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RESEARCH ARTICLE

# How important are the unit of analysis and equivalence scales when measuring income poverty and inequality? Evidence from Ireland

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**Abstract** We analyse the effect of varying equivalization scales and income-sharing units on inequality and poverty statistics using Irish microdata. We find that benchmark equivalization scales result in substantial variation in the degree of income poverty estimated at the household level, particularly for young children, the elderly, along with households comprised of one adult or more than two adults. We test multiple permutations of child and adult weights in a set of hypothetical equivalence scales. Our simulation results show that over a range of commonly observed adult-child equivalence weights most of this variation is attributable to changes in the adult weight. Inequality statistics tend to be less sensitive to the choice of equivalence scale but are sensitive to the choice of income-sharing unit. Other inequality metrics, such as the p90p10 ratio, exhibit increased volatility over the business cycle at sub-household unit levels.

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## 1. Introduction

Two important measurement issues underlie our understanding of income poverty and inequality. Firstly, these statistics are mostly produced at the household level. This assumes income is pooled equally amongst household members. This convention assumes away intra-household inequality, and solely focuses on inter-household inequality. This first assumption is most relevant to inequality. ***Atkinson and Jenkins (2020)*** and ***Jenkins (2022)*** also make this point and highlight that measuring inequality at a nuclear family level allows for some with-in household inequality. Secondly, income data is transformed non-monotonically using equivalence scales, which adjust for household size and composition for a given level of income, in order to better approximate welfare. This second assumption is most relevant to the estimation of income poverty. Estimates of income poverty are sensitive to the choice of equivalence scale, particularly the weight given to adults (***Želinský and Mysíková, 2021***). In this paper, we examine how sensitive inequality and poverty statistics are to these assumptions and explain the underlying mechanisms using micro data from Ireland in conjunction with the tax-benefit model EUROMOD. We contribute to a broad and varied literature on the sensitivity of income poverty to the choice of equivalence scale while also modelling intra-household relationships in order to measure income poverty and inequality statistics across different income sharing concepts. For microsimulation practitioners, an appreciation of this analysis is most relevant for those interested in the anti-poverty effects of reforms to the tax-benefit system. Our findings indicate that the choice of equivalence scale influences the level and composition of households living in income-poverty. As

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such, the effect of anti-poverty reforms, targeted at certain groups, may be influenced by the initial choice of equivalence scale used.

In Europe, poverty and inequality statistics are measured at the household level by Eurostat.[1] In the United States, the Bureau of Labor Statistics uses the family as the relevant unit of analysis. While measurement at the household level might facilitate harmonization of statistics across European countries, it could mask important inequality and poverty dynamics. The literature highlights that inequality and poverty estimates tend to be smaller at the household than sub-household levels (***Fiegehen and Lansley, 1976***; ***Lansley, 1980***; ***Johnson and Webb, 1989***; ***Burkhauser et al., 2018***). As inequality and poverty statistics are derived at the household level, with full income-sharing assumed between household members, a divergence between household membership and household income-sharing habits could have a significant effect on our understanding of societal inequality and poverty.

In Ireland, the complete income sharing assumption within a household is a non-trivial simplification. The 2011 and The , 2016 Irish Censuses indicate that close to 12 per cent of private households are comprised of multiple separate families,[2] giving *prima facie* evidence that complete intra-household sharing of income may not fully measure the welfare of a non-trivial portion of the population. In addition to this, income is not fully shared within families. ***Watson et al. (2013)*** analyse the special income sharing module available in the 2010 EU Statistics on Income and Living Conditions data for Ireland and find that only 52 per cent of households fully share income, 44 per cent share a portion of their income whilst 14 per cent share no income. There is also substantial heterogeneity across household types. Unsurprisingly, couples with young children fully share their income in 68 per cent of cases, while 24 per cent pool some portion of their income. Non-family households fully share income in only 11 per cent of cases and 27 per cent shared none of their personal income with other household members. Singletons living with their parents were the least likely to share their income, with 47 per cent contributing nothing to the income of their parents. This gives empirical evidence that full income sharing within households is a strong assumption, as even married couples only fully share their income in less than 70 per cent of cases.

***Lise and Seitz (2011)*** provide strong evidence that intra-household inequality, amongst couples with no children specifically, can be large in certain circumstances. They highlight that the current approach to measuring inequality is only appropriate for one-adult households and for couples where partners have comparable incomes. ***Cantillon and Nolan (2001)*** examine how current poverty indicators can measure differences between spouses, discussing the impact of within-household resource-sharing on child poverty, whereas ***Verbist et al. (2020)*** make a similar case for multigenerational households and the way resources are shared within them. In instances where there is a large gap between partner incomes, there will be asymmetric bargaining power amongst partners meaning that income will not be shared equally. Given the inequality that can be induced by marital sorting patterns, it is likely that income-sharing amongst independent families living within the same household will be smaller. This is the main channel we analyse. In the empirical component of the paper, we allow for full income-sharing across household and sub-household units, as is standard, and see how variation in the unit of analysis affects inequality and poverty. As such, we focus on intra-household inequality arising from multiple tax-/benefit-units living in a single household and abstract from imperfect income-sharing that may occur within a tax-/benefit-unit due to asymmetric bargaining power. ***Creedy and Sleeman (2005)*** completed a similar exercise but concentrated on comparing the household to the equivalent adult and the individual, whereas we use alternative income-sharing units. We contribute to the literature by showing that inequality, as measured by the Gini coefficient, is smallest at the traditional household level, increases at the benefit-unit level and further increases when measured at the tax-unit level. Measures such as the p90p10 ratio also exhibit more volatility over the business cycle at sub-household levels.

We also examine how sensitive poverty and inequality metrics are to the choice of equivalence scale utilised. Equivalization adjusts household income to be expressed in per adult equivalent terms,

1. There was change in 2020 to what defined a household. In previous versions of the EU Statistics on Income and Living Conditions a household was anyone living in a given address. Since 2020 the definition has been altered so as to include individuals living away from the address but whom share income and living expenses- see https://circabc.europa.eu/sd/a/f8853fb3-58b3-43ce-b4c6-a81fe68f2e50/Methodological%20guidelines%202021%20operation%20v4%2009.12.2020.pdf p.35 .
2. Authors' calculations, with a given family type (e.g., married couple) living with "other persons" being indicative of a multi-family household.

so that raw income can be adjusted based on the number of adults and children it must be shared between. It has long been understood that these scales can influence income poverty estimates and ***Allison, 1978*** urged researchers to experiment with a range of equivalization indices incorporating different aspects of poverty. Equivalization is particularly important in settings where average family size is large (***Buhmann et al., 1988***). How equivalization affects these estimates is also of interest-with a U-shaped pattern between the size of equivalization weights/equivalence elasticities and inequality observed in a cross-country study (***Buhmann et al., 1988***), in the case of Spain (***Cowell and Mercader-Prats, 1999***) and in United Kingdom data (***Coulter et al., 1992***). In contrast, ***Cowell and Mercader-Prats (1999)***, in the case of the United Kingdom find that inequality increases in equivalization weights. ***Želinský and Mysíková (2021)*** note that this sensitivity extends to head count poverty ratios, with the size of the weight given to adults having a larger bearing on the estimated poverty rate. ***Aaberge and Melby (1998)***, using Norway as an example, note that utilising income-dependent scales leads to significantly different results about income inequality amongst children.

These sensitivities can vary across countries, and the Russian case highlighted by ***Abanokova et al. (2022)*** is of particular note. They highlight the sensitivity of Russian poverty statistics to the choice of equivalence scale due to the high prevalence of three-adult households in Russia compared to the United Kingdom, Germany, and Switzerland. The Russian poverty rate for 2017 increased by as much as four percentage points when the adult weight decreased from 1 to 0.5, depending on the child parameter values, and a U-shaped relationship was evident between the poverty rate and the equivalence weights. These recent studies complement a number of studies in the United Kingdom during the 1990s which examined the effect of equivalence scales, of various functional forms, on inequality and poverty statistics.[3] Authors found U-shaped relationships between equivalence weights and poverty and inequality (***Coulter et al., 1992***), a positive linear relationship between weights given to children and the Gini coefficient (***Banks and Johnson, 1994a***; ***Banks and Johnson, 1994b***) and highlighted that changes to the household size relativity rather than adult-child weights led to more volatility in both inequality and poverty (***Jenkins and Cowell, 1994***). While these studies are decades old, many of the discussion points in these papers are relevant to the current academic and policy landscape. For instance, ***Jenkins and Cowell (1994)*** highlight that the McClemens equivalence scale in use in the United Kingdom at the time was mainly due to "inertia" and appealed for more discussion on an appropriate scale while ***Banks and Johnson (1994b)*** made that point that the appropriateness of a given equivalence scale could vary across time and between countries. These conceptual issues are still relevant topics, and given the statistical integration of many European countries, the appropriateness of a common equivalence scale is of base importance and discussed in ***Daley et al. (2020)*** and ***Mysíková et al. (2022)***.

Our research contributes to this literature and highlights that the at-risk-of-poverty rate is extremely sensitive to the value of adult-child weight in expert equivalence scales, and we find that income poverty decreases in the value of the adult weight. Importantly for practitioners, we find that income poverty measures such as the at-risk-of-extreme poverty rate and Foster-Greer-Thorbecke indices with aversion parameters are not sensitive to the choice of equivalence scale. We also find that inequality and poverty rates are declining in the size of adult weight - we also find some evidence of a U-shaped relationship between inequality and the size of the household relativity parameter.

Our findings will be of interest to policy makers and researchers in numerous countries, especially due to the recent change of the household definition applied to all European survey data sets. Article 2 of Commission Implementing Regulation 2019/2181 standardized the definition of a household across survey data sets collected in the European Union. In an Irish context, this legislation meant that the Irish Central Statistics Office moved from defining households on an "address" basis to "shared income and expenditure" basis.[4] Given this change in the statistical landscape, our research is timely in providing evidence on the divergence between equality and poverty statistics based upon different income-sharing definitions. The analysis is most relevant to countries which will see their living standard statistics move from an address-based system to a "shared income and expenditure" basis, based upon the updated EU regulations.

3. See ***Jenkins and Cowell (1994)*** for a more detailed discussion of this debate.
4. See the Irish Central Statistics Office note on the discontinuity of the SILC pre and post-2020 for further information: https://www.cso.ie/en/releasesandpublications/in/silc/informationnote-breakintimeseriessilc2020/#:~:text=Up%20until%202020%20in%20defining,shared%20income%20and%20expenditure%20concept.

We believe that Ireland makes for a particularly interesting case study. Ireland is typified by high level of market income inequality – top 5 in the OECD based upon 2018/2019 data – but below average levels of inequality after accounting for taxes and social transfers (***OECD, 2022***). Irish household size is also large by European norms – with an average of 2.6 persons per household, compared to 2.2 in other Euro area countries as per 2019 data. The Irish economy has also experienced mixed fortunes during the recent past, suffering a sovereign debt crisis and a sharp rise in unemployment rates during the financial crisis of 2008. Despite this economic volatility the Gini coefficient has remained very stable from 1987 to 2013 (***Callan et al., 2018***).[5] This is in contrast to top 1% income shares, from administrative tax-data, which have been trending upward over time (***Callan et al., 2021***).[6] Overall, we analyse a developed country with a very unequal distribution of market income, a progressive tax-benefit system, an above average household size and a volatile macroeconomy from 2007 to 2019.

The rest of the paper is structured as follows; in Section 2 we discuss our methodology; Section 3 highlights our empirical findings; Section 4 continues with a discussion of and reconciliation of these findings. Section 5 concludes.

# 2. Methodology

We use numerous annual releases of the Irish Statistics on Income cand Living Conditions (EU-SILC) along with the tax-benefit model EUROMOD to estimate annual income levels. EUROMOD is a European wide tax-benefit microsimulation model. EUROMOD processes the detailed reported labour market and demographic information of individuals in SILC but has the advantage that calculates theirs, and other household members, tax liabilities and social welfare entitlements based upon the tax-benefit rules in place in Ireland spanning from 2007 to 2019. EUROMOD is calibrated with the latest release of SILC on an annual basis. In earlier years of analysis this was completed less regularly, meaning that in the earlier years included in our analysis, for adjacent policy years, identification of changes in inequality and poverty comes predominantly from policy changes, as captured in the microsimulation model, rather than changes in both market incomes and entitlement under tax-benefit parameters. For instance, the 2008 and 2009 EUROMOD simulation results both use the 2008 SILC data set but vary the tax-benefit parameters. In cases where the SILC data lags the policy year, we uprate key monetary variables in EUROMOD to match the observed average growth recorded in national statistics. For a review of the uprating process in EUROMOD (see ***Sutherland and Figari, 2012***). In ***Table A11*** we show the exact SILC data year used to generate the simulated disposable income for each policy year.

## 2.1. Equivalence scales

We estimate the sensitivity of inequality and poverty estimates to equivalization and to the unit of analysis. Distributional statistics in Ireland are produced by the Irish Central Statistics Office (CSO) on an annual basis using the SILC data set. As in all European countries, and in line with Eurostat procedure, the household is the income-sharing unit across which incomes are summed. To arrive at an equivalized income concept, total household disposable income, i.e., income after the deduction of all tax liabilities and with the addition any net social welfare (means tested, non-means tested and universal payments such as child benefit), is divided by the sum of the household's equivalence weight. A household's equivalized disposable income is often referred to as income per adult equivalent to account for this adjustment based on household composition. The choice of equivalence scale is important as it embodies technical assumptions about the extent of economies of scale in consumption and subjective value judgments around the needs of non-earning household members –particularly children. Most importantly however, the utilization of an equivalence scale amounts to a non-monotonic transformation of income data. As such, researchers should appreciate that the choice of equivalence scale will cause re-ranking effects amongst households. An understanding of possible functional forms equivalence may take is important, as this function will be the way researchers express these subjective value judgments analytically. For the remainder of this section, we will turn our focus

5. Calculated at the household level using survey data.
6. Tax data will contain information behind extremely high-income individuals, whom may be unlikely to be sampled in household surveys.

**Table 1.** Parameter values of expert equivalence scales used in the analysis.

| | Irish national | OECD-Modified | OECD | Per capita | Square root |
|---|---|---|---|---|---|
| $\alpha$ | 0.66 | 0.5 | 0.7 | 1 | 1 |
| $\beta$ | 0.33 | 0.3 | 0.5 | 1 | 1 |
| $\gamma$ | 1 | 1 | 1 | 1 | 0.5 |

Notes: Each scale assigns a value of 1 to the first adult in the household. In all scales adults are defined persons aged 14+ years old) and child equivalents are defined as those <14 years old.
$\alpha$ is the parameter value given to additional adult equivalents, $\beta$ is the parameter value given to additional child equivalents and $\gamma$ is the household size relativity parameter.

to defining a flexible function for a set of expert equivalence scales, while also providing background on some functional forms used in the literature.

In a seminal paper, ***Buhmann et al. (1988)*** compare equivalence scales across countries and surmised that all scales are closely related to a power function, meaning that economic well-being (or equivalized income) could be expressed succinctly in terms of a single parameter called the equivalence elasticity. According to them, economic well-being or disposable income (W) is equal to unadjusted disposable income (D) divided by household size (S):

$$W = D/S^e \tag{1}$$

The parameter $e$, with range 0 to 1 is the equivalence elasticity. ***Buhmann et al. (1988)*** find that equivalence rules of the late 1980s, when applied to household data, encompass a broad range of equivalence elasticity values. For instance, scales used with the intention of identifying vulnerable groups, tend to have an average elasticity of 0.72 while elasticities inferred from consumption data tend to be much lower at 0.36. All the scales they analysed tended to be highly correlated with the log of household size, meaning that a power function closely approximated many variable equivalence rules.

Modern equivalence scales tend to vary based on the weight given to adults, children and to household size in general and can be thought of as three-parameter scales. As such the equivalence elasticity is only directly observable in cases where income is equivalized solely on the basis of household size and independent of composition, amounting to a one-parameter equivalence scale. In our analysis we test the sensitivity of inequality and poverty measures to the choice of equivalence scale using popular expert equivalence scales outlined in ***Table 1***. The scales we analyse are all typified as expert scales, as they rely on expert choices and are normative benchmarks. All these scales assign a value of 1 to the household head and as such all treat a single adult household as a reference category for assessing the size of scale economies and value judgements around the relevant weights of additional adults and children. The scales we analyse can be generalized to the functional form described in Equation 2, with the household equivalence weight being derived as a function of the number of adult equivalents (those older than 14), $S_a$, the number of child equivalents (those younger than 14), $S_k$, and a parameter $\gamma$ denoting economies of scale in household size which are independent of the composition of adult-child variations. We define $\gamma$ as the household size relativity parameter so as not to confuse it with the equivalent elasticity parameter $e$.We view $\gamma$ as a functional form assumption regarding scale economies at the household level which are independent of household composition. If $\gamma$=0, additional household members generate no additional costs and there is no need for equivalization. If $0 < \gamma < 1$, economies of scale are decreasing in $\gamma$. With $\gamma = 1$, no economies of scale are assumed, and the household weight will be determined by $\alpha$, $\beta$ values. With the expert scales we analyse $\gamma$ is typically valued at 1; meaning that net of variation in $\alpha$, and $\beta$, the number of people in a household has no impact on the equivalence weight. The exception is the square root scale, where $\gamma$=0.5. The square root scale also treats adults and children identically, with $\alpha = \beta = 1$. This assumes that adults and children consume an even share of household resources. The per capita equivalence scale is identical to the square root scale, but with $\gamma$=1. As such, variation in household equivalence scales when using the per capita and square root scales are purely a function of household size, and independent of household composition. This is in contrast to the CSO, OECD-modified and the

OECD scale where variation in household equivalence weights is purely due to differences in the values of $\alpha$ and $\beta$, with $\gamma$=1 in all cases.

$$\text{Equivalence weight} = \left(1 + \alpha\left(\mathrm{S_a} - 1\right) + \beta \mathrm{S_k}\right)^{\gamma}, \quad 0 \leq \alpha,\ \beta,\ \gamma \leq\ 1 \tag{2}$$

The per capita and square root scales represent benchmark scales where the equivalence elasticity is *a priori* defined. In the case of the per capita scale, $e$=1, meaning there are no economies of scales in household size. The square root scale is characterized by $e$=0.5, as the scale amounts to indexing household size by 0.5. For all the other expert scales we examine, the equivalence elasticity is not known *a priori*, as for a given household size, variation in the number of adult and child equivalents would lead to variation in household weights. In contrast using the per capita scale one knows that the household weight will be $n^1$ and in the case of the square root scale $n^{0.5}$, where $n = S_a + S_k$.

The Irish national scale assigns a value of $\alpha = 0.66$ and $\beta = 0.33$. These ratios closely follow the ratios of additional adult and child dependant allowances payable through the Irish social welfare system.[7] In general, an individual in receipt of a social welfare scheme can avail of a top-up payment of 66 per cent of their weekly rate if they live with an adult who is dependent on their income, and 33 per cent in the case of a child.[8] The adult-child weight values in the Irish national scale were proposed by ***Callan et al. (1989)*** before becoming the official equivalence scale used by the Irish Central Statistics Office. Empirical work by ***van de Ven et al. (2017)*** found that equivalence weights implicit to the tax-benefit system in Ireland were close to OECD-modified scale. Benefit relativities has changed since then only for children, with the implied child relativity being at 0.37 in 2023. Whether one can conclude that the Irish national scale represents societal preferences, or is a feature of inertia, seems somewhat ambiguous however.

The original OECD equivalence scale, which can be referred to as the "Oxford scale" or the "old OECD scale" and was first mentioned by the OECD in 1982 (***OECD, 1982***) and was used throughout the 1980s and early 1990s by Eurostat. This scale was replaced with the OECD-modified scale, which was proposed by ***Hagenaars et al. (1994)*** and was adopted by Eurostat in the late 1990s. The modified scale gives a smaller weight to adult and child equivalents than the OECD scale meaning that for a given level of income, larger households would be better-off with the modified scale than the original scale. In the European literature, the OECD-modified scale has become the benchmark equivalence scale for applied research (***Garbuszus et al., 2021***). Interestingly, the OECD has adopted the square root scale as their baseline equivalence scale.[9]

## 2.2. Unit of analysis

We examine the effect of the unit of analysis by examining the variation in inequality and poverty measures across multiple income-sharing definitions. We use three units throughout the paper; firstly, we use the household as our main income-sharing unit, as is standard in much of the literature and in the production of national statistics in the European Union. Secondly, we use a tax-unit definition, based on definitions from the Office of Revenue Commissioners. In Ireland, the tax system is partially individualized. Before 2000, couples were jointly assessed for income tax, meaning that a worker could use the unused tax credits of a non-working spouse to reduce their overall tax liability. A series of tax reforms from 2000 to 2002 meant that this 100 per cent sharing of tax credits in a joint system was reduced to around 32 per cent in a partially individualized system (***Doorley, 2018***). Income splitting at the standard income tax rate has remained stable since these reforms (***Doorley, 2018***). Due to the partial splitting of tax credits, the married couple as opposed to the individual is the relevant unit of analysis for tax purposes. Couples who cohabitate, but are not legally married, are treated as separate tax-units as a result. Singletons are also independent tax-units. We treat cohabitating children aged 18 years and older as singletons and assess them individually if they are not enrolled in

7. As an aside, older research had used the relativities implicit in the social welfare system in Ireland to extrapolate equivalence scales. ***Conniffe and Keogh (1988)*** document this and give an interesting timeline into the use of Engel curves and caloric need-based equivalence scales.
8. In Budget 2019, different child dependent allowances were introduced for children under and over 12 years of age, so this relationship has been slightly modified.
9. This square root equivalence scale is used in preparing the OECD Income Distribution Database, a key data set for comparing inequality across countries and over time (***OECD, 2020***).

education.[10] Thirdly, we develop a benefit-unit concept as a final unit of analysis. This is the basis for assessment of income in means-tested social welfare schemes in Ireland. The benefit-unit is similar to the tax-unit, but it relaxes the assumption of legal marriage and allows cohabitating couples to fully share their income. Additionally, children aged less than 18 and those aged less than 22 and in full-time education are included in their parent's benefit-unit.[11]

The degree to which income is assumed to be shared between individuals in a household varies across all three units. Implicitly, the household unit assumes all income is split evenly between all household members. With the tax-unit, income is shared equally between all members in a married couple, but there is no sharing within a cohabitating couple. The benefit-unit on the other hand, assumes people in a relationship share their income fully, so there is no intra-relationship inequality. We estimate inequality and poverty measures across all three units to assess the variation induced by differential income aggregation. By examining these sub-household units, we intend to estimate intra-household inequality arising from multiple tax-/benefit-units living in a single household and abstract from imperfect income-sharing that may occur within a tax-/benefit-unit due to asymmetric bargaining power between spouses as per ***Lise and Seitz (2011)***.

