Journal of the Statistical and Social Inquiry Society of Ireland
Vol. XLIX

Barrington Lecture 2019/2020

Understanding Income Inequality in Ireland

Barra Roantree[♣]
Economic and Social Research Institute and Trinity College Dublin

(read before the Society, 23rd January and 27th February 2020)

Abstract: This paper shows that inequality in disposable income has fallen substantially in Ireland between 1987 and 2017. However, inequality in market income has risen on most measures over the same period, leaving Ireland the most unequal country in the EU in terms of income before taxes, benefits and pensions. While benefit and pension payments do most to reduce the absolute level of inequality, it is Ireland's highly progressive tax system that does most to reduce inequality relative to other EU countries, leaving us with a level of income inequality that is very close to the EU average.

Keywords*:* disposable income inequality, market income inequality, taxation
JELs: D3, E24, O15

1. INTRODUCTION

Concerns about income inequality have returned to the forefront of policy debates both in Ireland and abroad.[1] At home, these often highlight the role of a strongly progressive tax and welfare system that results in levels of disposable income inequality across households that are close to the EU and OECD average, offsetting a very high level of income inequality before taxes and government transfers (market income).[2] However, despite a rich literature exploring trends and the nature of income inequality in Ireland,[3] our understanding of the reasons underlying such high levels of market income inequality is limited. Nor do we know what features of the tax and welfare system are particularly effective at reducing levels of income inequality. This makes it difficult to assess whether income inequality is more appropriately addressed by substantial redistribution through the tax and welfare system or measures more directly targeted at the sources of this inequality.

This paper examines these questions, drawing on detailed household survey data collected by the Economic and Social Research Institute (ESRI) and the Central Statistics Office (CSO). It is most closely related to work by Callan et al. (2018) – which highlighted the role of the tax and welfare system in reducing high levels of market income inequality – as well as to that by Nolan and Maitre (2000) and Nolan et al. (2014), which have examined how the distribution of income in Ireland evolved over the 1980s, 1990s and 2000s.

The paper proceeds by first describing how household income in Ireland was distributed in 2017 (the most recent year of data available at the time of writing) and how this has changed since 1987 (the oldest year for which detailed household level microdata is available). Section 3 compares the distribution of household income to other European countries, using data collected by national statistical authorities and made available through Eurostat. Section 4 concludes by considering the implications of the results for policy.

♣ Email: barra.roantree@esri.ie. The data used in this paper are provided by ESRI, Central Statistics Office (CSO) and Eurostat. The author would like to thank Jean Acheson, Richard Blundell, Donal de Buitler, Karina Doorley, Seán Lyons and Cormac O'Dea for comments on an earlier version of this paper, as well as attendees of the SSISI Barrington Lectures and an internal seminar at the ESRI. Work on this paper was carried out as part of the ESRI's Tax, Welfare and Pensions research programme, but all views expressed, errors and omissions are the sole responsibility of the author.

[1] See, for example, Alvaredo et al. (2013, 2015), Atkinson (2015), Piketty (2014) and Piketty and Saez (2003).
[2] See, for example, de Buitleir (2016) and Sweeney (2019).
[3] See, for example, O'Connell (1982), O'Neill & Sweetman (2001), Callan & Nolan (1997), Nolan et al. (2000), and Nolan (2009), alongside the other papers cited in this introduction.

2. THE DISTRIBUTION OF HOUSEHOLD INCOME IN IRELAND

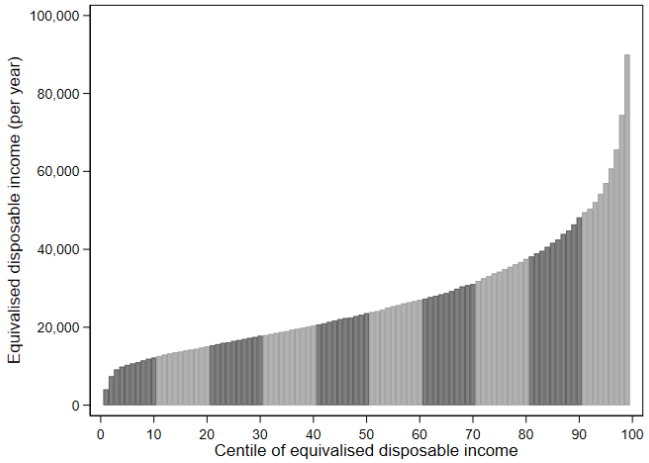
The primary source of data on incomes in Ireland is the EU Survey of Income and Living Conditions (EU-SILC). This is a representative survey carried out by the CSO annually since 2003, which collects a detailed range of information on the characteristics and incomes of households.[4] It is used to produce official statistics on income inequality and poverty, based on a measure of household disposable (after tax and welfare) income adjusted for household size and composition. This 'equivalisation' is designed to reflect the fact that a given level of income will provide a different living standard for someone in a large as compared to a small household. While not without controversy, the practice has become standard in the income inequality literature and is followed here.[5]

Figure 1 shows the distribution of equivalised household disposable income from the 2017 EU-SILC microdata, using the harmonised Eurostat definition of disposable income for comparability with the other European countries examined in Section 3.[6] It divides the population into 100 equally sized groups – or centiles – ordered from lowest- to highest-income, left-to-right, plotting the equivalised income needed to enter each group on the vertical axis in January 2019 terms. This shows that to be in the top 10% required equivalised household disposable income of €46,713: twice that of someone at the median – or middle – of the distribution and 3.8 times that of someone at the 10th percentile of the distribution. Known as the 90:50 and 90:10 percentile ratios respectively, these statistics are commonly used measures of income inequality and are displayed in Table 1 alongside the corresponding 50:10 and 75:25 percentile ratios, which coincidentally both also stand at around 2.

Not shown in Table 1 are measures of income inequality at the very top, for example the 99:50 percentile ratio. The reason for this is simply that household surveys tend to under-sample those in the extreme tails of the income distribution (Burkhauser et al., 2016). As a result, they are not a reliable source of data for examining the nature and extent of income inequality at the very top: a topic which therefore receives little attention in this paper though is returned to in the conclusion.

Table 1 also shows the corresponding percentile ratios for 1987, calculated using the ESRI Survey of Income Distribution, Poverty and State Services, described in detail by Callan et al. (1989).[7] This is the first year for which detailed microdata on household incomes is available and – given the period of household income growth associated with the Celtic Tiger only really began in 1988 (Callan et al., 2018, p.4) – represents a natural point of comparison for 2017.

Figure 1: Distribution of equivalised household disposable income, 2017



Source: Author's calculations using the 2017 EU Survey of Income and Living Conditions (EU-SILC).
Note: Figure shows the distribution of real equivalised household disposable income in January 2019 prices. Income is equivalised using the modified OECD scale with each member of the household included in the distribution, weighted by the Eurostat provided household weight (euroweight).

[4] For more information on EU-SILC, see https://www.cso.ie/en/silc/.
[5] See Cowell (1995) for a good discussion of this and other methodological issues that arise in the measurement of income inequality. I use the modified OECD scales to equivalise income and give each individual within a household the same weight, reflecting the fact that individual welfare is ultimately the main focus of concern. The use of the CSO's national weights does not lead to any qualitative change in the results presented.
[6] This differs from the CSO's 'national' definition of income primarily by its exclusion of some pension contributions, but also includes some forms of non-cash remuneration e.g. the imputed value of a company car.
[7] I try to align the definition of disposable income as closely as possible to the harmonised Eurostat definition used for the 2017 EU-SILC, although the 1987 survey asks about current income rather than income in the preceding 12 months as in the 2017 EU-SILC.

A comparison of these suggest that household income inequality is lower in 2017 than in 1987, with the 90:10, 90:50 and 75:25 ratios exhibiting small declines while the 50:10 ratio is unchanged. Table A1 in the appendix shows the same conclusion is reached looking at the income shares of each decile (i.e. tenth) of the population, with that of each of the bottom eight deciles higher in 2017 than in 1987, and that of the top two deciles lower.

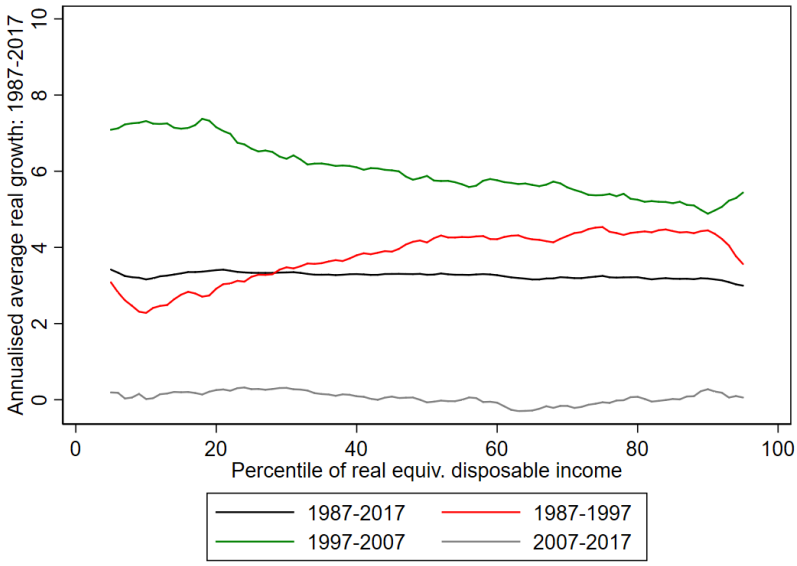
While both percentile ratio and decile share measures of income inequality look – by definition – only at specific parts of the distribution, summary measures of inequality that incorporate information about the entire distribution of income tell the same story. Table 1 displays the most popular of these – the Gini coefficient – which summarises the level of income inequality as a number between 0 (where everyone has the same income) and 1 (where one person has all income). This suggests income inequality is substantially lower in 2017 than 1987, with the Gini falling by 0.027 points: an 8% change that is statistically significant at the 95% level of confidence using jacknife estimates of standard errors (Karagiannis and Kovacevic, 2000). Other summary measures shown in appendix Table A2 tell the same story of a decline in the dispersion of disposable income between 1987 and 2017.

