2006; Saunders and Naidoo, 2009). The inclusion of deprivation in the measurement of poverty in Ireland is grounded in a theoretical understanding of the multi-dimensional nature of poverty (Nolan and Whelan 2007; Whelan et al., 2019). Nolan and Whelan also argue that while income measures can show who is poor, deprivation measures can show *"what it is like to be poor"* (2010, p.306). Importantly, previous research shows that deprivation indicators should be specific, and should be tested regularly (Whelan, 2007; Maître et al., 2006).

Non-monetary indicators of deprivation have also been adopted in European measures of poverty. The official poverty measure of the EU includes income poverty, material deprivation and labour market situation. The European approach to poverty measurement is discussed below. The overlap between the EU deprivation measure, the current Irish measure and the alternative 15-item deprivation measure is outlined in Section 4.4. We first consider income poverty measures and their limitations.

1.2.1 Income poverty measures

Relative income poverty or the at-risk-of income poverty rate is calculated using an income threshold related to mean or median income. Previous research has set these thresholds between 40 and 70 per cent of equivalised median household income (Bradshaw, 2001; Whelan 2007; Saunders and Naidoo, 2009). The

European Commission and the Irish government use the threshold of 60 per cent of the median equivalised household income for the official poverty lines.[2]

There are a number of well-known limitations in the reliance solely on income as a measure of poverty. First, current income does not include savings[3] or other assets or accumulated debts, which can result in households with the same level of income having a very different standard of living and pattern of consumption (Whelan, 2007; Maître et al., 2006; Saunders and Naidoo, 2009). Second, non-cash benefits and services (like healthcare, childcare, and other benefits) for specific groups can affect consumption despite not impacting the person's income (Maître et al., 2020; Whelan 2007). Third, households and individuals on the same income can have different needs that are not fully accounted for by equivalising income.[4] For example, people with a disability have significant extra costs to attain the same standard of living (Cullinan et al., 2011). Fourth, the understanding of the changes in income poverty rates over time can be difficult, as poverty rates are based on relative income poverty thresholds that fluctuate with the median (or mean) income. Finally, deprivation items are useful for clarifying instances where income has been mis-recorded or is more difficult to calculate (Nolan and Whelan, 2010).[5]

Moreover, as outlined above, conceptually social exclusion is not confined to low income, but consists of people who are more generally disadvantaged in society, in spheres like education, health, housing, and access to the labour market (Nolan and Whelan, 2010). Therefore, measures of deprivation can provide further information of those who need support. For these reasons, non-monetary indicators can better identify excluded groups with low incomes.

[2] Eurostat uses the modified OECD equivalence scale and CSO uses a national equivalence scale. For more details about the CSO equivalence scale see: https://www.cso.ie/en/aboutus/takingpartinasurvey/surveysofhouseholdsindividuals/surveyonincomelivingconditions/.

[3] Interest on savings and investments is included.

[4] These adjust for the number of adults and children in the household, but do not take account of other differences in need

[5] Some household surveys ask people to self- estimate and report their total household income forgetting some income components resulting into an underestimation of their real total household income. The use of administrative records in SILC minimises this problem, but the incomes of the self-employed are more volatile and difficult to measure.

1.2.2 Deprivation measures in Ireland

One challenge in using material deprivation indicators is the wide array of available measures. Nolan and Whelan (2010) observe that the measures were developed ad-hoc as countries learned from each other's approaches and combined measures to construct unique indicators. The current 11-item deprivation measure was adopted following an analysis of over 40 indicators of material deprivation and a detailed comparison of the validity and consistency with the old eight-item measure (Whelan, 2007).

Whelan (2007) showed that the 11-item 'broad' measure outperformed the eight-item 'narrow' measure in three important ways. First, the broad 11-item measure was more strongly correlated with income than the narrow measure. Second, in terms of reliability, the broader measure had a higher Cronbach's alpha[6] than the narrow measures, although both measures had high internal consistency. Finally, on construct validity, the broad measure was highly correlated with key disadvantaged group status, and this correlation was stronger than that between the narrow measure and the same groups.[7] In particular, the broad measure was more strongly correlated with labour force status, educational qualifications, social class, and housing tenure.

On foot of this re-examination of the deprivation scale Whelan (2007), and elsewhere Maître et al., (2006),) concluded that the 11-item measure better captured the target population in terms of socioeconomic disadvantage. In both articles the authors emphasise the importance of routinely re-assessing, with new data, how deprivation and poverty measure can be best constructed. A *"good standard of living"* is a dynamic concept that routinely changes. For example, in the past access to a landline may have been important for social interaction, accessing information and seeking work. More recently, internet access and computer or smartphone access has become much more important for participating in society. To keep up with such changes, measures of deprivation should be tested and if necessary, updated. The

[6] Cronbach's alpha is a measure of internal consistency, ranging from 0 to 1 where a high value means a high internal consistency. See footnote 1 about internal consistency and Cronbach (1951) and Tavakol and Dennick (2011) for technical details.
[7] The validity of a measure or of an index is the extent to which it measures effectively what it is supposed to capture.

social and economic shock caused by the COVID-19 pandemic may further alter our understanding of deprivation and acceptable standards of living, for example, by highlighting the importance of infrastructure like broadband access or local green spaces. These changes have not been picked up in the current analysis as the most recent SILC data was collected 2019.

1.2.3 Poverty and deprivation measurement in the EU

The EU has also adopted a multidimensional indicator of poverty and social exclusion. In 2010, the European Commission adopted a poverty target as part of the Europe 2020 strategy for *"for smart, sustainable and inclusive growth"* (European Commission, 2010). The headline target on poverty and social exclusion was to lift at least 20 million people out of poverty and social exclusion by 2020. The European Commission proposed an indicator designed by Eurostat (2013) to monitor progress towards the headline poverty target. Those below a 60 per cent income poverty threshold, **or** above a three-item material deprivation threshold, **or** in a 'jobless' household are considered at risk of poverty or social exclusion (Maître et al., 2013). This measure is called the At Risk of Poverty or Social Exclusion (AROPE) rate. This definition considers membership of any category as grounds for including someone as poor and social excluded. Research has found the countries' rates of poverty differ widely depending on which of the component measures are included (Copeland and Daly, 2012, p.274; Maître at al., 2013). This approach thus focuses on the union of indicators rather than their intersection as is the cases with consistent poverty.

Maître et al. (2013), using the EU-SILC 2009, showed that the overlap between the three components (income, deprivation and joblessness) differs widely across Members States. The cumulative addition of deprivation to low income had a big impact on the rate, depending on the country considered. In Denmark, the Netherlands, Luxembourg, and the UK the AROPE rate increased by one per cent. In Northern Scandinavian countries, the inclusion of deprivation did not change the AROPE that was found using income poverty alone, suggesting both measures captured a similar key group of people. However, in Romania, Bulgaria, and Hungary

the AROPE rate doubled with the inclusion of deprivation, suggesting that measures of deprivation and income poverty were identifying two distinctly different groups.

Adding the final criterion, people living in jobless households (also labelled *"low work intensity"*) who are not in income poverty or experiencing material deprivation, does little to change the AROPE in most countries, but does affect countries like the UK and Ireland. Here poverty levels are especially sensitive to low work intensity households, where the rate increases by seven and ten percentage points respectively (Maître et al., 2013).

A number of studies have highlighted that the EU AROPE measure of poverty is particularly prone to mischaracterisation of the poor and deprived among new EU Member States (Ayllón and Gabos, 2017; Maître et al., 2013). Maître et al. (2013) argue for an intersection approach like that used in the Irish consistent poverty measure.

This previous analysis of the EU poverty measure highlights the importance of selecting items for the deprivation measure that are internally consistent and in setting a threshold which means that the measure is correlated with vulnerable group status.[8] This suggests that the measure should be updated and reconfigured regularly, which is the purpose of this paper.

1.3. Outline of the paper

The remainder of the paper is organised as follows. Chapter 2 presents the methodology and discusses SILC's deprivation measures more broadly. Chapter 3 outlines the results of our factor analysis and compares the new measure to the previous measure. Chapter 4 considers how this measure varies across vulnerable groups and vulnerable households. Chapter 5 concludes and outlines several recommendations.

[8] Vulnerable groups (lone parents or people with disabilities, for example) are people whose socio-demographic profile is associated with greater likelihood of risk of poverty and social exclusion than experienced by the overall population.

Chapter 2: Methodology and SILC's deprivation measures

2.1 Introduction

In this chapter, we present the methodology of the paper and outline the current 11-item deprivation measure, while discussing the full range of deprivation measures that exist in the SILC dataset.

2.2 Data and measurement

2.2.1 SILC survey

The purpose of the Survey on Income and Living Conditions (SILC) is to provide statistics on household and individual income as well as related indicators of living standards, poverty and inequality (CSO, 2012a, p.87). The SILC survey in Ireland has been conducted by the Central Statistics Office (CSO) since 2004.[9] It is also the Irish component of the broader European Union Statistics on Income and Living Conditions (EU-SILC) overseen by Eurostat.

The Survey on Income and Living Conditions (SILC) is a voluntary survey of private households. The primary focus of SILC is the collection of information on the income and living conditions of different types of households in Ireland and to derive indicators on poverty, deprivation and social exclusion. From 2004, the completed sample size was between 5,000 to 6,000 households each year. During the household interviews, every person aged 16 and over is interviewed face-to-face and detailed information is collected on the whole household, such as household composition and the nature of the dwelling. In 2019, the sample size was 4,183 households and 10,698 individuals (Central Statistics Office, 2020).