We also assess the re-ranking effects introduced under different income-sharing assumptions. We do so by using a series of rank-rank regressions. We regress an individual's rank in the household income distribution onto their rank in the benefit-/tax-unit distribution. This is shown in Equation 3 below, where the household percentile rank of individual $i$, in year $t$, using equivalence scale $j$, is regressed onto a constant $\alpha$ and the individual's percentile rank in the income-sharing concept $s$. We focus solely on re-ranking effects from unit of analysis here, variations in $s$ only, and keep the equivalence scale $j$, fixed at the Irish national scale levels. In Equation 3, the vector $\boldsymbol{B}$ estimates the rank-rank coefficients. The model is estimated in percentile levels and the rank-rank coefficients can be interpreted as the correlation between household percentiles relative to the benefit-/tax-unit. An individual specific independent and identically distributed error term $e$ completes the simple model. We estimate equation 3 for the population and for specific sub-groups of interest: the elderly, children and adults by age-employment status. We exclude adults older than 22 enrolled in full-time education so as to only assess the re-ranking effects that occur for individuals who have finished formal human capital formation.

$$HH\ Rank_{i,j,t} = \alpha + \boldsymbol{B} Rank_{i,s,j,t} + e_i \tag{3}$$

## 2.3. Measures of inequality and income poverty

We use key headline measures of inequality and income to gauge measurement sensitivity to the unit of analysis and equivalence scale. In constructing Gini coefficients and percentile ratios, we analyse a population of households, tax-units, and benefit-units. To be precise, we collapse individual-level disposable income data to a dataset of sums at the relevant unit and then equivalize income. This allows us to analyse between-unit inequality and compare how this between-unit inequality varies across household, tax-unit, and benefit-unit. The inequality and poverty measures used are discussed and defined below.

- **Gini coefficient** measures the extent to which income concentration deviates from perfect equality. In our context, perfect equality, a Gini coefficient of 0, would arise if in a given year all household/tax-unit/benefit-unit have equal equivalized disposable income. Perfect inequality, a Gini coefficient of 1, would arise if one household/tax-unit/benefit-unit held all income. For a given unit of analysis and equivalence scale, the Gini coefficient is defined for the population of households/tax-units/benefit-units, sorted in ascending order of equivalized income $y_i$ of $i = 1, 2 \ldots .N$ as $G = 1 + \frac{1}{N} - \left(\frac{2}{mN^2}\right) \sum \left(N - i + 1\right) y_i$ ,where m is mean arithmetic equivalized income.
- **p90/p10 ratio** is the ratio of income of the 90$^{th}$ percentile household/tax-unit/benefit-unit divided by the income of the 10$^{th}$ percentile household/tax-unit/benefit-unit. This statistic gives a sense of the gap in income between high- and low-income households.

10. See: https://www.revenue.ie/en/personal-tax-credits-reliefs-and-exemptions/children/single-person-child-carer-credit/how-do-you-qualify-for-the-spccc.aspx for more details about what qualifies as a child for tax purposes.
11. See: https://www.citizensinformation.ie/en/social_welfare/irish_social_welfare_system/claiming_a_social_welfare_payment/claiming_and_increase_in_your_payment_for_a_child_dependant.html

- **p90/p50** ratio is the ratio of income of the 90th percentile household/tax-unit/benefit-unit divided by the income of the median household/tax-unit/benefit-unit. This statistic gives a sense of the gap in income between high- and middle-income households.
- **p10/p50 ratio** is the ratio of income of the 10th percentile household/tax-unit/benefit-unit divided by the income of the household/tax-unit/benefit-unit household. This statistic gives a sense of the gap in income between low- and middle-income households.
- **At-risk-of-poverty measure (AROP**) rate is calculated using a notional poverty line defined as 60 per cent of the median household/tax-unit/benefit-unit equivalised income. People residing in units below this poverty line are classified as being at risk of facing income poverty. We calculate AROP rates using headcount ratios, so that the percent of the population living in poverty is the relevant metric. This circumvents the issue that variation in equivalence scales could lead to compositional changes in household poverty due to differences in economies of scale in household size e.g., a declining portion of households living in poverty, but a rising portion of the population.
- **At-risk-of-extreme poverty measure (AROEP**) rate is calculated in the same manner as the AROP rate, but the notional poverty line is calculated as 40 per cent of the median household/tax-unit/benefit-unit, so the threshold for being classified as poor is even lower. As with the AROP rate, AROEP rates are calculated using a headcount ratio.
- **Foster-Greer-Thorbecke (FGT) with aversion parameters** are used in our context to measure the *intensity* of poverty experienced when measured at the household/tax-unit/benefit-unit

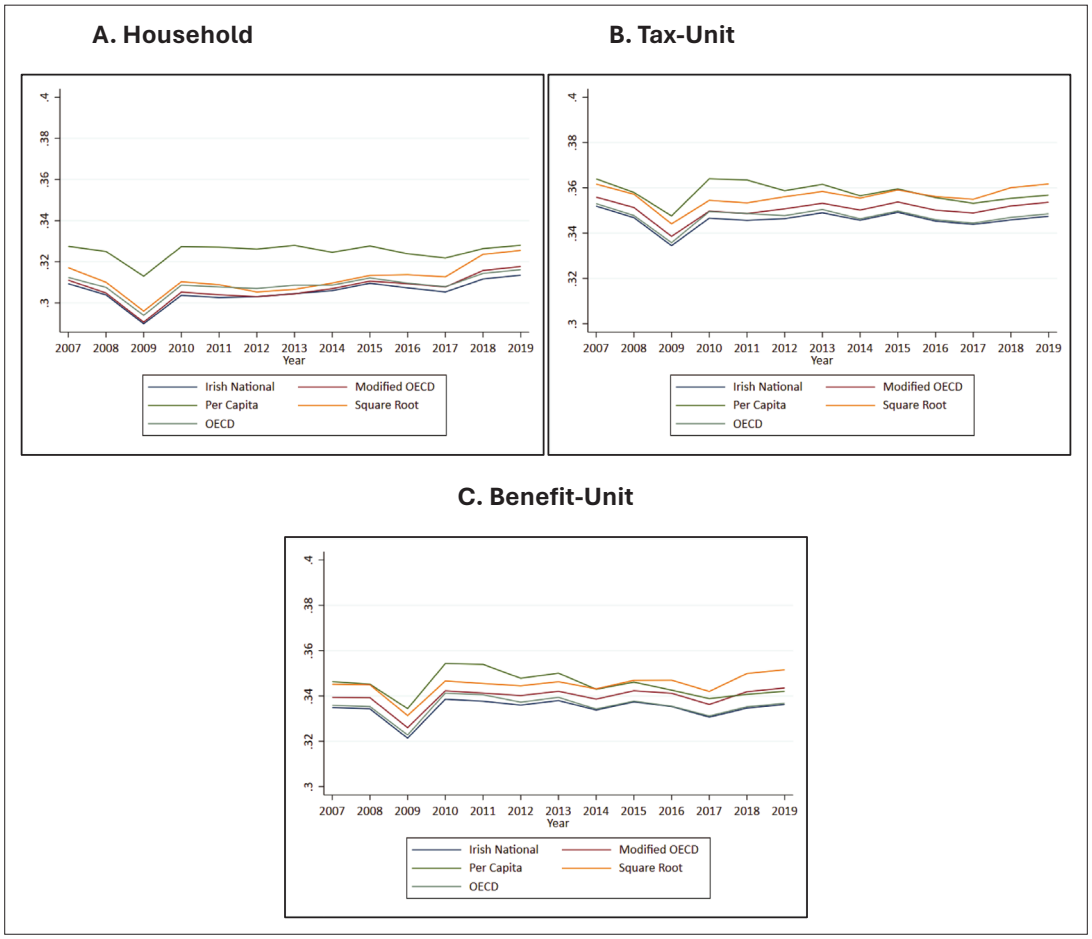


**Figure 1.** Gini Coefficient.

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

Notes: Gini coefficients are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated over a population of households (A), tax-units (B) and benefit-units (C). Statistics are also tabulated in tables A1–A3.

level. This class of poverty measure is defined in ***Foster et al. (1984)*** and is defined as a $P_a = \frac{1}{n}\sum_{i=1}^{q}\left(\frac{z-y_i}{z}\right)^a$, where $z$ is the poverty line, $y_i$ is the $i^{th}$ lowest equivalized income, $n$ is the total population,$q$ is the head count of persons who are poor, and $a$ is the "poverty aversion" parameter. With $a = 0$, the FGT measure reduces to the AROP headcount measure. As such, we use FGT poverty measurements with $a = 1$ and $a = 2$. $(\frac{z-y_i}{z})$ represents a normalized distance from the poverty line, z, for the $i^{th}$ lowest income household/tax-unit/benefit-unit. As the aversion parameter, $a$, increases, we give larger weight to the lowest income household/tax-unit/benefit-units below the poverty threshold, $z$. This measure complements the headcount AROP rate as we can examine both the extensive and intensive margin of poverty.

# 3. Results

## 3.1. Inequality

In ***Figure 1***, we show how the Gini coefficient varies across different income-sharing concepts and equivalence scales.[12] ***Savage et al. (2019)*** note that despite the volatility in the Irish labour market surrounding the 2008 financial crisis, the Gini coefficient has been remarkably stable, with much of this stability induced by the automatic stabilisation effect of a robust social welfare system in place pre-2008.[13] ***Callan et al. (2018)*** also show the flat profile of the Gini coefficient in Irish survey data from 1987 through to 2013 and that quintile income shares have been remarkably constant over the same period. These trends are also evident in tax- and benefit-unit measurements we present in ***Figure 1***. There is a noticeable increase in the Gini coefficient at sub-household levels, with the household producing the smallest estimates of inequality and increasing non-trivially as we allow for within-household inequality via the tax- and benefit-units. Our estimates of the time-series variation in the Gini coefficient differ from recent work by ***Roantree et al. (2021)*** using annual releases of the Irish SILC research microdata file, where the Gini coefficient can be seen to decrease from 2017 to 2019. This trend difference arises from differences in simulated incomes as estimated from our microsimulation model EUROMOD,[14] relative to reported incomes in ***Roantree et al. (2021)***.

Starting with the benchmark household case, the Gini coefficient is largest in all years when the per capita scale is used, with estimates at a low of 0.31 in 2009 and a high of 0.32 in 2019. All equivalence scales show a similar pattern, with the Gini coefficient dipping in 2009 and peaking in 2019. The other scales are quite similar in their estimates of the Gini coefficient, however, for 2018 and 2019, the square root scale approaches the relatively lofty estimates of the per capita scale. The Irish national scale produces the smallest estimates of inequality —with a low of 0.28 in 2009, peaking at 0.31 in 2019. At the tax-unit level, the per capita scale no longer appears as an outlier and is comparable to all other scales. Once again, the Irish national scale tends to give the most modest measurements of inequality, with the Gini coefficient varying between a low of 0.33 in 2009 and a peak of 0.34 in 2019. Overall, the level of inequality is much higher at the tax-unit level, with Gini coefficients routinely in the range of 0.34 to 0.36. Moving to the benefit-unit level, where non-married couples are assumed to evenly share income, reduces the size of the Gini coefficient, but these are still higher than traditional household measures. For instance, at the benefit-unit level, the Irish national scale has a low of 0.32 in 2009 and a high of 0.33 in 2019. Across all three units, the Irish national and OECD scales produce very similar results. The per capita scale leads to much higher estimates of inequality at the household level, but from 2013 onward, it yields estimates that are comparable to the OECD and Irish national scales at the benefit and tax-unit level. This is attributable to a greater incidence of single-person units at the benefit/tax-unit level than will be the case at the household level. As all the scales assign

12. Tables reporting the inequality and poverty statistics presented in ***Figure 7–12*** are also available in the Appendix.
13. ***Savage et al. (2019)*** developed a formal decomposition method which separately identified the contribution of discretionary policy and the contribution of automatic stabilisation to changes in overall levels of inequality between two points in time. From 2008 to 2013, they showed that approximately 70 per cent of the increase in the index of redistribution (Reynolds-Smolenksy) was due to automatic stabilisation, and the remaining 30 per cent was due to discretionary changes in policy.
14. ***Doorley and McTague (2020)***, in validating the robustness of the Irish EUROMOD model, also show a flat profile in Gini coefficient from 2017 to 2020. The primary aim of this piece is to isolate the effect of equivalence scale—income-sharing assumption variations in inequality and poverty statistics. As such, we are willing to tolerate the small amount of measurement error that simulated incomes from EUROMOD may incur to avail of its highly flexible modelling of intra-household relationships needed to establish tax and benefit-units.

a weight of one to single-person units, there will be less dispersion between scales as units become more granular. In contrast to the per capita scale, the square root scale produces similar results at the household level to the Irish national and OECD scales but tends to exceed these scales at the benefit and tax-unit level.

One issue to be mindful of is how re-ranking effects may affect the Gini coefficient as we permute between income-sharing concepts. ***Atkinson (1970)*** notes that the Gini is sensitive to transfers from one-point of the income distribution to another. ***Allison (1978)*** concludes that for the most commonly observed income distributions, the Gini index tends to be most sensitive to transfers around the middle of the distribution and the least sensitive to transfers among the very rich and very poor. ***Gastwirth (2017)*** highlights that most contemporary research has referred to the Gini as being sensitive to transfers around the middle or mode of the income distribution. However, ***Gastwirth (2017)*** also shows that the rank preservation plays a large role in the effect a transfer of income will have on the Gini coefficient. Where a transfer or increment preserves the order, transfers from the rich to the poor had a large effect on the Gini index. When transfers do not preserve the order, the difference in the ranks of the donor and recipient, before or after the transfer is the main contributor to a change in the Gini index. In our analysis, there will be re-ranking effects when moving from household to tax-unit/benefit-unit, e.g. a low-income singleton aged 26 may live with his/her high-income parents — in this case the 26 year old will be re-ranked from a high-income household to a low-income tax-unit/

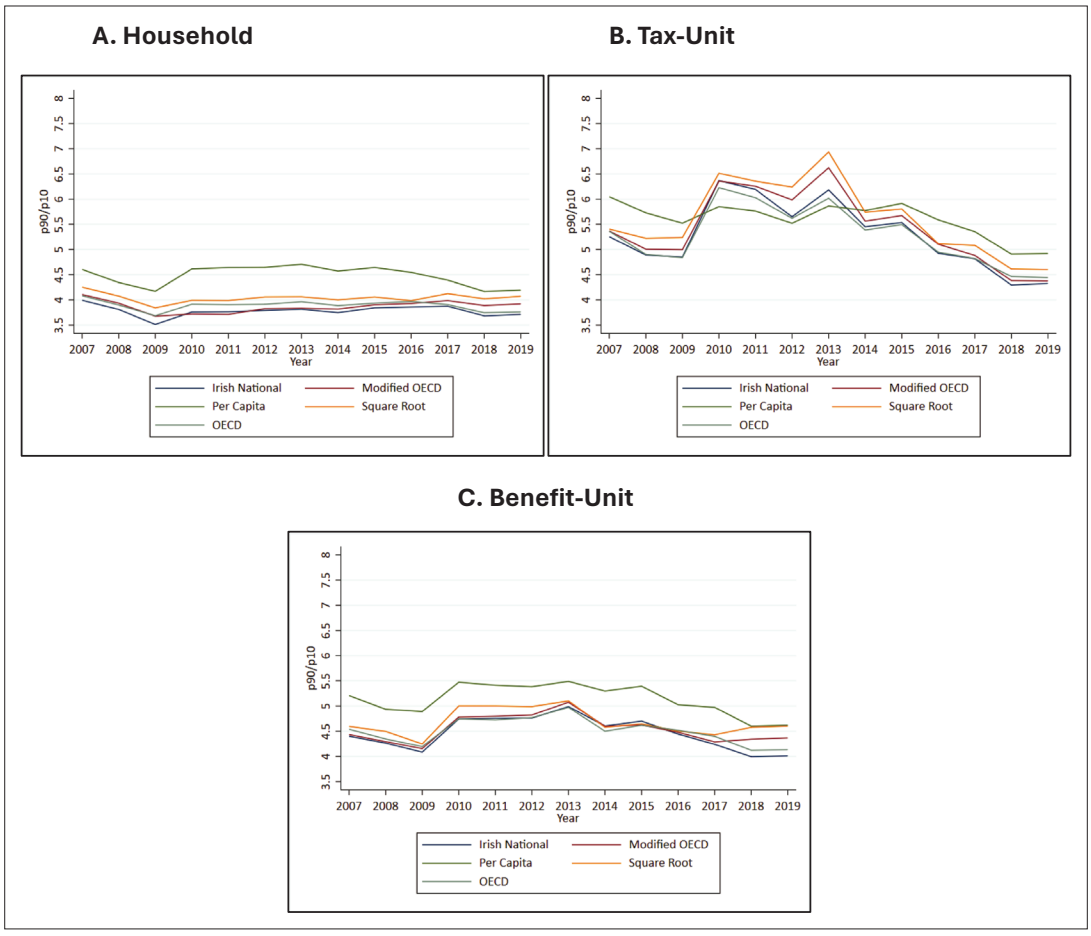


**Figure 2.** p90/p10 ratio.

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

Notes: p90/p10 ratios are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated over a population of households (A), tax-units (B) and benefit-units (C) and represent the ratio of income of the 90$^{th}$ percentile unit relative to the 10$^{th}$ percentile unit. Statistics are also tabulated in Table A1-A3.


**Figure 3.** p10/p50 ratio

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

Notes: p10/p50 ratios are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated over a population of households (A), tax-units (B) and benefit-units (C) and represent the ratio of income of the 10th percentile unit relative to the 50th percentile/median unit. Statistics are also tabulated in Table A1-A3.

benefit-unit. As a robustness check on our findings, we also analyse other inequality measures, specifically ratio measures which will not be as sensitive to re-ranking effects as they are simply taken from discrete points of the income distribution rather than a characterization of the entire distribution.

Our ratio estimates highlight that the spike in inequality observed at the tax-unit level is induced by a greater differential between low- and high-income tax-units. In ***Figure 2***, we present p90/p10 estimates for the household, tax-unit, and benefit-unit. At the household level, the p90/p10 ratio in 2019 using the Irish national scale was 3.7. This is similar to all other scales, except for the per capita scale, which also produces larger estimates of inequality in the case of the Gini index. The ratio is higher at the benefit-unit level, at 4.0 in 2019 using the Irish scale –all other scales produced slightly higher estimates. The p90/p10 ratio is stable throughout the time-series at the household level but demonstrates some cyclicality at the benefit-unit level, rising in 2010 before decreasing in 2014. The tax-unit produces very large p90/p10 estimates, with all equivalence scales showing a ratio of 5.6 - 6.6 from 2010 to 2013. For the most part, these decline from 2014 onward and are close to 4.3 but are significantly higher than household levels for all scales except the per capita scale by 2019. The p10/p50 ratio, shown in ***Figure 3***, also follows a similar trend to the p90/p10 ratio, with estimates at the household level comparable to those at the benefit-unit level. This means that the gap between low- and middle-income units is comparable across these income-sharing concepts, with estimates of

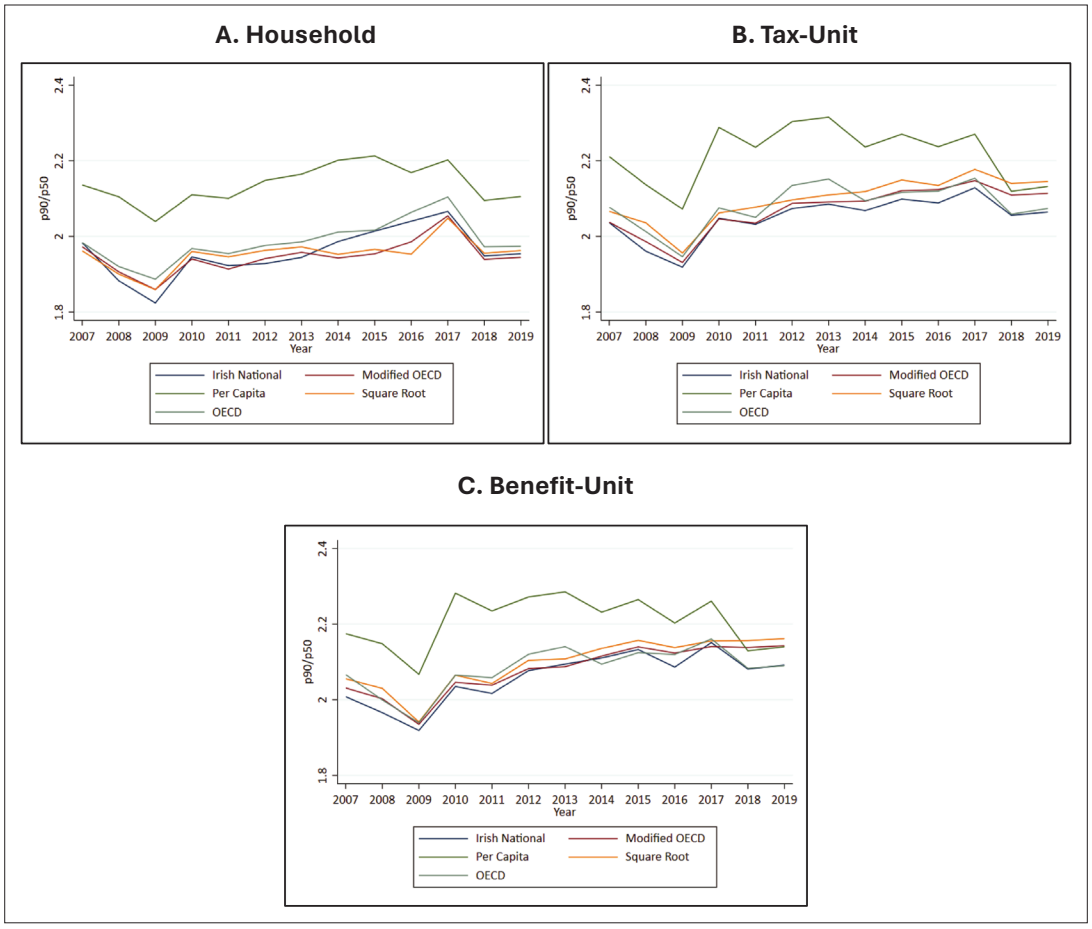


**Figure 4.** p90/p50 ratio.

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

Notes: p90/p50 ratios are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated over a population of households (A), tax-units (B) and benefit-units (C) and represent the ratio of income of the 90$^{th}$ percentile unit relative to the 50$^{th}$ percentile/median unit. Statistics are also tabulated in Table A1-A3.

