Special Article

Distributional Impact of Tax and Welfare Policies: Budget 2017

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Abstract

The distributional impact of budgetary policies is a matter of continuing interest. This article examines the impact of the tax and welfare changes introduced in Budget 2017 using SWITCH, the ESRI tax-benefit model. The model now includes more than 8,000 households, drawn from the CSO's nationally representative Survey of Income and Living Conditions for 2013 and 2014 – the most recent available. The impact of policy is measured against a distributionally neutral benchmark – a budget which would index the money value of tax credits and welfare payment rates in line with expected growth in wages of about 2.4 per cent.

Key findings include the fact that while overall impacts are small, the greatest gains are focused on the lowest income groups. Average gains for the one-tenth of households with the lowest incomes are close to 1 per cent, while gains for other households are less than half of one per cent, and typically close to one quarter of one per cent. Analysis at family unit level reveals that the majority of family types will also have small gains – between ¼ and ½ of one per cent. The family types with the largest gains are non-earning lone parents and unemployed couples (approximately 2 per cent of income), though together these family types represent just 3 per cent of the population.

[1] We thank Brian Ring and the SILC team at CSO for access to SILC data on which the SWITCH tax-benefit model is based. We thank anonymous referees for comments; any remaining errors or obscurities are the responsibility of the authors.

Introduction

In this article we examine the distributional impact of the main tax and welfare measures in Budget 2017. We also consider the impact of some changes which were introduced during 2016, and were not therefore part of either Budget 2016 or Budget 2017; specifically the suspension of the water charges from end-March 2016, and the increase in the maximum rent limits for the Rent Supplement Scheme in July 2016.

Analysis of the distributional impact of budgetary measures is commonly done on a Budget-to-Budget basis. This means that a given year's budgetary policy is compared with a wage-growth indexed version of the policy announced in the previous year's budget (see for example, Callan et al., 2015; Keane et al., 2014). Budget 2017, and policy reform during 2016, raised a number of issues relating to the timing of policy changes. For example, the suspension of water charges in March 2016, and the move to have welfare payment rates increase in March 2017 are particularly relevant in the context of analysing Budget 2017. The impact of policy changes on household incomes can be somewhat different depending on whether analysis is conducted on a Budget-to-Budget basis, or whether we account for the part-year impact of policy reform implemented during the year.

We take account of this issue by presenting two different perspectives on the distributional impact of Budget 2017. We look first at the impact of policy as announced in Budget 2017 as compared with policy announced in Budget 2016: a 'Budget-to-Budget' comparison. The second view takes account of the fact that some policies change within the calendar year. Here the focus is on comparing policies over the whole calendar year 2017 with those in force over the calendar year 2016. We refer to this as a 'year-on-year' comparison.

The analysis uses SWITCH, the ESRI tax-benefit model,[2] to ensure that we obtain a nationally representative picture based on SILC (Survey of Income and Living Conditions), the CSO's main survey of household income. The scale, depth and diversity of this survey allows it to provide an overall picture of the impact of the budget on Irish households, which cannot be gained from selected example cases. This year, for the first time, we have 'pooled' the 2013 and 2014 waves of the survey in order to increase the effective sample size to almost 8,000

[2] See Callan et al. (2013a) for a full description of the model.

households, as compared with a figure closer to 4,500 households in last year's analysis. This helps to improve the accuracy of the estimates of policy impact.[3] The final sample on which the analysis is based contains almost 8,000 households, or over 20,000 individuals; an increase in sample size of more than 70 per cent from previous analyses.

To ensure that these pooled data are nationally representative, weights are calibrated using information from demographic projections, the Revenue Commissioner's Income Distribution Statistics, Department of Social Protection estimates of the number of recipients of a range of social welfare schemes, and a number of other sources to represent the 2017 situation.[4]

The areas covered by SWITCH, including income tax, PRSI, USC, property tax, welfare benefits and public service remuneration, account for the bulk of the impact of budgetary policy changes on households' cash incomes in recent years. The model was also recently extended to take account of water charges and the water conservation grant. There are, however, some taxes (e.g. indirect taxes, which affect the purchasing power of cash incomes) which cannot at present be integrated fully within the modelling framework. In recent work, Savage and Callan (2015) examined the feasibility of including indirect taxes in analysis of budgetary policy using data from the CSO's Household Budget Survey in combination with SILC. In the coming year, the SWITCH team plan to expand on this work and include indirect tax analysis in future budgetary analysis.