[9] A restricted sample was first collected in the latter half of 2003.

The CSO uses a two-stage sample design when gathering the data.[10] All households in Ireland have an equal probability of selection. The sample is stratified by NUTS4, and quintiles derived from the Pobal Haase-Pratschke HP Deprivation Index.[11]

Sample weights were obtained by adjusting design weights for patterns of non-response. These were further adjusted to reflect the wider population. At the household level, weights were designed to account for household composition and region. At the individual level, weights were designed to account for the age and sex differences in the population.

2.2.2 Deprivation in the SILC survey

The SILC survey has an advantage over previous surveys like Living in Ireland in that it has more measures of deprivation to choose from, over 40 in the 2019 SILC dataset. Households that cannot afford customary goods and services are deprived. Currently, these households are identified using an 11-item basic deprivation measure listed below, where an inability to afford two or more items from this list constitutes deprivation:

- two pairs of strong shoes
- a warm waterproof overcoat
- buy new (not second-hand) clothes
- eat meal with meat, chicken, fish (or vegetarian equivalent) every second day
- have a roast joint or its equivalent once a week
- had to go without heating during the last year through lack of money
- keep the home adequately warm
- buy presents for family or friends at least once a year
- replace any worn out furniture
- have family or friends for a drink or meal once a month

[10] See note in the Appendix for more details about the sampling methodology.
[11] The HP deprivation index is a synthesis indicator based on three dimensions of disadvantage of the population living in “small areas”, they are: the demographic profile, the social class composition and the labour market situation. See http://trutzhaase.eu/deprivation-index/the-2016-pobal-hp-deprivation-index-for-small-areas/ for more details.

- have a morning, afternoon or evening out in the last fortnight for entertainment.

2.3 Dimensions of deprivation

In this report, we consider 47 items over four dimensions of deprivation as identified by Maître et al. (2006): basic deprivation, secondary deprivation, housing deprivation, and neighbourhood environment. We discuss the full list of items below, which are measured at both the individual and the household level.

Most of the questions asked in 2019 appeared in the first wave of SILC data collection in 2004; however, six new questions were added in 2016 to follow new EU regulations. These six new items will be examined to see if they might be included in a revised basic deprivation measure to give a more up-to-date picture of deprivation among the population. The measures can be split into wider deprivation categories, such as consumer durables, housing, the neighbourhood conditions of the households, and people's social interaction with family and friends.[12] We discuss each of these in turn.

The first set of measures considers if households can afford a list of specific items in the home (the question wording is outlined in appendix table A3), with three possible answers: *"Yes"*, *"No because cannot afford"*, *"No, other reason"*. In considering items for a deprivation index, we are interested in cases where the answer is *"No because cannot afford"*. The items are listed below:

- paying for a week's annual holiday away from home in the last 12 months
- eating meat chicken or fish (or vegetarian equivalent) every second day, if you wanted to
- having a roast joint (or equivalent) once a week
- buying new, rather than second-hand clothes

[12] Additional information on the questionnaire used for the CSO's SILC is available here. https://www.cso.ie/en/media/csoie/methods/surveyonincomeandlivingconditions/PR_700162_Standard_Report_on_Methods_and_Quality_for_the_2019_Survey_and_Income_and_Living_conditions_(EU-SILC)_(19).pdf

- a warm waterproof overcoat for each household member
- two pairs of strong shoes for each household member
- replacing any worn-out furniture
- keeping your home adequately warm
- having friends or family for a drink or meal at least once a month
- buying presents for family/friends at least once a year.

The next topic considers consumer durables. Respondents for the household are asked if the household have a given item in the home. The possible answers are *"Possesses item"*, *"Doesn't possess because cannot afford"* and *"Doesn't possess, other reason"*. Lacking an item for reasons of affordability is the outcome of interest.

The items are listed below:

- satellite dish
- DVD player
- video recorder
- stereo
- CD player
- camcorder
- home computer
- TV
- dish washer
- liquidiser
- washing machine
- clothes dryer
- telephone (fixed line)
- vacuum cleaner
- fridge
- fridge with separate freezer
- deep freeze
- deep fat fryer
- microwave

- food processor
- car.[13]

The third measure considers housing deprivation and facilities in the home. Each measure contained two answers, *"Yes"* or *"No".* Some measures asked if the household shared certain amenities with non-household members. Because these amenities are very basic and common, we considered respondents to be deprived on each item if they either answered *"No"* to the question or if they shared an amenity. These are listed below:

- bath or shower
- internal toilet
- central heating
- hot water
- running water.

The next set of questions considered specific problems with the dwelling as well as the person's neighbourhood. The questions are only answered by the head of the household,[14] who answers either *"Yes"* or *"No"* to each measure. A household is therefore considered deprived if the household respondent answers *"No".* They are:

- leaking roof, damp walls/ceilings/floors/foundations, rot in doors, window frames.
- rooms too dark, light problems.
- noise from neighbours or from the street.
- pollution, grime or other environmental problems.
- crime, violence or vandalism in the area.

[13] The question about possession and affordability of a car was asked separately to the other consumer items.
[14] Although this section focuses only on the Household Reference Person (HRP), previous Irish research has shown that HRP responses correlate strongly with partner responses on deprivation measures (Cantillon et al., 2016).

The last set of questions is asked to all household members aged 16 and over. We selected the answer from the household reference person (HRP), and we applied their answer to all household members. The format of answers varies across questions such as some straightforward answers (*"Yes"* or *"No"*) or three option answers (*"Yes", "No, can't afford"* or *"No, other reasons"*). The topics of some of these questions are already covered with the questions asked at household level in the first set of measures (clothes, shoes, meal with friends, family) so we are not using these items in the analysis about the dimensions of deprivation. The list of items is:

- in the last fortnight having a day without a substantial meal due to lack of money ("*Yes"/"No"*)
- had to go without heating during the last 12 months through lack of money ("*Yes"/"No"*)
- have a morning, afternoon or evening out in the last fortnight, for your entertainment ("*No, cannot afford"*)
- have a mobile phone? ("*Yes"/"No"*)
- regularly participate in a leisure activity (sport, cinema, concert) ("*No, cannot afford"*)
- spend a small amount of money each week on yourself ("*No, cannot afford"*)
- internet connection for personal use at home ("*No, cannot afford"*)
- replace worn-out clothes by new ones (not second-hand clothes) ("*No, cannot afford"*)
- two pairs of strong shoes (including an all-weather one) (*"No, cannot afford"*)
- get together with friends or family for a drink or meal at least once a month (*"No, cannot afford"*).

Based on the analysis of the items available in SILC 2004, Maître, Nolan and Whelan (2006) hypothesise that these measures can be split into four factors or dimensions of deprivation. While new deprivation items have been added since SILC 2004, we start our analysis with the same hypothesis, that the measures in SILC 2019 fit into four distinct factors or dimensions of deprivation. We use the same terminology as Maître, Nolan and Whelan (2006) to describe these dimensions:

1. Basic deprivation – consisting of basic items relating to food, clothing, furniture but also minimal participation in social life.
2. Secondary deprivation – comprising mainly a range of consumer durables including a phone, PC, Video, CD, dishwasher etc.
3. Housing facilities – comprising basic facilities such as bath, toilet etc.
4. Neighbourhood environment – including items about pollution, crime/vandalism, noise but also items relating to deteriorating housing conditions.

There are significant cost differences in the items proposed here, where owning a stereo for example may be less expensive than affording a weeklong holiday. We argue that, it is important not to dwell on the individual items themselves, but rather how these items fit together to capture deprived groups. Although cost differences between items exist, it is how these items fit into the wider distribution of poverty and deprivation, and if they do fit, how these categories experience economic pressure like ‘making ends meet’ and other subjective experiences of deprivation. Frequency of being unable to afford an item will of course vary with cost. This is investigated in the analysis of scale reliability, if one more expensive item dominates the scale, it will be excluded.

Further, some of items above, particularly consumer durables, could be provided by a landlord if the person is renting, or by other household members if the person is living with family. The concern here is whether the person is excluded from access to items that are possessed by the majority of the population and to test whether lacking an item is or is not associated with a wider underlying concept of deprivation, not with whether the item is purchased by the household or is provided by the landlord and costed into rent.

Finally, although some of the items appear outdated (a video recorder, for example), the emphasis is again on whether the person could afford the item, and not whether they have access to such items or whether they are already provided to that person by someone else.

Using the measures above, we run a factor analysis and determine the appropriate measure of basic deprivation from this analysis. We then update the measure in steps, before comparing the new measure to the previous 11-item measure as outlined by Whelan (2007) and Maître et al. (2006). This analysis is presented in the next chapter.

Chapter 3: Dimensionality of deprivation

3.1 Introduction

The current measure of deprivation (based on 11-items) designed by Maître, Nolan and Whelan (2006) was adopted by the Irish Government in 2007 as an official measure of basic deprivation and consistent poverty. In this chapter we build on this analysis and explore if the current measure of deprivation remains relevant or if it needs to be updated by a new measure, using 2019 data. We assess the quality of a deprivation measure by using criteria of reliability and validity. The reliability study involves looking at the internal consistency of the items within the measure; that is, how well all the items in this measure go together. The validity analysis consists in looking at how well the identified measure is associated with other variables in accordance with theoretical expectations. We follow the same approach developed by Maître, Nolan and Whelan (2006) in identifying the current dimensions of deprivation in Ireland and testing if these dimensions and their components (including the measure of basic deprivation) are similar to the ones found in 2006 using SILC 2004.