0.46-0.52 at the household level since 2007. There is a similar range at the benefit-unit level but with some smaller differences across equivalence scales. The tax-unit exhibits much more inequality, with estimates in the range of 0.32-0.48. The smallest estimates of the p10/p50, which highlight the largest levels in inequality between low- and middle-income tax-units, occur in 2010 and 2011, indicating that high levels of unemployment during this period led to lower incomes for those at the bottom of tax-unit income distribution. In ***Figure 4***, the p90/p50 ratio is comparable across the household, tax- and benefit-units, indicating that differences in the p90/p10 and p10/p50 are caused by differences arising at the 10$^{th}$ percentile across income-sharing concepts.

These results indicate that inequality measures are more sensitive to the unit of analysis used. For a given unit of analysis, the choice of equivalence scale affects the level of the inequality indices analysed only marginally. The exception is the per capita scale, which drastically changes results at the household level. This is less important as the per capita scale is not commonly used and can be viewed as a special, or even an extreme case –since the equivalence elasticity in this scale is equal to 1 ($e$=1), as adults and children are treated equally and there are no economies of scale in household size.

In ***Figure 5***, we highlight the extent of the re-ranking of individuals at the household level, to those at the tax-unit and benefit-unit level. Overall, we find that young adults are most affected by re-ranking effects as one transition from the equivalized income distribution at the household level to that at the tax/benefit-unit level. In Panels A and B of ***Figure 5***, we can see that 18 to 24-year-olds tend

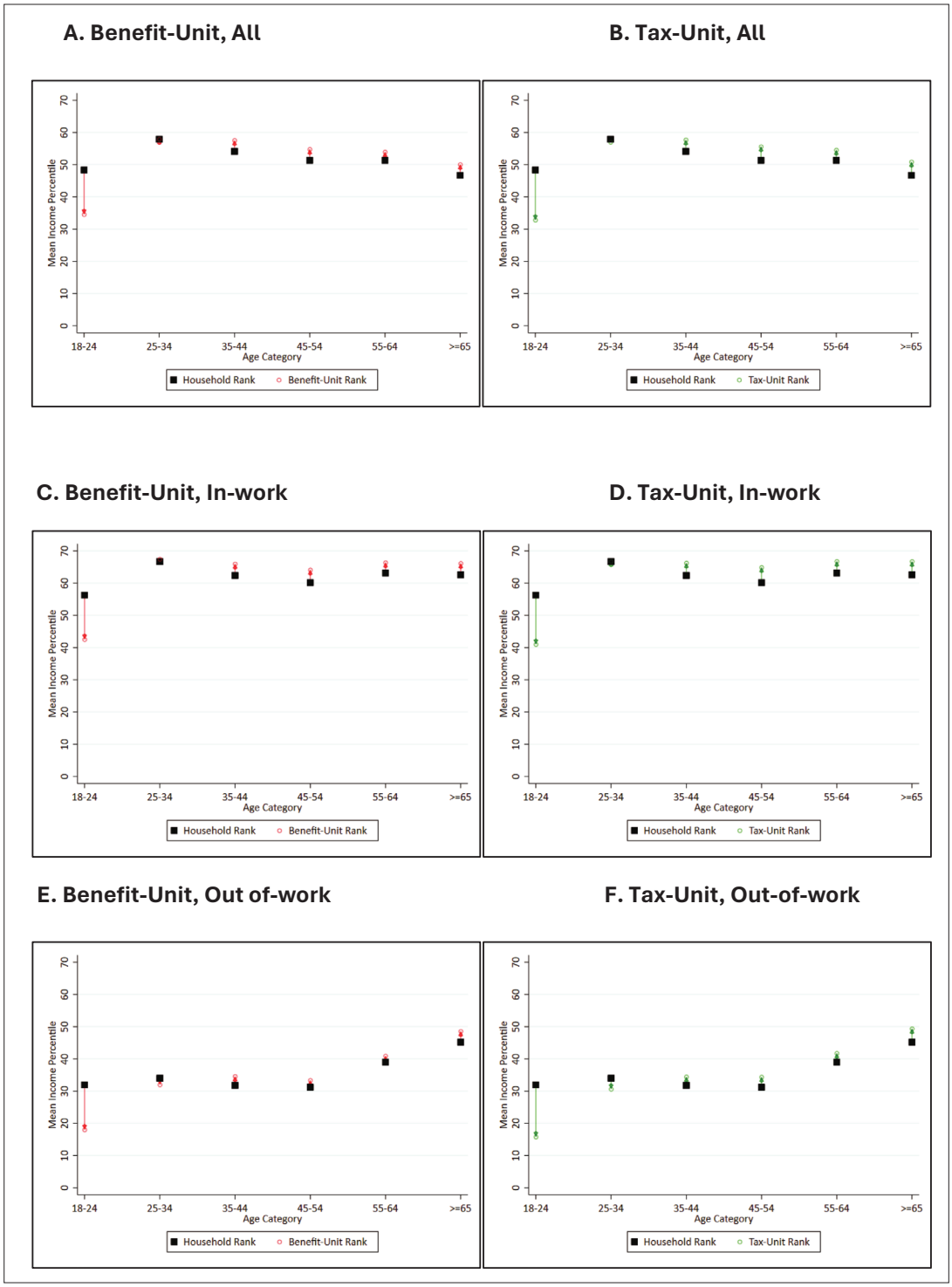


**Figure 5.** Re-ranking from household income distribution to tax-/benefit-units

Source: Data from EUROMOD tax-benefit simulations using system-year combinations as per Table A11 are pooled.

Notes: These show the average income percentile in the household, benefit- and tax-unit income distributions for each demographic group listed. We exclude individuals in full-time education.

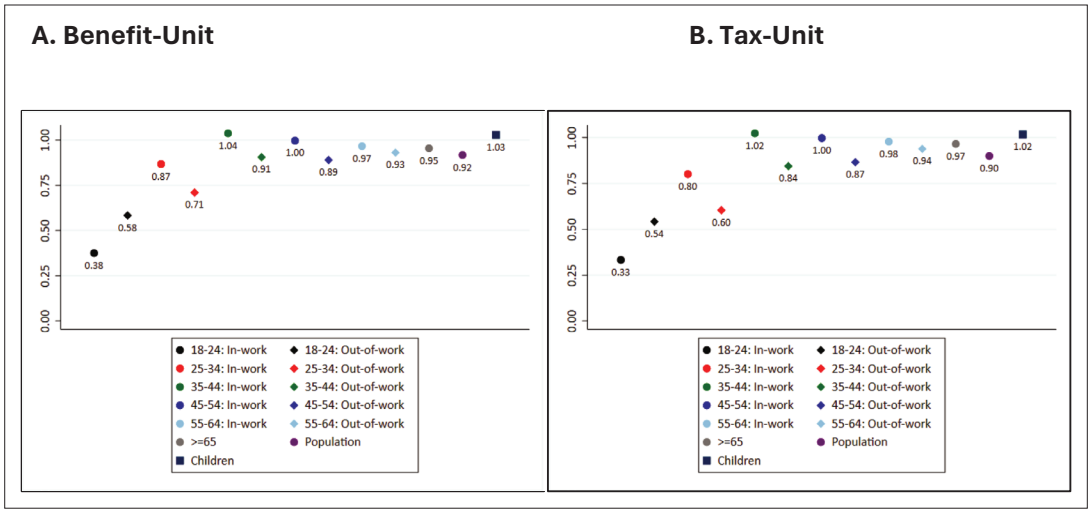


**Figure 6.** Rank-rank regression coefficients

Source: Data from EUROMOD tax-benefit simulations using system-year combinations as per Table A11 are pooled.

Notes: These show the regression coefficient of the household income percentile after being regressed on benefit- and tax-unit income percentile for each demographic group listed (see Equation 3). We exclude individuals in full-time education.

to live in middle income households (on average, very close to the 50th percentile). The re-ranking at the tax-/benefit-unit level moves them close to the 33rd percentile in both distributions. Young people in this age group who are out-of-work tend to fall further down the tax-/benefit-unit income distribution; these out-of-work 18 to 24-year-olds tend to live in households just above the 30th percentile on average but they fall to just below the 20th percentile when moving to the tax-/benefit-unit. Their in-work peers tend to live in 60th percentile households and move close to the 40th percentile at the tax-/benefit-unit level. The relative rank of 25 to 34-year-olds does not change from household, tax- and benefit-units on average. For all other age groups (35 to 44, 45 to 54, 55 to 64 and 65+), there are small increases in their rank going from the household to the tax-/benefit-unit level.

In ***Figure 6***, we show formal regression coefficients from Equation 2 to establish the rank-rank relationship between household and benefit-/tax-units. These results are similar to those shown in ***Figure 5*** but have the feature that they estimate the slope between household and smaller unit rankings while also capturing the level effect of moving from household to a smaller unit in the form of a constant in the estimated regression. There is a strong, positive correlation between household rankings and other units at the population level, 0.92 in the case of the benefit-unit and 0.90 for the tax-unit. These are similar magnitudes for the elderly (0.95 and 0.97 at the benefit and tax-unit level respectively) and for children (1.03 and 1.02 at the benefit/tax-unit level respectively).

Despite this broadly strong relationship, there is substantial heterogeneity across age groups among the working age population. For 18 to 24-year-olds, the correlations are relatively weak and particularly so for those in-work. At the benefit-unit, the correlation is just 0.38 for those in-work and 0.58 for those out-of-work. The correlations are slightly smaller at the tax-unit level- 0.33 and 0.54. For those aged 25-34, the correlations are much stronger and closer to population averages. At the benefit-unit (tax-unit) level, for those in-work, the coefficient is 0.87 (0.80) and 0.71 (0.60) for those out-of-work. For older age groups the regression coefficients tend to follow the population averages quite closely.

## 3.2. Poverty

In the previous section we highlighted that inequality measures, p90/p10 ratio and the Gini coefficient, were much higher at the tax-unit level, but that the choice of equivalence scale had only a marginal effect on estimates. Our findings for poverty (AROP) rate differ, and the choice of equivalence scale emerges as an important consideration for poverty analysis but only for headcount ratios. We find that

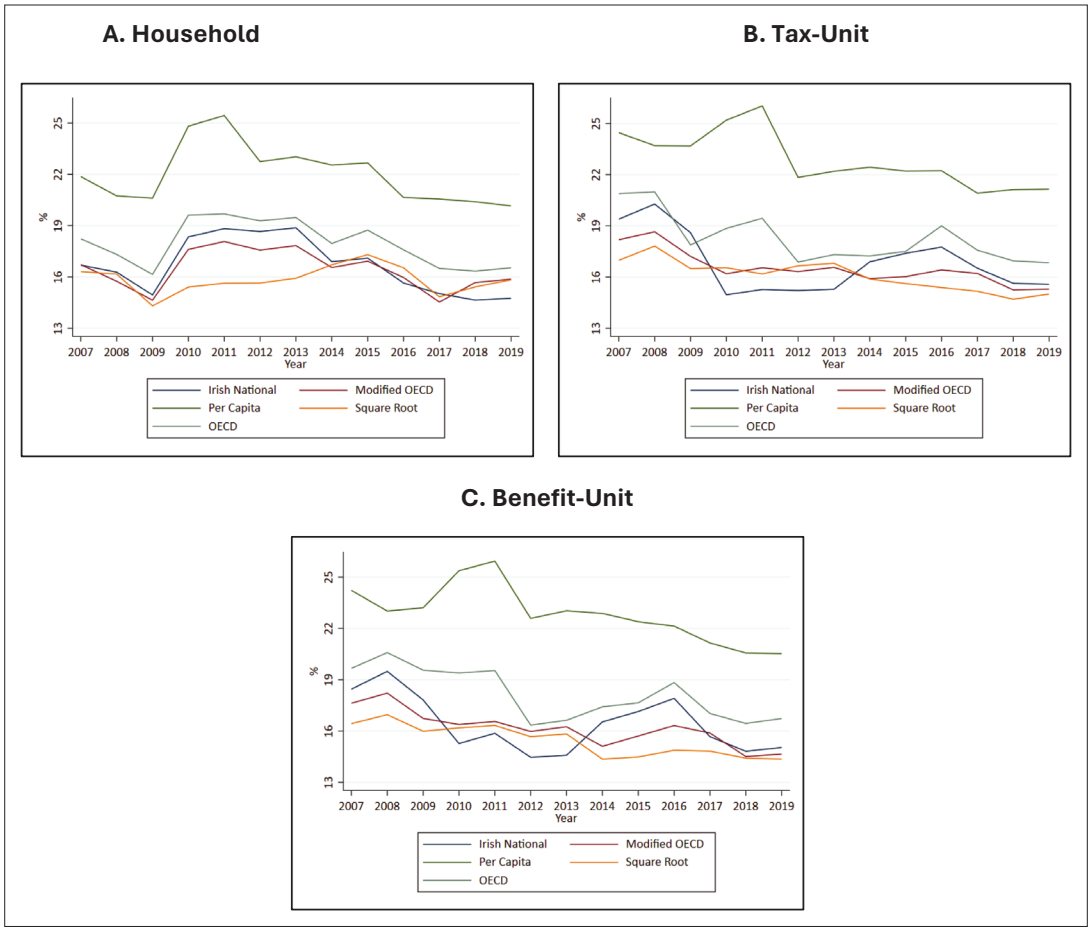


**Figure 7.** At-risk-of-poverty (AROP) rate.

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

Notes: Income poverty rates- head count at-risk-of-poverty rates- are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated as a headcount ratio of individuals living in households (A), tax-units (B) and benefit-units (C) below the poverty line, <60% of median unit equivalized disposable income. Statistics are also tabulated in Table A4-A6.

headcount poverty rates vary widely with the choice of equivalence scale, whereas FGT indices and AROEP measures show much less variation.

In ***Figure 7***, we show the variation in the AROP rate, when different income-sharing units and equivalence scales are applied from 2007 to 2019. Overall, AROP rates are quite similar across all income-sharing units and results at the tax-unit do not differ substantially from household/benefit-unit level results as was seen in the case of the p90/p10 ratio and Gini coefficient.

In terms of the household, the population level AROP rates shown in ***Figure 7*** tend to be very sensitive to the choice of equivalence scale used. All scales show Irish AROP rates reached their lowest level in 2009 but the rate of poverty varies substantially -– with estimates as high as 20.6 per cent for the per capita scale and as low as 14.3 per cent in the case of the square root scale. The Irish national and OECD-modified scales tend to be quite similar, which is unsurprising given they assign similar weights to the additional members, while the OECD scale leads to higher rates of poverty.

There is less variation in AROP rates when we examine the benefit-unit and tax-unit. For a given equivalence scale, AROP rates are comparable across household, benefit-unit and tax-unit level. For instance, in the case of the Irish national scale, going from the household to the tax-unit reduces AROP rates by an average of 0.2 percentage points from 2007 to 2019. There is a similar effect for the benefit-unit whereby AROP rates increase slightly by 0.3 percentage points. Overall, there

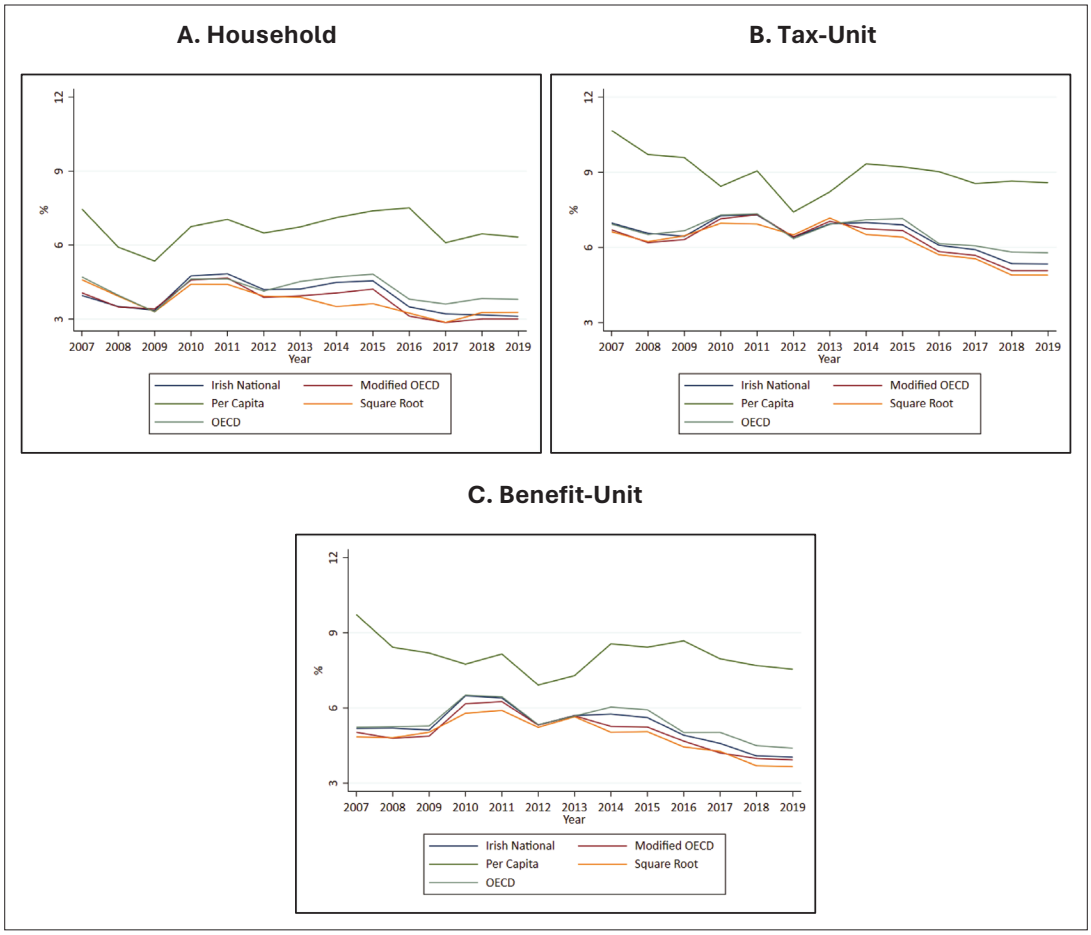


**Figure 8.** At-Risk-Of-Extreme-Poverty (AROEP).

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

Notes: At-risk-of-extreme poverty rates are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated as a headcount ratio of individuals living in households (A), tax-units (B) and benefit-units (C) below the poverty line, <40% of median unit equivalized disposable income. Statistics are also tabulated in tables A4–A6.

are modest effects of the unit of analysis on AROP rates, but the spread in AROP rates between equivalence scales within a given income-sharing unit tends to outweigh the spread in AROP rates between income-sharing units for a given scale. Interestingly, when we examine the AROEP rate (***Figure 8***) equivalence scales tend to converge and report very comparable results for a given income-sharing unit. Equally, in the case of the intensity of poverty, the results from the FGT poverty estimates (***Figure 9*** and ***Figure 10***) are very insensitive to the choice of equivalence scale, but poverty intensity is highest at the tax-unit level and substantially higher than at the household level. The FGT and AROEP results match our earlier findings for the Gini coefficient, that the unit of analysis affected measurement substantially, but equivalence scales had less of a bearing. The case of AROP rates seems unique however, and irrespective of the unit of analysis, AROP rates appear to be extremely sensitive to the choice of equivalence scale.

Of further interest, the sensitivity of AROP rates to the choice of equivalence scale also exhibits distinct heterogeneity across the lifecycle, with AROP rates for children and the elderly particularly sensitive to the choice of scale. This sensitivity is most pronounced when AROP rates are measured at the traditional household level. The full year-unit-scale-lifecycle AROP rates are graphed in

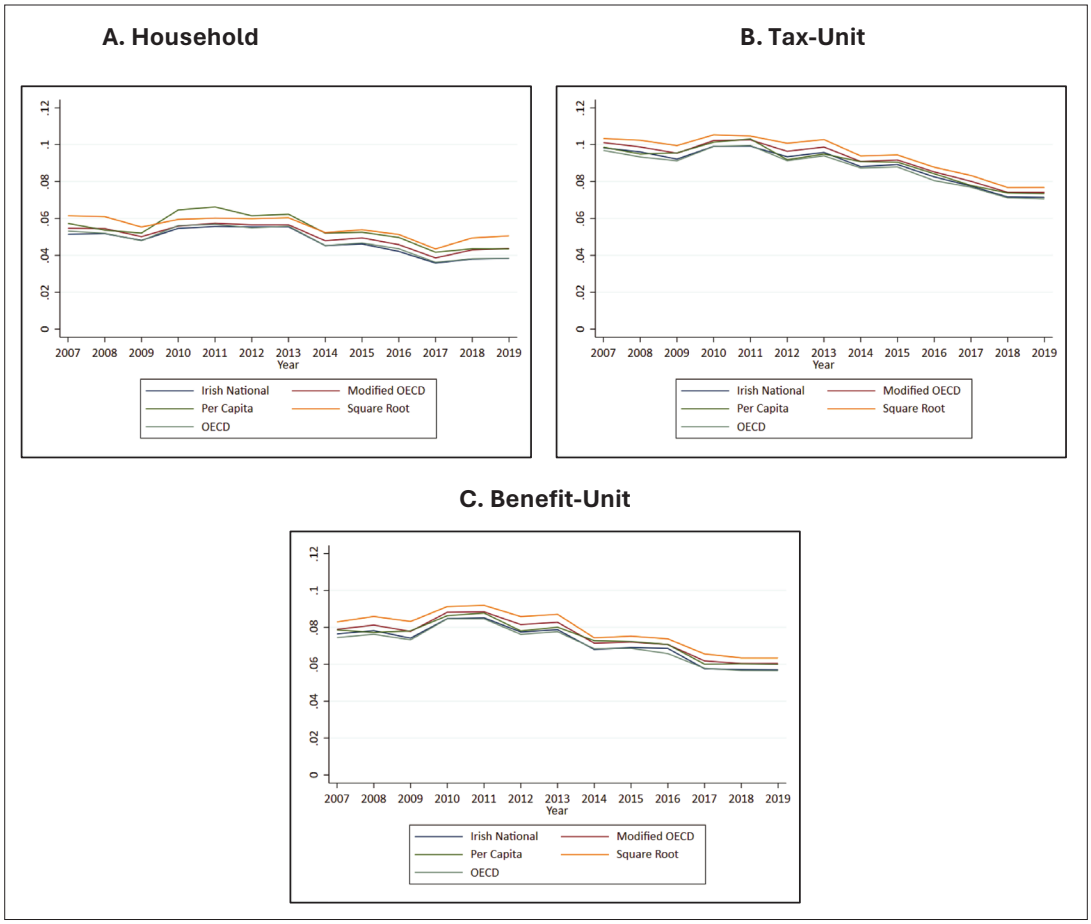


**Figure 9.** Foster-Greer-Thorbecke (FGT) index, aversion parameter=1.

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

***Figures A2–A4***.[15] We summarize this variation in ***Figure 11*** where we present AROP rates by ten-year age bands based on the income-sharing unit and the equivalence scale applied using 2019 data.[16] Poverty among children is considerably higher when the per capita scale is used –this is the case for households and tax-units/benefit-units. There is also very substantial variation in AROP rates for children less than 10 years old across income-sharing units, indicating that for youngest children, the choice of equivalence scale is an important factor. The sensitivity of the child poverty rate to the choice of equivalence scale is highlighted by the spread of AROP rates at the household level. For instance, the AROP rate for children less than 10 years of age is 35.3 per cent when the per capita scale is used compared to 15.3 per cent when the CSO scale is applied. In comparison, AROP rates are very similar across all income-sharing units; this seems sensible given that, for the majority of children, the household will equate to the tax-unit/benefit-unit. Young children seem to be unique in this context, and it is the case that for all other age groups, AROP rates differ depending on the income-sharing unit analysed.

