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POLICY PAPER

Supporting Pension Contributions Through the Tax System: Outcomes, Costs and Examining Reform

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Abstract: Using the taxation system as a means of supporting contributions to pensions is a long standing and increasingly important policy tool. This paper examines the effectiveness of that tool using new data for Ireland in 2014. Looking at contributions from employees, employers and individuals into private pensions, we show the relatively small size of most pension contributions and highlight the challenges these imply for the adequacy of future pension income. Distributively, our results demonstrate a concentration of supports among those on the highest earnings and on the highest incomes and raise questions regarding the more efficient use of these resources.

I INTRODUCTION

Across most OECD nations the last decade has seen a further shift towards an enhanced role for private-provided pensions and a decrease in the prominence of state-provided pensions. Typically, defined benefit (DB) pension schemes are being substituted for various types of defined contribution (DC) schemes with an associated transfer of risk and responsibility to individuals.[1] These developments

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[1] See OECD (2015: 9, 27-29).

underscore the growing importance of personal contributions to pension schemes and highlight the importance of better understanding these payments and the success of policy initiatives intended to induce them. In particular, a large part of public policy in this area has involved using the taxation system to encourage retirement savings.

These international trends have been reflected in Ireland which serves as an interesting case given its relatively young demographic profile and the consequent potential to pursue policy initiatives that minimise some of the ageing challenges facing other countries.[2] There have also been recurring policy initiatives intent on highlighting the importance of personal pension contributions alongside reforms to the qualification criteria and generosity of social security pensions.[3] Supporting private pension savings is a costly component of the taxation system with the various tax expenditures costing, in revenue forgone terms, the equivalent of 4.8 per cent of total annual taxation and social insurance revenue.[4]

The scale of this support raises obvious questions regarding its effectiveness and sustainability. Similarly, how these resources are targeted, and how likely they are to assist policymakers in pursuing the recent OECD highlighted objective of "ensuring that pensions systems provide adequate retirement incomes to all workers" is of clear policy interest (OECD, 2015: 10). Using new data on individual earnings and pensions contributions, we examine these issues in this paper; questions that have not been asked of the Irish pensions system for some time (see Callan *et al.* (2007; 2009), Hughes and Sinfield (2004) and Hughes (2000)). The analysis offers a comprehensive examination of all tax expenditure associated with tax supported contributions from both individuals (employees and otherwise) and employers. It also considers the distributive profile of tax-based pension supports and simulates the first-round effects of changes to the structure of these reliefs and pension contribution limits.

We find that the current system is typified by low contributions, in both nominal terms and as a proportion of earnings. The results suggest that the ability of these pension contributions to accumulate to a sum sufficient to provide adequate retirement income is questionable. We also find that the current system of taxation supports is concentrated among those on the highest earnings and among those residing at the top of the income distribution. Our simulated reforms to these

[2] For population projections and age-dependency ratio estimates see European Commission (2015) and CSO (2013).

[3] Hughes and Maher (2016) and Stewart (2011a) provide an overview of the development of the Irish pension system including recent reforms to social security entitlements. See also Pensions Board (1996; 2006).

[4] In 2013, the latest year for which full tax expenditure data are available, the revenue forgone cost of tax expenditures associated with private pensions was estimated by the Revenue Commissioners (2016) as €2.39 billion. The total taxation and social insurance collected in that year was €50.015 billion.

structures offer the potential to reduce state support costs and provide resources that could be employed elsewhere to achieve greater and more adequate pension contributions.

This paper adds to the existing literature in two ways. First, we provide a new insight into the scale and adequacy of pension contributions covering all sources: from employees and employers to occupational pensions and individuals into private pensions. To date, previous studies in Ireland, and many elsewhere, have only focused on employee and private pension contributions. Adding employer contributions completes the picture and offers a more comprehensive basis to determine the adequacy of pension contributions. Second, we establish an updated picture of the cost and distributive profile of one of the largest areas of tax expenditure in the Irish taxation system. In contrast to many other areas of taxation policy, the distributive profile of large tax expenditure is frequently overlooked. Morel *et al.* (2016:3) note that these forms of "social tax expenditure" are "largely uncharted territory" in the European research literature; a void we attempt to address.