3.2 Reliability

Before presenting the results, we briefly outline what the purpose of factor analysis is. Factor analysis is a statistical technique that reduces many variables into smaller categories or factors. The method is a form of exploratory data analysis which looks for joint variations in latent variables. In our case, the many items that people can't afford are our observed variables, and our hypothesised forms of deprivation are our latent variables. As with previous authors, we are interested in capturing a measure of basic deprivation, which can be combined with indicators of income to measure consistent poverty.

3.2.1 Initial factor analysis

We first run an exploratory factor analysis without specifying a factor solution (the number of latent variables which we think may exist among the data). The factor analysis gives eigenvalues of the correlation matrix. Then, based on the Kaiser's criterion of eigenvalues greater than one (Kaiser, 1960) our factor analysis suggests that we have a ten-factor solution (or ten latent variables tied to deprivation).[15] However, a ten-factor solution does not make theoretical sense in that it becomes impossible to interpret and isolate a basic form of deprivation.[16] Instead, we use a supplementary criterion of selecting factors where the cumulative variance reaches a threshold of 60 per cent, as commonly accepted in social sciences (Hair et al., 2006), and we identify a four-factor solution (cumulative variance of 64%), similar to previous authors.

We then run a second exploratory factor analysis with a four-factor solution, based on the cumulative variance criterion and the hypothesis that there are four dimensions of deprivation as found previously by Maître, Nolan and Whelan (2006). We use a tetrachoric correlation matrix as the deprivation items are binary (value of 0 or one) and we hypothesise that the dimensions of deprivation are correlated (oblique rotation).[17] Table 3.1 shows the factor loadings (correlation) of each item with a four-factor solution. For ease of interpretation, we report only loadings greater than 0.3 (Field, 2013, p.692).

[15] Eigenvalues are the total amount of variance accounted for by each factor.
[16] The results for the factor analysis without selecting a number of factor solution is available from the authors.
[17] A tetrachoric correlation matrix measures correlation of pairwise binary variables (takes only two values) assuming the variables have a normal distribution. An oblique rotation assumes that the factors are correlated unlike an orthogonal rotation. The rotation of the factors is a technique that makes the results easier to interpret as well as keeping the same mathematical properties between the factors.

Table 3.1: Rotated factor loadings with oblique rotation, 2019

Deprivation item	Basic	Secondary	Housing	Neighbourhood
Going without heating (HOH)	0.7302			
Household adequately warm	0.6895			
Family or friends for drink or meal	0.7350			
Shoes	0.6295			
Roast joint or equivalent	0.6189			
New rather than second-hand clothes	0.6445			
Meals with meat, fish or chicken	0.4089			
Warm waterproof overcoat	0.3874			
Ability to replace worn out furniture	0.7588			
Presents for family/friends	0.6334			
Able to afford afternoon or evening out (HOH)	0.8292			
Going without a substantial meal due to lack of money (HOH)	0.4057			
Leisure activity (HOH)	0.8099			
Some personal spending money (HOH)	07877			
PC		0.4659		
Internet (HOH)			0.4706	
Phone (including mobile phone)	0.4876			
Holiday	0.8020			
Car	0.5955			
TV		0.5415		
Washing machine				
Satellite dish		0.6388		
DVD		0.7357		
Video		0.9122		
Stereo		0.745		
CD player		0.8950		
Camcorder		0.7411		
Clothes dryer		0.5707		
Dishwasher		0.5240		
Vacuum cleaner		0.4318		
Fridge		0.7031		
Fridge with freezer		0.6323		
Freezer		0.7116		
Deep fat fryer		0.8796		
Liquidiser		0.8418		
Food processor		0.8358		
Hot water	0.5133			
Running water				0.5272
Central heating	0.3081			
Bath or shower				
Toilet				
Leaking roof and damp	0.4308			
Rooms too dark	0.3390			03293
Noise			0.4372	0.3753
Pollution			0.5936	0.6492
Crime, violence, vandalism			0.3916	

Note: Items in bold are part of the original 11-item deprivation scale. To avoid duplication, we used the item "phone (including mobile phone)" rather than "telephone (fixed line)" as the latter is included in the former. The full descriptions of the abbreviations of the 15 items used for the measure of basic deprivation are listed in the Appendix Table A3

Focusing on the first column, we find 20 items that are loading on the basic deprivation dimension ranging from 0.31 (central heating) to 0.83 (afternoon/evening out). We note that all the indicators in the 11-item deprivation measure are also loading on this new measure of basic deprivation. Looking at the other nine items, three items previously loaded on the housing dimensions: hot water, central heating and leaking roof and damp. A further two items with high loadings are related to social interactions (leisure activity and personal spending money). Finally, the holiday item also has a high loading estimate of 0.80, while it is much lower for the other three items of phone, car and going out without a substantial meal with values below 0.6.

The second dimension, capturing secondary deprivation, consists of 17 items. Sixteen of the 17 items also appeared in the previous secondary dimension recorded by Maître, Nolan and Whelan (2006). The loadings vary from a low 0.43 for a vacuum cleaner to a high 0.91 for a video player.

For the housing dimension, there is no clear loading of relevant items. The loading values for the toilet and bath items are extremely low with values below 0.14 (not shown), both now load on the secondary dimension. The central heating and hot water items have been found to load on the basic dimension. Part of this may stem from how uncommon deprivation of these items is, with just less than one per cent of persons reporting deprivation for the toilet measure, and for the bath measure. The measure for internet also loads on to the housing dimension. Although this measure is particularly important for communication and social inclusion, we find that the internet is somewhat complicated for an analysis of deprivation. First, an inability to access the internet is uncommon in the data, as most respondents have some form of access. Second, there is a strong correlation between internet access and age. Older people are more likely to report that they do not have the internet for reasons other than the unaffordability reason. Third, there is a strong urban and rural divide in whether groups have access to the internet.

Finally, while the highest loading of some of the items previously found in the neighbourhood dimension are spread across the basic dimension (leaking and dark) or the housing dimension (noise and crime), four out of these five items second-

highest loadings are on the same dimension of neighbourhood dimension. The satisfactory Cronbach's alpha for internal consistency (see Table 3.4 below) confirms the clustering of these items together.

Most deprivation items above load into the expected dimensions and also into the same dimensions as in the previous analysis carried out by Maître, Nolan and Whelan (2006). Furthermore, our analysis clearly outlines three dimensions of the four dimensions of deprivation found by Maître, Nolan and Whelan (2006). The basic deprivation dimension is now more wide-ranging than in previous analyses, comprising of 20 items, including new social interaction items that were not originally collected in 2004. Finally, some of the items which previously loaded on the secondary dimension have since moved to the basic deprivation (holiday, car).

3.2.2 Internal consistency

In the section below we test the internal consistency of the basic deprivation dimension. We focus on Cronbach's alpha throughout, as a measure of how well a group of variables go together. The statistic ranges from 0 (completely unreliable) to one (completely reliable). Social researchers seek to identify indices with an alpha ranging from 0.70 to 0.95 (Nunnally, 1978; Nunnally and Bernstein, 1994; Bland and Altman, 1997) to indicate that the observed variables are capturing a common factor. A Cronbach's alpha with a value of 0.8 or greater is considered as a very good level of reliability.

A measure with 20 deprivation items gives a Cronbach's alpha of 0.849 (Table 3.2) which indicates a high level of internal consistency. Table 3.2 also reports what the total Cronbach's alpha would be if a specific item was excluded from the dimension. We note that excluding certain indicators, namely hot water, phone, central heating and leaking roof and damp, would each increase the total Cronbach's alpha for our basic deprivation measure, suggesting that deprivation items would fit together better, without these indicators of deprivation.

Table 3.2: Cronbach's alpha over basic deprivation with 20 Items, 2019

Deprivation items	Cronbach's Alpha if item excluded
Going without heating (HOH)	0.8382
Household adequately warm	0.8402
Family or friends for drink or meal	0.8326
Shoes	0.8438
Roast joint or equivalent	0.8434
New rather than second hand-clothes	0.8396
Meals with meat, fish or chicken	0.8453
Warm waterproof overcoat	0.8472
New not second-hand furniture	0.8350
Presents for family/friends	0.8427
Able to afford afternoon or evening out (HOH)	0.8329
Going without a substantial meal due to lack of money (HOH)	0.8450
Leisure activity (HOH)	0.8319
Some personal spending money (HOH)	0.8353
Phone (including mobile phone)	0.8509
Holiday	0.8395
Car	0.8455
Central heating	0.8533
Leaking roof and damp	0.8517
Hot water	0.8523
Total alpha	0.8494

We exclude these four items from the measure of basic deprivation and run a new reliability analysis using the 16-item measure (Table 3.3). This produces a Cronbach's alpha of 0.863, a slightly higher value than with the 20-items measure. We report also in Table 3.3 the percentage of people lacking each of the 16 items and the corresponding Cronbach's alpha if the item was deleted. The items in Table 3.3 are sorted by descending percentage value of people lacking the item. Almost a third of people cannot afford a holiday and this is by far the item with the highest level of deprivation, followed by not being able to replace furniture at 18 per cent. The percentage then falls to values between ten and 20 percent for five items, including two new items, leisure activity at 16 per cent and some personal spending at 12 percent. All the other items range from one per cent to nine per cent. The percentage of people lacking meals with meat, fish or chicken and a warm waterproof overcoat are extremely low with respective values of almost two per cent and one per cent. Excluding each of these two items would reduce only slightly the overall Cronbach's alpha. To avoid any bias in the performance of the measure of deprivation, the measure of deprivation should not rely disproportionately on a single

item, so we exclude the holiday item reducing the total Cronbach's alpha from 0.863 to 0.856.[18] Ultimately, we are left with a 15-item dimension of basic deprivation, which has a Cronbach's alpha of 0.856. This measure contains the 11-items from the original measure of deprivation but includes four items which previously did not feature:

- ability to afford a holiday
- ability to afford a leisure activity
- ability to afford some personal spending money
- went without a substantial meal due to lack of money.