There is also a rank-reversal effect in equivalence scales through the lifecycle at the household level. The per capita scale produces the *highest* AROP estimates for children but the *lowest* for those over the age of 50. On the other hand, both the square root and OECD-modified scale produce the *highest* AROP rates for children but the *lowest* AROP rate for those aged over 60. For those aged

15. By lifecycle we mean child, adult, and elderly.
16. In ***tables A7–A9***, we present the relevant variation of the AROEP rate by ten-year age groups with the results being quite similar with those of the AROP rate present in ***Figure 9***.

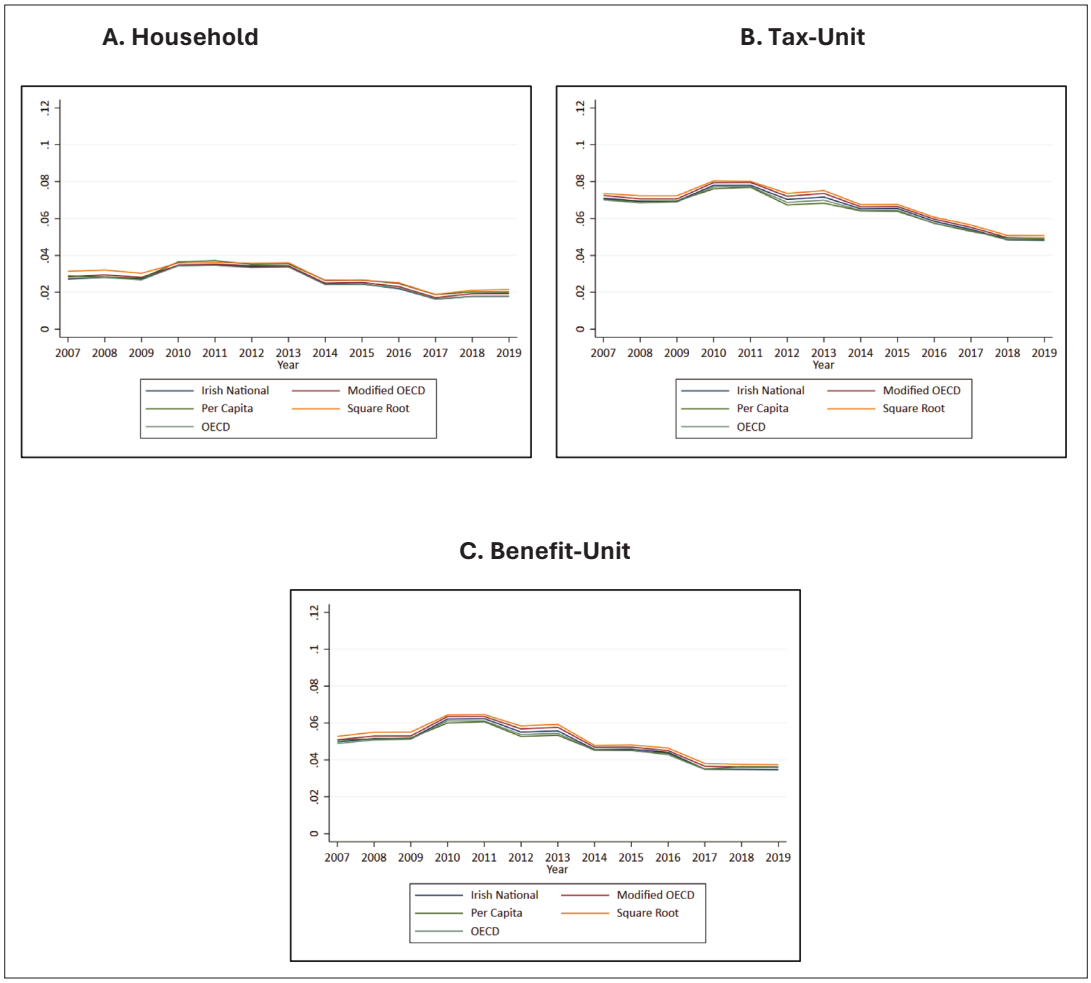


**Figure 10.** Foster-Greer-Thorbecke (FGT) index, aversion parameter=2.

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

between 30 and 50 years of age there is more commonality in the estimates, with the per capita, the OECD and the square root scales producing similar AROP rates, whereas the other two scales (square root and OECD-modified) produce higher poverty rates. These quirks are in line with work by ***Gelders (2021)*** who reports a similar dispersion in child and elderly AROP rates when varying the household relativity parameter across a set of African and Asian countries. One possible explanation for this observation is that the elderly individuals tend to live in smaller households than the general population and are less likely to have children in the household (***Gelders, 2021***).[17]

When examining AROP rates across income-sharing units, it is clear from ***Figure 11*** that the tax-unit and the benefit-unit produce comparable results. In contrast, AROP rates at the household level tend to vary substantially for many ages categories compared to their tax-unit/benefit-unit levels. A notable difference is the rise in the AROP rate of young adults at sub-household levels, consistent with our earlier finding that adults aged 18 to 24-years-old tend to fall down the tax-unit/benefit-unit income distribution relative to their household rank. In 2019, AROP rates for those aged 20 to 29 ranged between 9.7 and 12 per cent across different equivalence scales at the household level. At the benefit-unit level these rise dramatically, with a range of 22.1 to 28.1 per cent. AROP rates at the tax-unit are marginally larger, with a range of 22.5 to 29.5 per cent. A portion of these individuals in their 20s below the poverty line will be those in full-time education, so the rise in poverty may be less

17. This remark is observed in our data as well, with children living in households with 4.3 members on average, whereas the average members per household for individuals older than 60 is 1.8 (see ***Table A10*** in the Appendix).

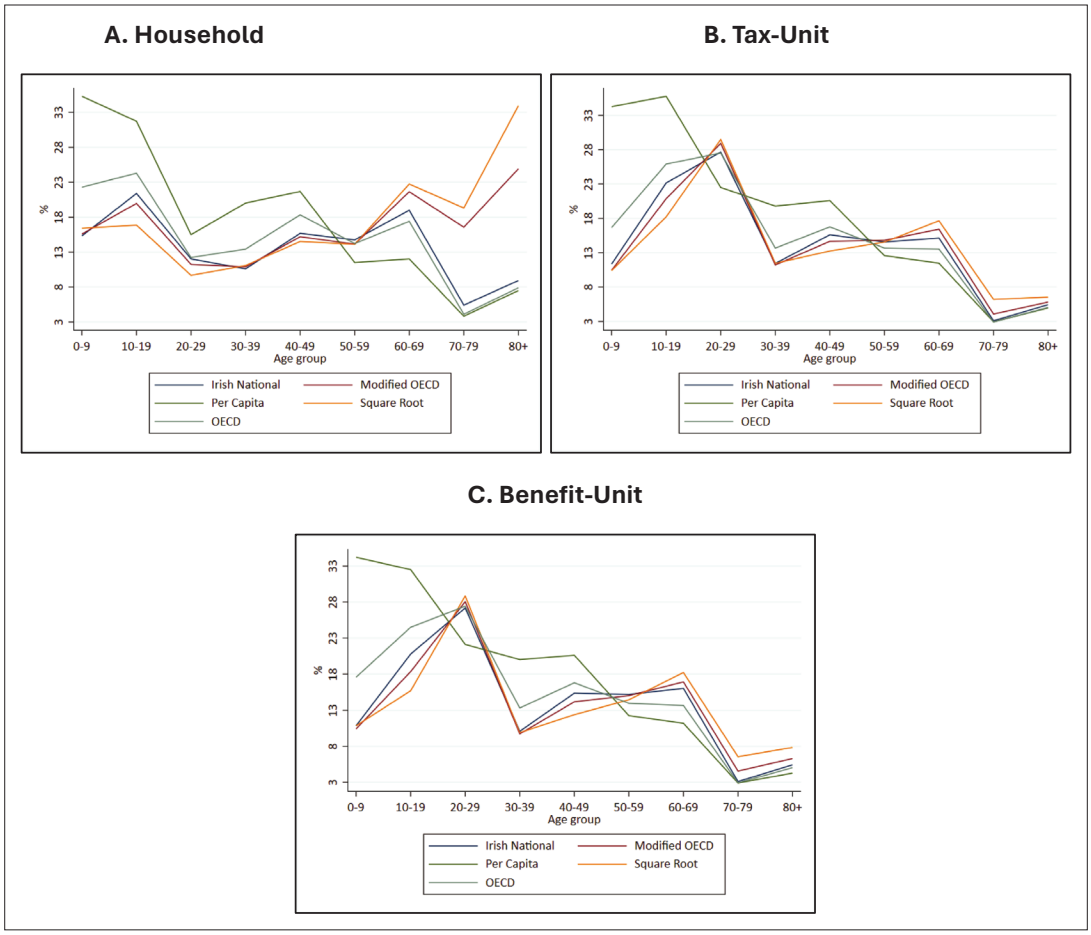


**Figure 11.** At-Risk-Of-Poverty (AROP) rate by ten-year age groups (2019).

Source: EUROMOD tax-benefit simulations using 2019 Irish tax-benefit rules and 2018 Irish EU-SILC UDB.

Notes: Income poverty rates or at-risk-of-poverty rates are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated as a headcount ratio of individuals in a given age bracket living in households (A), tax-units (B), and benefit-units (C) below the poverty line, defined as <60% of median unit equivalized disposable income. Statistics are also tabulated in tables A7–A9.

of a concern for policymakers. The other striking change is the convergence of AROP rates for the elderly, particularly those aged 70 or over, in the tax and benefit-unit results. Elderly AROP rates are very insensitive to the choice of equivalence scale at the tax and benefit-unit level, and are very low, at close to 1 per cent for all scales for those aged 70 to 79. This is in stark contrast to the large spread of AROP rates at the household level, ranging from 3.8 to 19.3 per cent for the elderly. This indicates that the variation in living conditions of elderly individuals may lead to different conclusions around their poverty status. Those over 70 also tend to have noticeably different AROP rates when moving from the household to the tax-unit/benefit-unit, but this only tends to occur when analysing the square root or modified OECD scale. This gives evidence that the currently dominant expert scale, the modified-OECD scale, likely overstates the degree of elderly poverty. The degree of convergence in poverty estimates for the elderly at sub-household levels is astounding and indicates that there could be substantial confounding factors in measuring living conditions for the elderly at the household level.

The last analysis we perform focuses on sensitivity of the AROP rate of different household types, depending on the equivalence scale utilised.[18] ***Figure 12*** presents AROP rates with different equiv-

18. The same analysis is performed for AROEP rates, and the results can be found in ***Table A12*** and Figure A5 in the Appendix. The results about AROEP are similar with the rest of the analysis, showing mainly that AROEP rate varies considerably less than the AROP rate when different equivalence scales are applied.

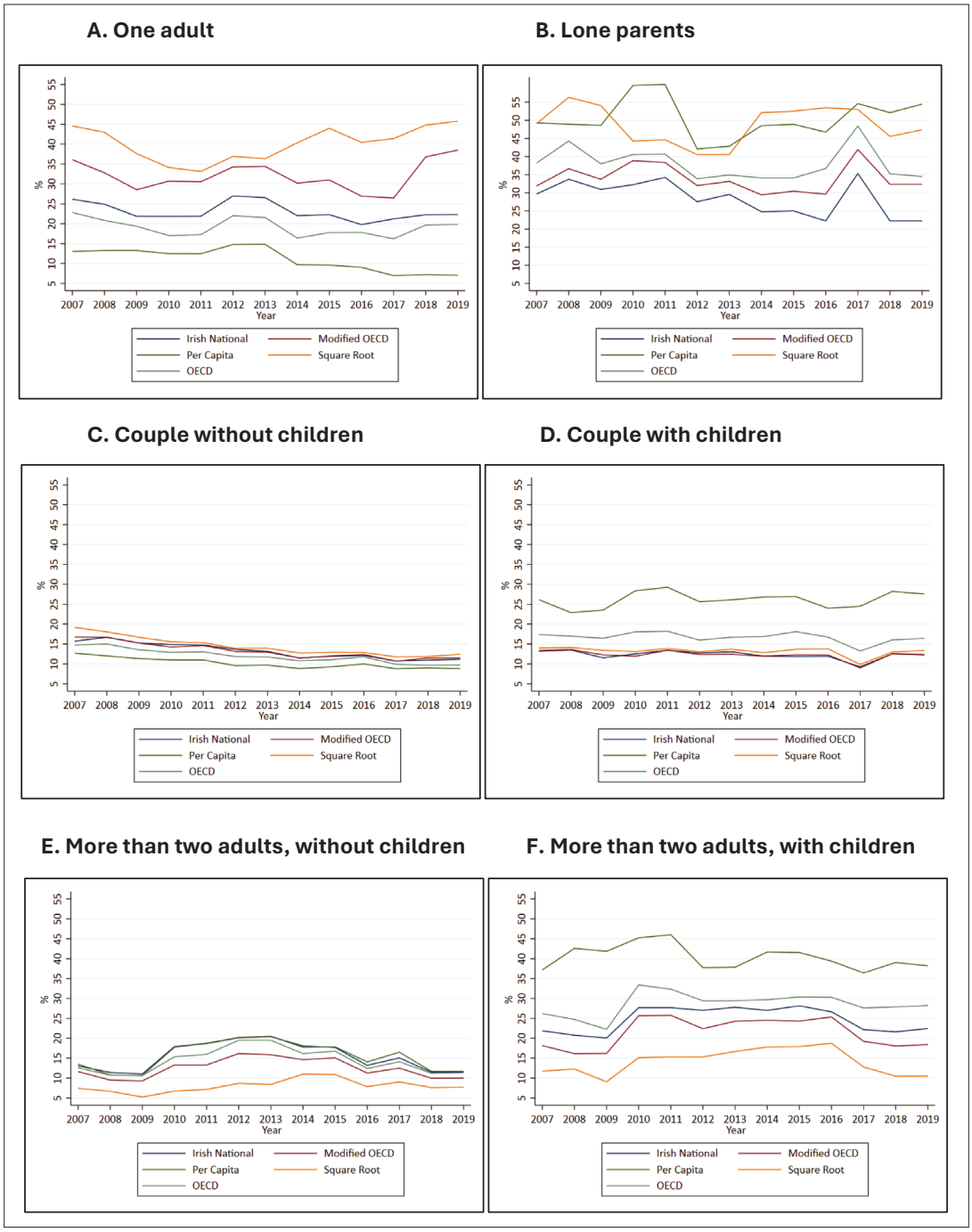


**Figure 12.** At-Risk-Of-Poverty (AROP) rate for different household types

Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

Notes: Income poverty rates or at-risk-of-poverty rates are calculated using simulated disposable income (market income less taxes plus net social welfare) based on calculations from the Irish policy systems in EUROMOD using the Irish EU-SILC UDB file. Statistics are calculated as a headcount ratio of individuals in single households (A), lone parent households (B), couple without children household (C), couple with children household (D), more than two adults without children households (E), and more than two adults with children household (F) living below the poverty line, defined as <60% of median household equivalized disposable income. Statistics are also tabulated in Table A12.

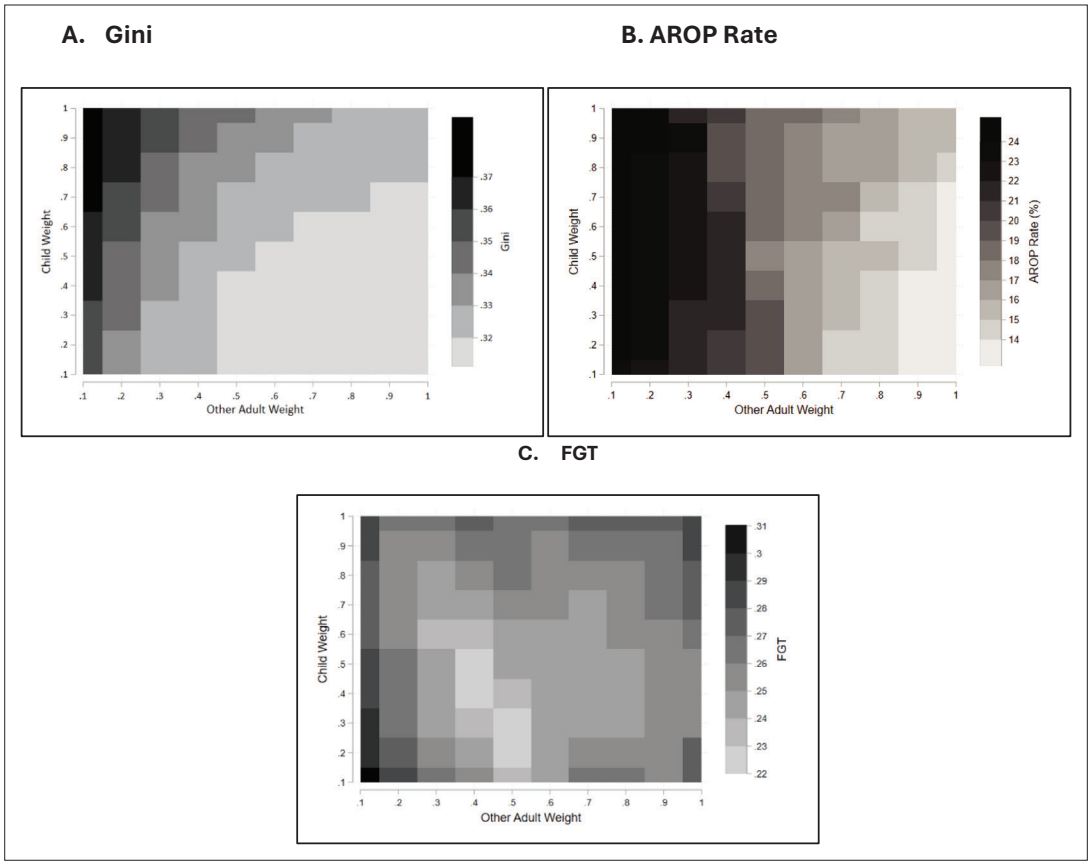


**Figure 13.** Household level Gini and poverty rates using simulated equivalence scales, 2019 data

Source: EUROMOD tax-benefit simulations using 2019 Irish tax-benefit rules and 2018 Irish EU-SILC UDB.

Notes: We calculate Gini coefficients, poverty rates and FGT indices using 100 hypothetical equivalence scales based on the functional form defined in Equation 2: $\left(1+\alpha\left(S_a-1\right)+\beta S_k\right)^{\gamma}$. For all scales we hold the household relativity parameter, $\gamma$, as a constant at 1. We allow the adult weight, $\alpha$ and the child weight, $\beta$ to vary discretely at values [0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1].

alence scales are applied from 2007 to 2019 for six different household types: (a) one adult, (b) lone parents, (c) couples without children, (d) couples with children, (e) more than two adults without children and (f) more than two adults with children. As it might be expected, the size of the household seems to matter. From the graphs below we can see that equivalence scale seems to matter less when the households consist of two or more adults without children. On the other hand, for single and lone parent households, the choice of the equivalence scale seems to be quite important. The graphs also depict the mirroring effect that equivalence scales have on the AROP rate of households with different size. For example, the use of the square-root equivalence scale makes single households the household type with the second highest AROP rate in 2019 (45.7 per cent), whereas households with more than two adults and with children have one of the lowest AROP rates (10.4 per cent). The situation is reversed if instead of the square-root equivalence scale we use the OECD equivalence rate; single households have lower AROP rates (19.8 per cent) compared with households with more than two adults and with children (28.2 per cent). As such, the choice of equivalence scale will also have implications for the types of households who are classified as living below the poverty line.

## 4. Sensitivity analysis

In this section, we conduct sensitivity analysis by simulating the impact of hypothetical equivalence scales on income poverty and inequality for adults and children. In ***Figure 13*** we demonstrate just how sensitive the AROP rates are to the choice of equivalization weights. We implement a simulation using the latest income data, from 2018 income data paired with the latest tax-benefit parameters

from 2019, available in EUROMOD.[19] From these disposable incomes we then calculate Gini coefficients and AROP rates at the household level using 100 different hypothetical equivalization scales (all permutations of 0.1, 0.2. 0.3, 0.4…0.9, 1 for both child and adult equivalents), we hold the household size relativity parameter constant at 1. Based on the logic of Equation 2, our preferred functional form for referencing the three-parameter expert equivalence scales: $\left(1+\alpha\left(S_a-1\right)+\beta S_k\right)^{\gamma}$, this amounts to allowing both $\alpha$ and $\beta$ to vary discretely at values [0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1] while holding $\gamma$=1 in all cases. Our primary interest in this thought experiment is to examine the partial effect of $\alpha$ and $\beta$ on inequality and poverty.

To summarize our findings, we show a heatmap of the variation produced in Gini, AROP rates and FGT indices by all these hypothetical scales in ***Figure 13***. Its apparent that there is much more variation in AROP rates due to permutations in child-adult weights. AROP rates are lowest at the highest values of adult weights and lowest values of child weights and tend to be less than 14 per cent. At moderate levels of adult weights, between 0.5 and 0.7, and moderate levels of child weights, 0.3-0.5, AROP rates range from 15.0 per cent to 19.5 per cent, with an average of 16.8 per cent.