Table 1: Measures of disposable income inequality, 2017 and 1987

Year	*p90:10*	*p90:50*	*p50:10*	*p75:25*	*Gini*	*s.e.*
2017	3.8	2.0	1.9	2.0	0.306	0.007
1987	4.0	2.1	1.9	2.2	0.333	0.006

Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions (EU-SILC) and 1987 ESRI Survey of Income Distribution, Poverty and State Services. Disposable income equivalised using the modified OECD scales and EU definition of disposable income. Includes small number of cases with 0 disposable income. Standard errors estimated using jacknife procedure implemented in Stata through the fastgini command.

Figure 2: Growth in real equivalised disposable income, 1987-2017



Source: Author's calculations using the 2017 EU Survey of Income and Living Conditions (EU-SILC) and 1987 ESRI Survey of Income Distribution, Poverty and State Services
Note: Income is equivalised using the modified OECD scale with each member of the household included, weighted by the survey provided household weight.

This decline in disposable income inequality is in contrast to the experience of most – but not all – other OECD countries over a similar horizon (Thewissen et al., 2019).[8] Indeed the narrative of rising inequality in disposable income appears to be shaped by developments in English speaking countries – in particular the US – where the Gini coefficient and top 10 per cent income share has risen sharply while median incomes have stagnated (ibid).

[8] The only other OECD country to see a similar decline in the Gini coefficient over this period was France. Austria, Denmark, Estonia, Iceland, Portugal and South Korea also saw reductions, but smaller or over a shorter horizon.

However, as Figure 2 shows, the pattern of growth in disposable income across the distribution in Ireland has been remarkably even over this period as a whole. The solid black series shows that between 1987 and 2017, real disposable incomes grew by an average of around 3 per cent per year across the 5th to 95th percentile. This compares to around 1.5 per cent per year in Britain over the same period, and closer to 1.2 per cent for the bottom fifth of households (Bourquin, 2019).

Table 2: Measures of market income inequality, 2017 and 1987

Year	*p90:10*	*p90:50*	*p50:10*	*p75:25*	*Gini*
2017	14.5	2.6	5.5	3.5	0.544
1987	20.5	2.5	8.1	3.2	0.523

Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions (EU-SILC) and 1987 ESRI Survey of Income Distribution, Poverty and State Services. Market income equivalised using the modified OECD scales. Gini includes larger number of cases with 0 market income while percentile ratios exclude these cases as they are not otherwise defined. Gini coefficient excluding these cases also exhibits a rise, though a smaller one.

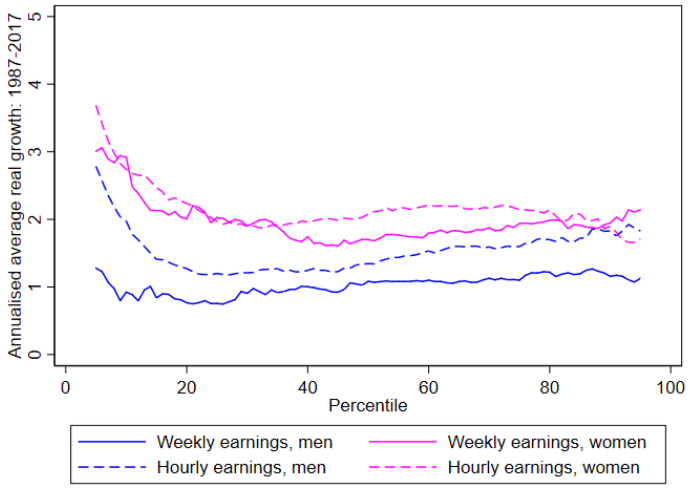
However, this picture of broad-based growth between 1987 and 2017 is not mirrored by the pattern of growth in market income: household income before taxes, transfers or pensions.[9] Table 2 shows that although the 90:10 and 50:10 ratios have fallen (reflecting strong growth at the very bottom of the distribution), the 90:50 and 75:25 ratios have increased (reflecting stronger growth at the top than the bottom half of the distribution).[10] The Gini coefficient has also increased substantially, from 0.523 to 0.544 (a rise of 4%) with other summary measures of market income inequality exhibiting a similar pattern of a rise in top- but a decline in bottom-sensitive measures (see Appendix Table A2).

One factor that helps explain these changes is the pattern of growth in individual earnings and wages. The solid series in Figure 3 plot the average annualised real growth in weekly earnings by sex across the distribution over the period 1987 to 2017. This shows that that for men, real weekly earnings growth has been relatively even at around 1 per cent per year, though slightly higher at the top and bottom of the distribution than the middle. By contrast, the weekly earnings of women have grown faster at the bottom of the distribution than elsewhere. The dashed series show that for both men and women, growth in hourly wages has been far stronger at the bottom of the distribution than elsewhere.[11] This suggests that stronger growth at the bottom of the wage and – for women – earnings distribution is part of the reason behind the decline in bottom sensitive measures of market income inequality like the 90:10 and 50:10 percentile ratios.

Given we are also interested in understanding why *household* market income inequality has risen at the top – and more generally as measured by the Gini coefficient – another important consideration is changes in the composition of employment across households. Probably the most dramatic change in the Irish labour market over this time has been the huge rise in the employment of women. Figures from Eurostat show that the share of women aged 25 to 64 in paid work has more than doubled from 31% in 1987 to 67% in 2017.[12]

[9] I exclude occupational pension income from this measure of market income because it is not possible to distinguish this from state pension income in the EU-SILC data.
[10] These percentile ratios are calculated excluding those in households with zero or negative market income (around a quarter of the total) as otherwise the 90:10, 50:10 and 75:25 ratios are undefined.
[11] That the hourly wage series lie for the most part above the weekly earnings series suggests that hourly wage growth has been the main source of growth in weekly earnings growth for those in work, rather than hours of work. However, this is only suggestive because those with the lowest hourly wages are not necessarily the same individuals as those with the lowest weekly earnings.
[12] See Eurostat table LFSA ERGAED 'Employment rates by sex, age and educational attainment level', available at http://appsso.eurostat.ec.europa.eu/nui/show.do?dataset=lfsa_ergaed&lang=en.

Figure 3: Growth in real earnings and wages 1987-2017, by sex



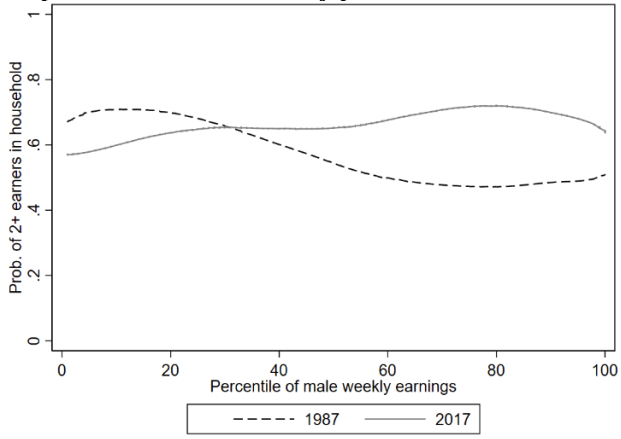
Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions and 1987 ESRI Survey of Income Distribution, Poverty and State Services. Hourly wage derived by dividing weekly earnings by usual hours.

However, Figure 4 shows that this rise in the employment rate of women has been concentrated in households where there is also a higher earning man. The series plot the predictions from non-parametric regressions of the likelihood that a household contains more than one worker against the (year and sex specific) percentile that the highest earning man in that household falls into.[13]

The dashed line shows that in 1987, lower-earning men were the most likely to be in a household containing an additional earner. Indeed, at 72%, men in in the bottom fifth of the distribution were on average 24 percentage points more likely to live with another earner than men in the top half of the earnings distribution. By contrast, the solid series show that this pattern had reversed by 2017, with higher-earning men the most likely and lower-earning men the least likely to be in a household containing an additional earner.

This suggests that changing patterns of employment within couples has played an important role in increasing levels of market income inequality, with a rise in the number of high income two-earner couples leading to a greater concentration of market income, especially at the top. Similar developments have been observed in the UK (Roantree and Vira, 2018), while Schwartz (2010) found that a strengthening of the association between spouses' earnings in the US has acted to increase income inequality significantly, with shifts in the division of paid work within couples more important that the rise in educational homogamy (Gonalons-Pons and Schwartz, 2017).

Figure 4: Multiple-earner households, by percentile of male earnings and year



Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions and 1987 ESRI Survey of Income Distribution, Poverty and State Services. Series show predictions from a non-parametric regression of the likelihood that a household contains more than one earner against the percentile of male earnings that the highest earning man falls into. Estimates restricted to households where at least one man works.

[13] I look at the probability of a household having multiple earners rather than the probability that both adults in a couple are in work because the microdata available for the 1987 Survey does not contain the information needed to identify the partners of those in households containing multiple adults. Carrying out the same exercise including only households containing 2 adults who both report being married or cohabiting yields similar results.

To summarise, inequality in market income appears to have risen on most measures between 1987 and 2017 at the same time that inequality in disposable income has fallen. This has coincided with a period of remarkably strong and broad-based growth in disposable income.

Although it is important to understand how and why income inequality has changed over time, such comparisons tell us little about whether the level or nature of income inequality in Ireland is unusual. To address these questions, this paper now turns to look at how levels of inequality in Ireland compare to other European countries.