Table 3.3: Cronbach's alpha over basic deprivation with 16 Items, 2019

Deprivation items	% Deprived	Cronbach's Alpha if item excluded
Holiday	30.4	0.8564
New not second-hand furniture	18.1	0.8504
Leisure activity (HOH)	15.7	0.8463
Family or friends for drink or meal	13.6	0.8465
Some personal spending money (HOH)	12.1	0.8499
Able to afford afternoon or evening out	11.7	0.8472
Going without heating (HOH)	8.6	0.8531
New rather than second hand-clothes	7.7	0.8546
Car	6.9	0.861
Household adequately warm	4.9	0.8551
Roast joint or equivalent	4.5	0.8582
Presents for family/friends	4.3	0.8575
Going without a substantial meal due to lack of money (HOH)	4.0	0.8597
Shoes	3.1	0.8585
Meals with meat, fish or chicken	1.7	0.8600
Warm waterproof overcoat	1.4	0.8619
Total Alpha		0.8628

Table 3.4 shows the Cronbach's alpha for our 15-item measure and compares this measure to the previous 11-item measure using SILC's 2019 data. For reference, we

[18] To support our decision to exclude the holidays item, Guio (2009) found also that people lacking the holidays item were less deprived than those lacking the most necessary items. Moreover, using the Eurobarometer data, Dickes et al. (2008) found that among a list of items that were similar to the ones in EU-SILC (keeping home warm, meat, car, washing machine etc.), the smallest percentage of people across the EU27 considering that these items were absolutely necessary or necessary was for the holidays item (49%).

also include the other deprivation dimensions from the analysis above. Our 15-item measure has a higher Cronbach's alpha (0.86) when compared with the original 11-item measure (0.81). Our measure has greater consistency than the 11-item basic deprivation measure. However, the 11-item measure also has a high Cronbach's alpha, indicating that it is characterised by strong internal consistency. Further, the Cronbach's alpha for the current basic deprivation measure (11 items) is only slightly lower than the one found with SILC 2004 data (0.840) (Maître, Nolan and Whelan, 2006). This suggests that the 11-item measure is a strong predictor of basic deprivation and has remained consistent over time.

Table 3.4: Cronbach's alpha over dimensions of deprivation, 2019

Dimension of deprivation	Cronbach's alpha
Basic deprivation 11 items	0.8111
New basic deprivation 15 items	0.8628
Secondary dimension	0.9006
Housing dimension[19]	0.2991
Neighbourhood dimension	0.5448

Before testing the validity of the measures, we briefly consider the other deprivation domains. The Cronbach's alpha for the secondary dimension is very high at 0.90 and almost identical as found in SILC 2004 at 0.89 (Maître, Nolan and Whelan, 2006). However, while being slightly different in its composition, the Cronbach's alpha for the housing dimension at 0.299 is much lower than what was found in SILC 2004 at 0.565 (Maître, Nolan and Whelan, 2006). Finally, very little has changed for the neighbourhood dimension as it is 0.544 with SILC 2019 while it was 0.568 with SILC 2004 (Maître, Nolan and Whelan, 2006). These estimates have maintained their internal consistency, the only exception is the housing domain as the loadings of the items that are included in this dimension are low and inconsistent.

[19] The low internal consistency is due to the fact that the items have loadings spread across the basic and secondary dimensions and that for some items the loadings are very low and have low prevalence of deprivation. However, while the items seem to be loosely related, a meaningful interpretation of the nature of each item is to combine them into one housing domain as previously suggested (Maître et al., 2006). As in previous publications, we are mostly interested in basic deprivation.

While the focus of the paper is on the dimension of basic deprivation, we look at the relationship between the current dimension of deprivation (11 items) and the new measure (15 items) with the other dimensions of deprivation as reported with the Pearson correlation coefficient in Table 3.5. The secondary dimension has the highest correlation with the current basic deprivation 11 items (0.51) and the new basic deprivation 15 items (0.49) followed then by the neighbourhood dimension (0.28 and 0.29 respectively). The lowest correlation for both measures of basic deprivation is with the housing dimension. We note that the correlations of the secondary and housing dimensions are slightly greater for the basic deprivation 11 items than it is for the basic deprivation 15 items.

Table 3.5: Correlations between deprivation dimensions

	Basic deprivation 11 items	**New basic deprivation 15 items**	**Secondary dimension**	**Housing dimension**	**Neighbour hood dimension**
Basic deprivation 11 items	1				
New basic deprivation 15 items	0.9741	1			
Secondary dimension	0.5144	0.4995	1		
Housing dimension	0.1145	0.1134	0.0954	1	
Neighbour hood dimension	0.2874	0.2921	0.1916	0.0732	1

3.2.3 Distributions of deprivation

In Table 3.6 we compare the distribution of deprived items for the 11-item measure against the 15-item measure. The distributions between the two set of items are quite similar and the main difference is for people lacking at least four or more items. Looking at the 11-item deprivation measure, almost, 18 per cent of people are lacking at least two items with the 11 items set while it is almost 23 per cent with the 15 items set. This rate falls to 12 per cent and 17 per cent respectively for those lacking at least three items.

Table 3.6: Percentage of people deprived by deprivation measure, 2019

	Current basic deprivation 11 items	New basic deprivation 15 items
0	70.4	65.4
1	11.7	11.8
2	5.9	5.8
3	3.9	4.1
4+	8.1	13.0
Total	**100.0**	**100.0**
1+	29.6	34.6
2+	17.9	22.8
3+	12.0	17.0

Note: The CSO releases report a deprivation rate of 17.8 while we find 17.9. The marginal difference could be related to a slight difference in the identification of the head of household for the "going without heating" item

3.3 Validity

Having evaluated the consistency of both measures, we now focus on their validity. In this section, we consider whether both the old and new measures capture financial hardship. We check if there is a strong association between the experience of deprivation and theoretically expected outcomes (like economic hardship). Indeed, we can expect that people living in poverty and deprivation will report distinctive levels of economic pressure and financial stress. SILC collects a wide range of such measures which can be used to validate a deprivation or poverty. We focus on three measures, (1) the difficulty for a household to make ends meet; (2) the extent to which a household considers their housing costs to be a burden; and (3) the capacity of the household to face unexpected expenses.

The first variable is based on the answer to the question asked to person answering to the household questionnaire (generally the head of household or HOH) *"Concerning your household's total monthly or weekly income, with which degree of ease or difficulty is the household able to make ends meet?"*. From the six possible answers going from *"very easily"* to *"very great difficulty"* we consider a household answering, *"with difficulty" and "very great difficulty"* to have difficulty making ends meet (value 1) and none otherwise (value 0).

The second variable is based on the answer to the question about the head of household's perception of total housing costs. Those responding that it *is "somewhat of a burden"* and *"a heavy burden"* are categorised as experiencing a burden (value

1) unlike those answering, *"not a burden at all"* (value 0). The last variable is based on the answer to the question about the household's ability to face unexpected expenses with *"Yes"* or *"No"* as possible answers.

Table 3.7 lists the rate of financial difficulty within each basic deprivation measure. It shows that financial difficulty is most common among groups with higher deprivation levels. Those with no deprivation items have the lowest rates of financial difficulty for each measure. We compare financial difficulty across both deprivation measures to capture a deprivation threshold which would identify groups of people experiencing distinctive hardship. The current measure of basic deprivation with 11 items uses a deprivation threshold of lacking two or more items. However, our results show that the 15-item measure may require a higher threshold. This is explained in Table 3.7.

Table 3.7: Percentage of people experiencing financial difficulties by deprivation level, 2019

	0	**1**	**2**	**3**	**4+**	**Total**
Difficulty making ends meet						
Basic 11 items	6.9	25.9	45.4	47.2	78.7	18.7
Basic 15 items	5.4	22.6	30.1	51.4	65.8	18.7
Total housing cost a burden						
Basic 11 items	12.8	31.5	51.3	49.6	75.0	23.7
Basic 15 items	11.5	27.8	29.7	62.4	64.9	23.7
Difficulty facing unexpected expenses						
Basic 11 items	20.9	58.0	86.2	91.5	98.2	38.1
Basic 15 items	17.5	57.8	66.5	87.8	94.8	38.1

Looking at *"difficulty making ends meet"*, we see that households with higher deprivation levels also report higher rates of difficulty making ends meet. Overall, 19 per cent of the population report difficulty making ends meet. However, this rate is far higher among respondents who lack two items on the 11-item deprivation scale (45%), and those lacking three items on the 15-item scale (51%).

Looking at the households where housing costs are a burden, we also see an increase in the rate of difficulty. Overall, 24 per cent of people see their housing costs as a burden, but this rate is far higher among people who lack two items on the 11-item deprivation scale (51%) and those who lack three items on the 15-item deprivation scale (62%). Further, most people who lack four or more items on either scale report that their housing costs are a burden, this rate is 75 per cent for the 11-item scale and 65 per cent for the 15-item scale.