Tax-benefit models do not, in general, attempt to measure the impact of cuts in public services on households at different income levels.[5] While this is an important area, there is no standard methodology for the attribution of benefits from public spending to households. Thus, there is no agreed international approach which can simply be applied to Ireland. In recent years the UK Treasury (HM Treasury, 2014) has begun to publish analyses which seek to distribute the

[3] Due to the longitudinal component of SILC, some households are in both waves of the survey. Where a household is present in more than one of these waves, we use the most recent observation. For close to 70 per cent of households it is the 2014 data which is used; 2013 data is used only where a household is not reinterviewed. By design, SILC does not reinterview 25 per cent of households, and a further significant proportion cannot be contacted or refuse to respond. This structure means that the households in the pooled sample are not automatically representative of the 2014 population, but this issue is dealt with by the reweighting procedure described in the text, which ensures the SWITCH database is representative of the 2017 situation.

[4] A technical adjustment for sample size differences between years of SILC also applies.

[5] The inclusion of a valuation for the pre-school place provided under the Early Childhood Care and Education (ECCE) scheme is an exception. This arose from the fact that ECCE partially replaced a cash payment (Early Childcare Supplement).

value of public spending across the household income distribution. O'Dea and Preston (2012) raise some important questions about the assumptions made and propose some alternative methods, but these methods have yet to be implemented.

The results we obtain relate to the 'cash' or 'first round' effects of policy changes, before any adjustments in individual behaviour such as changes in employment status or hours of work. This is by far the most common approach internationally. Indeed, Adam et al. (2015) omit behavioural responses from their analysis of UK tax and benefit reforms between 2010 and 2015. In the absence of a structural model of utility, they argue that 'measuring changes in household incomes before behavioural responses is preferable to analysing them afterwards', as the first-round income change better approximates the welfare effect of a policy change. For example, suppose a child benefit cut resulted in an individual choosing to work more hours. The person's net income might rise after the behavioural change, yet their welfare may have reduced as their income, at any given choice of working hours, would be lower than before the policy change.

In this article, our focus is on the impact of Budget 2017 at different income levels. In previous analyses of budgetary policy (see for example Callan et al., 2015; Keane et al., 2014), we have also examined the net impact of the set of budgets since 2007. As the economic recovery continues in Ireland, and the underlying population and distribution of market incomes continues to change, the appropriateness of continuing to group budgets since 2007 together as a set of 'austerity budgets' needs to be carefully considered. In work planned for the forthcoming year, we will examine the issues involved in such a cumulative analysis of budgetary policy during and after the Great Recession, using decomposition methods proposed by Bargain and Callan (2010). Applying the Bargain and Callan decomposition will allow us to quantify the relative role of policy changes compared to all other factors, such as changes in market incomes and changes in the underlying population.

Measuring the Distributional Impact of Policy

What has been the overall impact of Budget 2017 at different income levels and on different family types? Analysis based on a large-scale nationally representative sample of households is essential in answering such questions. Calculations for selected example households cannot give an accurate picture of the impact of the budget for the population as a whole. This requires calculations for large numbers of real households in a nationally representative sample. The ESRI tax-benefit model (SWITCH) allows us to do this: it estimates the impact of

direct tax and welfare changes using anonymised data from the CSO's Survey on Income and Living Conditions. Basing the analysis on a pooled sample of two waves of SILC allows for greater precision of estimates reported in this paper, as well as the impact of policy reform on more refined groups of individuals and families where necessary.

The impact of policy change must be measured against an alternative specifying what would happen if the policy change did not take place (a 'counterfactual' policy). In the construction of budgets, the practice in Ireland has been to construct an 'opening budget' against which changes are measured. For tax and welfare, Ireland's conventional opening budget simply freezes tax rates, credits and welfare payments at their existing levels, whereas the UK and the US have adopted differing forms of indexation with respect to prices and/or wages (see Callan et al., 2015, for more details). While the frozen benchmark is useful in accounting terms, it would be highly misleading in an analysis of distributional impact.[6] With nominal wages, prices and real wages all showing positive growth, implementing the conventional opening budget would lead to real income *losses* for those dependent on welfare, while further up the income distribution incomes would *rise*. (Callan et al., 2001; Bargain and Callan, 2010).[7] Furthermore, using the opening budget as a basis to measure policy impact would mean that measured policy impact would depend on government's definition of this default policy – something which varies across countries, and can change over time.