3. HOW DOES IRELAND COMPARE TO THE REST OF THE EU?

This section uses data from the 2017 EU-SILC for the (then) 28 member states of the EU, collected by national statistical agencies and provided through Eurostat. These data provide harmonised measures of income along with household characteristics and demographics (Eurostat, 2019).

Looking first at market income, Table 3 shows that the Gini coefficient in Ireland was the highest in the EU-28 at 0.544, followed closely by Portugal, Bulgaria and Greece. This is substantially higher than the median of 0.498 and about a third higher than that for the most equal country, Slovakia (0.403): a huge difference in terms of the Gini coefficient.

However, the high levels of market income inequality in Ireland arise because of the large number of individuals in households without positive market income rather than because of an extremely unequal distribution among those with positive amounts of market income.

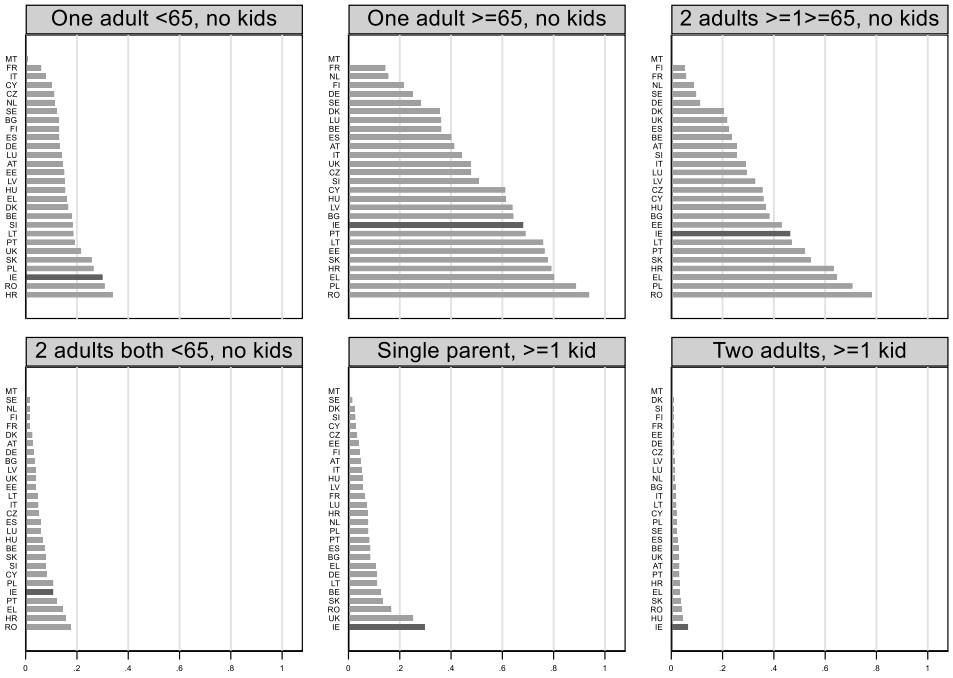
Table 3: Gini coefficient for market income, 2017

	Gini, including 0s		Gini, excluding 0s	
	Coefficient	*Rank*	*Coefficient*	*Rank*
AT	0.504	12	0.456	10
BE	0.501	14	0.442	16
BG	0.538	3	0.477	2
CY	0.458	24	0.404	23
CZ	0.447	27	0.387	26
DE	0.507	10	0.471	4
DK	0.504	11	0.451	12
EE	0.465	23	0.375	27
EL	0.538	4	0.424	18
ES	0.520	7	0.478	1
FI	0.502	13	0.476	3
FR	0.489	17	0.471	5
HR	0.494	15	0.393	24
HU	0.488	18	0.411	20
IE	0.544	1	0.457	9
IT	0.518	9	0.467	6
LT	0.521	6	0.433	17
LU	0.492	16	0.451	11
LV	0.481	21	0.417	19
MT	0.448	26	0.448	14
NL	0.486	19	0.460	7
PL	0.473	22	0.390	25
PT	0.540	2	0.449	13
RO	0.523	5	0.410	21
SE	0.482	20	0.447	15
SI	0.457	25	0.407	22
SK	0.403	28	0.318	28
UK	0.520	8	0.458	8
Median	0.498		0.447	

Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions. Market income – defined as the sum of gross cash or near cash income; gains or losses from self-employment; pensions from individual plans; income from land and property rental; regular inter-household cash transfers received; interest, dividends, profits; and income received by people aged under 16 – equivalised using modified OECD scale with each member of the household included, weighted by the Eurostat provided household weight (euroweight).

The second set of Columns in Table 3 illustrate this, showing the Gini coefficient and ranking of countries excluding individuals in households with zero or negative market income. On this measure, Ireland has the 9th most unequal distribution of market income in the EU-28, at 0.457 below France (0.471) and only slightly above Denmark (0.451). Other summary measures – which by definition exclude zeros or negative values, and are shown in appendix Table A3 – also suggest that Ireland lies around mid-table in terms of market income inequality. This is somewhat surprising, as individuals in households with no positive market income are typically retired and Ireland has one of the lowest shares in the EU of individuals aged 65 or older.

Figure 5: Share without positive market income, by household type and country



Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions, excluding households consisting of three or more adults and Malta, who censor household size. Market income defined as above.

However, Figure 5 shows that where Ireland stands out compared to its European neighbours is the high share of working-age adults living alone and single parents who do not report having any market income. Indeed, only Romania and Hungary have a higher share of working-age adults living alone without market income while at 29.7%, Ireland has the highest share of single parent households with no market income.[14] This reflects very low rates of employment among such households, which – at 36.3% – Figure A1 in the Appendix shows are the lowest in the EU-28.[15] The SILC data also suggest that – at 7% – single parent households constitute a much larger share of total households than in other EU countries, making the high share without any market income particularly important.

The high share of working-age adults living alone without market income also appears to be related to low levels of economic activity. 18.6% of these adults report being "permanently disabled and/or unfit for work", almost triple the average of 6.3% and – as Figure A2 in the appendix shows – by far the highest in the EU-28.

Taken together, this suggests that Ireland has a high level of market income inequality as measured by the Gini not because of an unusually skewed distribution of earnings among those in work, but because of low levels of economic activity among some groups.[16]

[14] Ireland also has the largest share of two-adult households with children that do not report receiving any market income, but like other EU-28 countries this proportion is very low in absolute terms, at 6.5%.

[15] Watson et al. (2015) show that there is a substantial difference in estimates of jobless households using SILC and the Quarterly National Household Survey, due primarily to lower estimates of employment in SILC.

[16] This is not to say that patterns of individual earnings are not unequally distributed. Sweeney (2019), for example, shows that Ireland has a comparatively high share of full-time workers with less than two-thirds of median earnings. However, what the

Table 4: Gini coefficient for disposable, gross and market income, 2017

	Disposable		Gross		Market	
	Gini	*Rank*	*Gini*	*Rank*	*Gini*	*Rank*
AT	0.279	21	0.331	14	0.504	12
BE	0.260	24	0.309	23	0.501	14
BG	0.410	1	0.416	1	0.538	3
CY	0.308	12	0.345	10	0.458	24
CZ	0.244	26	0.281	27	0.447	27
DE	0.282	17	0.326	16	0.507	10
DK	0.276	22	0.311	21	0.504	11
EE	0.316	10	0.340	13	0.465	23
EL	0.334	6	0.345	11	0.538	4
ES	0.341	4	0.377	4	0.520	7
FI	0.253	25	0.303	25	0.502	13
FR	0.293	15	0.319	18	0.489	17
HR	0.299	14	0.344	12	0.494	15
HU	0.281	19	0.309	22	0.488	18
IE	0.306	13	0.377	5	0.544	1
IT	0.327	9	0.372	7	0.518	9
LT	0.376	2	0.395	3	0.521	6
LU	0.309	11	0.329	15	0.492	16
LV	0.345	3	0.372	6	0.481	21
MT	0.282	18	0.316	20	0.448	26
NL	0.271	23	0.320	17	0.486	19
PL	0.292	16	0.306	24	0.473	22
PT	0.335	5	0.398	2	0.540	2
RO	0.331	8	0.359	8	0.523	5
SE	0.280	20	0.317	19	0.482	20
SI	0.237	27	0.290	26	0.457	25
SK	0.232	28	0.261	28	0.403	28
UK	0.331	7	0.359	9	0.520	8
Median	0.296		0.330		0.498	

Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions. Income measures as defined above, equivalised using the modified OECD scale with each member of the household included, weighted by the Eurostat provided household weight (euroweight).

The fact that Ireland has a high level of market income inequality – if not the reasons underlying it – has been well noted in previous research and policy debates (de Buitleir, 2016; and Sweeney, 2019). These debates have also highlighted the role of Ireland's highly redistributive tax and benefit system in doing relatively more than other EU countries to reduce income inequality. This is illustrated by Table 4, which shows that the Gini coefficient in Ireland for disposable income (which adds social welfare benefits to and subtracts taxes from market income) is very close to the EU average: 13th of the EU-28 at 0.306, just above the median of 0.296. Table A5 in the Appendix shows that the same impression emerges from examination of other summary measures of disposable income inequality, with Ireland around the median level of EU-28 countries.

Table 4 also shows that while welfare benefits and pensions do more than taxes to reduce the *absolute* level of income inequality (both in Ireland and abroad), taxes do more in Ireland than any other country to reduce *relative* inequality. This can be seen by comparing the Gini coefficients for disposable, gross and market income. Adding welfare benefits and pensions to market income reduces the Gini coefficient in Ireland by almost a third, from 0.544 for market income to 0.377 for gross income. However, welfare benefits and pensions also reduce income inequality in other countries, with the median Gini coefficient in the EU-28 falling from 0.498 to 0.330. As a result, Ireland remains one of the most unequal countries in the EU in terms of gross income as measured by the Gini coefficient, although it falls slightly from being the most to the 5th most unequal country.[17]

EU-SILC data show is that this does not translate into high levels of equivalised household market income inequality because of the patterns of household composition and size.