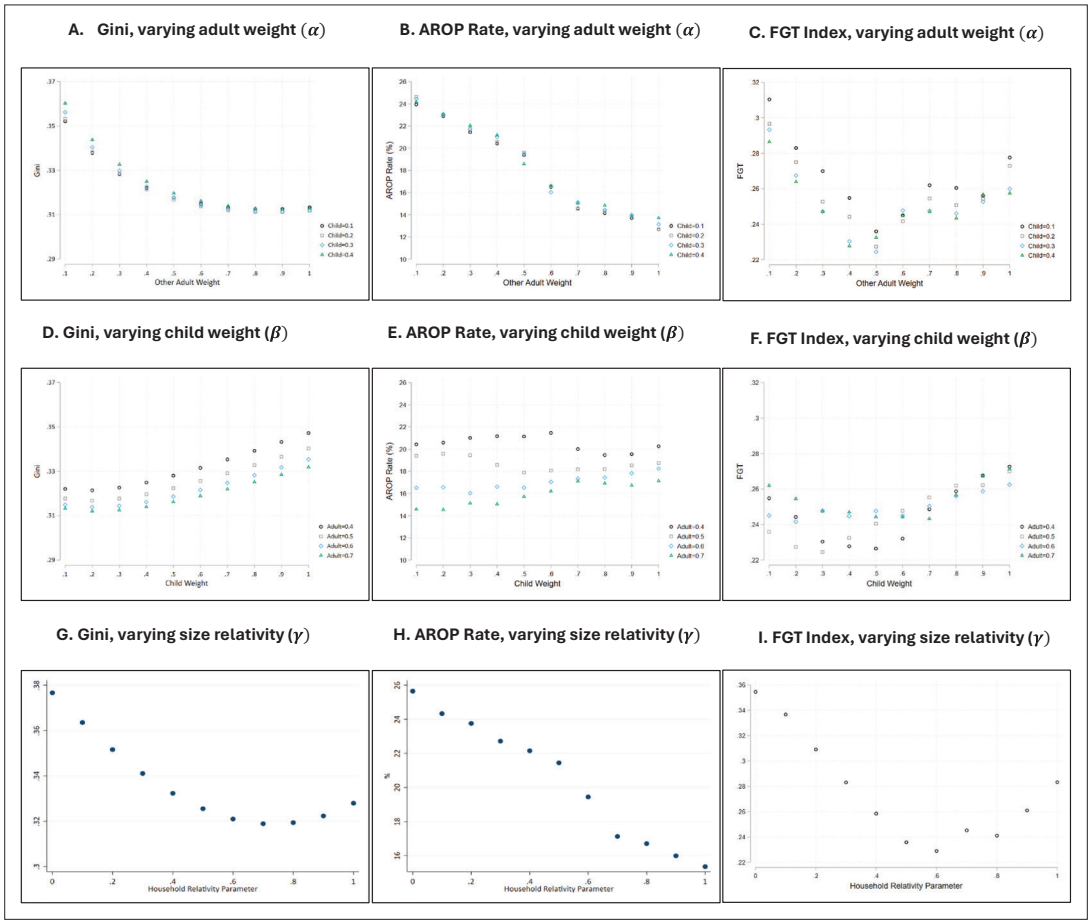


**Figure 14.** Selected Gini, poverty rates and FGT index using simulated equivalence scales, 2019 data

Source: EUROMOD tax-benefit simulations using 2019 Irish tax-benefit rules and 2018 Irish EU-SILC UDB.

Notes: We calculate Gini coefficients, poverty rates and FGT indices using 100 hypothetical equivalence scales based on the functional form defined in Equation 2: $\left(1+\alpha\left(S_a-1\right)+\beta S_k\right)^{\gamma}$. For graphs A-F, we hold the household relativity parameter, $\gamma$ , as a constant at 1. We allow $\alpha$ and $\beta$ to vary discretely at values [0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1]. In Panels A, B and C we display the Gini coefficient and poverty rate for varying $\alpha$ from 0.1 to 1 for selected values of $\beta$. In Panels D, E and F we display the Gini coefficient and poverty rate for varying $\beta$ from 0.1 to 1 for selected values of $\alpha$. In Panels G, H and I we hold $\alpha=1$ and $\beta=1$ and allow the value of $\gamma$ to vary discretely from [0, 0.1, 0.2, 0.3, 0.4, 0.5, 0.6, 0.7, 0.8, 0.9, 1].

19. We opted to exclude the 2020 tax-benefit parameters from the analysis as numerous discretionary policy changes were made to support household incomes in the wake of the COVID-19-related job losses.

This sensitivity of the AROP rate is contrasted by the relative stability of the Gini coefficient, where a "stepped" pattern is evident in child-adult weights. The lowest Gini estimates are evident at medium to high levels of adult weights and low to medium levels of child weights. As is the case with the AROP rate, the Gini coefficient tends to be highest as the child weight approaches 1 and the adult weight approaches 0.1. For the FGT index, we find that it's higher at extreme scenarios were both the adult and child weight are the same (with weights of 0.1 or 1). In ***Figure 14*** we plot a sub-set of the results shown in ***Figure 13***, so that the shape of the AROP rate, Gini coefficient and FGT indices in response to a *ceteris parabis* change in adult and child weights can be more easily identified. For selected values of the child weight, 0.1 to 0.4, both inequality and poverty tend to decrease as the adult weight increases, with the rate of decrease flattening after a weight of 0.7. The FGT index follows more a W-shape pattern. In contrast, inequality is increasing in the child weight, the increase is subtle at low levels of the child weight but increase quite rapidly at a weight of 0.4. There is no clear relationship between the poverty rate (or the FGT index) and the child weight, and the pattern of increasing values of the child weight seem very sensitive to the choice of initial adult weight, indicating that interaction effects between adult and child weights are also substantial. We also demonstrate the effect of varying the value of the household relativity parameter, $\gamma$. To do so we hold $\alpha$ and $\beta$ at 1- this is

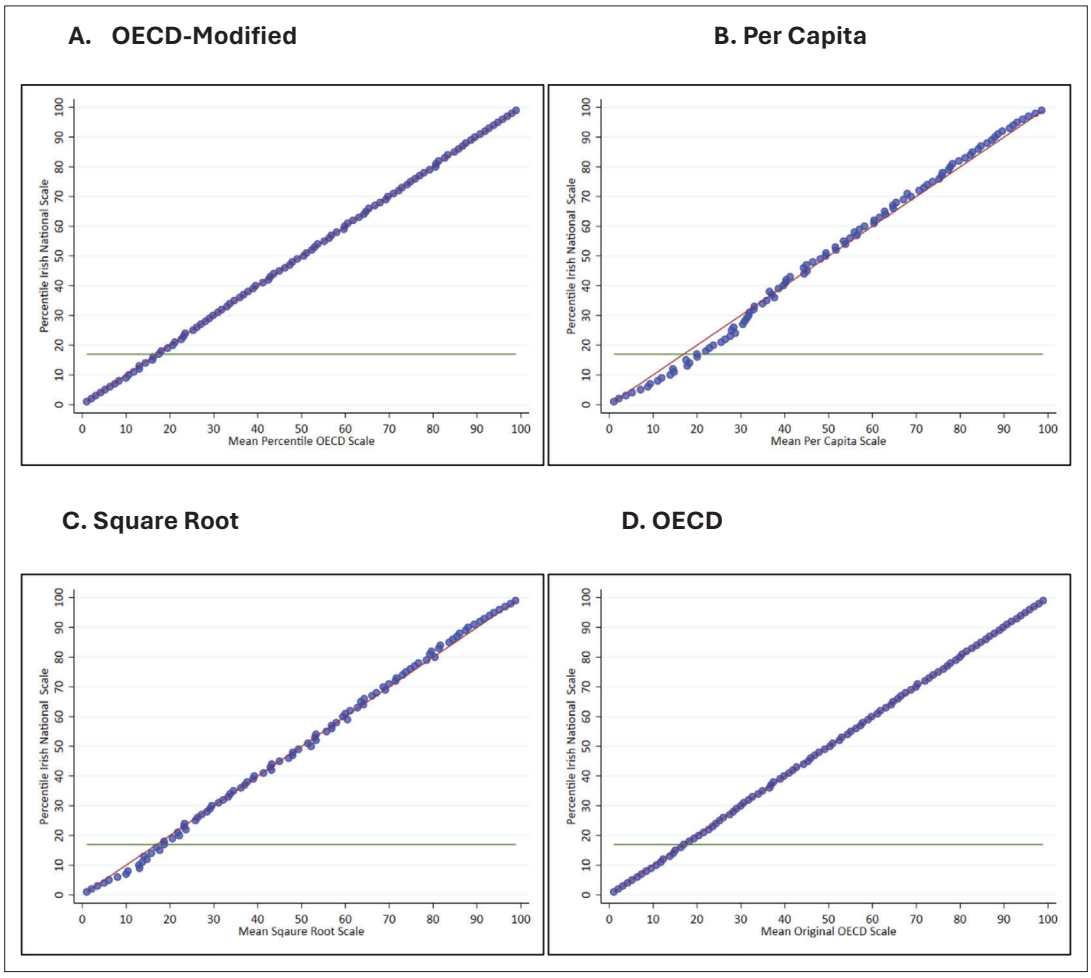


**Figure 15.** Re-ranking across household income percentiles from equivalization scales 2007-2019

Source: Data from EUROMOD tax-benefit simulations using system-year combinations as per Table A11 are pooled.

Notes: Red-line is a 45-degree line indicating a perfect match between household income ranking with the Irish National scale and the other examinable scales. In each graph the average income ranking of households under the Irish national scale is plotted against the corresponding average rank for the OECD, per capita, square root and OECD original scale. Data are from 2007-2019 EUROMOD systems. The horizontal line represents the average household poverty rate from 2007-2019 using the Irish National equivalence scale.

equivalent to a one-parameter scale in household size and allows for comparability with ***Coulter et al. (1992)*** who undertook a comparable exercise for Ireland's nearest neighbour, the United Kingdom. We observe a somewhat U-shaped relationship between $\gamma$ and the Gini - as noted in ***Coulter et al. (1992)***- as well as the FGT index, but not as markedly U-shaped. It is also clear that the AROP rate is decreasing, quite dramatically, in $\gamma$, with a change in the AROP rate of more than 10 percentage points over the range of $\gamma$. This is in contrast to the distinct U-shaped relationship between the AROP rate and $\gamma$ observed in ***Coulter et al. (1992)***.

We can reconcile these findings by examining ***Figure 15***, which shows a scatterplot of the mean centile ranks of households from 2007-2019, using the CSO equivalence scale, against these same household ranks using the square root, per capita, OECD and modified scales. A 45-degree line in each of the plots shows the extent to which the equivalence scales cause re-ranking effects along the income distribution. For instance, in plot A, there is very little deviation from the 45-degree line between mean household ranks using the Irish national or OECD-modified scale –implying that households that were on average located in the $i^{th}$ centile under the CSO equivalized income distribution tend to be located close to the $i^{th}$ centile under the OECD-modified equivalized income distribution. This is also the case with the OECD scale, but there are noticeable differences between the CSO scales and both the square root and per capita scales in the ranking of low-income household close to the poverty line (the average household level poverty rate from 2007-2019 is shown as a horizontal line). In both cases, the most substantial re-ranking effects occur at the bottom of the income distribution, close to the average household poverty line. The scatter points are to the right of the 45-degree line at the bottom of the income distribution, indicating that low-income households move slightly up the per capita and square root equivalized income distribution compared to the distribution generated using the CSO scale. There is less re-ranking at the very bottom of the income distribution however e.g. $<5^{th}$ centile, which explains why we tend to notice little change in AROEP measures as opposed to AROP rates. Across all scales, there is very little movement from household income centile ranks from the middle to the top of the income distribution. From this observation we conclude that while the process of equivalization represents a non-monotonic income transformation, variation in equivalence scales tend to be non-monotonic at the bottom of the income distribution, particularly close to the poverty line, and approximately monotonic at the middle and top of the distribution. This reconciles our finding that statistics such as the Gini coefficient, which summarize the entire income distribution are less sensitive to the choice of equivalence scale than the AROP rate which is a low-income specific statistic and is a function of distance from the median income household.

## 5. Conclusion

Our research has shed light on the importance of equivalence scales for headcount poverty ratios and the sensitivity of the Gini coefficient to different income-sharing assumptions within households. We use Ireland as a case study, but our results have significant general implications for applied public economists, microsimulation researchers and policy makers. We find that equivalence scales have a major impact on household level poverty and also the composition of poor households. This is concerning, particularly given the large range of estimates produced for young children and elderly across different scales. The effect of these equivalence scales was also unique to the at-risk-of-poverty rate which used 60 per cent of the median income as the relevant poverty line. We find that using a 40 per cent poverty line (at-risk-of-extreme-poverty) or Foster-Greer-Thorbecke measures of poverty intensity were unaffected by equivalence scales. We believe this finding undermines the ability of the at-risk-of-poverty rate to accurately assess the degree of income poverty at a point in time. Using 2019 data, we simulated a range of 15.0 to 19.5 per cent for at-risk-of-poverty rates using commonly used adult-child weights in expert equivalence scales. Our simulation also suggests that inequality and poverty rates are most sensitive to the choice of the adult weight, with both poverty and inequality decreasing as the size of the adult weight increases. This sensitivity stems from the re-ranking of households close to the poverty line across different equivalence scales.

The act of equivalizing represents a non-monotonic transformation of income and makes households which are larger or have a higher concentration of adults appear as "lower income". We show that this re-ranking across scales tend to mostly affect individuals close to the initial poverty line (close to the $20^{th}$ percentile) based on the Irish national equivalence scale. Very low-income, middle- and high-income households are much less affected.

This variance represents a challenge to the public economist, who should be conscious of how sensitive the at-risk-of-poverty metric is to the choice of equivalence scale. This issue is not easily remedied, as a strictly dominant equivalence scale is difficult, if not impossible to identify. The lack of consensus in optimal equivalence scales in the Irish context is highlighted by the use of three different scales from three different statistical bodies: the Irish national scale used by the Irish Central Statistics Office, the square root scale used by the OECD and the OECD-modified scale used by Eurostat.

We also find that inequality systematically rises at sub-household levels, with the Gini coefficient rising by an average of 4 percentage points (13 per cent) and 2.8 percentage points (9 per cent) at the tax and benefit-units relative to the household. Our analysis shows that young adults, those aged 18 to 24-years-old, have their position in the income distribution significantly distorted when moving from the household to sub-household level; 18 to 24-years-olds tend to live in middle income households but are downgraded to the bottom-third at the tax-/benefit-unit level. This re-ranking effect also has a significant effect on our understanding of income poverty levels amongst young adults, with at-risk-of-poverty rates more than doubling at the tax/benefit-unit as compared to the household level. While some of this increased poverty may be as a result of students living with their parents, the re-ranking effects are solely estimated over those not in-education. This is also very policy relevant in the context of the COVID-19 pandemic. As more young people return to live with their parents during the pandemic- equally seen in the United Kingdom and noted by ***Jenkins (2022)***- inequality measurement at the household level will likely decrease due to demographic change. Given concerns regarding affordability of rental accommodation and property prices in Ireland (***Corrigan et al., 2019***), young people may increasingly live with their parents, meaning that demographic change may further reduce household level inequality and mask societal issues.

From a practical viewpoint, since the 2020 release of EU-SILC, EU-level legislation has attempted to divide single dwellings/addresses into multiple households based upon the income and expense sharing habits of residents. Our findings suggest that further development is needed in this area, particularly to formalize the unit of analysis in greater detail, as inequality seems to be noticeable higher at sub-household levels.

Practitioners and policy makers should be particularly aware that the at-risk-of-poverty measure, when calculated at the traditional household level is very sensitive to the value of equivalence scales, particularly for children and elderly as well as households with one or more than two adults where the sensitivity is most pronounced. We suggest that authors report multiple estimates for these groups so as to get a sense of the range of estimated income poverty, especially when examining child and elderly poverty rates which seem acutely sensitive. Alternatively, analysts can use the at-risk-of-extreme poverty head count ratio alongside Foster-Greer-Thorbecke indices with an at-risk-of-poverty line (60 per cent of median income) to avoid concerns about the choice of equivalence scale.

This paper employs the concept of income poverty as defined in Europe, with implications also extending to other advanced non-EU economies. Researchers and policymakers should be mindful of how their underlying assumptions impact welfare statistics, noting these implications in their publications. The choice of equivalence scale can impact income poverty, with scales with higher weights for adults leading to lower poverty rates. Similarly, utilizing an equivalence scale with higher weights for adults yield lower measures of inequality, whereas higher weights for children can result in higher inequality measures. The definition of a household can also significantly influence inequality. For instance, young adults counted as separate households—whether living with parents or housemates—might experience heightened levels of poverty. Future studies should compare the effect of these assumptions across countries, examining whether the impact is consistent internationally.

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are based on EUROMOD version I1.0+. Having been originally maintained, developed and managed by the Institute for Social and Economic Research (ISER), since 2021 EUROMOD is maintained, developed and managed by the Joint Research Centre (JRC) of the European Commission, in collaboration with EUROSTAT and national teams from the EU countries. We make use of microdata from the EU Statistics on Incomes and Living Conditions (EU-SILC) made available by Eurostat.

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## Data and code availability

Paper Submission entitled "How important are the unit of analysis and equivalence scales when measuring income poverty and inequality? Evidence from Ireland" – Data and Code availability statement
The paper utilizes the EUROMOD platform, accessible at https://euromod-web.jrc.ec.europa.eu/. However, due to restrictions imposed by EUROSTAT, the entity providing the underlying data for the model, we are unable to share the input datasets used. Nevertheless, we are pleased to offer the STATA code employed in our analysis.
We are committed to preserving both the data and code for a minimum period of five years following the publication of the manuscript. Additionally, we are dedicated to providing reasonable assistance to any requests for clarification or replication.

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# Appendix A

**Table A1.** Inequality statistics by equivalence scale, household level.

| | Irish National | OECD-Modified | Per capita | Square root | OECD |
|---|---|---|---|---|---|
| | | | Gini | | |
| 2007 | 0.3093 | 0.3111 | 0.3275 | 0.3171 | 0.3124 |
| 2008 | 0.3039 | 0.3048 | 0.3250 | 0.3101 | 0.3076 |
| 2009 | 0.2898 | 0.2906 | 0.3130 | 0.2960 | 0.2940 |
| 2010 | 0.3037 | 0.3052 | 0.3274 | 0.3103 | 0.3086 |
| 2011 | 0.3026 | 0.3040 | 0.3271 | 0.3089 | 0.3077 |
| 2012 | 0.3030 | 0.3030 | 0.3262 | 0.3053 | 0.3070 |
| 2013 | 0.3045 | 0.3044 | 0.3279 | 0.3066 | 0.3086 |
| 2014 | 0.3059 | 0.3069 | 0.3246 | 0.3097 | 0.3086 |
| 2015 | 0.3095 | 0.3106 | 0.3277 | 0.3134 | 0.3121 |
| 2016 | 0.3073 | 0.3093 | 0.3239 | 0.3137 | 0.3096 |
| 2017 | 0.3053 | 0.3077 | 0.3218 | 0.3127 | 0.3079 |
| 2018 | 0.3116 | 0.3158 | 0.3264 | 0.3236 | 0.3144 |
| 2019 | 0.3135 | 0.3177 | 0.3280 | 0.3255 | 0.3162 |
| | | | p90p10 | | |
| 2007 | 3.9917 | 4.1064 | 4.6051 | 4.2513 | 4.0816 |
| 2008 | 3.8100 | 3.9351 | 4.3434 | 4.0752 | 3.8987 |
| 2009 | 3.5104 | 3.6752 | 4.1688 | 3.8417 | 3.6839 |
| 2010 | 3.7582 | 3.7185 | 4.6149 | 3.9906 | 3.9139 |
| 2011 | 3.7629 | 3.7110 | 4.6423 | 3.9871 | 3.9054 |
| 2012 | 3.7897 | 3.8263 | 4.6446 | 4.0575 | 3.9127 |
| 2013 | 3.8137 | 3.8332 | 4.7077 | 4.0608 | 3.9630 |
| 2014 | 3.7456 | 3.8174 | 4.5722 | 4.0013 | 3.8864 |
| 2015 | 3.8418 | 3.9029 | 4.6433 | 4.0574 | 3.9358 |
| 2016 | 3.8590 | 3.9284 | 4.5474 | 3.9843 | 3.9679 |
| 2017 | 3.8742 | 3.9854 | 4.3916 | 4.1245 | 3.9070 |
| 2018 | 3.6817 | 3.8887 | 4.1653 | 4.0206 | 3.7438 |
| 2019 | 3.7099 | 3.9209 | 4.1923 | 4.0715 | 3.7606 |
| | | | p10p50 | | |
| 2007 | 0.4968 | 0.4803 | 0.4638 | 0.4614 | 0.4860 |
| 2008 | 0.4941 | 0.4845 | 0.4846 | 0.4663 | 0.4925 |
| 2009 | 0.5195 | 0.5059 | 0.4892 | 0.4839 | 0.5122 |
| 2010 | 0.5177 | 0.5218 | 0.4573 | 0.4911 | 0.5028 |
| 2011 | 0.5110 | 0.5156 | 0.4525 | 0.4880 | 0.5004 |
| 2012 | 0.5088 | 0.5073 | 0.4624 | 0.4838 | 0.5050 |
| 2013 | 0.5098 | 0.5107 | 0.4597 | 0.4857 | 0.5010 |

| | Irish National | OECD-Modified | Per capita | Square root | OECD |
|---|---|---|---|---|---|
| 2014 | 0.5304 | 0.5089 | 0.4815 | 0.4879 | 0.5176 |
| 2015 | 0.5242 | 0.5006 | 0.4765 | 0.4845 | 0.5123 |
| 2016 | 0.5286 | 0.5055 | 0.4769 | 0.4901 | 0.5200 |
| 2017 | 0.5332 | 0.5154 | 0.5015 | 0.4965 | 0.5386 |
| 2018 | 0.5292 | 0.4987 | 0.5030 | 0.4863 | 0.5268 |
| 2019 | 0.5267 | 0.4959 | 0.5022 | 0.4820 | 0.5248 |
| | | | p90p50 | | |
| 2007 | 1.9832 | 1.9725 | 2.1359 | 1.9616 | 1.9836 |
| 2008 | 1.8827 | 1.9064 | 2.1048 | 1.9005 | 1.9203 |
| 2009 | 1.8238 | 1.8593 | 2.0393 | 1.8591 | 1.8869 |
| 2010 | 1.9457 | 1.9402 | 2.1102 | 1.9599 | 1.9678 |
| 2011 | 1.9227 | 1.9136 | 2.1005 | 1.9457 | 1.9544 |
| 2012 | 1.9280 | 1.9411 | 2.1479 | 1.9630 | 1.9759 |
| 2013 | 1.9443 | 1.9577 | 2.1643 | 1.9722 | 1.9854 |
| 2014 | 1.9865 | 1.9428 | 2.2015 | 1.9524 | 2.0115 |
| 2015 | 2.0140 | 1.9537 | 2.2125 | 1.9658 | 2.0162 |
| 2016 | 2.0400 | 1.9857 | 2.1685 | 1.9528 | 2.0634 |
| 2017 | 2.0658 | 2.0543 | 2.2023 | 2.0477 | 2.1042 |
| 2018 | 1.9483 | 1.9392 | 2.0950 | 1.9553 | 1.9724 |
| 2019 | 1.9539 | 1.9445 | 2.1055 | 1.9625 | 1.9736 |