The alternative used here is a policy which indexes both tax and welfare parameters with respect to the expected growth or decline in wages. This ensures that average tax rates are held constant (i.e. no fiscal drag); and leads to approximately equal growth (or decline) in income across different income groups (Callan et al., 2001). It should be clear that this is designed to provide a 'distributionally neutral' benchmark, and is not intended as a policy recommendation. There are many reasons why it may be desirable to depart from this benchmark; but having a distributionally neutral benchmark, independent of the default position chosen by government, is essential in examining the distributional impact of policy changes.

[6] For a more detailed exposition, see Callan et al. (2001).

[7] When wages are falling, the conventional benchmark would give rise to income gains for welfare recipients and income losses for those in employment.

We use forecasts of wage growth (or decline) to implement this approach on a prospective basis. Results examining the impact of Budget 2017 are based on forecast wage growth of 2.4 per cent – an average of the forecast wage growth from the current *Quarterly Economic Commentary* (McQuinn et al., 2016, 2.3 per cent) and the Central Bank's *Quarterly Bulletin* (Central Bank of Ireland, 2016, 2.5 per cent).

Results shown are at the household level unless otherwise specified and are based on household disposable income (after taxes and benefits), adjusted for household size and composition, i.e. income per adult equivalent or 'equivalised income'.[8]

Budget 2017

A wide range of taxation and welfare measures are directly included in our model-based analysis, including:

- €5 increase in the weekly rates of payment for pensioners aged 66 and over, with proportional increases for qualified adults and those on reduced rates;
- €5 increase in the weekly rates of payment for working age (under 66 years of age), with proportional increases for qualified adults, Jobseekers Allowance (JA) recipients who are aged under 26 years of age and other recipients on reduced rates;
- €20 per week increase in the income disregard for One Parent Family Payment and the Jobseeker's Transition payment;
- an increase in the Social Welfare Christmas Bonus, from 75 per cent to 85 per cent;
- €100 increase in the Home Carer Tax Credit;
- €400 increase in the Earned Income Credit;
- 0.5 per cent reduction in the lowest two rates of Universal Social Charge, and a €104 increase in the income threshold at which the second rate becomes payable.

We also include the 10 cent per hour increase in the National Minimum Wage (NMW) in the analysis throughout.[9] As this is paid for by employers, it can be argued that it should not be included on a par with tax and welfare adjustments.

[8] This adjusts income to take account of household size. The scale used is the scale used in official monitoring of poverty in Ireland, i.e. 1 for the first adult, 0.66 for subsequent adults and 0.33 for children aged 14 or under.

[9] Some individuals in the sample have wages below the minimum wage. In our simulations, these cases are treated as if they had the minimum wage, and benefited from an increase. Alternative approaches to modelling the 10 cent per hour rise in the NMW also have very little overall impact on the outcomes measured here.

We have therefore run the analysis without the increase in the minimum wage; differences in results from those presented here are barely perceptible.

The analysis also includes two tax and welfare reforms that occurred during 2016, after Budget 2016 was announced. First are the increases in the maximum rent limits for the Rent Supplement Scheme that were introduced in July 2016. Also included in the analysis are the suspension of the water charges and the related suspension of the Water Conservation Grant.

As described in the introduction, we analyse the impact of Budget 2017 using two approaches. First, we take the usual approach of analysing policy changes on a Budget-to-Budget basis. The second approach accounts for the fact that some policies were introduced, or were planned to be introduced, part-way through the calendar year, so that incomes in that year will only be partly affected by the policy change. This is what we term 'year-on-year' analysis.