Finally, the percentage of people living in households with difficulty paying unexpected expenses is high (38%). However, these difficulties are especially pronounced among those with two items on the 11-item deprivation measure (86%) and those with three items on the 15-item measure (88%). We see that across the three financial difficulty measures, people that are deprived on one and two items on the basic 11-item deprivation measure are experiencing higher level of financial difficulties than their corresponding counterparts on the 15-item measure. This could be related to the very different type of items that people are deprived at a low level of deprivation across the two sets of deprivation measures. Indeed, people lacking one or two items on the 11-item measure could lack (a) more ‘severe’ item(s) than their corresponding counterparts on the 15-item measure.

In Table 3.8, we report the results of a sensitivity analysis in order to determine a potential deprivation threshold at which we will consider people as being deprived. We report the percentage of people experiencing the same measure of financial stress as presented in Table 3.7 but with two alternative deprivation thresholds for the new measure of deprivation based on 15 items. While 61 per cent of people experiencing deprivation (11 items, 2+ reported) have difficulties making ends meet, it is much lower with the new measure of deprivation at 54 per cent with a threshold of 2 items and more (15 items, 2+ reported) but it is higher at 62 per cent when the threshold increases to at least 3 items (15 items, 3+ reported). In terms of odds ratios, people reporting deprivation are 15 times more likely to have difficulty making

ends meet (11 items, 2+ reported) while it is 14 times with the new deprivation measure at 2+ (15 items, 2+ reported) and 16 times at 3+ (15 items, 3+ reported).[20]

[20] Detailed odds ratios calculations are available from the authors.

Table 3.8: Percentage of people experiencing financial difficulties by deprivation level, 2019

	Basic 11 items (2+)	Basic 15 items (3+)	Basic 15 items (2+)
Difficulty ends meet	60.9	62.4	54.2
Total housing cost as a burden	61.6	64.3	55.5
Difficulty to face unexpected expenses	92.8	93.2	86.4

The same pattern and result emerge with the measure of housing cost being a burden where the percentage is the highest for those with a deprivation threshold of 3+. Converted in odds ratios, people reporting deprivation are nine times more likely to have experience total housing cost as a burden (11 items, 2+ reported) while it is eight times with the new deprivation measure at 2+ (15 items, 2+ reported) and ten times at 3+ (15 items, 3+ reported). Finally, the percentage of deprived people who cannot face unexpected expenses is much higher than for difficulties making ends meet and housing cost burden. It is 93 per cent for the current measure of basic deprivation, 86 per cent with the new measure at 2+ and 93 per cent with a threshold of 3+. For the purpose of comparison, expressed in odds ratios, people reporting deprivation are 37 times more likely to not to be able to face unexpected expenses (11 items, 2+ reported), it is much less, 21 times with the new deprivation measure at 2+ (15 items, 2+ reported) and 38 times at 3+ (15 items, 3+ reported).[21] The measure of basic deprivation with 15 items with a threshold of at least three items identifies people with much higher financial stress than those with a threshold of 2+ with a much sharper contrast between people reporting no deprivation and those with deprivation.

So far, the analysis shows that the choice of a deprivation threshold of a least three items on a new measure with 15 items produces a similar level of deprivation (Table 3.6) as the current measure of deprivation (11 items, 2+ reported). Moreover, the sensitivity analysis in Table 3.8 based on the association between the deprivation measure with 15 items and several financial distress outcomes, shows that a

[21] Detailed calculations not shown here but available from the authors.

threshold of at least three items identifies a slightly greater proportion of people in financial distress than with the current deprivation measure but that is much larger than with a threshold of at least two items out of 15 items. For these reasons we choose a deprivation threshold of lacking at least three items out of fifteen as a potential new measure of basic deprivation (15-items, 3+ reported).

Focusing on the measure of deprivation with a threshold of 3+ items, Table 3.9 lists the percentage of people having difficulties making ends meet across different measures of deprivation (11 items, 2+ reported, 15 items, 3+ reported). The people classed as deprived on the new measure only (15 items, 3+ reported) have a higher level of difficulty making ends meet when compared to people that are deprived only on the current measure of basic deprivation (11 items, 2+ reported). The new measure of deprivation (15 items, 3+ reported) performs better than the current measure of deprivation (11 items, 2+ reported) in identifying people with high levels of financial stress.

Table 3.9: Percentage of financial difficulty by definition of deprivation, 2019

	Not deprived	**Deprived on Basic 11 items (2+) only**	**Deprived on Basic 15 items (3+) only**
Difficulty making ends meet	9.0	32.0	34.5

3.4 Consistent poverty

Consistent poverty identifies people who are both at-risk of poverty (AROP) and materially deprived. As mentioned above, those at risk of poverty are households whose household income is below 60 per cent of the median equivalised income amount. Those who are deprived are households lacking two or more items on the 11-item deprivation scale or three or more items on the 15-item deprivation scale.

In Table 3.10 we look at the relationship between these two measures of poverty by reporting their overlap. There are almost no differences between the two deprivation measures. Indeed, 86-87 per cent of those not AROP are also not deprived, while 43-44 per cent of those AROP are also experiencing material deprivation.

Table 3.10: Percentage of people deprived by AROP at 60% median equivalised income, 2019

Basic 11 items	**Not AROP**	**AROP**
Not deprived	85.8	57.3
Deprived 2+	14.2	42.7
Total	**100**	**100**
Basic 15 items		
Not deprived	86.9	56.0
Deprived 3+	13.1	44.0
Total	**100**	**100**

In Table 3.11 we look at the proportion of people that are deprived who are also at risk of poverty. Again, there are almost no differences between the 11-item deprivation scale and the 15-item deprivation scale. We find that 31-33 per cent of people materially deprived are also AROP while only nine per cent of those not materially deprived are AROP. Both Tables 3.10 and 3.11 show that the overlap between AROP and material deprivation is not as large as might have been expected, a common finding as highlighted in the poverty literature (Whelan et al., 2004; Nolan and Whelan, 2011)

Table 3.11: Percentage of people AROP by deprivation, 2019

Basic 11 items	**Not AROP**	**AROP**	**Total**
Not deprived	91.1	8.9	100
Deprived 2+	69.4	30.6	100
Basic 15 items			
Not deprived	91.4	8.6	100
Deprived 3+	67.2	32.9	100

Table 3.12 shows the consistent poverty rate using different definitions and thresholds for deprivation. We find that rates are similar using the current measure (11 items, 2+ reported) (5.5%) compared to the new measure (15 items, 3+ reported) (5.6%).

Table 3.12: Consistent poverty by deprivation measure, 2019

	Basic 11 items (2+)	**Basic 15 items (3+)**
Consistent poverty	5.5	5.6

Table 3.13 shows the overlap between the current measure of consistent poverty and a measure where the deprivation threshold is set at 3+ items for the 15-item index. Only, four per cent of those who are poor using the basic 11-item measure do not register as poor using the basic 15-item measure. Further, only seven per cent of those who are poor on the 15-item measure, do not register as poor on the basic 11-item measure. In short there is a high level of overlap between consistent poverty measured using the 11-item deprivation scale and the 15-item deprivation scale.

Table 3.13: Overlap between consistent poverty measures (%), 2019

	Basic 11 items	
Basic 15 items (3+)	Not consistently poor	Consistently poor
Not consistently poor	99.6	4.3
Consistently poor	0.4	95.7
Total	**100**	**100**
	Basic 15 items (3+)	
Basic 11 items	Not consistently poor	Consistently poor
Not consistently poor	99.8	7.1
Consistently poor	0.2	92.9
Total	**100**	**100**

In Table 3.14 we compare the levels and trends of the different measures of deprivation and consistent poverty. We compare the various measures from 2016 onwards, as some of the items used in the proposed measure (15 items) such as the inability to participate in a leisure activity or spending some money on yourself have been collected in SILC since 2016 only. Overall, there are no differences in levels and trends. This highlights the importance of continuity if remaining with the 11-item measure.

Table 3.14: Basic deprivation and consistent poverty trends (2016-2019)

		2016	**2017**	**2018**	**2019**
Current measure	Basic 11 items (2+)	21.0	18.8	15.1	17.8
	Consistent poverty (2+)	8.2	6.7	5.6	5.5
Proposed measure	Basic 15 items (3+)	20.2	18.0	14.7	17.0
	Consistent poverty (3+)	8.4	6.7	5.5	5.6

Table 3.15 shows the consistent poverty rate by age and location across the current (11-item deprivation scale, 2+ reported) and alternative measures (15-item, 3+ reported) of consistent poverty. Compared to the current consistent poverty measure, a 15-item consistent poverty measure only marginally increases the consistent poverty rate overall. This measure raises the rate for children and working-age people slightly. The measure then slightly decreases the rate for people aged 65 and over. There is almost no change by location as we move from the current consistent poverty measure to a 15-item consistent poverty measure with a threshold of at least three items.

Table 3.15: Age and region differences in consistent poverty measures, 2019

	Consistent poverty 11 items (2+)	**Consistent poverty 15 items (3+)**
Age		
0-17	8.1	8.3
18-64	5.1	5.3
65+	2.3	2.1
Location		
Urban	6.5	6.7
Rural	3.1	3.0
Total	**5.5**	**5.6**

This chapter has outlined a factor analysis for an updated 15-item deprivation scale. Although the scale has strong validity and high internal consistency, it performs as well as the current 11-item deprivation scale. We have also shown how the 15-item, 3+ limit scale compares in terms of outcomes associated with poverty and deprivation, and in terms of adjustments to consistent poverty. In the next chapter, we show group differences in these measures, and what the new scale means for analyses of vulnerable groups.