The rest of this paper is organised as follows. In Section II, we outline the structure of the Irish pension system and detail the system of tax supports for pensions and pension contributions. Section III describes the data and methods used in the paper while Section IV presents and discusses our results. Finally, Section V summarises the paper's main conclusions.

II BACKGROUND

2.1 The Irish Pension System

Ireland has a Beveridgean type pension system with three pillars. Although changes have occurred, the underlying nature of the system is largely a product of what was inherited upon independence from the United Kingdom almost a century ago. The first pillar is a state social welfare pension financed on a pay-as-you-go (PAYG) basis. Payments are flat-rated, independent of earnings, and vary slightly depending on social insurance contributions. Additional payments are provided where recipients have dependants and means-tested payments are available to those with limited, or absent, social insurance histories. A second pillar is represented by occupational pensions where employers and/or employees contribute to a pension fund which pays out a pension, generally earnings-related, upon retirement. This is commonplace among public sector employees and in private sector firms that have been operating since clear legal structures were established for these schemes in 1972. The third pillar comprises voluntary private pensions where individuals contribute to their own pension fund. Their subsequent pension entitlement is determined by the size of that fund upon retirement and the precise structure via which they manage it and draw upon it.

The state social welfare pension, the first pillar, remains the bedrock of the Irish pension system. In 2014 the qualifying age for these payments was 66 years. The social insurance-related contributory pension was paid at a maximum flat-rate of €230.30 per week and the means tested non-contributory pension paid €219 per week. For spouses and qualified adults under 66 years of age the contributory pension paid an increase of €153 per week and the non-contributory pension paid €144.70 per week (Department of Finance, 2013). The flat-rate personal rates for both state pensions amount to about one-third of average earnings.

Using data from an analysis of the Survey on Income and Living Conditions (SILC) we outline the income of current pensioners from occupational, private and state pensions and other sources in Table 1. In 2014 the average gross income for a pensioner was €19,257 or almost one-third less than the national average of €29,116 (CSO, 2015). On average, income from private and occupational pensions amounted to €6,222 per annum and accounted for 32 per cent of the total income for pensioners. State pensions were the most important source of income amounting to €10,222 per annum and they accounted for 53 per cent of income. A small minority of pensioners had income from work as employees or self-employed. Combined these sources of income provided around €1,300 per annum or about 7 per cent of total income. The remaining sources of income, rents, investment, housing allowances and other social transfers provided small amounts for pensioners and in no case did they account for more than 2.5 per cent of income for the average pensioner.

Table 1: Average Composition of Pensioner Gross Income in Ireland, 2014

Income Category	*Average %*	*Average Amount €*
Employee income	1.9	359.67
Self-employment income	4.9	941.41
Private pension income	4.4	847.75
Occupational pension	27.9	5,373.82
State old-age related payments	53.1	10,222.32
Rent income	1.8	355.71
Investment income	2.0	385.67
Other direct income	0.0	1.72
Housing allowances	2.3	445.89
Other social transfers	1.7	323.02
Gross income	100.0	19,256.97

Source: Authors analysis from SILC 2014.

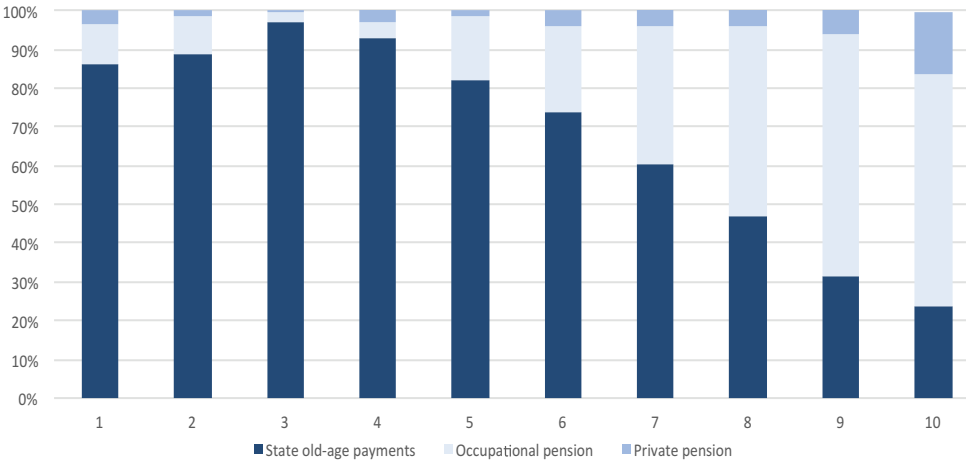
Note: Pensioners are defined as those aged 66 years and over.