[17] Tables A3-5 in the Appendix shows that other measures of income inequality tell a similar story.

It is only when taxes are deducted from gross income to get disposable income that inequality in Ireland falls significantly relative to other EU countries. In Ireland, the Gini coefficient falls by almost a fifth, from 0.377 to 0.306: proportionally more than any other country in the EU. This leaves Ireland the 13th most unequal country of the EU-28 as measured by the Gini coefficient for disposable income, mid-table and just above the median of 0.296.[18]

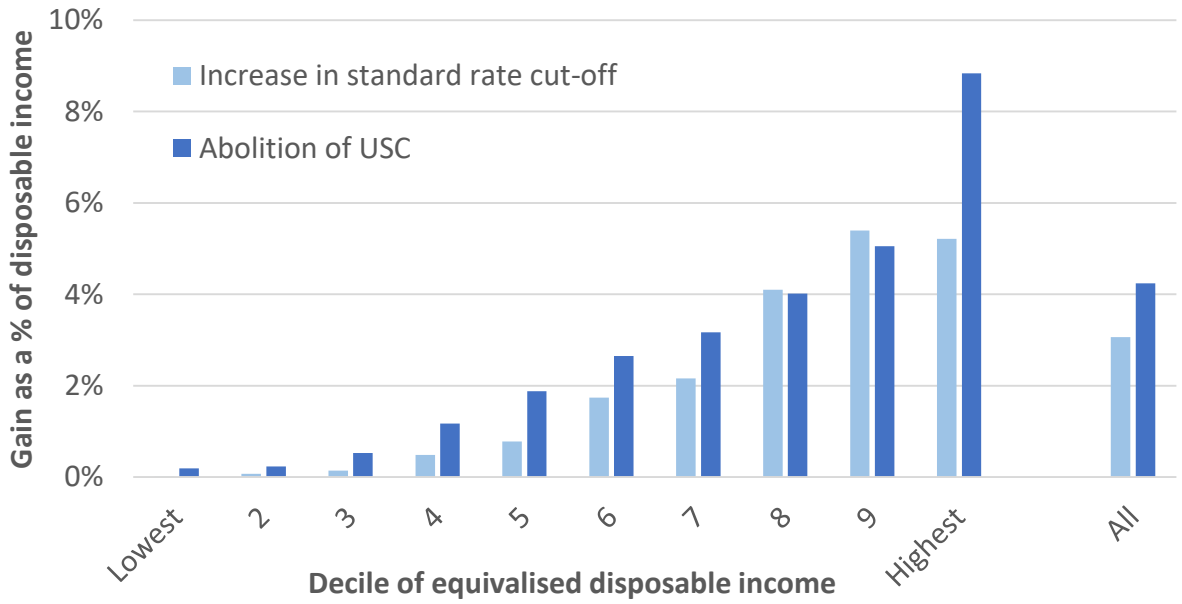
These differences suggest that it is the tax rather than benefit and pension system that does most to reduce income inequality in Ireland relative to other EU countries. They also raise the question as to which specific features of the tax system are particularly effective at reducing income inequality. Figures compiled by the OECD show that while the effective rate of income tax for a single adult earning two-thirds the average is quite typical, that for a single adult earning more than the average is among the highest in the OECD.[19] This points to the role played by the early level at which the higher rate of income tax begins to apply (€33,800 in 2017) in making the tax system in Ireland comparatively progressive, particularly given that Ireland is among a small number of countries with 2 or fewer rates of income tax.[20]

However, these calculations do not include the effect of the Universal Social Charge (USC), the progressive supplementary income tax charged on most forms of personal income, including pension contributions but excluding payments from the Department of Employment Affairs and Social Protection.

To examine the role these two features of the Irish tax system play in reducing levels of inequality, I use EUROMOD – the European Union tax and benefit microsimulation model (Sutherland and Figari, 2013) – to simulate the effect of:

a) Increasing the point at which the higher rate of income tax begins to apply (the standard rate cut-off) from €33,800 for a single adult, €42,800 for a one-earner married couple and (a maximum of) €67,600 for a two-earner married couple to €50,000, €59,000 and €100,000 respectively.
b) Eliminating the Universal Social Charge.

Figure 6: Distributional impact of income tax and USC cuts



Note: Author's calculations using EUROMOD version I2.0+ run on the 2017 EU Survey of Income and Living Conditions for Ireland with 2017 baseline policy and reforms as described in main text.

[18] Again, Tables A3-5 in the Appendix shows that other measures of income inequality tell a similar story.
[19] See Table 5.4, available at http://dx.doi.org/10.1787/888933924930.
[20] See Table I.1 of the OECD's Tax Database at https://stats.oecd.org/index.aspx?DataSetCode=TABLE_I1.

Successive Governments have said they would implement both these changes, with that to income tax forming a central plank of the Fine Gael manifesto for the February 2020 General Election.[21] Figure 6 plots the distributional impact of the gains from these reforms by decile of equivalised disposable income and shows that both would be regressive, with the largest proportional gains going to individuals in higher income households. Indeed the series show that while individuals in the highest income decile would gain by an average of 5.2% and 8.8% of disposable income for the income tax and USC reform respectively, those in the lowest income decile would gain by less than 0.2% in both cases.

Unsurprisingly then, these reforms would have the effect of raising income inequality substantially. The simulations show that raising the standard rate cut-off would raise the Gini coefficient for disposable income to 0.321 while abolishing USC would raise it to 0.325: near British levels of inequality. Indeed both these increases would leave Ireland in the top 10 most unequal countries in the EU, up from 13th. They would also have a significant cost to the exchequer, with official estimates suggesting that raising the standard rate cut-off to the levels above would cost €2.3bn per year while abolishing the USC would cost more than €3.5bn.[22] This illustrates significant role played by these two – often decried – features of the tax system in reducing inequality from one of highest levels in the EU to near the average.

4. CONCLUSIONS AND IMPLICATIONS FOR POLICY

This paper has shown that in contrast to most advanced economies, inequality in disposable income has fallen in Ireland between 1987 and 2017. Over the same period inequality in market income has risen on most measures, leaving Ireland the most unequal country in the EU in terms of income before taxes, benefits and pensions. The paper has also shown that while benefit and pension payments do most to reduce the absolute level of inequality, it is Ireland's highly progressive tax system that does most to reduce inequality relative to other EU countries, leaving us with a level of income inequality that is very close to the EU average.

However, the degree of progressivity of the income tax system in particular may limit its scope to reduce inequality much further at the same time as raising revenue, if so desired. This is because the progressivity of the system combined with the unequal distribution of income means that income tax revenues in particular are now very concentrated among higher earners. Revenue statistics show that in 2017, 21.5% of these came from around 1% of all tax units: the 25,425 with taxable income in excess of €200,000.[23]

We know from international evidence that higher earners tend to be much more responsive to tax changes, especially as they have greater scope to manipulate the form and timing of their incomes (Saez et al., 2012). There is unfortunately no evidence for Ireland as to what the revenue maximising rate of income tax on higher earners is, but it is not unreasonable to question whether further increases to higher rates of income tax can deliver substantial revenues after allowing for behavioural responses. While one could reduce inequality by bringing more individuals into the income tax system (through reductions in personal tax credits, for example) or increasing the basic and higher rates of income tax, this goes somewhat counter to the direction of recent policy and is likely to be politically difficult.

This does not mean that options do not exist for reducing income inequality while raising tax revenues from those with higher incomes. There are many tax reliefs that predominantly benefit higher-income households which have a very weak policy rationale and that could be eliminated or heavily restricted. For example, entrepreneur's relief reduces the tax rate that applies to capital gains on assets owned by sole-traders and the disposal of shares owned in certain companies from 33% to 10%.[24] As Miller and Roantree (2017) among others have argued, this creates an array of significant economic distortions and is far from the most efficient way of achieving the stated objective of encouraging people to set up businesses, costing the exchequer upwards of €80 million per year.

Similarly, there are many options open to policymakers seeking to reduce income inequality by boosting incomes at the bottom of the distribution. Although increases to the minimum wage are often proposed as such a measure, the results presented here show that this may not be particularly effective given the large proportion of households without any market income. Indeed, Logue and Callan (2016) found that most of the gains from an increase go to

[21] See, https://www.thejournal.ie/can-usc-be-abolished-2388636-Oct2015/, https://www.thejournal.ie/leo-varadkar-income-tax-fg-ard-fheis-4345216-Nov2018/ and https://www.thejournal.ie/taxes-parties-4991584-Feb2020/.

[22] See p.20 of Department of Finance (2019) and https://www.revenue.ie/en/corporate/information-about-revenue/statistics/receipts/receipts-taxhead.aspx respectively.

[23] Table RVA02 'Distribution of Income Tax by Range of Taxable Income, Marital Status, Year and Statistic', available at https://statbank.cso.ie/px/pxeirestat/statire/SelectTable/Omrade0.asp?Planguage=0.

[24] See https://www.revenue.ie/en/gains-gifts-and-inheritance/cgt-reliefs/revised-entrepreneur-relief.aspx for more details about entrepreneur's relief.

households in top half of the income distribution while Redmond et al. (2019) showed that 12% of minimum wage workers live in households with incomes of more than €100,000 per year. This suggests that those wanting to reduce income inequality may want to focus on other measures more targeted at household income than individual earnings.