3.5 Material deprivation in Ireland in a European context

Several of the deprivation items that are collected within the SILC survey are specific to Ireland. However, SILC is also part of the broad EU-SILC survey that is used for monitoring poverty and social inclusion within the European Union. One of the instruments to monitor poverty and social exclusion in Europe is a measure of material deprivation. At a European level, in 2009 the European Commission adopted a nine-item measure of 'economic strain and durables' to measure material deprivation across member states. The deprivation measure was then revised in 2017 with a new 13-item measure of 'material and social deprivation'.[22] The EU nine-item measure differs considerably from the Irish measure of material deprivation in the number and the type of items of items. EU indicator identifies people as materially deprived when they cannot afford at least three out of the nine following items:

- to pay their rent, mortgage or utility bills
- to keep their home adequately warm
- to face unexpected expenses
- to eat meat or proteins regularly
- to go on holiday
- a television set

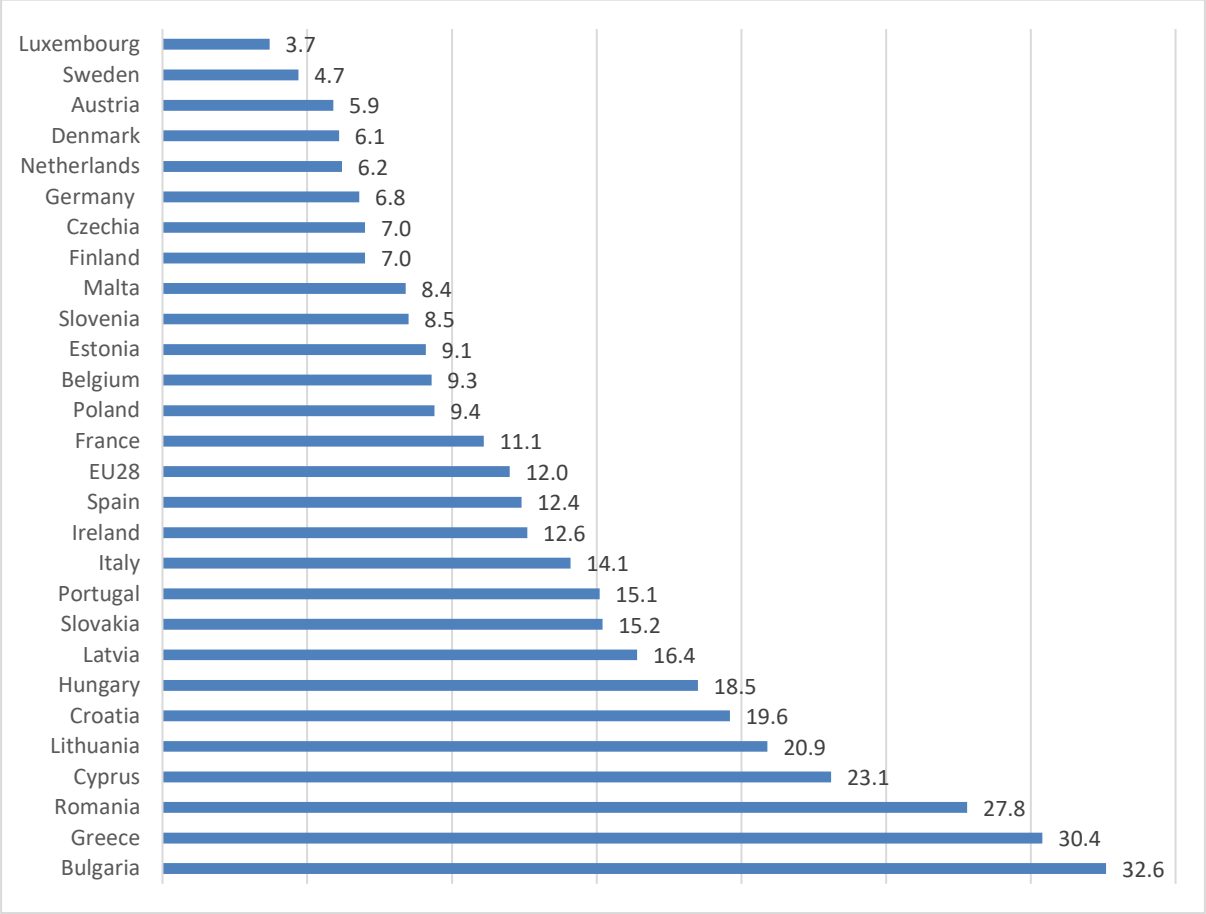
[22] The EU 13-item measure uses a combination of household and individual items. There are quite large proportions of missing values for the individual items and it was not possible to reproduce the Eurostat Irish deprivation rate with this measure. For this reason, we do not report results for the EU 13-item. A detailed description of the EU 13-item measure and the overlap with the current and new measure of Irish deprivation is in the Appendix.

- a washing machine
- a car
- a telephone.

There are only two items in common between the Irish set of items (in both the current 11-item scale and the new 15-item scale) and the EU set: *"to keep their home adequately warm"* and *"to eat meat or proteins regularly"*.

The deprivation rate for Ireland with the EU measure of deprivation in 2019 at almost 13 per cent is much lower than the official Irish measure of basic deprivation (11 items 2+) at almost 18 per cent. This is due to the fact that the EU measure of deprivation has a much smaller number of items, that only a very small percentage of the population in Ireland cannot afford some of these items (television, washing machine) and finally that the EU measure of deprivation had a greater deprivation threshold. The EU comparative deprivation rates in Figure 3.1 shows that the deprivation rate for Ireland, at almost 13 per cent, is close to the EU28 rate at 12 per cent, placing Ireland in the middle of the distribution for deprivation rates across the EU28.

Figure 3.1: Material deprivation rate across EU28, EU-SILC 2019



Note: Date of data 02/09/2021. At the time of the data download there was no data available from the Eurostat website based on the revised 13 items deprivation measure

While there are very few common deprivation items between the current measure of basic deprivation (11 items) or the new basic deprivation measure (15 items) with the EU measure of 'economic strain and durables', 60 per cent of people deprived with the measure of basic deprivation (11 items) are also found deprived on the EU measure. It is 56 per cent for the new basic deprivation measure. Similarly, 79 per cent of people deprived on the EU measure of 'economic strain and durables' are also found deprived on both current and new measures of basic deprivation.

Chapter 4: Vulnerable groups and deprivation

4.1 Introduction

In this chapter we will compare the risk of deprivation and consistent poverty using the current 11-item measures and the new 15-item measures across a wide range of socio-demographic characteristics that we expect to be associated with poverty. We consider how well the new measure captures deprivation across vulnerable groups like lone parents and adults with a disability, and compare the performance of the 11-item measure.

4.2 Risk of deprivation and socio-demographic characteristics

In this section we explore the relationship between some socio-demographic characteristics and various measures of deprivation with a specific focus on the most vulnerable groups. In Table 4.1 we compare the relative risk of deprivation by social risk group using the current measure of deprivation and a new measure with 15 items and a 3+ threshold).[23] All results show that the risk of deprivation is the highest for lone parents and their children as well as for adult with disabilities and their children on both measures. The risk of deprivation is lowest for working-age adults and people aged 65 and over. The risk of deprivation for all vulnerable groups is similar when we compare the 11-item, 2+ threshold to the 15-item, 3+ threshold.

However, the pattern across groups remains the same as with the current 11-item measure of deprivation. Overall, the risk of deprivation with a threshold of 3+ is similar to the current measure of deprivation (11 items, 2+selected). There is a slight change in the risk of deprivation for adults with disabilities, children in households with both parents, and people aged 30 to 65 but the largest change is the reduction

[23] See in the Appendix Table A1 for the distribution of the social risk groups and the composition of deprivation with both measures of deprivation.

of deprivation for people aged 65 and over from ten per cent (11 items, 2+ selected) to eight per cent (15 items, 3+ selected).

Table 4.1: Deprivation by social risk groups (%), 2019

	Basic 11 items (2+)	Basic 15 items (3+)
Lone parent	44.7	45.3
Children of lone parent	45.9	47.3
Adult with disabilities	33 6	31.5
Children of adult with disabilities	28.7	29.1
Children in households with both parents	14.7	13.8
Other adults aged 18-29	16.0	16.0
Other adults aged 30-65	12.0	11.0
Other adults aged 66+	10.3	8.4
Total	**17.9**	**17.9**

We can also consider social class differences in deprivation, using the 15-item and 11-item measures.[24] There is very little change in the risk of deprivation between the current measure of deprivation (11 items, 2+ selected) and a new measure (15 items, 3+ selected). There is a slight reduction in the risk of deprivation among the lower managers and intermediate occupations. In general, both thresholds align quite closely in terms of the overall deprivation rate, and the social class differences in the deprivation rate.

Table 4.2: Deprivation by social class groups of head of household (%), 2019

	Basic 11 items (2+)	Basic 15 items (3+)
Large employers, higher managers/professionals	13.2	12.8
Lower managers/professionals, higher supervisors	7.8	6.7
Intermediate occupations	16.4	13.6
Small employers and self-employed	15.9	13.4
Lower supervisors and technicians	15.5	15.3
Lower sales and service	29.9	30.8
Lower technical	35.3	33.3
Routine	35.1	33.7
Never been in employment	37.0	38.3
Total	**17.9**	**17.9**

Note: Non-agricultural and agricultural small employers and self-employed are aggregated to have large enough cases to report

[24] See Table A2 in the Appendix for the distribution of the social class groups and the composition of deprivation with both measures of deprivation.

In Table 4.3, we consider differences in deprivation measure across education groups. Once again, we are comparing the 11-item measure and the 15-item measure and finding that the results are similar overall and within different educational groups. There is almost no change for those with lower education if we move to a new measure of deprivation (15 items, 3+ reported) but there is a slight reduction among the better educated.