The structure of pensioner incomes varies a lot across the income distribution (Table 2). Occupational and private pensions account for over half of the income

for pensioners in the ninth and tenth deciles whereas most of the remaining deciles get little from these sources. The bottom two deciles receive only 10 per cent of their income from occupational and private pensions. Pensioners in the bottom to sixth decile, which covers low and middle incomes, depend on state pensions, housing allowances and other social transfers for 65-87 per cent of income in retirement. Income from work for employees and the self-employed is significant only for the top three deciles.

Figure 1 demonstrates the importance of pillar 1 welfare pensions for the current cohort of pensioners relative to those from pillars 2 and 3. The provision of pillar 1 pensions is overwhelmingly important for pensioners in the bottom to seventh deciles. It accounts for around 90 per cent of total pension income for pensioners in the bottom half of the income distribution, for over 70 per cent for the sixth decile and for 60 per cent for those in the seventh decile. Pension income from other sources is most important for only the eighth, ninth, and tenth deciles. For the eighth decile it accounts for over half of total pension income while for the ninth and tenth deciles it amounts to around 70-80 per cent of total pension income.[5]

Figure 1: The Importance of Various Pension Incomes Across the Income Distribution, 2014



Source: Authors' analysis from SILC 2014.
Note: See notes to Tables 1 and 2.

The effectiveness of state expenditure on pillar 1 pensions is best judged against its objective of minimising poverty rates among the elderly.[6] In 2014 this stood at 11.5 per cent of those aged 65 years or more, five percentage points lower than the

[5] Nivakoski (2014) finds similar results in an examination of data from the Irish Longitudinal Study on Ageing (TILDA).
[6] This objective is set out in Department of Social and Family Affairs (2007).

Table 2: Sources of Gross Income of Pensioners in Ireland by Decile, 2014 (%)

Income Category	*Bottom*	*2nd*	*3rd*	*4th*	*5th*	*6th*	*7th*	*8th*	*9th*	*Top*
Employee income	0.0	0.6	1.5	0.0	1.2	2.1	0.3	1.3	1.9	5.7
Self-employed income	2.2	1.4	1.7	0.9	3.0	1.8	4.7	8.0	5.5	10.3
Private pension income	2.6	1.2	0.2	2.8	1.4	3.3	3.5	3.5	5.4	12.0
Occupational pension	7.8	8.9	2.5	3.7	14.4	18.0	32.0	42.1	54.8	44.9
State old-age related payments	65.4	81.3	85.0	85.4	72.5	60.2	53.9	40.0	27.7	17.6
Rent income	3.7	1.6	0.9	1.1	0.7	0.7	1.3	2.4	1.5	4.3
Investment income	2.8	0.1	0.5	0.1	0.6	6.9	1.1	1.0	2.2	4.5
Other direct income	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Housing allowances	10.6	4.1	5.1	4.2	2.8	2.3	1.3	1.4	0.7	0.4
Other social transfers	4.8	0.9	2.7	1.8	3.5	4.8	1.9	0.4	0.3	0.2
Total	100	100	100	100	100	100	100	100	100	100

Source: Authors' analysis from SILC 2014.

Note: See notes to Table 1. Deciles are gross equivalised income deciles for all of the Irish population.

poverty rate for the entire Irish population and the ninth lowest rate in the EU28 where pensioner poverty averages at 13.7 per cent (Eurostat, 2017). Given the dominance of state welfare pensions in the income of most pensioners (see Table 2) these transfers had a notable effect on preventing pensioner poverty. However, achieving that outcome was costly with direct expenditure on these pensions amounting to €5.2 billion (3.2 per cent of GNP) in 2014.