**Table A2.** Inequality statistics by equivalence scale, tax-unit level.

| | Irish National | OECD-Modified | Per capita | Square root | OECD |
|---|---|---|---|---|---|
| | | | Gini | | |
| 2007 | 0.3519 | 0.3559 | 0.3640 | 0.3617 | 0.3530 |
| 2008 | 0.3469 | 0.3513 | 0.3580 | 0.3572 | 0.3478 |
| 2009 | 0.3345 | 0.3386 | 0.3476 | 0.3441 | 0.3358 |
| 2010 | 0.3466 | 0.3497 | 0.3640 | 0.3545 | 0.3495 |
| 2011 | 0.3457 | 0.3487 | 0.3635 | 0.3533 | 0.3487 |
| 2012 | 0.3464 | 0.3507 | 0.3587 | 0.3561 | 0.3477 |
| 2013 | 0.3490 | 0.3532 | 0.3616 | 0.3584 | 0.3504 |
| 2014 | 0.3457 | 0.3502 | 0.3565 | 0.3555 | 0.3464 |
| 2015 | 0.3492 | 0.3537 | 0.3595 | 0.3591 | 0.3498 |
| 2016 | 0.3453 | 0.3501 | 0.3557 | 0.3561 | 0.3460 |
| 2017 | 0.3438 | 0.3489 | 0.3532 | 0.3549 | 0.3444 |
| 2018 | 0.3459 | 0.3520 | 0.3553 | 0.3601 | 0.3470 |
| 2019 | 0.3475 | 0.3536 | 0.3568 | 0.3617 | 0.3486 |
| | | | p90p10 | | |
| 2007 | 5.2534 | 5.3655 | 6.0483 | 5.4052 | 5.3616 |
| 2008 | 4.8907 | 5.0062 | 5.7276 | 5.2219 | 4.9026 |

| | Irish National | OECD-Modified | Per capita | Square root | OECD |
|---|---|---|---|---|---|
| 2009 | 4.8503 | 4.9968 | 5.5215 | 5.2373 | 4.8381 |
| 2010 | 6.3670 | 6.3591 | 5.8516 | 6.5140 | 6.2264 |
| 2011 | 6.1914 | 6.2547 | 5.7620 | 6.3548 | 6.0290 |
| 2012 | 5.6498 | 5.9856 | 5.5196 | 6.2395 | 5.6186 |
| 2013 | 6.1824 | 6.6235 | 5.8646 | 6.9368 | 6.0179 |
| 2014 | 5.4499 | 5.5621 | 5.7726 | 5.7409 | 5.3863 |
| 2015 | 5.5345 | 5.6730 | 5.9153 | 5.8028 | 5.4931 |
| 2016 | 4.9235 | 5.1041 | 5.5872 | 5.1132 | 4.9462 |
| 2017 | 4.8155 | 4.8826 | 5.3542 | 5.0825 | 4.8198 |
| 2018 | 4.2929 | 4.3825 | 4.9087 | 4.6128 | 4.4652 |
| 2019 | 4.3254 | 4.3752 | 4.9195 | 4.6011 | 4.4408 |
| | | | p10p50 | | |
| 2007 | 0.3876 | 0.3797 | 0.3656 | 0.3822 | 0.3874 |
| 2008 | 0.4009 | 0.3968 | 0.3730 | 0.3899 | 0.4106 |
| 2009 | 0.3956 | 0.3864 | 0.3753 | 0.3734 | 0.4022 |
| 2010 | 0.3216 | 0.3217 | 0.3911 | 0.3165 | 0.3333 |
| 2011 | 0.3282 | 0.3253 | 0.3880 | 0.3269 | 0.3401 |
| 2012 | 0.3670 | 0.3487 | 0.4173 | 0.3360 | 0.3799 |
| 2013 | 0.3373 | 0.3157 | 0.3948 | 0.3041 | 0.3575 |
| 2014 | 0.3795 | 0.3763 | 0.3874 | 0.3690 | 0.3888 |
| 2015 | 0.3792 | 0.3739 | 0.3838 | 0.3703 | 0.3853 |
| 2016 | 0.4242 | 0.4161 | 0.4004 | 0.4175 | 0.4285 |
| 2017 | 0.4420 | 0.4398 | 0.4240 | 0.4284 | 0.4468 |
| 2018 | 0.4788 | 0.4813 | 0.4317 | 0.4640 | 0.4610 |
| 2019 | 0.4772 | 0.4831 | 0.4334 | 0.4662 | 0.4670 |
| | | | p90p50 | | |
| 2007 | 2.0362 | 2.0373 | 2.2110 | 2.0659 | 2.0770 |
| 2008 | 1.9606 | 1.9863 | 2.1366 | 2.0358 | 2.0128 |
| 2009 | 1.9187 | 1.9309 | 2.0724 | 1.9559 | 1.9460 |
| 2010 | 2.0479 | 2.0459 | 2.2883 | 2.0618 | 2.0753 |
| 2011 | 2.0318 | 2.0349 | 2.2355 | 2.0773 | 2.0503 |
| 2012 | 2.0735 | 2.0873 | 2.3033 | 2.0963 | 2.1347 |
| 2013 | 2.0854 | 2.0910 | 2.3152 | 2.1097 | 2.1516 |
| 2014 | 2.0681 | 2.0931 | 2.2362 | 2.1184 | 2.0941 |
| 2015 | 2.0985 | 2.1209 | 2.2702 | 2.1491 | 2.1166 |
| 2016 | 2.0884 | 2.1236 | 2.2370 | 2.1347 | 2.1196 |
| 2017 | 2.1286 | 2.1474 | 2.2702 | 2.1772 | 2.1536 |
| 2018 | 2.0556 | 2.1094 | 2.1192 | 2.1401 | 2.0586 |
| 2019 | 2.0643 | 2.1137 | 2.1321 | 2.1450 | 2.0738 |

**Table A3.** Inequality statistics by equivalence scale, benefit-unit level.

| | Irish National | OECD-Modified | Per capita | Square root | OECD |
|---|---|---|---|---|---|
| | | | Gini | | |
| 2007 | 0.3349 | 0.3394 | 0.3463 | 0.3452 | 0.3359 |
| 2008 | 0.3343 | 0.3393 | 0.3452 | 0.3449 | 0.3353 |
| 2009 | 0.3214 | 0.3260 | 0.3344 | 0.3313 | 0.3228 |
| 2010 | 0.3386 | 0.3423 | 0.3543 | 0.3466 | 0.3413 |
| 2011 | 0.3377 | 0.3413 | 0.3539 | 0.3455 | 0.3405 |
| 2012 | 0.3360 | 0.3402 | 0.3478 | 0.3445 | 0.3373 |
| 2013 | 0.3380 | 0.3421 | 0.3501 | 0.3463 | 0.3394 |
| 2014 | 0.3338 | 0.3386 | 0.3429 | 0.3431 | 0.3342 |
| 2015 | 0.3374 | 0.3423 | 0.3461 | 0.3469 | 0.3377 |
| 2016 | 0.3353 | 0.3412 | 0.3426 | 0.3470 | 0.3355 |
| 2017 | 0.3306 | 0.3363 | 0.3388 | 0.3420 | 0.3312 |
| 2018 | 0.3346 | 0.3419 | 0.3407 | 0.3499 | 0.3352 |
| 2019 | 0.3362 | 0.3435 | 0.3421 | 0.3516 | 0.3368 |
| | | | p90p10 | | |
| 2007 | 4.4002 | 4.4338 | 5.2076 | 4.5956 | 4.5393 |
| 2008 | 4.2636 | 4.2928 | 4.9359 | 4.4967 | 4.3459 |
| 2009 | 4.0852 | 4.1545 | 4.8914 | 4.2471 | 4.1958 |
| 2010 | 4.7436 | 4.7816 | 5.4716 | 5.0013 | 4.7445 |
| 2011 | 4.7581 | 4.7975 | 5.4125 | 5.0010 | 4.7251 |
| 2012 | 4.7605 | 4.8226 | 5.3834 | 4.9890 | 4.7690 |
| 2013 | 4.9895 | 5.0762 | 5.4894 | 5.1028 | 4.9735 |
| 2014 | 4.6032 | 4.5986 | 5.2969 | 4.5785 | 4.5006 |
| 2015 | 4.7012 | 4.6240 | 5.3934 | 4.6462 | 4.6178 |
| 2016 | 4.4432 | 4.4783 | 5.0267 | 4.5025 | 4.5196 |
| 2017 | 4.2395 | 4.2885 | 4.9739 | 4.4303 | 4.3977 |
| 2018 | 3.9946 | 4.3415 | 4.6011 | 4.5775 | 4.1221 |
| 2019 | 4.0122 | 4.3672 | 4.6179 | 4.6005 | 4.1333 |
| | | | p10p50 | | |
| 2007 | 0.4563 | 0.4581 | 0.4176 | 0.4473 | 0.4552 |
| 2008 | 0.4611 | 0.4665 | 0.4352 | 0.4514 | 0.4601 |
| 2009 | 0.4696 | 0.4657 | 0.4226 | 0.4570 | 0.4622 |
| 2010 | 0.4290 | 0.4279 | 0.4170 | 0.4129 | 0.4353 |
| 2011 | 0.4238 | 0.4249 | 0.4129 | 0.4085 | 0.4356 |
| 2012 | 0.4363 | 0.4318 | 0.4220 | 0.4217 | 0.4446 |
| 2013 | 0.4197 | 0.4112 | 0.4163 | 0.4130 | 0.4304 |
| 2014 | 0.4585 | 0.4600 | 0.4213 | 0.4665 | 0.4653 |
| 2015 | 0.4536 | 0.4628 | 0.4199 | 0.4642 | 0.4600 |
| 2016 | 0.4695 | 0.4741 | 0.4382 | 0.4748 | 0.4690 |

| | Irish National | OECD-Modified | Per capita | Square root | OECD |
|---|---|---|---|---|---|
| 2017 | 0.5074 | 0.4992 | 0.4545 | 0.4865 | 0.4913 |
| 2018 | 0.5210 | 0.4925 | 0.4628 | 0.4711 | 0.5053 |
| 2019 | 0.5213 | 0.4907 | 0.4634 | 0.4699 | 0.5057 |
| | | | p90p50 | | |
| 2007 | 2.0079 | 2.0310 | 2.1748 | 2.0556 | 2.0663 |
| 2008 | 1.9660 | 2.0025 | 2.1480 | 2.0299 | 1.9994 |
| 2009 | 1.9185 | 1.9348 | 2.0672 | 1.9411 | 1.9391 |
| 2010 | 2.0349 | 2.0461 | 2.2818 | 2.0651 | 2.0651 |
| 2011 | 2.0166 | 2.0384 | 2.2348 | 2.0430 | 2.0584 |
| 2012 | 2.0770 | 2.0824 | 2.2717 | 2.1041 | 2.1200 |
| 2013 | 2.0941 | 2.0872 | 2.2853 | 2.1077 | 2.1405 |
| 2014 | 2.1104 | 2.1154 | 2.2316 | 2.1357 | 2.0941 |
| 2015 | 2.1326 | 2.1399 | 2.2649 | 2.1570 | 2.1242 |
| 2016 | 2.0863 | 2.1233 | 2.2027 | 2.1379 | 2.1195 |
| 2017 | 2.1513 | 2.1407 | 2.2608 | 2.1554 | 2.1608 |
| 2018 | 2.0811 | 2.1383 | 2.1292 | 2.1565 | 2.0830 |
| 2019 | 2.0916 | 2.1431 | 2.1400 | 2.1616 | 2.0900 |

**Table A4.** Poverty statistics by equivalence scale, household level.

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| | | | At-risk-of-poverty rate | | |
| 2007 | 16.69 | 16.72 | 21.87 | 16.32 | 18.23 |
| 2008 | 16.28 | 15.75 | 20.74 | 16.17 | 17.32 |
| 2009 | 14.95 | 14.64 | 20.61 | 14.31 | 16.15 |
| 2010 | 18.34 | 17.61 | 24.82 | 15.41 | 19.61 |
| 2011 | 18.83 | 18.07 | 25.44 | 15.64 | 19.69 |
| 2012 | 18.66 | 17.57 | 22.75 | 15.65 | 19.28 |
| 2013 | 18.88 | 17.83 | 23.03 | 15.93 | 19.48 |
| 2014 | 16.90 | 16.55 | 22.54 | 16.71 | 17.96 |
| 2015 | 17.10 | 16.92 | 22.67 | 17.31 | 18.74 |
| 2016 | 15.65 | 15.97 | 20.65 | 16.54 | 17.59 |
| 2017 | 15.02 | 14.54 | 20.55 | 14.84 | 16.50 |
| 2018 | 14.65 | 15.67 | 20.40 | 15.42 | 16.34 |
| 2019 | 14.76 | 15.87 | 20.15 | 15.83 | 16.54 |
| | | | At-risk-of-extreme-poverty rate | | |
| 2007 | 3.95 | 4.06 | 7.46 | 4.60 | 4.71 |
| 2008 | 3.51 | 3.49 | 5.92 | 3.93 | 3.97 |
| 2009 | 3.36 | 3.41 | 5.35 | 3.30 | 3.29 |
| 2010 | 4.75 | 4.58 | 6.75 | 4.41 | 4.62 |
| 2011 | 4.84 | 4.66 | 7.04 | 4.41 | 4.63 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2012 | 4.20 | 3.88 | 6.49 | 3.93 | 4.13 |
| 2013 | 4.22 | 3.94 | 6.74 | 3.89 | 4.52 |
| 2014 | 4.49 | 4.06 | 7.12 | 3.51 | 4.71 |
| 2015 | 4.55 | 4.21 | 7.39 | 3.63 | 4.82 |
| 2016 | 3.49 | 3.12 | 7.51 | 3.24 | 3.81 |
| 2017 | 3.21 | 2.86 | 6.10 | 2.86 | 3.61 |
| 2018 | 3.17 | 3.01 | 6.45 | 3.27 | 3.83 |
| 2019 | 3.11 | 3.01 | 6.32 | 3.27 | 3.80 |
| At-risk-of-poverty rate, children | | | | | |
| 2007 | 19.98 | 18.83 | 33.04 | 17.25 | 24.17 |
| 2008 | 19.32 | 18.00 | 32.32 | 18.16 | 23.45 |
| 2009 | 17.99 | 17.14 | 32.24 | 16.21 | 21.90 |
| 2010 | 21.98 | 20.59 | 39.19 | 16.82 | 27.34 |
| 2011 | 22.75 | 21.38 | 39.63 | 17.42 | 27.23 |
| 2012 | 20.66 | 18.80 | 33.35 | 17.00 | 24.17 |
| 2013 | 21.37 | 19.76 | 33.87 | 17.74 | 24.69 |
| 2014 | 20.09 | 19.30 | 34.97 | 18.54 | 24.27 |
| 2015 | 20.20 | 19.51 | 34.76 | 19.11 | 25.24 |
| 2016 | 19.77 | 19.83 | 32.74 | 19.73 | 24.86 |
| 2017 | 17.78 | 17.07 | 32.76 | 15.97 | 23.05 |
| 2018 | 18.67 | 18.33 | 35.15 | 16.80 | 23.80 |
| 2019 | 18.88 | 18.36 | 34.86 | 17.26 | 24.14 |
| At-risk-of-poverty rate, working age population | | | | | |
| 2007 | 14.71 | 14.34 | 17.56 | 13.41 | 15.43 |
| 2008 | 14.23 | 13.31 | 16.43 | 12.81 | 14.37 |
| 2009 | 12.87 | 12.55 | 16.28 | 11.36 | 13.38 |
| 2010 | 17.17 | 16.48 | 20.48 | 14.46 | 17.07 |
| 2011 | 17.78 | 17.00 | 21.32 | 14.83 | 17.35 |
| 2012 | 17.97 | 16.92 | 19.87 | 14.31 | 17.80 |
| 2013 | 18.10 | 17.02 | 20.08 | 14.56 | 17.93 |
| 2014 | 17.21 | 16.68 | 20.30 | 15.97 | 17.27 |
| 2015 | 17.41 | 17.00 | 20.50 | 16.13 | 18.10 |
| 2016 | 15.36 | 15.74 | 18.25 | 15.01 | 16.43 |
| 2017 | 15.42 | 14.59 | 18.52 | 13.52 | 15.84 |
| 2018 | 14.41 | 14.05 | 17.38 | 13.32 | 15.37 |
| 2019 | 14.47 | 14.10 | 17.13 | 13.64 | 15.52 |
| At-risk-of-poverty rate, elderly | | | | | |
| 2007 | 19.98 | 25.83 | 17.62 | 32.05 | 19.21 |
| 2008 | 21.44 | 25.28 | 18.36 | 32.14 | 20.24 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2009 | 20.23 | 21.42 | 18.18 | 27.96 | 18.90 |
| 2010 | 16.18 | 16.88 | 14.60 | 17.46 | 15.33 |
| 2011 | 15.23 | 16.13 | 14.42 | 15.90 | 14.68 |
| 2012 | 17.89 | 18.37 | 14.30 | 20.03 | 16.24 |
| 2013 | 17.45 | 17.94 | 14.40 | 19.38 | 16.09 |
| 2014 | 8.40 | 9.93 | 6.84 | 16.43 | 7.71 |
| 2015 | 8.81 | 10.91 | 7.32 | 19.34 | 7.83 |
| 2016 | 8.26 | 8.85 | 6.61 | 17.22 | 7.76 |
| 2017 | 7.55 | 9.14 | 5.95 | 19.04 | 6.57 |
| 2018 | 7.96 | 18.15 | 5.92 | 22.62 | 6.43 |
| 2019 | 8.10 | 19.35 | 5.77 | 23.31 | 6.51 |

**Table A5.** Poverty statistics by equivalence scale, tax-unit level.

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| | | | At-risk-of-poverty rate | | |
| 2007 | 19.39 | 18.19 | 24.46 | 16.98 | 20.89 |
| 2008 | 20.28 | 18.65 | 23.70 | 17.81 | 20.99 |
| 2009 | 18.60 | 17.21 | 23.68 | 16.50 | 17.89 |
| 2010 | 14.96 | 16.19 | 25.19 | 16.55 | 18.85 |
| 2011 | 15.27 | 16.55 | 26.02 | 16.18 | 19.44 |
| 2012 | 15.21 | 16.32 | 21.83 | 16.66 | 16.88 |
| 2013 | 15.29 | 16.57 | 22.20 | 16.81 | 17.32 |
| 2014 | 16.89 | 15.91 | 22.44 | 15.89 | 17.24 |
| 2015 | 17.39 | 16.03 | 22.21 | 15.62 | 17.50 |
| 2016 | 17.76 | 16.42 | 22.23 | 15.39 | 19.00 |
| 2017 | 16.52 | 16.21 | 20.91 | 15.17 | 17.57 |
| 2018 | 15.64 | 15.25 | 21.13 | 14.70 | 16.95 |
| 2019 | 15.57 | 15.29 | 21.15 | 15.00 | 16.84 |
| | | | At-risk-of-extreme-poverty rate | | |
| 2007 | 6.97 | 6.71 | 10.67 | 6.62 | 6.93 |
| 2008 | 6.57 | 6.19 | 9.71 | 6.23 | 6.51 |
| 2009 | 6.44 | 6.31 | 9.59 | 6.46 | 6.67 |
| 2010 | 7.27 | 7.14 | 8.44 | 6.96 | 7.29 |
| 2011 | 7.30 | 7.31 | 9.06 | 6.93 | 7.34 |
| 2012 | 6.41 | 6.42 | 7.41 | 6.50 | 6.35 |
| 2013 | 6.94 | 7.04 | 8.22 | 7.18 | 6.92 |
| 2014 | 6.99 | 6.74 | 9.34 | 6.51 | 7.10 |
| 2015 | 6.90 | 6.68 | 9.21 | 6.41 | 7.15 |
| 2016 | 6.09 | 5.83 | 9.03 | 5.71 | 6.15 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2017 | 5.91 | 5.68 | 8.55 | 5.55 | 6.07 |
| 2018 | 5.35 | 5.08 | 8.65 | 4.90 | 5.81 |
| 2019 | 5.34 | 5.08 | 8.59 | 4.90 | 5.79 |
| At-risk-of-poverty rate, children | | | | | |
| 2007 | 18.09 | 15.31 | 35.14 | 12.45 | 22.98 |
| 2008 | 19.37 | 16.32 | 35.90 | 14.12 | 22.50 |
| 2009 | 17.12 | 14.47 | 35.61 | 12.67 | 21.34 |
| 2010 | 13.61 | 11.73 | 37.40 | 12.15 | 22.37 |
| 2011 | 13.67 | 12.13 | 38.88 | 11.89 | 23.36 |
| 2012 | 13.45 | 10.94 | 30.76 | 11.69 | 18.85 |
| 2013 | 13.79 | 11.42 | 31.32 | 12.28 | 19.60 |
| 2014 | 14.99 | 12.16 | 33.27 | 11.57 | 20.56 |
| 2015 | 15.84 | 12.16 | 32.85 | 11.06 | 21.15 |
| 2016 | 16.56 | 13.82 | 33.55 | 11.51 | 22.17 |
| 2017 | 15.56 | 13.98 | 32.07 | 12.02 | 19.91 |
| 2018 | 15.68 | 13.70 | 34.86 | 11.91 | 19.99 |
| 2019 | 15.50 | 13.80 | 34.78 | 12.31 | 19.86 |
| At-risk-of-poverty rate, working age population | | | | | |
| 2007 | 20.07 | 19.14 | 20.74 | 18.32 | 20.41 |
| 2008 | 20.75 | 19.46 | 19.49 | 18.94 | 20.62 |
| 2009 | 19.09 | 17.99 | 19.58 | 17.56 | 16.29 |
| 2010 | 15.36 | 18.11 | 21.71 | 18.43 | 17.92 |
| 2011 | 15.89 | 18.54 | 22.42 | 18.19 | 18.46 |
| 2012 | 15.62 | 18.42 | 19.23 | 18.63 | 16.15 |
| 2013 | 15.61 | 18.62 | 19.58 | 18.68 | 16.58 |
| 2014 | 19.63 | 19.32 | 20.93 | 19.52 | 17.87 |
| 2015 | 20.04 | 19.48 | 20.73 | 19.23 | 18.02 |
| 2016 | 20.60 | 19.58 | 20.71 | 18.87 | 20.24 |
| 2017 | 19.16 | 19.33 | 19.61 | 18.42 | 19.16 |
| 2018 | 17.95 | 18.01 | 19.00 | 17.48 | 18.36 |
| 2019 | 17.92 | 18.02 | 19.04 | 17.72 | 18.23 |
| At-risk-of-poverty rate, elderly | | | | | |
| 2007 | 18.77 | 20.28 | 17.87 | 21.33 | 18.04 |
| 2008 | 19.65 | 19.53 | 19.11 | 20.15 | 19.42 |
| 2009 | 19.26 | 19.32 | 19.08 | 19.55 | 19.12 |
| 2010 | 15.95 | 16.07 | 15.30 | 16.40 | 15.58 |
| 2011 | 15.62 | 15.84 | 15.30 | 15.07 | 15.51 |
| 2012 | 17.00 | 17.05 | 15.75 | 17.15 | 16.40 |
| 2013 | 16.91 | 16.98 | 15.73 | 16.81 | 16.15 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2014 | 7.22 | 6.88 | 6.51 | 6.94 | 6.84 |
| 2015 | 7.41 | 7.00 | 6.56 | 7.34 | 6.99 |
| 2016 | 6.30 | 6.41 | 5.54 | 6.56 | 6.11 |
| 2017 | 5.52 | 5.42 | 4.88 | 5.54 | 5.11 |
| 2018 | 4.68 | 5.28 | 4.43 | 7.11 | 4.47 |
| 2019 | 4.70 | 5.40 | 4.60 | 7.48 | 4.47 |