One such measure could be to expand eligibility to Working Families Payment: a means-tested benefit (previously called Family Income Supplement) available to low-income families with children. Low-income adults without children are entitled to similar payments in other countries, for example to the Earned Income Tax Credit in the US and to Working Tax Credit in the UK. Expanding the eligibility for Working Families Payment to low-income single adults and couples without children offers a more targeted way of reducing income inequality while raising incomes at the bottom than increases to the minimum wage.

Such a reform could also have the benefit – though potentially at significant cost to the exchequer – of strengthening the financial incentive to be in paid work. While Callan et al. (2016) showed that these are generally quite strong, the evidence presented in this paper suggests there are groups with low levels of employment that targeted measures could help increase. The government has already recognised this in its 2017 Making Work Pay report, which highlighted the potential for the design of Disability Allowance (a means-tested payment available to individuals with a disability or long-term illness) to inhibit some recipients from taking up employment with earnings in excess of €120 per week.[25]

Although recent changes have addressed this sharp financial disincentive to take up paid-work,[26] there is also a need to monitor the strength of financial work incentives for the claimants of means-tested benefits more generally. This is particularly pressing given the proliferation of new means-tested payments including Housing Assistance Payment (HAP) and the National Childcare Scheme (NCS). These have the potential to interact with the means-tests of existing benefits and generate poverty traps for the claimants of multiple supports unless careful attention is given to how the system as a whole operates.

While this paper has sought to further our understanding of the nature of income inequality in Ireland, there are certain areas where our knowledge is limited and that this paper has not addressed, largely because of data constraints. Among these are the composition and extent of incomes at the very top. Nolan (2007, 2012, 2018) provides long-run estimates of top income shares using published Revenue income tax statistics, which suggest that the top 1% and top 0.1% share declined over the period 1940 to 1980 before rising sharply over the 1990s and early 2000s. However, these estimates are not directly comparable with those obtained from household survey data as they are collected at the tax unit rather than household level, so do not adjust for household size or composition in the same way. In addition, they are reliant on what income was reported to Revenue (so are subject to bias from evasion and avoidance behaviour) and exclude certain forms of income. Most notable among these are capital gains, which are taxed at a much lower rate than income from employment and accrue to a very small number of taxpayers (50,788 in 2017), many of whom own their own company.[27] However, we currently know very little about these individuals or the joint distribution of income and capital gains in Ireland. Linking administrative company, income tax and capital gains tax records provides a promising avenue for future research that can improve our understanding of incomes at the very top.

We also know little about the joint distribution of income, consumption and wealth in Ireland. International research has shown that wealth is much more unequally distributed than income, which is in turn is typically more unequally distributed than consumption (Alvaredo et al., 2017, Meyer and Sullivan, 2013; Blundell and Etheridge, 2010). However, the three concepts are closely related as consumption today or in the future can be increased by drawing down on savings, making it important to consider their joint distribution. Research into this in Ireland has been restricted by data availability, with at most only two of the three concepts well measured in the same survey.[28] However, this will change with the availability of the joint income, consumption and wealth data due to be collected by the CSO in the second half of 2020, a welcome development that will hopefully become an annual or biennial occurrence.

[25] See, in particular, pages 14-20 and page 100 of the 2017 Making Work Pay report, available online at https://assets.gov.ie/10940/c4c20348897148eb9a50ac2755fd680f.pdf.

[26] The medical card earnings disregard for claimants of Disability Allowance was raised from €120 per week to €427 per week in December 2018, allowing claimants to earn up to €22,204 per year without losing their automatic entitlement to a medical card. See https://www.gov.ie/en/press-release/c4f82d-new-medical-card-measures-to-remove-barriers-to-work-for-people-with/.

[27] See https://www.revenue.ie/en/corporate/documents/statistics/registrations/registrations-assessment.pdf.

[28] Income and consumption in the Household Budget Survey and income and wealth in the Household Finance and Consumption Survey. O'Neill and Sweetman (2001) analyse early years of the former survey and show that there were not significant differences in most measures of income and consumption inequality, but do not analyse the measures jointly.

Finally, we know almost nothing about the nature of intergenerational income inequality and mobility in Ireland. This is because little long-running longitudinal data on incomes and living standards have been collected, with the relatively brief Living in Ireland survey (1994-2001) covering too short a time period to derive typical measures used in the literature.[29] However, this shortcoming in our knowledge should be addressed in the coming years with the continuation of the Growing Up in Ireland survey. This follows a random sample of children born in 1998 and 2008, with the former cohort now reaching the age where most enter the labour market.[30] Opportunities also exist for greater linkage of existing data, in the spirit of the CSO's pioneering match between Census 2016 and administrative data (CSO, 2019). Such linkages could combine data on earnings from tax records with genealogical information from Censuses to construct measures of intergenerational earnings for periods and cohorts that would otherwise be unavailable.

All this bodes well for future research into the nature and extent of income inequality in Ireland, which – as this paper has hopefully shown – stands out as somewhat of an outlier among European countries. Accordingly, such research should be of interest not only to policymakers or researchers based here in Ireland, but internationally as well.

References

Alvaredo, F., Atkinson, A. B., Piketty, T., and Saez, E. (2013). The top 1 percent in international and historical perspective. *Journal of Economic Perspectives*, 27 (3), 3–20.

Alvaredo, F., Atkinson, A. B., Piketty, T., Saez, E. (2015). The World Top Incomes Database. http://g-mond.parisschoolofeconomics.eu/topincomes/.

Alvaredo, Facundo, Lucas Chancel, Thomas Piketty, Emmanuel Saez, and Gabriel Zucman. 2017. "Global Inequality Dynamics: New Findings from WID.world." *American Economic Review*, 107 (5): 404-09.

Atkinson, A. B. (2015). *Inequality. What Can Be Done?* Cambridge, MA: Harvard University Press.

Belfield, C., Crawford, C., Greaves, E., Gregg, P., and Macmillan, L. (2017). Intergenerational income persistence within families (No. W17/11). IFS Working Papers.

Blundell, R., and Etheridge, B. (2010). Consumption, income and earnings inequality in Britain. *Review of Economic Dynamics*, 13(1), 76-102.

Chetty, R., Hendren, N., Kline, P., Saez, E., & Turner, N. (2014). Is the United States still a land of opportunity? Recent trends in intergenerational mobility. *American Economic Review*, 104(5), 141-47.

Callan, T., Nolan, B., Whelan, B., Hannan, D. and Creighton, S. (1989). *Poverty, Income and Welfare in Ireland*, General Research Series No. 146, Dublin: The Economic and Social Research Institute.

Callan, T., & Nolan, B. (1997). Income inequality and poverty in Ireland in the 1970s and 1980s, in Peter Gottschalk, Bjorn A. Gustafsson and Edward E. Palmer (eds), *Changing Patterns in the Distribution of Economic Welfare: An Economic Perspective*, 220.

Callan, T., O'Dea, C., Roantree, B., and Savage, M. (2016). Financial incentives to work: comparing Ireland and the UK. Dublin: Economic and Social Research Institute.

Callan, T., Bercholz, M., and Walsh, J. (2018). Income growth and income distribution: a long-run view of Irish experience. Budget Perspectives Series No. 2019/3. Dublin: Economic and Social Research Institute

CSO, (2019). 'Geographical Profiles of Income in Ireland 2016', Dublin: Central Statistics Office.

Cowell, F., (1995). 'Measuring Inequality', LSE Handbooks on Economics, Hemel Hempstead: Prentice Hall/Harvester Wheatsheaf.

Dearden, L., Machin, S. and Reed, H. (1997), 'Intergenerational mobility in Britain', *Economic Journal*, 107(440), 44–66.

de Buitleir, D. (2016). 'Income Inequality in Ireland'. Paper presented at the McGill Summer School, available at http://www.macgillsummerschool.com/income-inequality-in-ireland/

Department of Finance (2019). 'Income Tax'. Tax Strategy Group paper 19/03. Dublin: Government of Ireland.

Eurostat (2019). Methodological Guidelines and description of EU-SILC target variables.

Gonalons-Pons, P. and Schwartz, C. R. (2017). Trends in economic homogamy: changes in assortative mating or the division of labor in marriage?. *Demography*, 54(3), 985-1005.

Karagiannis E. and M. Kovacevic' (2000), "A Method to Calculate Jakknife Variance Estimator For the Gini Coefficient", *Oxford Bulletin of Economics and Statistics*, Vol. 62 Issue 1 119-122.

[29] This literature typically considers the relationship between father and son's earnings at a given age (e.g. Solon, 1992; Dearden et al., 1997), but more recently has shifted to examine the association in family income more broadly defined (Belfield et al., 2017; Chetty et al., 2014; Mitnik et al., 2015).

[30] See https://www.growingup.ie/information-for-researchers/.

Logue, C., and Callan, T. (2016). *Low pay, minimum wages and household incomes: evidence for Ireland*. Economic and Social Research Institute: Dublin.

Meyer, B. D., & Sullivan, J. X. (2013). Consumption and income inequality and the great recession. *American Economic Review*, 103(3), 178-83.

Miller, H. and Roantree, B., 2017. 'Pre-Budget submission to the Irish Department of Finance'. Institute for Fiscal Studies: London. https://www.ifs.org.uk/publications/9688

Mitnik, P. A., Bryant, V., Weber, M. and Grusky, D. B. (2015), 'New estimates of intergenerational mobility using administrative data', Stanford Center on Poverty and Inequality.

Nolan, B., Maitre, B., O'Neill, D. and Sweetman, O. (2000). *The distribution of income in Ireland*. Dublin: Oak Tree Press.

Nolan, B., & Mâitre, B. (2000). A comparative perspective on trends in income inequality in Ireland. *Economic and Social Review*, 31(4), 329-350.