2.2 Tax Supports for Pension Contributions

The system of tax supports for pension contributions in Ireland aims to encourage the participation of individuals and employers in pillars 2 and 3 of the pension system. Across OECD countries these measures have proliferated over recent decades in response to projected demographic pressures and expectations of unsustainable demands on state-provided pillar 1 pensions.[7]

In theoretical terms, these incentives enhance the attractiveness of individuals investing in a particular asset (savings) through decreasing their cost and consequently increasing the asset's relative rate of return. The scale of that gain depends on the precise structure of the tax incentive, its management over time and the broader structure of the taxation system.[8] Barr (1992) pointed to the redistributive nature of these mechanisms as "voluntary welfare" with their latent delivery, through tax expenditure structures, indicating that they are part of what Howard subsequently termed "the hidden welfare state" (1997: 26).[9]

There is a long history of the state providing tax reliefs for supplementary pensions with the objective of assisting employees, and other tax payers, to maintain living standards in retirement. Indeed, these mechanisms, some of the oldest tax expenditure within the Irish fiscal system, predate independence in 1922. The British parliament passed the Finance Act of 1921 which introduced tax relief on employees' contributions and on the investment income of pension schemes set up under trust law which were approved by the Inland Revenue. Income tax on pensions was due only when they were paid after retirement and employers' contributions were already deductible as a trading expense.

In modern times these supports have taken the form of tax relief on employee and employer contributions to occupational pensions (pillar 2) and contributions to voluntary schemes (pillar 3). The latter include mechanisms for self-employed persons to contribute to a Retirement Annuity Contract (RAC) and persons who are not covered by an occupational pension scheme to contribute to a Personal

[7] This debate evolved following World Bank (1994) and continues to feature in recent OECD pensions reports (OECD, 2015; 2016).

[8] Attanasio *et al*. (2004) and Barr and Diamond (2006) provide a review of the theory behind these incentives.

[9] Similarly, Titmuss (1958) highlighted what he termed "the social division of welfare" and distinguished between three sources of welfare: social, occupational and fiscal welfare. Pension tax supports fit in the latter as a type of social expenditure programme delivered through the fiscal system

Retirement Savings Account (PRSA). Overall the tax treatment of private pensions takes an EEpT structure; contributions are exempt on the way into a fund, the fund's investment income and capital gains are exempt, and the funds are partially taxed upon withdrawal (Yoo and de Serres, 2004:79; Collins and Walsh, 2010: 28). The partial taxation at withdrawal reflects the ability of pensioners to receive up to €200,000 of their pension fund as a tax-free lump sum upon retirement and the probability that subsequent withdrawals are taxable at a lower marginal rate because of declining incomes associated with old age and the design of the Irish income taxation system which treats the income of the elderly in a more favourable way than that of those of working age.[10]

Table 3: The Revenue Forgone Cost of Pension Tax Expenditure by Component, Selected Years (€ million)

Tax Expenditure Category	*2005*	*2010*	*2013*	*2014*
Tax relief for employees	423.5	598.5	552.0	548.8
Tax relief for employers	90.0	515.0	132.0	138.0
Employees tax relief on employers' contributions (BIK)	370.0	515.0	497.0	520.0
Tax relief on voluntary pension contributions	399.9	253.1	211.0	210.0
Exemption of investment income and gains of funds	1,050.0	835.0	865.0	n/a
Tax relief on "tax free" lump sums	120.0	136.0	134.0	134.0
Total	2,453.4	2,852.6	2,391.0	n/a
% GNP	1.7	2.1	1.6	n/a
% Total taxation revenue	4.9	6.4	4.8	n/a

Source: Revenue Commissioners online statistics (accessed January 2017) and authors' analysis.
Notes: Cost data for exemption of investment income are unavailable for 2014. Employees receive a benefit-in-kind (BIK) from employer pension contributions as these are classified as equivalent to additional employment income.

Table 3 outlines the reported costs of these tax expenditures for a number of recent years. Collectively, they amount to a revenue forgone equivalent to 1.5-2 per cent of GNP and 5-6 per cent of total taxation revenue. While these costs are reasonably stable for the years examined in Table 3 they contrast with the earliest estimate of the cost of this support by the Revenue Commissioners which indicated a tax forgone of 0.33 per cent of GNP for 1980/1981 (Hughes, 2000: 28). Yoo and de Serres, using data for 2000, also found that the cost of these supports was higher in Ireland than in any of the other 15 OECD countries they examined (2004: 94). The most recent cost estimates suggest that the annual tax forgone cost of tax

[10] Collins (2017) provides a more comprehensive review of this system.

supports for pillar 2 and 3 contributions is approximately half of the annual direct state expenditure associated with providing pillar 1 welfare pensions.