**Table A6.** Poverty statistics by equivalence scale, benefit-unit level.

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| | | | At-risk-of-poverty rate | | |
| 2007 | 18.44 | 17.62 | 24.22 | 16.43 | 19.66 |
| 2008 | 19.48 | 18.21 | 23.01 | 16.95 | 20.58 |
| 2009 | 17.81 | 16.74 | 23.20 | 15.99 | 19.56 |
| 2010 | 15.27 | 16.38 | 25.37 | 16.18 | 19.39 |
| 2011 | 15.87 | 16.55 | 25.93 | 16.33 | 19.53 |
| 2012 | 14.46 | 15.97 | 22.58 | 15.67 | 16.34 |
| 2013 | 14.58 | 16.25 | 23.03 | 15.83 | 16.63 |
| 2014 | 16.53 | 15.10 | 22.87 | 14.35 | 17.41 |
| 2015 | 17.14 | 15.71 | 22.39 | 14.48 | 17.65 |
| 2016 | 17.91 | 16.32 | 22.13 | 14.87 | 18.83 |
| 2017 | 15.67 | 15.88 | 21.15 | 14.82 | 17.02 |
| 2018 | 14.81 | 14.51 | 20.56 | 14.41 | 16.44 |
| 2019 | 15.03 | 14.65 | 20.52 | 14.36 | 16.73 |
| | | | At-risk-of-extreme-poverty rate | | |
| 2007 | 5.18 | 5.03 | 9.72 | 4.85 | 5.23 |
| 2008 | 5.20 | 4.79 | 8.42 | 4.81 | 5.25 |
| 2009 | 5.12 | 4.88 | 8.19 | 5.03 | 5.28 |
| 2010 | 6.48 | 6.17 | 7.75 | 5.79 | 6.51 |
| 2011 | 6.40 | 6.25 | 8.15 | 5.90 | 6.44 |
| 2012 | 5.32 | 5.32 | 6.91 | 5.23 | 5.33 |
| 2013 | 5.70 | 5.69 | 7.29 | 5.65 | 5.68 |
| 2014 | 5.75 | 5.26 | 8.56 | 5.03 | 6.03 |
| 2015 | 5.61 | 5.24 | 8.42 | 5.05 | 5.93 |
| 2016 | 4.91 | 4.68 | 8.68 | 4.44 | 5.02 |
| 2017 | 4.59 | 4.21 | 7.96 | 4.27 | 5.03 |
| 2018 | 4.09 | 3.98 | 7.69 | 3.69 | 4.50 |
| 2019 | 4.04 | 3.93 | 7.54 | 3.66 | 4.40 |
| | | | At-risk-of-poverty rate, children | | |
| 2007 | 17.39 | 15.18 | 35.03 | 12.13 | 21.63 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2008 | 18.67 | 15.78 | 34.55 | 12.87 | 22.13 |
| 2009 | 16.71 | 14.00 | 34.84 | 11.88 | 21.24 |
| 2010 | 14.01 | 11.88 | 37.82 | 11.48 | 23.56 |
| 2011 | 14.97 | 12.57 | 38.80 | 11.54 | 23.86 |
| 2012 | 12.93 | 11.56 | 31.55 | 11.04 | 18.87 |
| 2013 | 13.66 | 12.37 | 32.34 | 11.49 | 19.65 |
| 2014 | 15.76 | 11.97 | 34.60 | 10.10 | 22.13 |
| 2015 | 16.50 | 13.18 | 33.84 | 10.19 | 22.40 |
| 2016 | 17.89 | 15.08 | 33.50 | 10.99 | 22.84 |
| 2017 | 15.65 | 14.57 | 33.04 | 12.28 | 20.23 |
| 2018 | 15.41 | 13.81 | 34.33 | 13.00 | 20.43 |
| 2019 | 15.36 | 13.91 | 34.25 | 12.73 | 20.90 |
| At-risk-of-poverty rate, working age population | | | | | |
| 2007 | 18.70 | 17.99 | 20.30 | 17.07 | 18.92 |
| 2008 | 19.67 | 18.82 | 18.88 | 17.92 | 20.04 |
| 2009 | 17.90 | 17.33 | 19.07 | 16.92 | 18.83 |
| 2010 | 15.60 | 18.23 | 21.76 | 18.07 | 18.19 |
| 2011 | 16.20 | 18.32 | 22.29 | 18.34 | 18.37 |
| 2012 | 14.60 | 17.50 | 20.07 | 17.22 | 15.23 |
| 2013 | 14.52 | 17.63 | 20.46 | 17.28 | 15.41 |
| 2014 | 18.75 | 18.10 | 21.10 | 17.57 | 17.48 |
| 2015 | 19.34 | 18.48 | 20.63 | 17.72 | 17.72 |
| 2016 | 20.18 | 18.79 | 20.50 | 18.17 | 19.61 |
| 2017 | 17.72 | 18.47 | 19.54 | 17.54 | 18.06 |
| 2018 | 16.71 | 16.72 | 18.30 | 16.35 | 17.32 |
| 2019 | 17.09 | 16.78 | 18.27 | 16.30 | 17.60 |
| At-risk-of-poverty rate, elderly | | | | | |
| 2007 | 19.79 | 22.18 | 18.53 | 24.54 | 18.76 |
| 2008 | 20.39 | 20.59 | 19.66 | 21.22 | 20.07 |
| 2009 | 20.06 | 19.94 | 19.53 | 20.52 | 19.83 |
| 2010 | 16.46 | 16.70 | 15.63 | 16.78 | 16.07 |
| 2011 | 16.14 | 16.12 | 15.32 | 16.40 | 15.59 |
| 2012 | 17.21 | 17.64 | 15.84 | 17.70 | 16.71 |
| 2013 | 17.05 | 17.50 | 15.89 | 17.70 | 16.45 |
| 2014 | 7.05 | 6.84 | 6.37 | 7.40 | 6.80 |
| 2015 | 7.43 | 7.22 | 6.38 | 7.50 | 6.97 |
| 2016 | 6.76 | 6.77 | 5.86 | 6.93 | 6.43 |
| 2017 | 5.65 | 5.83 | 5.13 | 6.63 | 5.52 |
| 2018 | 4.77 | 5.49 | 4.44 | 8.05 | 4.54 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2019 | 4.77 | 6.09 | 4.44 | 8.39 | 4.56 |

**Table A7.** AROP and AROEP rate by ten-year age groups, household unit (2019).

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| At-risk-of-poverty rate | | | | | |
| 0-9 | 15.32 | 15.59 | 35.29 | 16.41 | 22.29 |
| 10-19 | 21.39 | 19.96 | 31.72 | 16.87 | 24.29 |
| 20-29 | 12.03 | 11.24 | 15.50 | 9.68 | 12.22 |
| 30-39 | 10.61 | 10.89 | 20.02 | 11.08 | 13.43 |
| 40-49 | 15.69 | 15.20 | 21.67 | 14.52 | 18.33 |
| 50-59 | 14.75 | 14.14 | 11.51 | 14.12 | 14.22 |
| 60-69 | 18.99 | 21.64 | 12.03 | 22.74 | 17.40 |
| 70-79 | 5.41 | 16.56 | 3.83 | 19.31 | 4.12 |
| 80+ | 8.94 | 24.92 | 7.49 | 33.94 | 7.89 |
| At-risk-of-extreme-poverty | | | | | |
| 0-9 | 1.90 | 1.79 | 10.79 | 3.15 | 4.01 |
| 10-19 | 4.68 | 3.89 | 11.40 | 3.67 | 6.15 |
| 20-29 | 3.20 | 3.20 | 4.76 | 2.50 | 3.43 |
| 30-39 | 1.73 | 1.52 | 5.81 | 2.25 | 2.36 |
| 40-49 | 4.17 | 4.03 | 6.28 | 3.40 | 4.60 |
| 50-59 | 2.49 | 2.70 | 3.07 | 3.27 | 2.67 |
| 60-69 | 4.28 | 4.72 | 4.06 | 5.91 | 4.16 |
| 70-79 | 1.80 | 1.80 | 1.56 | 1.43 | 1.77 |
| 80+ | 3.25 | 3.49 | 1.70 | 4.16 | 3.25 |

**Table A8.** AROP and AROEP rate by ten-year age groups, tax-unit (2019).

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| At-risk-of-poverty rate | | | | | |
| 0-9 | 11.36 | 10.45 | 34.27 | 10.41 | 16.66 |
| 10-19 | 23.16 | 20.87 | 35.78 | 18.22 | 25.91 |
| 20-29 | 27.66 | 28.93 | 22.50 | 29.50 | 27.53 |
| 30-39 | 11.44 | 11.22 | 19.80 | 11.46 | 13.67 |
| 40-49 | 15.61 | 14.66 | 20.59 | 13.25 | 16.76 |
| 50-59 | 14.56 | 14.81 | 12.57 | 14.54 | 13.68 |
| 60-69 | 15.14 | 16.42 | 11.48 | 17.65 | 13.54 |
| 70-79 | 3.09 | 4.07 | 2.94 | 6.20 | 2.91 |
| 80+ | 5.43 | 5.81 | 4.95 | 6.54 | 5.04 |
| At-risk-of-extreme-poverty | | | | | |
| 0-9 | 2.02 | 1.98 | 12.17 | 2.83 | 3.64 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 10-19 | 9.08 | 7.51 | 15.97 | 6.21 | 10.09 |
| 20-29 | 12.03 | 13.71 | 11.79 | 13.93 | 12.39 |
| 30-39 | 3.94 | 3.94 | 7.93 | 4.47 | 4.27 |
| 40-49 | 4.58 | 4.08 | 7.01 | 2.96 | 4.82 |
| 50-59 | 3.86 | 3.33 | 4.37 | 3.23 | 3.84 |
| 60-69 | 5.38 | 5.07 | 5.03 | 5.02 | 5.22 |
| 70-79 | 1.19 | 1.01 | 1.13 | 1.01 | 1.19 |
| 80+ | 2.87 | 3.18 | 1.88 | 3.18 | 2.54 |

**Table A9.** AROP and AROEP rate by ten-year age groups, benefit-unit (2019).

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| | | | At-risk-of-poverty rate | | |
| 0-9 | 10.85 | 10.41 | 34.19 | 10.85 | 17.58 |
| 10-19 | 20.79 | 18.35 | 32.49 | 15.70 | 24.50 |
| 20-29 | 27.17 | 28.05 | 22.12 | 28.85 | 27.42 |
| 30-39 | 10.08 | 9.72 | 20.02 | 9.90 | 13.31 |
| 40-49 | 15.36 | 14.17 | 20.62 | 12.38 | 16.81 |
| 50-59 | 15.18 | 15.02 | 12.25 | 14.45 | 13.96 |
| 60-69 | 16.03 | 16.93 | 11.19 | 18.23 | 13.66 |
| 70-79 | 3.12 | 4.56 | 2.91 | 6.56 | 2.94 |
| 80+ | 5.43 | 6.31 | 4.29 | 7.84 | 5.04 |
| | | | At-risk-of-extreme-poverty | | |
| 0-9 | 1.27 | 1.23 | 11.19 | 1.33 | 2.17 |
| 10-19 | 4.75 | 3.72 | 12.34 | 2.61 | 5.74 |
| 20-29 | 12.25 | 13.93 | 11.96 | 14.29 | 12.51 |
| 30-39 | 1.75 | 1.78 | 6.57 | 2.03 | 2.06 |
| 40-49 | 3.40 | 3.21 | 6.07 | 2.09 | 3.60 |
| 50-59 | 3.51 | 2.89 | 4.19 | 2.99 | 3.48 |
| 60-69 | 5.22 | 5.04 | 4.87 | 4.88 | 5.22 |
| 70-79 | 1.19 | 1.19 | 1.13 | 1.01 | 1.19 |
| 80+ | 2.87 | 3.18 | 1.88 | 3.18 | 2.54 |

**Table A10.** Size of income-sharing unit (2019).

| | Household unit | Tax-unit | Benefit-unit |
|---|---|---|---|
| 0-9 | 4.16 | 3.93 | 4.05 |
| 10-19 | 4.40 | 3.80 | 3.99 |
| 20-29 | 3.78 | 1.61 | 1.70 |
| 30-39 | 3.30 | 2.71 | 2.97 |
| 40-49 | 3.55 | 3.13 | 3.27 |
| 50-59 | 3.17 | 2.53 | 2.57 |

| | Household unit | Tax-unit | Benefit-unit |
|---|---|---|---|
| 60-69 | 2.13 | 1.77 | 1.78 |
| 70-79 | 1.80 | 1.59 | 1.60 |
| 80+ | 1.59 | 1.36 | 1.37 |
| Total | 3.34 | 2.89 | 2.78 |

**Table A11.** Tax-benefit systems and Irish EU-SILC data years used.

| Tax-benefit system | SILC Data Used in Simulations |
|---|---|
| 2007 | 2007 |
| 2008 | 2008 |
| 2009 | 2008 |
| 2010 | 2010 |
| 2011 | 2010 |
| 2012 | 2012 |
| 2013 | 2012 |
| 2014 | 2015 |
| 2015 | 2015 |
| 2016 | 2016 |
| 2017 | 2017 |
| 2018 | 2018 |
| 2019 | 2018 |

**Table A12.** AROP and AROEP rate by households type.

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| At-risk-of-poverty rate, single households | | | | | |
| 2007 | 26.15 | 36.08 | 13.07 | 44.57 | 22.82 |
| 2008 | 24.90 | 32.81 | 13.26 | 42.97 | 20.83 |
| 2009 | 21.87 | 28.54 | 13.27 | 37.62 | 19.36 |
| 2010 | 21.84 | 30.70 | 12.50 | 34.13 | 17.03 |
| 2011 | 21.88 | 30.54 | 12.48 | 33.14 | 17.23 |
| 2012 | 26.99 | 34.28 | 14.78 | 36.92 | 22.01 |
| 2013 | 26.56 | 34.40 | 14.83 | 36.35 | 21.57 |
| 2014 | 22.03 | 30.20 | 9.70 | 40.33 | 16.39 |
| 2015 | 22.28 | 30.99 | 9.60 | 43.99 | 17.77 |
| 2016 | 19.78 | 26.92 | 9.05 | 40.45 | 17.80 |
| 2017 | 21.22 | 26.47 | 6.96 | 41.39 | 16.21 |
| 2018 | 22.26 | 36.79 | 7.22 | 44.80 | 19.68 |
| 2019 | 22.31 | 38.52 | 7.05 | 45.77 | 19.83 |
| At-risk-of-extreme-poverty rate, single households | | | | | |
| 2007 | 12.39 | 13.04 | 9.32 | 15.00 | 11.10 |
| 2008 | 12.34 | 13.26 | 9.26 | 14.54 | 11.13 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2009 | 11.37 | 13.27 | 9.31 | 14.08 | 11.09 |
| 2010 | 11.72 | 12.36 | 9.99 | 13.09 | 11.02 |
| 2011 | 11.63 | 12.41 | 10.05 | 12.74 | 11.02 |
| 2012 | 13.07 | 14.69 | 11.20 | 15.57 | 12.71 |
| 2013 | 13.42 | 14.66 | 11.53 | 15.40 | 13.09 |
| 2014 | 8.09 | 9.64 | 6.70 | 10.12 | 7.58 |
| 2015 | 8.54 | 9.49 | 6.67 | 10.07 | 7.51 |
| 2016 | 8.03 | 9.05 | 5.96 | 9.71 | 7.69 |
| 2017 | 5.27 | 6.74 | 3.89 | 7.20 | 4.83 |
| 2018 | 5.62 | 6.55 | 4.07 | 8.38 | 5.48 |
| 2019 | 5.60 | 6.51 | 3.95 | 8.53 | 5.48 |
| At-risk-of-poverty rate, lone parent households | | | | | |
| 2007 | 29.65 | 31.87 | 49.25 | 49.06 | 38.21 |
| 2008 | 33.73 | 36.64 | 48.92 | 56.33 | 44.28 |
| 2009 | 30.92 | 33.73 | 48.59 | 54.05 | 37.98 |
| 2010 | 32.21 | 38.85 | 59.59 | 44.28 | 40.56 |
| 2011 | 34.24 | 38.35 | 59.87 | 44.60 | 40.64 |
| 2012 | 27.54 | 31.98 | 42.10 | 40.54 | 33.88 |
| 2013 | 29.56 | 33.14 | 42.85 | 40.54 | 34.91 |
| 2014 | 24.76 | 29.44 | 48.51 | 52.13 | 34.09 |
| 2015 | 24.98 | 30.43 | 48.89 | 52.49 | 34.09 |
| 2016 | 22.24 | 29.61 | 46.72 | 53.46 | 36.68 |
| 2017 | 35.32 | 41.94 | 54.60 | 52.99 | 48.42 |
| 2018 | 22.26 | 32.33 | 52.10 | 45.53 | 35.22 |
| 2019 | 22.26 | 32.33 | 54.46 | 47.37 | 34.49 |
| At-risk-of-extreme-poverty rate, lone parent households | | | | | |
| 2007 | 1.09 | 1.09 | 25.46 | 13.56 | 1.67 |
| 2008 | 0.00 | 0.66 | 24.47 | 15.86 | 1.33 |
| 2009 | 0.00 | 0.33 | 21.21 | 1.35 | 0.66 |
| 2010 | 0.09 | 0.09 | 9.78 | 2.02 | 0.50 |
| 2011 | 0.09 | 0.09 | 10.39 | 2.02 | 0.50 |
| 2012 | 1.96 | 1.96 | 10.26 | 4.67 | 2.25 |
| 2013 | 3.97 | 3.97 | 11.69 | 4.67 | 4.26 |
| 2014 | 1.64 | 1.64 | 15.10 | 2.34 | 1.64 |
| 2015 | 1.64 | 1.64 | 15.30 | 2.66 | 2.20 |
| 2016 | 1.19 | 1.19 | 16.10 | 1.44 | 1.19 |
| 2017 | 0.00 | 0.00 | 23.58 | 7.94 | 1.48 |
| 2018 | 2.05 | 2.05 | 19.07 | 12.06 | 5.81 |
| 2019 | 2.05 | 2.05 | 19.07 | 11.91 | 5.81 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| At-risk-of-poverty rate, couple without children households | | | | | |
| 2007 | 15.71 | 16.78 | 12.69 | 19.18 | 14.73 |
| 2008 | 16.71 | 16.71 | 12.02 | 18.06 | 15.00 |
| 2009 | 15.26 | 15.26 | 11.33 | 16.70 | 13.55 |
| 2010 | 14.87 | 14.24 | 11.01 | 15.57 | 12.90 |
| 2011 | 14.74 | 14.63 | 11.00 | 15.34 | 13.03 |
| 2012 | 13.65 | 13.13 | 9.58 | 13.91 | 11.86 |
| 2013 | 13.16 | 12.96 | 9.70 | 13.94 | 11.75 |
| 2014 | 11.48 | 11.48 | 8.84 | 12.74 | 10.78 |
| 2015 | 11.93 | 12.01 | 9.27 | 12.90 | 11.08 |
| 2016 | 12.13 | 12.36 | 9.99 | 12.88 | 11.76 |
| 2017 | 10.74 | 10.68 | 8.79 | 11.78 | 9.92 |
| 2018 | 10.94 | 11.48 | 8.99 | 11.86 | 9.65 |
| 2019 | 11.19 | 11.50 | 8.81 | 12.42 | 9.72 |
| At-risk-of-extreme-poverty rate, couple without children households | | | | | |
| 2007 | 6.76 | 7.03 | 5.59 | 7.54 | 6.33 |
| 2008 | 5.54 | 5.54 | 3.71 | 6.02 | 4.96 |
| 2009 | 4.89 | 4.89 | 3.56 | 5.49 | 4.02 |
| 2010 | 6.15 | 6.13 | 3.97 | 6.17 | 5.15 |
| 2011 | 6.13 | 6.13 | 4.03 | 6.15 | 5.20 |
| 2012 | 5.40 | 5.40 | 3.80 | 5.51 | 4.72 |
| 2013 | 5.31 | 5.31 | 3.80 | 5.40 | 4.58 |
| 2014 | 3.52 | 3.52 | 2.76 | 3.68 | 3.23 |
| 2015 | 3.62 | 3.62 | 2.93 | 3.88 | 3.17 |
| 2016 | 3.95 | 3.95 | 3.04 | 4.55 | 3.41 |
| 2017 | 3.22 | 3.22 | 2.51 | 3.36 | 2.94 |
| 2018 | 3.87 | 3.87 | 3.14 | 4.01 | 3.73 |
| 2019 | 3.89 | 3.89 | 3.14 | 4.12 | 3.62 |
| At-risk-of-poverty rate, couple with children households | | | | | |
| 2007 | 13.17 | 13.35 | 26.13 | 13.98 | 17.38 |
| 2008 | 13.50 | 13.61 | 22.89 | 14.13 | 16.98 |
| 2009 | 11.53 | 12.27 | 23.54 | 13.41 | 16.45 |
| 2010 | 12.53 | 11.94 | 28.36 | 13.09 | 18.05 |
| 2011 | 13.44 | 13.44 | 29.27 | 13.89 | 18.22 |
| 2012 | 12.73 | 12.35 | 25.62 | 13.04 | 15.99 |
| 2013 | 13.06 | 12.41 | 26.10 | 13.68 | 16.73 |
| 2014 | 11.95 | 11.95 | 26.82 | 12.80 | 16.86 |
| 2015 | 11.88 | 12.29 | 26.91 | 13.67 | 18.10 |
| 2016 | 11.92 | 12.25 | 23.98 | 13.79 | 16.74 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2017 | 9.28 | 9.00 | 24.49 | 9.87 | 13.24 |
| 2018 | 12.54 | 12.54 | 28.21 | 12.99 | 16.03 |
| 2019 | 12.24 | 12.36 | 27.58 | 13.37 | 16.43 |
| At-risk-of-extreme-poverty rate, couple with children households | | | | | |
| 2007 | 1.93 | 2.17 | 9.66 | 2.90 | 3.60 |
| 2008 | 1.67 | 1.71 | 7.91 | 1.88 | 2.80 |
| 2009 | 1.73 | 1.73 | 6.22 | 1.84 | 1.94 |
| 2010 | 1.56 | 1.56 | 4.79 | 1.56 | 2.07 |
| 2011 | 1.74 | 1.74 | 5.05 | 1.60 | 2.07 |
| 2012 | 1.43 | 1.43 | 5.67 | 1.43 | 1.95 |
| 2013 | 1.43 | 1.43 | 5.80 | 1.43 | 2.06 |
| 2014 | 2.40 | 2.40 | 7.00 | 2.74 | 3.07 |
| 2015 | 2.58 | 2.64 | 7.21 | 2.79 | 3.32 |
| 2016 | 0.81 | 0.81 | 8.04 | 1.12 | 1.77 |
| 2017 | 1.38 | 1.38 | 6.72 | 1.60 | 1.73 |
| 2018 | 1.71 | 1.71 | 7.35 | 2.15 | 3.17 |
| 2019 | 1.70 | 1.71 | 7.14 | 2.15 | 3.17 |
| At-risk-of-poverty rate, more than two adults without children households | | | | | |
| 2007 | 13.06 | 11.62 | 13.51 | 7.44 | 12.55 |
| 2008 | 11.40 | 9.50 | 10.79 | 6.68 | 10.74 |
| 2009 | 11.04 | 9.29 | 10.66 | 5.23 | 10.63 |
| 2010 | 17.91 | 13.29 | 17.74 | 6.72 | 15.35 |
| 2011 | 18.67 | 13.29 | 18.77 | 7.15 | 15.96 |
| 2012 | 20.14 | 16.16 | 20.21 | 8.70 | 19.50 |
| 2013 | 20.40 | 15.86 | 20.52 | 8.40 | 19.50 |
| 2014 | 18.06 | 14.63 | 17.73 | 10.99 | 16.16 |
| 2015 | 17.70 | 15.08 | 17.84 | 10.89 | 16.76 |
| 2016 | 13.19 | 11.26 | 14.07 | 7.84 | 12.41 |
| 2017 | 15.08 | 12.50 | 16.50 | 9.03 | 14.10 |
| 2018 | 11.46 | 9.96 | 11.69 | 7.62 | 11.18 |
| 2019 | 11.46 | 10.00 | 11.69 | 7.74 | 11.34 |
| At-risk-of-extreme-poverty rate, more than two adults without children households | | | | | |
| 2007 | 1.97 | 1.97 | 2.06 | 1.56 | 1.97 |
| 2008 | 1.62 | 1.53 | 1.55 | 1.12 | 1.62 |
| 2009 | 1.50 | 1.48 | 1.50 | 1.03 | 1.48 |
| 2010 | 4.10 | 3.63 | 4.32 | 2.85 | 3.63 |
| 2011 | 4.30 | 3.63 | 4.48 | 2.85 | 3.63 |
| 2012 | 4.26 | 3.25 | 4.23 | 3.13 | 3.67 |
| 2013 | 4.20 | 3.25 | 4.21 | 3.13 | 4.04 |