Nolan, B. (2007). 'Long-term trends in top income shares in Ireland', in AB Atkinson and T. Piketty (eds), *Top Incomes over the 20th Century: a contrast between continental European and English-speaking countries*. Oxford: Oxford University Press.

Nolan, B. (2009). Income inequality and public policy. *Economic and Social Review*, 40(4), 489.

Nolan, B. (2012). Updating top income shares for Ireland 2000-2009. WID.world Technical Note Series No. 2012/6.

Nolan, B., Whelan, C. T., Calvert, E., Fahey, T., Healy, D., Mulcahy, A., Maitre, B., Norris, M., O'Donnell, I., and Winston, N. (2014). Chapter 15 Ireland: inequality and its impacts in boom and bust. In Nolan et al. (eds) *Changing Inequalities and Societal Impacts in Rich Countries: Thirty Countries' Experiences*, Oxford: Oxford University Press

Nolan, B. (2018). Updating top income shares for Ireland to 2015. WID.world Technical Note Series No. 2018/2

O'Connell, P. (1982). The distribution and redistribution of income in the republic of Ireland. *The Economic and Social Review*, 13(4), 251-278.

O'Neill, D., and Sweetman, O., (2001) 'Inequality in Ireland 1987-1994: A Comparison using Measures of Income and Consumption'. *Journal of Income Distribution*, 10 :23-39

Piketty, T. (2014). *Capital in the Twentieth-First Century*. Cambridge, MA, and London: The Belknap Press.

Piketty, T. and Saez, E. (2003). Income inequality in the United States, 1913–1998. *Quarterly Journal of Economics*, 118 (1), 1–39.

Redmond, P., Doorley, K. and McGuinness, S., (2019). 'The impact of a change in the national minimum wage on the distribution of hourly wages and household income in Ireland'. ESRI Research Series No. 86. Dublin: Economic and Social Research Institute.

Roantree, B., and Vira, K. (2018). 'The rise and rise of women's employment in the UK'. IFS Briefing Note Series BN234. London: Institute for Fiscal Studies.

Saez, Emmanuel, Joel Slemrod, and Seth H. Giertz. 2012. "The Elasticity of Taxable Income with Respect to Marginal Tax Rates: A Critical Review." *Journal of Economic Literature*, 50 (1): 3-50.

Schwartz, Christine R. 2010 "Earnings Inequality and the Changing Association between Spouses' Earnings," *American Journal of Sociology* 115, no. 5 (March 2010): 1524-1557. https://doi.org/10.1086/651373

Solon, G. (1992). Intergenerational income mobility in the United States. *The American Economic Review*, 393-408.

Sutherland, H., and Figari, F. (2013). EUROMOD: the European Union tax-benefit microsimulation model. *International Journal of Microsimulation*, 6(1), 4-26.

Sweeney, R. (2019). 'The state we are in: inequality in Ireland today'. Dublin, Ireland: TASC.

Thewissen, S., Kenworthy, L., Nolan, B., Roser, M. and Smeeding, T. (2018). 'Rising Income Inequality and Living Standards in OECD Countries: How Does the Middle Fare?' *Journal of Income Distribution*, vol. 26(2), pages 1-23, July.

Watson, D., Maître, B., and Russell, H. (2015). 'Technical Paper on the Measurement of Household Joblessness in SILC and QNHS, 2004-2012: An Analysis of the Central Statistics Office (CSO) Survey of Income and Living Conditions (SILC) and the Quarterly National Household Survey (QNHS)', Social Inclusion Technical Paper No. 6, Dublin: Department of Social Protection.

APPENDIX: ADDITIONAL TABLES AND FIGURES

Table A1: Decile shares of equivalised disposable income

Decile	*1987*	*2017*
1 (lowest)	3.1	3.4
2	4.7	5.0
3	5.5	6.0
4	6.6	6.9
5	7.5	7.9
6	8.8	9.1
7	10.3	10.4
8	12.3	12.3
9	15.2	14.8
10 (highest)	25.9	24.2

Source: Author's calculations using the 2017 EU Survey of Income and Living Conditions (EU-SILC) and 1987 ESRI Survey of Income Distribution, Poverty and State Services.
Note: Disposable income equivalised using the modified OECD scales.

Table A2: Summary measures of equivalised income inequality

Measure	Disposable		Market	
	1987	*2017*	*1987*	*2017*
Gini	0.333	0.306	0.523	0.544
Gini*	0.332	0.306	0.451	0.457
GE(-1)	0.319	0.239	27.291	12.005
GE(0)	0.193	0.162	0.593	0.507
GE(1)	0.202	0.173	0.362	0.376
GE(2)	0.301	0.287	0.450	0.567
A(0.5)	0.092	0.079	0.191	0.186
A(1)	0.176	0.149	0.447	0.398
A(2)	0.390	0.324	0.982	0.960

Source: Author's calculations using the 2017 EU Survey of Income and Living Conditions (EU-SILC) and 1987 ESRI Survey of Income Distribution, Poverty and State Services.
Note: Income equivalised using the modified OECD scales. All measures but Gini exclude those in households with zero or negative incomes.

Table A3: Measures of market income inequality, 2017

	Gini	Gini*	GE(-1)	GE(0)	GE(1)	GE(2)	A(0.5)	A(1)	A(2)
AT	0.504	0.456	64.069	0.804	0.395	0.605	0.215	0.552	0.992
BE	0.501	0.442	289.722	1.064	0.370	0.426	0.227	0.655	0.998
BG	0.538	0.477	2.629	0.525	0.433	0.712	0.204	0.409	0.840
CY	0.458	0.404	1.632	0.369	0.304	0.493	0.147	0.308	0.765
CZ	0.447	0.387	20.420	0.548	0.282	0.330	0.161	0.422	0.976
DE	0.507	0.471	95.753	0.919	0.412	0.481	0.237	0.601	0.995
DK	0.504	0.451	300.277	0.829	0.432	1.187	0.223	0.563	0.998
EE	0.465	0.375	112.762	0.396	0.235	0.237	0.129	0.327	0.996
EL	0.538	0.424	1.258	0.377	0.339	0.648	0.158	0.314	0.716
ES	0.520	0.478	15.669	0.667	0.401	0.482	0.213	0.487	0.969
FI	0.502	0.476	128.364	0.987	0.417	0.476	0.240	0.627	0.996
FR	0.489	0.471	26.423	0.742	0.432	1.320	0.222	0.524	0.981
HR	0.494	0.393	2.245	0.361	0.271	0.327	0.139	0.303	0.818
HU	0.488	0.411	7.964	0.549	0.307	0.360	0.171	0.423	0.941
IE	0.544	0.457	12.005	0.507	0.376	0.567	0.186	0.398	0.960
IT	0.518	0.467	23.290	0.693	0.401	0.583	0.211	0.500	0.979
LT	0.521	0.433	6.250	0.432	0.330	0.433	0.165	0.351	0.926
LU	0.492	0.451	104.505	0.730	0.367	0.464	0.200	0.518	0.995
LV	0.481	0.417	1190.000	0.543	0.299	0.330	0.162	0.419	1.000
MT	0.448	0.448	3270.000	0.838	0.362	0.372	0.213	0.567	1.000
NL	0.486	0.460	81.783	0.905	0.394	0.452	0.230	0.595	0.994
PL	0.473	0.390	1.331	0.319	0.265	0.333	0.132	0.273	0.727
PT	0.540	0.449	2.506	0.447	0.364	0.528	0.176	0.360	0.834
RO	0.523	0.410	1.887	0.394	0.284	0.306	0.151	0.325	0.791
SE	0.482	0.447	252.391	0.713	0.423	1.099	0.212	0.510	0.998
SI	0.457	0.407	16.757	0.576	0.294	0.300	0.169	0.438	0.971
SK	0.403	0.318	5.058	0.304	0.181	0.187	0.101	0.262	0.910
UK	0.520	0.458	6.813	0.572	0.384	0.543	0.196	0.436	0.932
Median	0.498	0.447	18.589	0.561	0.366	0.470	0.191	0.429	0.974

Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions. Income equivalised using the modified OECD scale with each member of the household included, weighted by the Eurostat provided household weight (euroweight). All measures but Gini exclude those in households without positive income from calculation.