Unsurprisingly, the scale of this support has ensured it has been the focus of political and policy considerations on a recurring basis. Reports from the Department of Social and Family Affairs (2007), Commission on Taxation (2009) and OECD (2014) have all pointed towards reforms. The terms of Ireland's international bailout in 2010 also highlighted this area as one where an "adjustment" could be achieved with the associated National Recovery Programme (2010) committing to a reform of relief structures and rates such that €700 million per annum was saved from these tax supports (Department of Finance, 2010b). However, not unlike the experiences in other countries, these reforms were substituted for alternative measures and avoided altering the structure of the tax reliefs.[11]

We focus in this paper on examining the contributions by individuals, and employers on behalf of individuals, into pillar 2 and 3 pensions. Consequently, we focus on a subset of the tax relief costs outlined in Table 3, ignoring the business tax reliefs for employers and those for the internal gains of pension funds. As we are concerned with the nature and distribution of these contributions and reliefs we also ignore the tax relief associated with one-off lump sum payments. Taken together, in 2014 the revenue forgone cost of tax supports for employees' own contributions (€549 million), employee tax relief on employer's contributions (€520 million), and contributions to voluntary pensions (€210 million) totalled €1.279 billion (0.8 per cent of GNP and 2.3 per cent of total taxation revenue).

II DATA AND METHODS

The analysis in this paper draws from an examination of the microdata from the 2014 Central Statistics Office (CSO) Survey on Income and Living Conditions (SILC). This survey is part of an annual Europe wide household living standards survey and collects income and living standards information from a representative national sample. The data were released in late 2015 and comprised responses from 14,078 individuals in 5,486 households.

Like all survey data sources, the SILC dataset, and consequently any analysis drawn from it, is subject to some caveats. In particular, income surveys tend to experience lower response rates from high income households. Similarly, successful sampling can be challenging among low-income households and minorities while those in institutions are excluded from the sample. While the data include a

[11] Instead a levy was introduced on all pension assets and the limit on the overall value of a pension fund (the standard fund threshold) was reduced. In effect, this shifted the "adjustment" on to pensioners and pension assets and away from contributions.

probability weight variable to correct for under-representation and non-response, and these weights are used in the analysis, deficits at both ends of the distribution remain. However, the collected income data are reconciled by the CSO with administrative tax and welfare records in an attempt to ensure its accuracy. Subsequent analysis by Collins (2015) and Foley *et al.* (2015), which benchmarked the SILC data against other income and labour market measures, found the survey to be representative and reliable. Overall, the SILC data remain the most detailed and robust data source available for Irish individual and household income.[12]

The analysis in this paper draws on variables measuring gross individual and household income and includes data on the various components of income (earnings, transfers and investments) that comprise these concepts. The income reference period is the 12 months prior to interview. Flows into pensions are captured by variables within the data on employer contributions to employees' pensions, employee contributions to their own workplace pensions and contributions to private pension savings. The availability of income data on an individual basis allows us to compare pensions contributions to earnings, while having knowledge of the household context of these individuals offers a better insight into their living standards and their location within the overall societal distribution of income. The data are representative of approximately 605,000 individuals for whom some form of active pension contribution is occurring.

The data have some shortcomings. The aforementioned sampling challenges for very high income households impacts on the ability of the data to capture pension contributions among those most likely to participate in a pension. Consequently, our results will underestimate the concentration of contributions and tax relief among this cohort. Among employees, the structure of the questionnaire used to gather these data enquires about pension deductions from the last pay packet and uses those data to generate an annualised contribution. Therefore, results may misrepresent the contributions of employees with non-linear work patterns across the year. For those with second jobs the data do not disaggregate the employer contribution from that of the employee/individual; a feature which, although small, will exaggerate the latter and understate the former.

As part of a series of austerity measures adopted by Government following the fiscal crisis of 2008, public sector workers saw a mandatory Pension Related Deduction (PRD) taken from their salaries.[13] The payment, in effect a salary cut, was linked in name, but not via any additional entitlements, to public sector pensions.[14] Technically, the PRD is recorded in the SILC data as a pension contribution but as it does not finance the PAYG pensions of public sector workers

[12] Further details on these data are available on the website of the Central Statistics Office.

[13] See Drudy and Collins (2011) and Stewart (2011b). Stewart also provides an overview of public sector pension provision in Ireland.