The key differences between the Budget-to-Budget analysis and the year-on-year analysis regard the treatment of water charges and the water conservation grant, and the treatment of increases to social welfare payments. The Budget-to-Budget analysis contains the full impact of the suspension of the water charges and the water conservation grant. As water charges were only payable for the first quarter of 2016, and the water conservation grant was not paid to any households in 2016, in the year-on-year analysis households are liable only for one-quarter of water charges in 2016, and do not receive the water conservation grant in either 2016 or 2017.[10] Similarly, as the increase to social welfare payments announced in Budget 2017 is due to be implemented from 10 March 2017, the year-on-year analysis allows for a reduced impact of this reform on household incomes in 2017, compared to the full year impact in the Budget-to-Budget analysis.[11]

Overall, the SWITCH model provides excellent coverage of the main policy changes in Budget 2017. The items included in the SWITCH analysis account for over €470 million of the tax and social insurance changes in the budget,

[10] The standard approach in tax-benefit modelling is to simulate tax liabilities and welfare entitlements. Similarly, here we simulate the water charge liabilities. Low rates of payment of water charges in Q1 2016 mean that 'cash flow' impact on households would be smaller than the impact on liabilities which is modelled here.

[11] The increase in the maximum rent limits for the Rent Supplement Scheme was implemented mid-2016, so could also be treated differently in the year-on-year analysis. However, the full impact of the rent limit increases is included in both analyses, as it represents an approximation of the additional HAP expenditure in the year-on-year results.

representing over 95 per cent of the cost of all tax changes in Budget 2017. On the welfare side, SWITCH coverage is over €300 million or approximately 75 per cent of the cost of the welfare changes.

While the majority of changes announced in Budget 2017 are included in the analysis, some changes are too complex to be included in the model at this stage. Chief among these are changes to excise duties on cigarettes, the introduction of a 'Help-to-Buy' scheme aimed at first-time-buyers, and changes to Capital Gains Tax, Capital Acquisitions Tax and DIRT. Many of the welfare reforms not included in the analysis, such as extended dental and optical benefits, are not due to be implemented until the last quarter of 2017, so will have a relatively small impact on households in 2017.

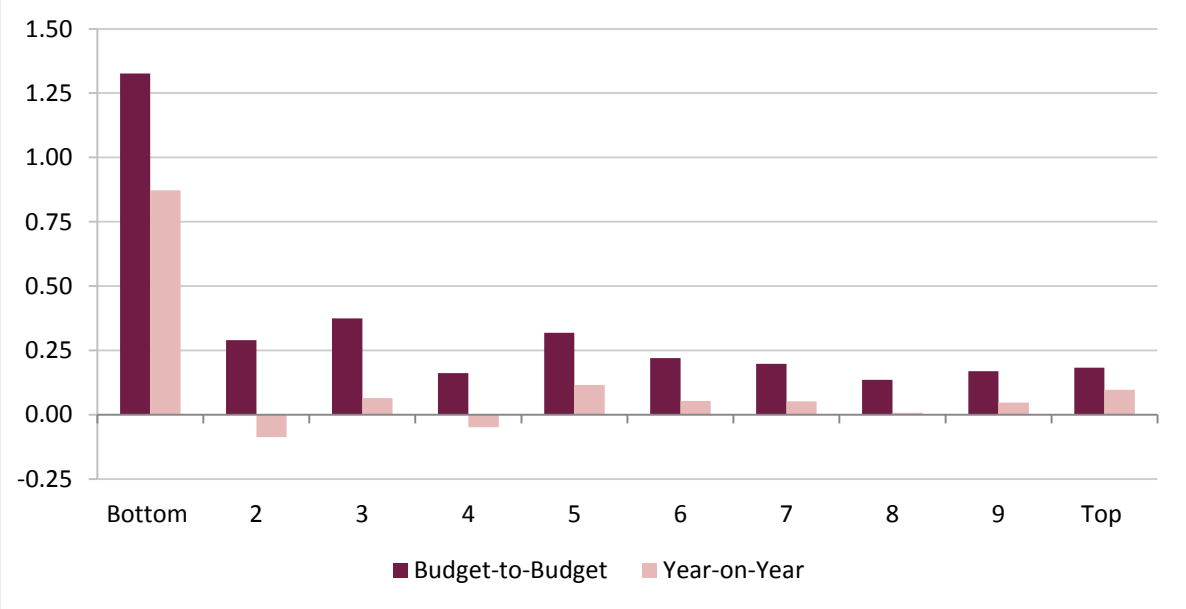
In addition, neither the €105 million allocated to the Housing Assistance Payment (HAP) scheme nor the introduction of the Affordable Childcare Scheme can be included in the present analysis. Work aimed at including these schemes in the SWITCH model is ongoing, and will be reported on in detail during 2017. The additional HAP expenditure is likely to be targeted at a similar group of individuals as the Rent Supplement scheme, so the increase in the maximum rent limits from July 2016 is included in full in both the Budget-to-Budget and year-on-year analyses to approximate this expenditure. Of all the items not covered, some will have a positive impact on lower income groups (e.g. increased expenditure on HAP), others will have an unfavourable impact (e.g. excise duties), and the impact of others is uncertain (e.g. the Help-to-Buy scheme).