Table A4: Measures of gross income inequality, 2017

	Gini	Gini*	GE(2)	GE(1)	GE(0)	GE(-1)	A(0.5)	A(1)	A(2)
AT	0.331	0.330	2.213	0.212	0.207	0.352	0.095	0.191	0.816
BE	0.309	0.309	0.963	0.169	0.169	0.261	0.080	0.155	0.658
BG	0.416	0.415	0.582	0.324	0.329	0.550	0.148	0.277	0.538
CY	0.345	0.345	0.215	0.195	0.225	0.385	0.099	0.178	0.300
CZ	0.281	0.281	0.152	0.133	0.143	0.202	0.066	0.125	0.233
DE	0.326	0.325	0.614	0.186	0.191	0.282	0.089	0.169	0.551
DK	0.311	0.306	0.355	0.177	0.214	0.717	0.088	0.162	0.415
EE	0.340	0.334	2.825	0.200	0.179	0.192	0.090	0.181	0.850
EL	0.345	0.341	0.393	0.217	0.223	0.416	0.101	0.195	0.440
ES	0.377	0.374	0.971	0.269	0.241	0.304	0.117	0.236	0.660
FI	0.303	0.303	0.213	0.157	0.165	0.225	0.077	0.145	0.298
FR	0.319	0.319	0.201	0.175	0.210	0.733	0.089	0.160	0.287
HR	0.344	0.343	0.353	0.215	0.202	0.252	0.098	0.194	0.414
HU	0.309	0.303	0.630	0.183	0.165	0.216	0.081	0.167	0.558
IE	0.377	0.377	0.350	0.240	0.260	0.428	0.116	0.213	0.412
IT	0.372	0.366	1.628	0.262	0.244	0.373	0.115	0.230	0.765
LT	0.395	0.391	0.486	0.276	0.266	0.359	0.126	0.241	0.493
LU	0.329	0.327	4.318	0.191	0.188	0.252	0.089	0.174	0.896
LV	0.372	0.370	49.809	0.255	0.227	0.268	0.112	0.225	0.990
MT	0.316	0.316	0.261	0.168	0.168	0.205	0.080	0.155	0.343
NL	0.320	0.318	0.471	0.178	0.183	0.266	0.085	0.163	0.485
PL	0.306	0.306	0.214	0.163	0.165	0.214	0.078	0.150	0.299
PT	0.398	0.398	0.408	0.276	0.288	0.432	0.130	0.241	0.450
RO	0.359	0.359	0.463	0.254	0.214	0.235	0.109	0.224	0.481
SE	0.317	0.315	1.772	0.192	0.224	0.671	0.093	0.174	0.780
SI	0.290	0.290	0.174	0.143	0.141	0.164	0.068	0.134	0.258
SK	0.261	0.253	0.261	0.124	0.111	0.123	0.056	0.116	0.343
UK	0.359	0.358	0.344	0.218	0.236	0.372	0.106	0.196	0.407
Median	0.330	0.328	0.436	0.193	0.208	0.275	0.091	0.176	0.465

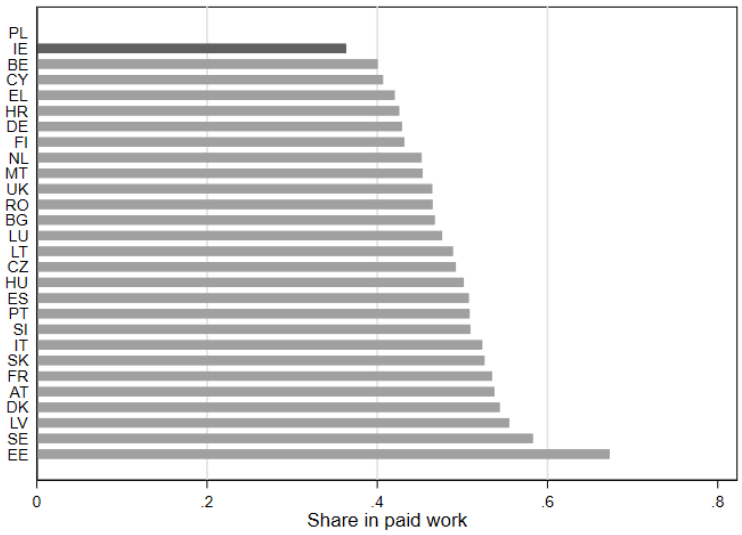
Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions. Income equivalised using the modified OECD scale with each member of the household included, weighted by the Eurostat provided household weight (euroweight). All measures but Gini exclude those in households without positive income from calculation.

Table A5: Measures of disposable income inequality, 2017

	Gini	Gini*	GE(2)	GE(1)	GE(0)	GE(-1)	A(0.5)	A(1)	A(2)
AT	0.279	0.277	2.119	0.157	0.143	0.199	0.069	0.146	0.809
BE	0.260	0.257	0.267	0.116	0.119	0.171	0.056	0.109	0.348
BG	0.410	0.410	0.529	0.310	0.336	0.622	0.146	0.267	0.514
CY	0.308	0.308	0.180	0.159	0.183	0.307	0.081	0.147	0.265
CZ	0.244	0.243	0.113	0.102	0.111	0.160	0.051	0.097	0.184
DE	0.282	0.278	0.234	0.135	0.145	0.217	0.067	0.126	0.319
DK	0.276	0.271	0.331	0.144	0.188	1.040	0.073	0.134	0.399
EE	0.316	0.309	0.302	0.168	0.152	0.160	0.076	0.155	0.376
EL	0.334	0.328	0.405	0.203	0.203	0.351	0.094	0.184	0.447
ES	0.341	0.337	0.910	0.225	0.194	0.229	0.097	0.201	0.645
FI	0.253	0.253	0.148	0.110	0.118	0.158	0.055	0.105	0.228
FR	0.293	0.288	0.164	0.143	0.173	0.601	0.073	0.133	0.247
HR	0.299	0.298	0.262	0.163	0.149	0.167	0.074	0.151	0.343
HU	0.281	0.274	0.445	0.147	0.139	0.195	0.067	0.137	0.471
IE	0.306	0.306	0.239	0.162	0.173	0.287	0.079	0.149	0.324
IT	0.327	0.320	1.188	0.208	0.186	0.259	0.090	0.188	0.704
LT	0.376	0.372	0.454	0.248	0.244	0.335	0.115	0.219	0.476
LU	0.309	0.307	0.547	0.168	0.163	0.204	0.078	0.155	0.522
LV	0.345	0.341	0.346	0.209	0.194	0.226	0.095	0.189	0.409
MT	0.282	0.281	0.226	0.134	0.133	0.159	0.064	0.125	0.311
NL	0.271	0.267	0.170	0.126	0.129	0.172	0.061	0.119	0.253
PL	0.292	0.291	0.271	0.151	0.150	0.192	0.072	0.140	0.351
PT	0.335	0.335	0.302	0.200	0.202	0.281	0.094	0.181	0.377
RO	0.331	0.328	0.373	0.210	0.180	0.199	0.092	0.189	0.427
SE	0.280	0.277	0.650	0.149	0.179	0.544	0.074	0.138	0.565
SI	0.237	0.237	0.114	0.096	0.094	0.102	0.046	0.092	0.186
SK	0.232	0.223	0.187	0.098	0.087	0.093	0.044	0.094	0.272
UK	0.331	0.326	0.244	0.183	0.202	0.337	0.090	0.167	0.328
Median	0.296	0.294	0.286	0.158	0.168	0.210	0.074	0.146	0.364

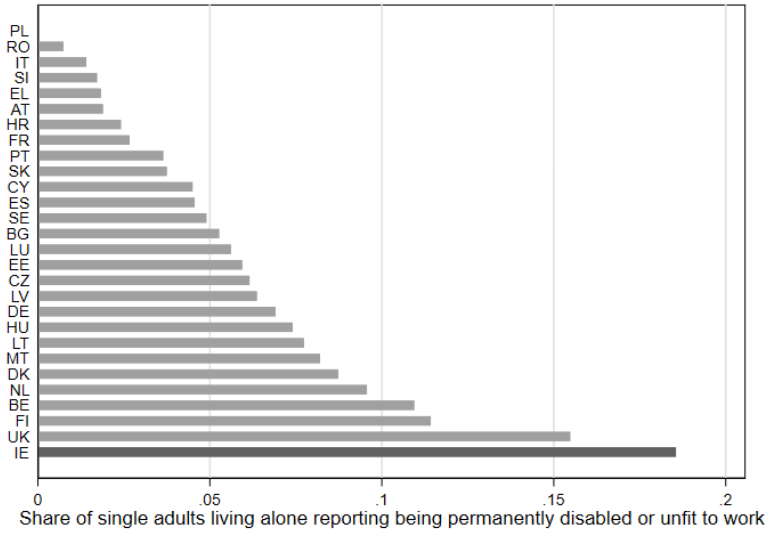
Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions. Income equivalised using the modified OECD scale with each member of the household included, weighted by the Eurostat provided household weight (euroweight). All measures but Gini exclude those in households without positive income from calculation.

Figure A1: Share of single parent households in paid work, by country



Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions. Excludes Poland due to high share of missing observations. Single parent households defined as single parents living with dependent children and no other adult. Paid work derived from reported economic activity status PX050.

Figure A2: Share of working-age single adults living alone reporting being unable to work because a permanent disability and/or illness, by country



Note: Author's calculations using the 2017 EU Survey of Income and Living Conditions. Excludes Poland due to high share of missing observations Derived from self-reported economic status PL031.

DISCUSSION (DUBLIN)

Reamonn Lydon*:* I ask whether Dr Roantree, or anyone else, had also looked at consumption inequality alongside income inequality.

Paul Sweeney: This is a very interesting and informative paper, with great data analysis, which adds to our knowledge of one of the most pressing economic problems today in Ireland and internationally – that of growing inequality. I congratulate Barra on his excellent contribution to our knowledge. I would like to suggest a few issues which might be addressed in finalising the paper.

In his paper he drew attention to the fall in disposable income inequality between 1987 and 2017 and I would like to comment on one possible contribution to this. I would suggest that one of the reasons for the greater equality today was that the crash of 2008 wiped out several of the very richest Irish individuals such as Sean Quinn, originally a productive manufacturer, who gambled all on Anglo Irish Bank and the likes of Sean Dunne, the property speculator, supported by Ulster Bank, who lost all of their wealth. This assumes that such considerable wealth was generating substantial incomes.

In the past, Socialist Revolutionaries would have sought radical redistribution/confiscation of great wealth in order to reduce inequality, but what happened was as effective. Their wealth was wiped out, making Ireland a more equitable society, but there was no redistribution, because the extreme wealth at the top turned out to be only paper, in Ireland's de-regulated and financialised economy.

Further, many other middle to high people had their incomes reduced as their wealth was also wiped-out with the collapse in 2008. There were very many builders/speculators who lost all their wealth and in addition, there were substantial swathes of middle-class wealthy people who lost substantial amounts through their holdings of property and bank shares. All of the Irish private banks were wiped out and many lost considerable savings in their shares. The collapse of 2008 had "a silver lining" in that it made Ireland a more equitable society. However, this is not a recommended route for future policy.