Table 4.3: Deprivation by education attainment of head of household (%), 2019

	Basic 11 items (2+)	**Basic 15 items (3+)**
Primary or below	30.0	29.5
Lower secondary	20.8	20.6
Higher secondary	22.9	21.0
Post leaving cert	23.5	22.4
Third level non-degree	12.5	11.4
Third level degree or higher	5.7	5.4
Total	**17.9**	**17.9**

Finally, table 4.4 considers the importance of employment on both measures of deprivation. Living in a jobless household is a major risk factor in terms of experiencing poverty and social exclusion (Watson et al., 2016) and is a strong concern for policy makers. Table 4.4 shows that the risk of deprivation is high in jobless households regardless of the deprivation measure used. Broadly, half of people living in a jobless household are experiencing deprivation. When we compare the 11-item measure to the 15-item measure, we find few differences in deprivation, which are near identical.

Table 4.4: Deprivation by household joblessness (%), 2019

	Basic 11 items (2+)	Basic 15 items (3+)
Not a jobless household	13.9	13.0
Jobless household	47.0	47.4
Total	**17.9**	**17.9**

4.3 Risk of consistent poverty and socio-demographic characteristics

In this section we compare measures of consistent poverty using the 11-item deprivation measure to the 15-item deprivation measure across different households and risk groups.

The pattern of distribution of consistent poverty across social risk groups is quite similar for both consistent poverty measures (Table 4.5). The consistent poverty rates based on the 15 items (3+ selected) is higher for lone parents and their children than it is with the current measure of consistent poverty (11 items, 2+ selected). Otherwise, the risk of consistent poverty is almost identical for all the other social risk groups.

Table 4.5: Consistent poverty by social risk groups (%), 2019

	11 items (2+)	15 items (3+)
Lone parent	17.9	19.4
Children of lone parent	19.0	20.7
Adult with disabilities	11.3	11.8
Children of adult with disabilities	12.7	12.3
Other children	3.5	3.4
Other adults aged 18-29	5.2	5.2
Other adults aged 30-65	2.8	2.8
Other adults aged 66+	1.8	1.6
Total	**5.5**	**5.6**

Across both the 11-item measure and the 15-item measure, the risk of consistent poverty increases as we move from the higher social class to the lower social class (Table 4.6). Once again there is almost no difference between the current measure of consistent poverty and the measure based on 15 items (3+ selected) with the very small exception of the lower sales and service.

Table 4.6: Consistent poverty by social class groups of head of household (%), 2019

	11 items (2+)	**15 items (3+)**
Large employers, higher managers/professionals	4.0	4.0
Lower managers/professional, higher supervisors	0.9	0.9
Intermediate occupations	3.8	*
Small employers and self-employed (non-agricultural)	6.5	6.4
Lower supervisors and technicians	*	*
Lower sales and service	7.2	8.0
Lower technical	19.5	19.1
Routine	13.2	13.7
Never been in employment	21.4	21.4
Total	**5.5**	**5.6**

Note: Too few cases to report in compliance with CSO statistical publication guidelines

A similar pattern emerges in Table 4.7 in relation to the education level of the head of household. The consistent poverty rate difference is the highest for people with primary education level and the consistent poverty gap between the two measures reduces as the education level increases. There are no changes in the consistent poverty risk relativities between education levels.

Table 4.7: Consistent poverty by education attainment of head of household (%), 2019

	11 items (2+)	**15 items (3+)**
Primary or below	13.2	13.8
Lower secondary	7.8	8.1
Higher secondary	7.7	8.0
Post leaving cert	2.6	2.1
Third level non-degree	3.7	3.9
Third level degree or higher	*	*
Total	**5.5**	**5.6**

Note: Too few cases to report in compliance with CSO statistical publication guidelines.

The percentages of people in consistent poverty that are not living in jobless households as well as those living in a jobless household are identical between the current measure of consistent poverty and a measure based on 15 items (3+ selected) respectively (Table 4.8). Expressed in terms of relativities, people living in a jobless household are thirteen times more likely to be in consistent poverty than those not in such households based on the current measure and a 15 items (3+) measure.

Table 4.8: Consistent poverty by household joblessness (%), 2019

	Basic 11 items (2+)	**Basic 15 items (3+)**
Not a jobless household	2.1	2.2
Jobless household	27.8	28.0
Total	**5.5**	**5.6**

Overall, we find that the proposed deprivation measures and the derived consistent poverty measures produce the same risk distribution pattern as with the current measures of deprivation and consistent poverty across the household socio-

economic characteristics. The risks are almost the same between a measure based on 15 items (3+) and the current measures of deprivation and consistent poverty.

Chapter 5: Conclusions

5.1 Introduction

This paper has re-examined Ireland's deprivation and consistent poverty indicators using SILC 2019 data. Specifically, we have compared Ireland's existing 11-item basic deprivation scale, first proposed in 2008, to an updated 15-item basic deprivation scale proposed using SILC 2019 data. Our 15-item scale encompasses a broader definition of deprivation and includes additional items as well as the original 11 items. Further, our updated 15-item scale has higher internal consistency than the existing 11-item scale. Despite these benefits, we find that the existing scale works well and rates highly in terms of internal consistency and validity. Further, in keeping the original scale, we allow for the safe continuity of measuring deprivation over time using the original 11-item measure.

We find that both measures correlate strongly with measures of financial difficulty. However, we show that the 15-item measure would benefit from a 3+ item threshold, while the previous 11-item measure works well using a 2+ item threshold, as originally argued by Maître et al., (2006). Once these limits are set, we find that measures of financial difficulty among those who are deprived using both measures are broadly similar. We also find that both measures correlate strongly with the at-risk-of-poverty rate, with roughly 44 per cent of those who are at risk of-poverty also experiencing deprivation, regardless of the measure used (11-item or 15 item measure).

We further find that both scales produce similar rates of consistent poverty, and both report similar rates of deprivation and consistent poverty across age and geographic groups, with the exception of older people for whom there is a slightly lower rate of deprivation on the new measure. We also find some small differences by education attainment: those with post leaving cert and third level non-degree record a slightly lower rate of deprivation on the new measure. Finally, we note that both scales

record similar deprivation rates and similar consistent poverty rates across socio-economic groups, and vulnerable groups like lone parent households. Despite these many similarities and despite the higher level of internal consistency among the 15-item measure, we argue that researchers should continue to use the original 11-item measure, which would allow for statistical continuity. Throughout our analysis we have shown that the 11-item measure performs remarkably well, even in today's data, using this measure of deprivation would allow for continuity in measures of deprivation and consistent poverty. This is highly relevant in the context of following progress achieved in relation to the poverty targets set up by the government (Roadmap for Social Inclusion 2020-2025).

5.2 Limitations

SILC is a survey of private households and as such does not collect any information about the standard of living of vulnerable people such as homeless people, people in institutions, travellers[25] and asylum seekers; populations that are exposed to high levels of poverty and deprivation, but which cannot be measured.

This analysis is based on several items collected in SILC. Some of these items are collected by CSO on a voluntary basis and used for national purposes to measure material deprivation (for example, affording a roast meat joint) while others are part of a set of items chosen at a European level within the framework of the Open Method of Coordination (OMC). The OMC has, among others, the task of establishing measuring instruments to inform EU policy making in several areas, such as employment and social protection. The Irish SILC is part of the broad EU-SILC and as such must collect a common set of deprivation indicators across all EU Member States. Some items collected within EU-SILC might be more relevant in some European countries than in others, as there is wide variation in the standard of living within the EU. It is also quite likely that other items that are not collected within SILC (or EU-SILC) would perform better to measure material deprivation in Ireland but as researchers we do not have the possibility to collect and use items other than those available in SILC.

[25] Members of the Travelling Community living in private households could be included in the sample but the sample size of SILC is too small to identify smaller groups and ethnicity is not collected in the survey.

Another limitation is that the CSO will no longer collect certain data used to measure dimension of deprivations annually; instead, it will collect these measures only every three years. For example, this applies to several measures used to capture environment deprivation. While not relevant for the purpose of the measures of basic deprivation and consistent poverty, this will limit other studies. Indeed, in the Monitoring Integration Report series which is regularly updated (see, for example, McGinnity et al., 2020) the authors examined environmental deprivation by nationality and found that non-Irish groups experienced a higher level of environmental deprivation when compared to Irish nationals. As poverty is a multidimensional experience, one must be careful about removing items that could restrict the analysis and our understanding of poverty.

Finally, researchers should be careful when revising measures of deprivation because of timing. Revisions should not take place in periods of turmoil, where the identification of what would constitute an average standard of living across the general population would be biased by profound and dramatic changes within society.

5.3 Policy implications

Our findings suggest that the existing deprivation scale (11-item, 2+ reported) is accurate and fit for the purpose of measuring deprivation and consistent poverty. It is also a valid indicator for setting poverty targets. Although the measure identified here (15-items, 3+ reported) has higher internal consistency, it is no better in terms of validity, in that it captures similar rates of deprivation overall and among vulnerable groups.

However, we also recommend that the measures be reviewed regularly as SILC data becomes available. The recent COVID-19 pandemic and subsequent economic lockdown have impacted on many of the measures considered here. Specifically, access to broadband and other communication infrastructure has become incredibly important, as has adequate living space. Given the rapid change in standards of

living, it is possible that some of the measures on the existing 11-item scale are less relevant (for example, having a warm waterproof coat), while other items related to social interaction may become more important.