Figure 1 shows the impact of Budget 2017, relative to a neutral, wage-indexed budget, across ten equally sized income groups (deciles) ranked from the lowest to the highest incomes, after adjustment for household size. Results are shown on both a 'Budget-to-Budget' and 'year-on-year' basis. In both cases, the bottom decile is the primary beneficiary of the policy changes. The bottom decile gains by about 1¼ per cent on a 'Budget-to-Budget' basis, or just over ¾ per cent on a 'year-on-year' basis. The higher than average increase in income in the bottom decile is due largely to the increase in maximum rent limits, with a further gain in income due to the suspension of water charges. Increases in personal rates of payment for social welfare payments in Budget 2017 were broadly in line with forecast wage growth, which means their impact is similar to that of a wage-indexed budget.

The impact of Budget 2017, compared to a wage-indexed budget, was much more limited across the remaining 90 per cent of households. On a 'Budget-to-

Budget' basis there were gains averaging close to 0.3 per cent for the rest of the bottom half of the income distribution, and about 0.2 per cent for the upper half. On a 'year-on-year' basis, which takes account of the timing issues discussed earlier, policy changes between 2016 and 2017 resulted in little to no change in household incomes across deciles 2 to 10.

FIGURE 1 Impact of Budget 2017 – Percentage Change in Disposable Income by Income Decile Relative to Wage-Indexed Budget



Source: Authors' analysis using SWITCH, the ESRI tax-benefit model, at December 2016 incorporating for 2017 the main changes in direct tax, welfare, water charges, and the National Minimum Wage. Each income group contains one-tenth of all households, ranked from lowest to highest incomes, adjusted ('equivalised') to take account of the numbers of adults and children in each household. Budgetary impacts are assessed relative to a neutral budget with tax bands, tax credits and welfare payments increased in line with expected wage growth of 2.4 per cent.

Impact by Family Type

The preceding analyses have examined the impact of Budget 2017 across the income distribution. Here we examine how different family types have been affected by budgetary policy changes. The analysis is conducted at the level of what is termed a 'tax unit', i.e. an individual or couple, together with dependent children, if any. Young adults including third-level students are treated as independent tax units.

Table 1 shows that, on a Budget-to-Budget basis, income for each family type either increased modestly or remained stable as a result of Budget 2017. No family type, on average, suffers losses in income as a result of policy changes announced in Budget 2017. The largest gains, at about 2 per cent of income, are

for non-earning couples and non-earning lone parents. Together, however, these family types represent only 3 per cent of all tax units. Gains in income of less than ½ per cent are most common, with single employed individuals, couples with at least one earner, and retired individuals and couples all seeing income gains in this range.

The second column of Table 1 compares how incomes were affected by policy over the calendar year 2016 (again indexed by 2.4 per cent) with policy over the calendar year 2017. Again, the largest gains are for unemployed couples and non-earning lone parents. On a 'year-on-year' basis, some family types experience small falls in income as a result of policy in 2017, compared with a wage-indexed version of policy in 2016. Retired individuals and couples, as well as single earner couples with children, experience falls of 0.2 per cent in income on a year-on-year basis. The pattern of small gains in income for all other family types remains similar to the Budget-to-Budget results, though income gains are slightly less pronounced on a year-on-year basis. As indicated earlier, the basic contrast here arises from two factors. First, the fact that gains which arose *before* the introduction of Budget 2017 are already included in 2016 incomes, and so have a lesser impact on 2017 over 2016 comparisons. Second, the fact that welfare increases are to be introduced from March 2017 rather than for the full calendar year.