| | Irish National (%) | OECD-Modified (%) | Per capita (%) | Square root (%) | OECD (%) |
|---|---|---|---|---|---|
| 2014 | 6.01 | 5.12 | 5.91 | 2.90 | 5.64 |
| 2015 | 6.53 | 5.60 | 5.85 | 3.15 | 5.85 |
| 2016 | 4.21 | 3.10 | 4.44 | 2.53 | 4.21 |
| 2017 | 3.41 | 2.30 | 3.86 | 1.52 | 3.41 |
| 2018 | 2.61 | 2.53 | 3.82 | 1.10 | 2.53 |
| 2019 | 2.61 | 2.53 | 3.62 | 1.10 | 2.53 |
| At-risk-of-poverty rate, more than two adults with children households | | | | | |
| 2007 | 21.89 | 18.15 | 37.17 | 11.73 | 26.21 |
| 2008 | 20.77 | 16.14 | 42.60 | 12.26 | 24.73 |
| 2009 | 20.07 | 16.19 | 41.85 | 9.07 | 22.24 |
| 2010 | 27.69 | 25.66 | 45.24 | 15.15 | 33.40 |
| 2011 | 27.69 | 25.76 | 46.01 | 15.34 | 32.35 |
| 2012 | 27.02 | 22.42 | 37.74 | 15.33 | 29.41 |
| 2013 | 27.79 | 24.28 | 37.85 | 16.66 | 29.44 |
| 2014 | 27.01 | 24.55 | 41.68 | 17.80 | 29.69 |
| 2015 | 28.17 | 24.31 | 41.56 | 17.91 | 30.38 |
| 2016 | 26.66 | 25.35 | 39.39 | 18.74 | 30.30 |
| 2017 | 22.16 | 19.23 | 36.42 | 12.78 | 27.61 |
| 2018 | 21.63 | 18.06 | 39.03 | 10.47 | 27.89 |
| 2019 | 22.44 | 18.41 | 38.21 | 10.50 | 28.24 |
| At-risk-of-extreme-poverty rate, more than two adults with children households | | | | | |
| 2007 | 3.95 | 3.65 | 10.41 | 2.35 | 6.78 |
| 2008 | 3.53 | 2.93 | 7.52 | 1.90 | 5.55 |
| 2009 | 3.95 | 3.35 | 7.63 | 1.90 | 4.33 |
| 2010 | 6.73 | 6.08 | 14.82 | 5.32 | 7.35 |
| 2011 | 6.73 | 6.29 | 15.72 | 5.42 | 7.35 |
| 2012 | 3.46 | 2.09 | 11.39 | 1.26 | 3.99 |
| 2013 | 3.09 | 2.09 | 12.18 | 1.26 | 5.18 |
| 2014 | 5.96 | 3.70 | 13.50 | 2.25 | 7.31 |
| 2015 | 4.87 | 3.51 | 14.64 | 2.25 | 7.31 |
| 2016 | 4.48 | 3.25 | 15.94 | 3.10 | 5.62 |
| 2017 | 5.32 | 3.97 | 10.82 | 2.77 | 7.55 |
| 2018 | 4.16 | 2.60 | 12.46 | 2.10 | 5.67 |
| 2019 | 3.81 | 2.60 | 12.33 | 1.93 | 5.59 |

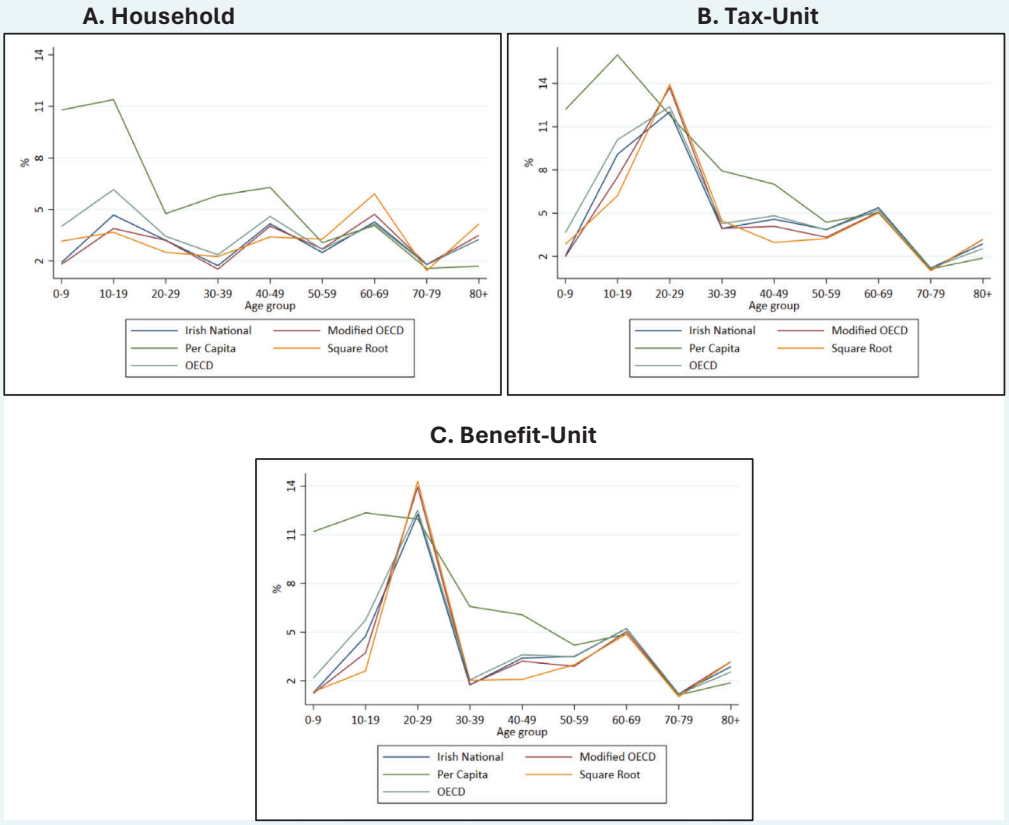


**Figure A1.** AROEP by age group, 2019 Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

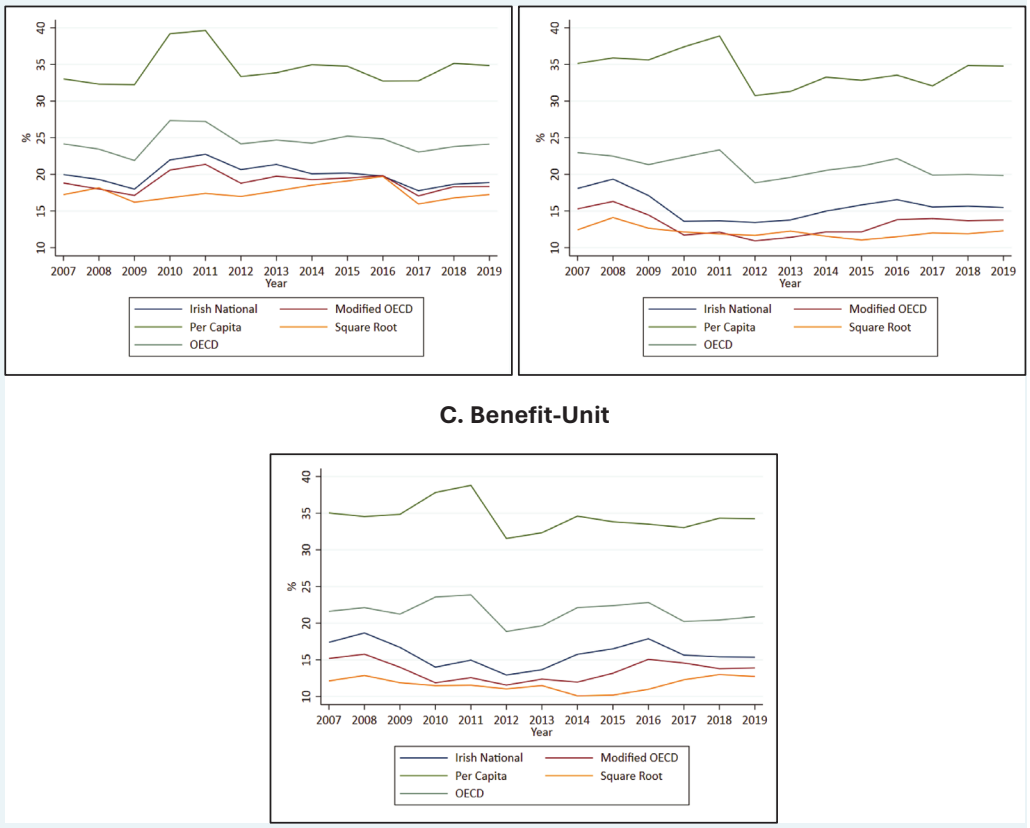


**Figure A2.** Child Poverty Rate Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

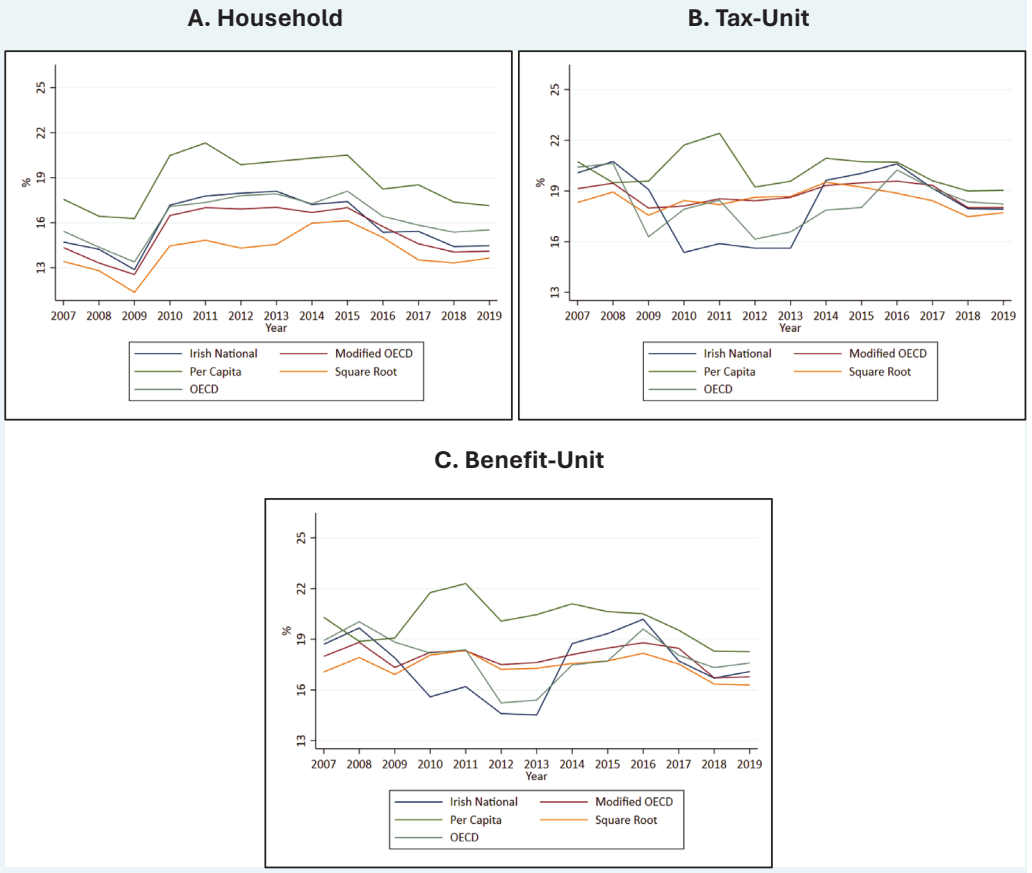


**Figure A3.** Working-Age Poverty Rate Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

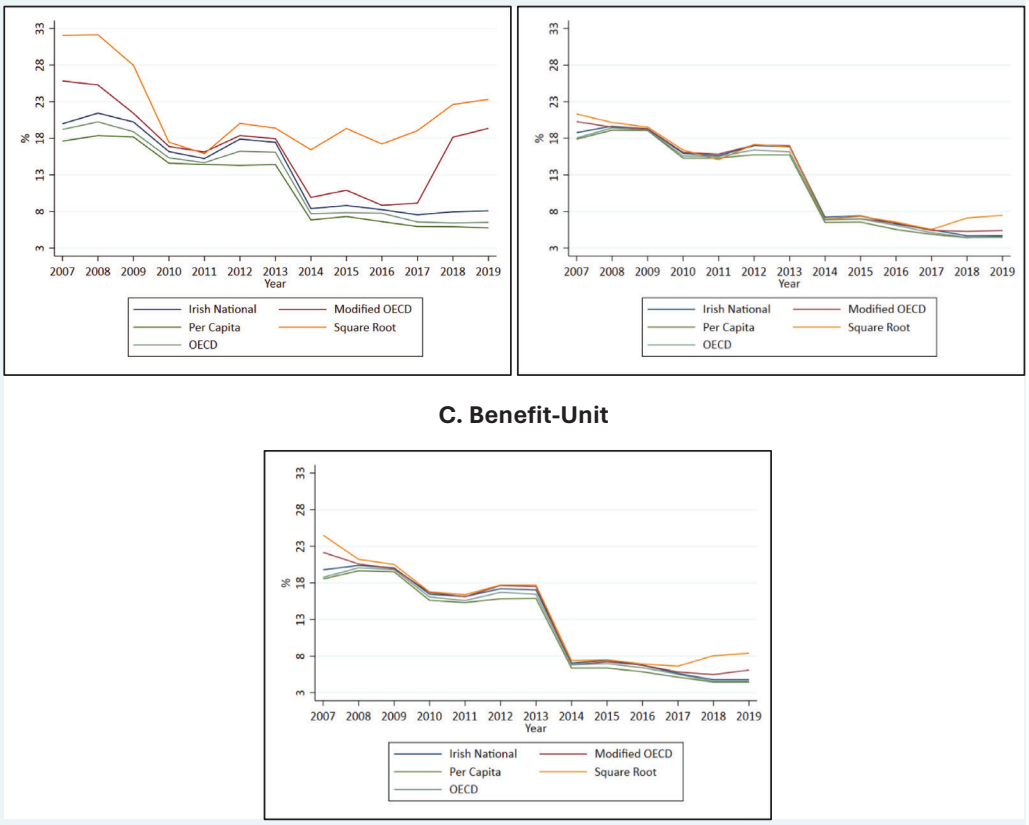


**Figure A4.** Elderly Poverty Rate Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.

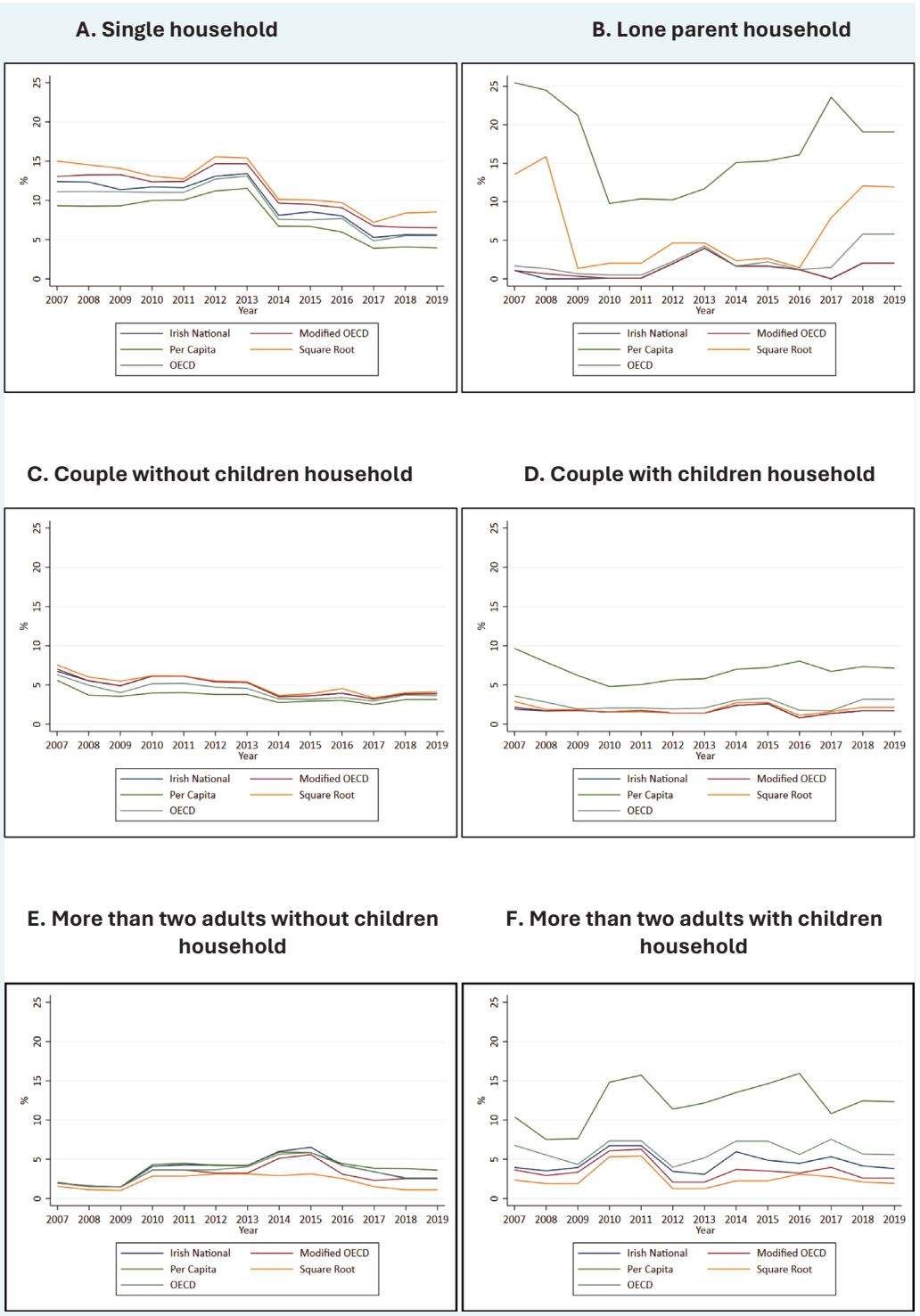


**Figure A5.** Extreme Poverty rate for different household types Source: EUROMOD tax-benefit simulations using system-year combinations as per Table A11.