One must still be wary of data which is based solely on Revenue statistics, a point made by Barra. While the Revenue do a reasonably good job, their reach is far from universal. Only last week I went to purchase four tyres and when I produced a credit card, the owner of the very busy, long-standing south, Dublin retailer looked at me as if I had descended from a different planet, insisting that his business only dealt with cash. Regrettably, I had a similar experience with a builder who wanted half of the payment in cash. There is still widespread tax evasion in Ireland and the Revenue audit system needs to be boosted.

Then there are tax avoidance loopholes or "incentives" as their defenders/ beneficiaries/ advisors would call them, which Barra also refers to, which undermine the actual as opposed to the "theoretical" progressivity of the Irish income taxation system. These as Barra points out, have "a weak policy rationale." Thus the statistics and assertions of progressivity are not fully reflective of reality.

This was highlighted recently in a court case between members of a wealthy family of cinema owners. One member of the family was suing the other because their share of income was not being paid tax efficiently, that is, through capital gains or other forms of capital which enjoy lower rates of tax than those on income/work.

The substantial difference between Ireland's GDP and GNP it's not simply a reflection of legitimate transfer-pricing by multinationals, but more accurately indicates industrial-scale tax avoidance. Of course, tax avoidance is legal.

Barra pointed out that Ireland has the largest market inequality in the EU. He points out that the tax and welfare system reduces this substantially, and that tax was effective in reducing relative inequality and welfare on absolute. This should give comfort to taxpayers that the system is working well. But policy must also address this large gap in the market inequality and more work should be done on this pressing issue.

Perhaps, the most effective way to reduce market inequality is to legalise collective-bargaining in the Irish economy. Over time, trade unions with the right to bargain collectively would increase the incomes of workers in the private-sector where they are currently not allowed to organise without the permission of the employer. This would increase the share of national income going to labour, which has been falling in recent decades. Correspondingly the reduction of national income share going to the owners of capital would be reduced, along with the increased aggregation of wealth and over time, it would make Ireland a more equal society.

Eoin Flaherty: I understand that the income taxation system became more progressive during the recession. Could you explain a bit more about how this compared with the social benefit and income tax system during the late phase of the boom, and how the change in taxes on employees interacted with the change in the social benefits system during the recession?

Stephen Calkins: Congratulations on your excellent, really fascinating presentation. Such an interesting story about income, taxes, and wealth. I wonder, however, whether the work could be enriched – both with respect to what tax policy is accomplishing and what it could accomplish – if there were more attention to the actual and potential role of inheritance taxes.

Patrick Honohan: The author is to be congratulated on bringing a great deal of interesting material together in such an informative way. The broad historical sweep is well presented. I am also sure that the data is very informative on the year-to-year changes around the crisis, from boom to bust. It would be worth developing the analysis in that direction also.

Perhaps the most striking fact that I learnt from the presentation is that two dimensions in which the Irish economy is an outlier are closely related, namely the exceptionally high percentage of jobless households and the exceptionally unequal distribution of market income. Dr. Roantree has shown us that, if we think of income-less households as more or less the same as jobless households, that it is the large number of these that generate the high Gini coefficients of market income. Looking only at the distribution among those who have a market income, Ireland would not be an outlier internationally.

I wonder is the conclusion that the Irish tax and welfare system is exceptionally progressive also an artefact of this unusual market income distribution. It would be interesting to apply the parameters of the Irish tax and welfare system to a distribution with much fewer income-less households, such as is observed in some other country, and see whether the reduction in inequality is as big there as it is in the Irish data.

Aedin Doris: Barra mentioned several gaps in the Irish data infrastructure that hamper research on inequality. I would like to add that one of the most important gaps is with respect to panel data is that we currently have no real panel data on earnings in Ireland. This is important for studying inequality as we know that individuals and households move between quantiles of the distribution over time, partly because of income shocks that can be permanent or transitory. It is important to distinguish between permanent and transitory inequality because their policy implications are very different. At present, Irish researchers are unable to undertake this kind of research as no suitable panel data are available.

There is reason to be optimistic, however, as the CSO seems to be moving towards linking administrative earnings data to survey data. If multiple years of earnings data could be linked to each survey observation, we could quickly have a research resource that would facilitate important research on inequality.

Ronan Lyons: I congratulate Dr Roantree on his lecture and ask whether it was possible to include information about the demographic composition of each decile (or other quantile), in particular in the context of public transfers condition on family-status. For example, what fraction of the bottom two deciles are single adults or two adults without children? Also, the combination of increasing educational attainment and increasing participation, with higher-income households likely to have incomes from two degree-holders, may help explain some of the trends observed in the higher part of the distribution over the last thirty years.

Frances Ruane: Thank you Barra for a very timely paper. I think that one of the challenges we have with getting traction with policy issues around inequality is that the wider population does not understand quintiles, let alone deciles or centiles. So I wonder, following on a previous question what further decompositions of the Irish data might be possible to produce insights that might lead to a wider understanding of how our tax and benefit system operate? And just as an aside to that - the longer we have deteriorating inequality the more we have the possibility that wealth inequality consolidates. It will be important to see what data are available to look at wealth inequality in Ireland also.

Noel T O'Gorman: I comment on the implications of the analysis for welfare and taxation policies. In my view, the relatively high proportion of certain households with no market income, one aspect of which was persons living alone and not working, raised important questions about the design of our system of welfare provision. In relation to the role of taxation in reducing inequality, I point to OECD analysis ("Taxing Wages") which highlighted the steep progression of Income Tax for middle-income earners in Ireland - resulting from the combination of a two-rate structure and a very low entry-point for the highest rate.

DISCUSSION (CORK)

Barry Kelleher: I ask whether the One Parent Family Payment could be proving overly generous and contributing to an unintended consequence of disincentivising paid employment. Additionally, the circa 20% of zero income households claiming disability payments seems very high and perhaps is being used by some to avoid the engagement and job seeking requirement under OPFP once a child turns 7. Data like this is very useful for future policy interventions. Allowing OPFP recipients to return to paid employment, while still keeping their social housing list placing, might also prove effective.

Stephen Lee: I ask whether Barra was aware of any research done on the effects of indirect taxes on the Gini coefficient.

Sean Barrett: It is a pleasure to be associated with the vote of thanks to Dr Roantree for his accomplished paper. Income distribution is an important topic at a time of disillusionment, post the bank bailout, concerning the role of the State in redressing income inequality. The paper finds that "the high levels of market income inequality in Ireland arise because of the large number of individuals in households without positive market income rather than because of an extremely unequal distribution among those with positive amounts of market income." In Figure 5 the paper "shows that where Ireland stands out compared to its European neighbours is the high share of working age adults living alone and single parents not having any market income." The paper recommends that "expanding the eligibility for Working Families Payment to low-income single adults and couples offers a more targeted way of reducing income inequality while rising incomes at the bottom rather than increasing the minimum wage." The paper shares concern of the Making Work Pay Report (2017) that the design of Disability Allowance may inhibit some recipients from taking up employment with earnings in excess of €120 per week. The paper has concerns about the proliferation of new means-tested payments such as Housing Assistance Payment and the National Childcare Scheme. Participating in the market economy increases equality. Barriers to labour market participation increase inequality.

Schemes of income redistribution on both the tax and expenditure sides of government may be either progressive, proportional or regressive. On the tax side the absence of a comprehensive definition of income in the levying of income tax and the growth of tax shelters have led to a large tax avoidance industry by law and accounting firms on behalf of their wealthier clients. Bobbio (2016), Cobham and Jansky (2018), the OECD (2015), and IMF (2017) present estimates of a shadow economy of 13.5% in high-income OECD countries with tax losses as high as $600 billion. The Carter Report in Canada (1967) proposed low tax rates on a comprehensive base would to reduce tax avoidance but fiscal privilege persists.

The abolition of water charges in 2016 in Ireland saw the end of a regressive poll tax. The case for the tax was that unpriced water was being wasted by consumers. The first levy for wasting water (February 2020) applied to only 3.6% of customers. By contrast the waste water rate from local authority pipes in June 2015 was 46.75%. The McLoughlin Report (2009) found serious problems of low managerial productivity in the Irish water sector but these were not addressed.

In the US, Grants Economists Boulding and Pfaff, examined in Redistribution to the Rich and the Poor, the regressive impacts of agricultural subsides. In Ireland today CAP subsides are highly regressive. The top CAP subsidy in 2018 was €323,000, over 8 times average earnings in Ireland. The top subsidy, paid in Wexford, was 31.2 times the average CAP subsidy in Connacht, the lowest income province.

In the UK, Le Grand (1982) found that "almost all public expenditure on the social services in Britain benefits the better off to a greater extent than the poor." Research by the Comptroller and Auditor General (2010) and the Higher Education Authority (2017) show "a redistributive model with a standard per capita amount that is used for annual allocation purposes" which favours students in veterinary medicine and dentistry to the extent of four times those in arts and humanities who have the lowest graduate earnings.

Means testing, or targeting of services and benefits towards those on low incomes, is the equivalent of progressive taxation on the government's income side. Targeting has been eroded by successful campaigns against means testing by those outside the target low income groups. The progressivity of the overall impact of government intervention has been reduced by such campaigns on the disbursement side of government combined with the growth of a large tax avoidance sector.

Economics can assist in our understanding of why hope in the State as an instrument of redistribution has declined. Is a fairer tax system eliminating tax avoidance, and the integration of taxation and all welfare transfers the way to restore that hope? Dr Roantree deserves our thanks for promoting a vital and overdue debate.

Kathryn Foskin: My comment is in relation to the high level of zero market income among lone parent households. In particular, I ask if the impact of national investment in childcare and the level of childcare costs on the market income levels of lone parents had been considered across countries.