TABLE 1 Impact of Budgetary Policy 2009-2016 – Percentage Change in Disposable Income by Family Type

	Budget 2017: Budget-to-Budget	Budget 2017: Year-on-Year	Proportion of Families
	% change	% change	%
Single Retired Tax Unit	0.1	-0.2	10
Retired Couple	0.1	-0.2	8
Single Employed without Children	0.2	0.2	32
All Other Tax Units	0.8	0.3	10
Single Earner Couple without Children	0.4	0.2	6
Employed Lone Parent	0.3	0.2	5
Dual Earner Couple without Children	0.4	0.2	5
Dual Earner Couple with Children	0.2	0.1	9
Single Earner Couple with Children	0.0	-0.2	8
Non-Earning Lone Parent	2.2	1.9	2
Unemployed Couple	2.0	1.3	1
Single Unemployed without Children	0.9	0.3	3

Source: Authors' analysis using SWITCH, the ESRI tax-benefit model, at December 2016 incorporating for 2017 the main changes in direct tax, welfare, water charges, and the National Minimum Wage.

Conclusion

Our analysis provides a nationally representative picture of the impact of the main tax and welfare changes in Budget 2017, taking into account the increase in the National Minimum Wage and a number of 'mid-year' policy reforms. The analysis is undertaken relative to a distributionally neutral budget, implemented via indexation of tax and welfare parameters in line with expected wage growth.

We analysed the impact of Budget 2017 using two approaches. The first approach, which we term a 'Budget-to-Budget' approach, compares how incomes are affected by policies announced in Budget 2017 compared with a wage-growth indexed version of the policy announced in Budget 2016. Compared with this wage-indexed benchmark, we find that Budget 2017 led to a modest increase – a quarter of 1 per cent – in aggregate household disposable income (i.e. incomes including welfare payments and net of income tax, USC and PRSI). On average, Budget 2017 is most favourable to the 10 per cent of households with the lowest incomes, who gain over 1 per cent in income. For most other income groups, changes in Budget 2017 will lead to small gains of up to half of 1 per cent, as compared with a neutral or wage-indexed budget.

The second approach, which we term a 'year-on-year' approach, compares policies over the whole calendar year 2017 with those in force over the calendar year 2016, again indexed by expected wage growth. On this basis, incomes in deciles 2 to 9 were largely unaffected by policy announced for 2017 compared to policy in 2016. Again, largely due to the suspension of water charges and the increase in maximum rent limits for the Rent Supplement scheme, those in the bottom decile stand to gain most, at just over three-quarters of 1 per cent.

Analysis at family unit level reveals that the majority of family types will gain between 0.2 per cent and 0.5 per cent as a result of Budget 2017. Single employed individuals, with or without children, gain between 0.2 per cent and 0.4 per cent of income on a 'Budget-to-Budget' and 'year-on-year' basis. Retired tax-units, either single individuals or couples, make small losses (-0.2 per cent) on a 'year-on-year' basis, but make modest gains on a 'Budget-to-Budget' basis. The family types with the largest gains are non-earning lone parents and unemployed couples (approximately 2 per cent of income), though together these family types represent just 3 per cent of the population.

New perspectives on how incomes changed over the recession, and how policy influenced these changes, are currently being analysed and we plan to report on these in a future publication.

References

Adam, S. and B. Roantree (2015). 'UK Tax Policy 2010-15: An Assessment' *Fiscal Studies,* Vol. 36, Issue 3, pp. 349-373, London: Institute for Fiscal Studies.

Alt, J., I. Preston and L. Sibieta (2012). 'The Political Economy of Tax Policy' in *Mirrlees Review* Chapter 13.

Bargain, O. and T. Callan (2010). 'Analysing the effects of tax-benefit reforms on income distribution: a decomposition approach.' *Journal of Economic Inequality*, Vol. 8, No. 1, pp. 1-21.

Belfield, C., J. Cribb, A. Hood and R. Joyce (2014). *Living Standards, Poverty and Inequality in the UK: 2014*, London: Institute for Fiscal Studies.

Callan, T., B. Colgan, C. Logue, M. Savage and J.R. Walsh (2015). 'Distributional Impact of Tax, Welfare and Public Service Pay Policies: Budget 2016 and Budgets 2009-2016' *ESRI Quarterly Economic Commentary,* Winter, Dublin: The Economic and Social Research Institute.