[14] From April 2017 the PRD is being phased out as Ireland's public finances recover although, again, pension entitlements are remaining unchanged.

it is not comparable to the tax supported contributions outlined earlier. The data have been adjusted to model and remove this effect by identifying those within the sample who were recorded as public sector employees and calculating the PRD they were required to make, given their earnings, during 2014. The calculated PRD amount was deducted from the recorded employee pension contribution for these individuals.[15] Furthermore, the data do not provide details of the implicit pension contributions of the public sector as an employer, since public employees are covered by a public sector PAYG occupational pension. As such the data are not a complete picture of the occupational pension system, but they do provide a comprehensive picture of tax supported pension contributions in Ireland.[16]

As a means of determining the tax relief received by individuals, and of simulating alternative structures for these taxation supports, a microsimulation model of the Irish taxation system was developed. The model was built using the 2014 SILC data and their variables on household and individual income and welfare entitlements. While the SILC data report individuals and their location and relationships within households, it does not indicate whether they are assessed as an individual or couple for tax purposes. Income tax rules facilitate couples (married or cohabiting) to be jointly assessed as one tax unit and collectively share most of the tax credits and tax bands that would otherwise apply to two single units. Based on SILC information on household composition, marital status and the income of couples, the model simulates the tax status (individually assessed or jointly assessed) of each individual. The approach determines the most tax favourable outcome for individuals, an approach which replicates the stated objective of the Revenue Commissioners when determining the tax liabilities of couples.

The model determines 1.91 million tax units, a figure equivalent to 87.6 per cent of the average number of tax units reported by the Revenue Commissioners across the years 2013 and 2014. The principal difference between the modelled and reported figures arises for tax units, principally single individuals, with gross incomes of less than €10,000. Revenue Commissioner data identify a larger number of such cases (plus 150,565) than SILC, reflecting the aforementioned challenges of sampling low income earners. However, these tax units report an average annual net income tax liability of less than €22 and have limited impact on the overall performance of the model. Among tax units above €10,000, the model determines 1.66 million units equivalent to 93.5 per cent of reported numbers.

[15] The 2014 yield from the PRD was €891 million and the modelled amount was €936 million (105 per cent).

[16] The data were cleaned to address a small number of cases where contributions had been incorrectly allocated to other household members and where contributions exceeded more than 60 per cent of total earnings.

The modelled gross income tax base of €80.1 billion compares to €82.5 billion as reported by the Revenue Commissioners in 2013/2014 (97.2 per cent) and the overall net income tax yield is modelled as €13.2 billion compared to an actual figure of €12.1 billion (108.6 per cent). Among tax units, the model overestimates the net income tax liabilities of tax units below €10,000 but matches closely (98 per cent) to the average liabilities of tax units above this threshold. However, for tax units above €100,000 the model underestimates these liabilities by 9 per cent.

Based on the income of the identified tax units and the structure of the 2014 income taxation system, the model established the marginal income tax rate for each individual – single or as part of a couple – in the SILC data. As tax reliefs for pension contributions are provided at the marginal rate, the determination of this status is important to the estimates outlined in the next section.

As a further assessment of the robustness of the model's estimates, it is possible to compare the modelled tax expenditure with that reported by the Revenue Commissioners for 2014 (see Table 3). The model performs well simulating €1.175 billion of tax relief on employee, employer and private pension contributions compared to a reported €1.279 billion (92 per cent); and €664 million of tax relief on employee and private pension contributions compared to a reported €759 million (87 per cent). Within these categories, the model simulates 90 per cent of total employee contributions, 98 per cent of employer contributions and 80 per cent of private pension contributions. The estimated tax forgone saving associated with the standard-rate tax relief simulation reported later in the paper (see Table 8) is equivalent to 95 per cent of the estimate provided by the Revenue Commissioners (2015) using data for a similar period.

IV RESULTS

Our results divide into three. First, we report on the value and distribution of tax supported pension contributions. Second, we examine how the tax relief associated with these contributions is distributed across income earners and the overall income distribution. Finally, we consider the revenue and distributive implications of some reforms to the current system.