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Appendix

Table A1: Social risk groups and deprivation composition (%), 2019

	% Population	% Deprived 11 items (2+)	% Deprived 15 items (3+)
Lone parent	3.5	8.7	9.2
Children of lone parent	5.5	14.2	15.3
Adult with disabilities	7.5	14.0	13.8
Children of adult with disabilities	3.3	5.3	5.6
Children in households with both parents	16.6	13.6	13.6
Other adults aged 18-29	12.2	10.9	11.3
Other adults aged 30-65	38.4	25.7	24.7
Other adults aged 66+	13.2	7.6	6.5
Total	**100.0**	**100.0**	**100.0**

Table A2: Social class groups and deprivation composition (%), 2019

	% Population	% Deprived 11 items (2+)	% Deprived 15 items (3+)
Large employers, higher managers/professionals	25.2	18.6	19.0
Lower managers/professionals, higher supervisors	25.7	11.3	10.1
Intermediate occupations	6.9	6.3	5.5
Small employers and self-employed	7.4	6.6	5.9
Lower supervisors and technicians	6.7	5.8	6.0
Lower sales and service	14.7	24.7	26.2
Lower technical	4.2	8.4	8.3
Routine	5.8	11.4	11.4
Never been in employment	3.4	7.0	7.6
Total	**100.0**	**100.0**	**100.0**

Table A3: List of abbreviations for the 15-item basic deprivation

Deprivation item abbreviation	Question
Going without heating (HOH)	Have you ever had to go without heating during the last 12 months through lack of money? (1) Yes (2) No
Household adequately warm	Does the household keep the home adequately warm? (1) Yes (2) No because cannot afford (3) No, other reason
Family or friends for drink or meal	Does the household have (get-together with) family and/or friends (relatives) for a drink or a meal once a month? (1) Yes (2) No because cannot afford (3) No, other reason
Shoes	Does each household member possess two pairs of strong shoes? (1) Yes (2) No because cannot afford (3) No, other reason
Roast joint or equivalent	Does your household have a roast joint (or its equivalent) once a week? (1) Yes (2) No because cannot afford (3) No, other reason
New rather than second hand-clothes	Do household members buy new rather than second-hand clothes? (1) Yes (2) No because cannot afford (3) No, other reason
Meals with meat, fish or chicken	Does your household eat meals with meat, chicken, fish (or vegetarian equivalent) every second day? (1) Yes (2) No because cannot afford (3) No, other reason
Warm waterproof overcoat	Does each household member possess a warm waterproof coat? (1) Yes (2) No because cannot afford (3) No, other reason
New not second-hand furniture	Does the household replace any worn out furniture? (1) Yes (2) No because cannot afford (3) No, other reason
Presents for family/friends	Does the household buy presents for family or friends at least once a year? (1) Yes (2) No because cannot afford (3) No, other reason
Able to afford afternoon or evening out (HOH)	Did you have a morning, afternoon or evening out in the last fortnight, for your entertainment (something that cost money)? (1) Yes (2) No. There is a follow up question for those answering (2) No. For what main reason haven't you had a morning, afternoon or evening out in the last fortnight? Six possible answers with (3) Couldn't afford to.
Going without a substantial meal due to lack of money (HOH)	During the last fortnight was there ever a day (i.e. from getting up to going to bed) when you did not have a substantial meal due to lack of money?). (1) Yes (2) No
Leisure activity (HOH)	Do you Regularly participate in a leisure activity (that costs money)? (1) Yes (2) No because cannot afford it (3) No, other reason
Some personal spending money (HOH)	Do you spend a small amount of money most weeks on yourself, for your own pleasure (buying/doing something for yourself)? (1) Yes (2) No because cannot afford it (3) No, other reason
Car	Does your household have a car or van for private use? (1) Yes (2) No. There is a follow up question for those answering (2) No. Why the household has no cars? (1) Cannot afford one (2) Other reason.

CSO Sampling Methodology

In the 2019 SILC sample, the clusters were based on Census Enumeration Areas, rather than the Household Survey Collection Unit Small Areas used in the 2014 sample. A sample of 1,200 blocks (i.e., Census Enumeration Areas, Census 2016) from the total population of blocks was selected. Blocks are selected using probability proportional to size (PPS), where the size of the block is determined by the number of occupied households on Census night 2016. All occupied households on Census night 2016 within each block were eligible for selection in the SILC sample. Households within blocks were selected using simple random sampling without replacement (SRS) for inclusion in the survey sample.

EU measure of 'material and social deprivation'

In 2017, the European Commission adopted a revised measure of deprivation based on 13-items rather than nine-items previously. However, Eurostat is still reporting deprivation rates across the EU with both deprivation measures. The EU 13-item uses a combination of household and individual deprivation items. There are seven household items and six individual items. The EU indicator identifies people as materially and socially deprived when they cannot afford at least five out of the thirteen following items [26]:

- to pay their rent, mortgage or utility bills (household deprivation)
- to keep their home adequately warm (household deprivation)
- to face unexpected expenses (household deprivation)
- to eat meat or proteins regularly (household deprivation)
- to go on holiday (household deprivation)
- a car (household deprivation)
- replace worn-out furniture (household deprivation)
- buying new, rather than second-hand clothes (individual deprivation)
- two pairs of strong shoes (individual deprivation)
- spend a small amount of money each week on yourself (individual deprivation)
- regularly participate in a leisure activity (individual deprivation)
- having friends or family for a drink or meal at least once a month (individual deprivation)
- have internet access (individual deprivation).

Among these 13 items, three are included in the current Irish measure of basic deprivation (home adequately warm, eat meat or proteins, replace worn-out furniture) and six are in the new 15-item measure (home adequately warm, eat meat or proteins, replace worn-out furniture, a car, spend a small amount of money, participate in a leisure activity). Other items

[26] There is also an EU measure of 'severe material and social deprivation' when people cannot afford seven out of the thirteen items.

are quite similar to the ones found in the current measure of basic deprivation and the new 15-item measure but they differ in their mode of collection, being collected at individual level in the EU 13-item measure (second-hand clothes, strong shoes, a drink or meal at least once a month).

Because some of the items for deprivation are only collected from people that have been interviewed (people aged 16+), Eurostat applies the following rules to assign a deprivation item to children (people aged under 16) as well as a deprivation threshold:

> *"if at least half the number of adults for which the information is available in the household lack an item, then the children living in that household are considered as deprived from that item. The same set of 13 items and the same threshold (5+) is used for both children and adults. However, when the deprivation rate is computed for children, the calculation is slightly different, in order to avoid making the indicator too sensitive to adult deprivations. Among the 5+ deprivations required for a child to be considered deprived, there needs to be at least three household deprivations (out of the seven household deprivations included in the list)*." (Guio et al., 2017)

Glossary

At-risk-of-income 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-income poverty has an adjusted (or equivalised) income below 60 per cent of the median adjusted household income. The at-risk-of-income 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-income poverty.

At-risk-of-income poverty: a term used at EU level to denote whether a household's income falls below the 60 per cent of median income threshold. It is also known as income poverty.

At risk of income poverty or social exclusion (AROPE): this EU measure combines the number of people who experience at-risk-of-income poverty or severe material deprivation (cannot afford at least four out of nine items) or low work intensity. This measure is the basis for the Europe 2020 income poverty target. In cases where people experience more than one of these indicators, they are counted only once. The AROPE measure has been modified in 2021 in the new 2030 target (see European Commission, 2021). The Irish version of this measure is the combination of at-risk-of-income poverty and basic deprivation.

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 Income poverty in Ireland, Dublin: ESRI, for further information on the indicator.

In this technical report we test an additional, 15-item measure of deprivation. This definition of basic deprivation states: people who are denied, through lack of income, at least three items or activities on this index/list of 15 are regarded as experiencing relative deprivation. The index is made up of the original 11- items above and contains four additional items:

- unable to afford a holiday
- unable to afford a leisure activity
- unable to afford some personal spending money
- unable to afford a substantial meal due to lack of money

Consistent income poverty: this is a measure of income poverty used in the National Action Plan for Social Inclusion 2007-2016 (NAP inclusion) 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-income poverty threshold (see above) and the household members are deprived of **at least two 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.

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

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-SILC: European Union Statistics on Income and Living Conditions 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'.

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. three-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).

Financial strain: is a composite indicator based on five items: difficulty making ends meet, housing costs burdensome, going into debt to meet ordinary living expenses, arrears on mortgage/rent or utility bills, and inability to save.

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.

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-income 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).

Pearson correlation coefficient shows the strength of the relationship between two indicators and ranges from 0 (no relationship) to 1 (perfect relationship).

Income poverty and Social exclusion: these terms are defined broadly in the National Action Plan for Social Inclusion 2007-2016 (NAP inclusion) as follows:

> *"People are living in income 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 income 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 the resources that are normally available to the general population.

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).

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 SILC survey. They produce analysis in accordance with Irish national income poverty targets, indicators and related issues. These results are reported in the Survey on Income and Living Conditions (SILC). Any data on Ireland 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.

Vulnerable groups: Vulnerable groups (such as lone parents or people with disabilities for example) are people whose socio-demographic profile is associated with greater likelihood of risk of poverty and social exclusion than experienced by the overall population.

Well-being: This is *"a positive physical, social and mental state. It requires that; basic needs are met, that individuals have a sense of purpose, that they feel able to achieve important goals, to participate in society and to live lives they value and have reason to value. Well-being is enhanced by conditions that include financial and personal security, meaningful and rewarding work, supportive personal relationships, strong and inclusive communities, good health, a healthy and attractive environment, and values of democracy and social justice"* (NESC, 2009, p.3).