Callan, T., C. Keane, J.R. Walsh and M. Lane (2013). 'From Data to Policy Analysis: Tax-benefit Modelling Using SILC 2008.' *Journal of the Statistical and Social Inquiry Society of Ireland*.

Callan, T., B. Nolan, C. Keane, M. Savage and J.R. Walsh (2013a). 'The Great Recession, Austerity and Inequality: Evidence from Ireland.' *Intereconomics*, Vol. 48, November/December 2013, Number 6.

Callan, T., B. Nolan, C. Keane, M. Savage and J.R. Walsh (2013b). 'Distributional Impact of Tax, Welfare and Public Sector Pay Policies: Budget 2015 and Budgets 2009-2015' in *Quarterly Economic Commentary,* Winter, Dublin: The Economic and Social Research Institute.

Callan, T. and C. Keane (2009). 'Non-cash Benefits and the Distribution of Economic Welfare.' *The Economic and Social Review*, Vol. 40, No. 1, pp. 49-71.

Callan, T., S. Lyons, S. Scott, R.S.J. Tol and S. Verde (2009). 'The distributional implications of a carbon tax in Ireland.' *Energy Policy*, Elsevier, Vol. 37, No. 2, pages 407-412, February.

Callan, T., A. Van Soest and J.R. Walsh (2009). 'Tax Structure and Female Labour Supply: Evidence from Ireland.' *LABOUR: Review of Labour Economics and Industrial Relations*, Vol. 23, No 1, March 2009, pp.1-35.

Callan, T., M. Keeney and J.R. Walsh (2001). 'Income Tax and Welfare Policies: Some Current Issues' in Callan, T. and McCoy, D. (eds.), *Budget Perspectives 2002*.

Canberra Group (2012). *Canberra Group Handbook on Household Income Statistics*, 2nd edition, New York: United Nations.

Central Bank of Ireland (2016). *Central Bank Quarterly Bulletin*, Quarter 4.

Department of Social Protection (2015). *Social impact assessment of the welfare and income tax measures in Budget 2016*, Research Briefing, www.welfare.ie/en/downloads/SocialImpact2016.pdf

Duffy, D., K. McQuinn and D. Foley (2016). *Quarterly Economic Commentary*, Autumn 2016, Dublin: The Economic and Social Research Institute.

HM Treasury (2014). *Impact on households: distributional analysis to accompany Budget 2014*, http://tinyurl.com/HMTreasuryBudget2014.

IMF (2015). 'Ireland: Staff Concluding Statement of the Fourth Post-Program Monitoring Mission', www.imf.org/external/np/ms/2015/111315.htm

Johnson, P. (2015). 'High levels of income for current retirees shouldn't blind us to future challenges', www.ifs.org.uk/publications/8026

Keane, C., T. Callan, M. Savage, J.R. Walsh and B. Colgan (2014). Special Article in *Quarterly Economic Commentary*, *Winter 2014*, Dublin: The Economic and Social Research Institute.

Keane, C. and T. Callan (2013). *Quarterly Economic Commentary*, Autumn, Dublin: The Economic and Social Research Institute.

Layte, R. and T. Callan (2001). 'Unemployment, Welfare Benefits and the Financial Incentive to Work' *The Economic and Social Review*, Vol. 32, No. 2.

Leahy, E., S. Lyons and R.S.J. Tol (2011). 'The Distributional Effects of Value Added Tax in Ireland.' *The Economic and Social Review,* Economic and Social Studies, Vol. 42, No. 2, pp. 213-235.

Nolan, B. (1993). *Low Pay in Ireland*, Dublin: ESRI.

O'Dea, C. and I. Preston (2012). 'The distributional impact of public spending in the UK.' IFS Working Papers W12/06, Institute for Fiscal Studies.

Pope,T., B. Roantree and C. Grace (2015). 'A survey of the UK tax system', Institute for Fiscal Studies, web address.

Savage, M., T. Callan, C. Keane, B. Nolan and B. Colgan (2015). 'Crisis, Austerity, Recovery: Income Distribution through the Great Recession in Ireland', *Intereconomics*, Vol. 49, November/December 2014, Number 6.

Savage, M. and T. Callan (2015). 'Modelling the Impact of Direct and Indirect Taxes Using Complementary Datasets' *ESRI Working Paper 496*