4.1 Pension Contributions

The data indicate that there are approximately 605,000 individuals for whom some form of active (non-zero) pension contribution is occurring; 34 per cent of all earners in 2014.[17] The legal structure of pension tax reliefs limits contributions by age group with the maximum contribution rates ranging from 15 per cent of

[17] Pension coverage, a measure of those contributing to or expecting, based on previous contributions, a pillar 2 or 3 pension is higher in Ireland at 43.2 per cent (Foley, 2016).

earnings for those under 30 years to 40 per cent of earnings for those aged 60 years and over; in all cases the amount of applicable earnings is capped at €115,000.[18] Table 4 compares the size of these contributions with earnings, where earnings are defined as the combined value of an individual's employee and self-employment income. The distribution is examined under two measures of contributions. The first is a comprehensive measure capturing the combined value of contributions by employees in occupational schemes, employer contributions to employees pensions and individual contributions to third pillar pension products. The second excludes the employer contribution and focuses on the combined value of employee and individual contributions.

Looking at the comprehensive measure, on average the combined value of contributions equals 9.3 per cent of total earnings. Nearly a third of contributions are small, representing less than 5 per cent of total earnings. One-third of contributions are equivalent to between 5 per cent and 10 per cent of earnings, with a further 27 per cent between 10 and 20 per cent of earnings. Just over 7 per cent of those making pension provision contribute more than one-fifth of their earnings.

Table 4: Distribution of Contributions to Pensions by % Earnings, 2014

From % – To %	*Employee, Employer for employee and Individual %*	*Employee and Individual %*
less than 1	5.6	8.3
1 – 4.99	26.7	49.5
5 – 9.99	33.8	25.9
10 – 14.99	20.9	7.1
15 – 19.99	6.0	3.1
20 – 24.99	3.4	2.2
25 – 29.99	1.0	0.9
30 – 39.99	0.9	0.8
40 plus	1.8	2.1
Total	100.0	100.0
Mean contribution %	9.3	6.9
Median contribution %	8.0	4.5
Mean contribution €	€5,058	€3,402
Median contribution €	€3,340	€1,978

Source: Authors' analysis from SILC 2014.
Note: Analysis is for all non-zero contributions.

[18] The age-related limits for pension contributions in 2014 were: 15 per cent of net relevant earning for those under 30 years, 20 per cent for those aged 30-39 years, 25 per cent for those aged 40-49 years, 30 per cent for those aged 50-54 years, 35 per cent for those aged 54-60 years, and 40 per cent for those aged 60 years or more.

Nominally the mean contribution is just over €5,000 with half of individuals contributing less than €3,300. Within this, about one-fifth of those with contributions pay a small amount of less than €1,000 per annum. About half (46 per cent) contribute moderate amounts ranging from €1,000 to €4,999 per annum.[19]

When employers' contributions are excluded the average contribution falls to 7 per cent of total earnings with the distribution further skewed towards the bottom with 58 per cent allocating less than 5 per cent of total earnings to pensions. The value of the mean contribution decreases by one-third (€1,656) while the median contribution decreases by 41 per cent (€1,362). The number of pension contributors also falls by 16 per cent (to approximately 510,000 individuals), underscoring the important role employers' contributions make to the scale of pension provision.

The nature of employer-provided pensions means that the structure of the labour market largely determines the great variation which is observed in pension coverage by occupation, industry, age and sex as Hughes and Nolan (2000) demonstrate using a segmented labour market model. Income is also an important determinant of pension coverage with those in high paying jobs far more likely than those in low paying jobs to participate in a pension. The SILC data for 2014 show that the median gross earnings of those where there is any form of contribution to a pension was €46,129 compared with a median gross earnings of €20,012 for those with no contributions. Those contributing to a pension were, therefore, likely to have a median gross income of more than twice those not actively contributing.[20]

Overall, our analysis highlights the relatively small size of most pension contributions (nominally and as a proportion of earnings); raising questions around the effectiveness of the collective suite of policy instruments focused on getting people to save for their retirement. It also raises questions of efficiency, given that most contributions are likely to be insufficient to guarantee adequate income replacement rates after retirement.[21] Alongside the implications this carries for future individual incomes and living standards, it also carries significant implications for the state given that "individuals with inadequate retirement savings are also more likely to draw on costly state benefit programmes in retirement" (Mirrlees Review, 2011: 476).

4.2 Pension Tax Supports

Tax Supports are provided at the marginal income tax rate of contributors.[22] As a consequence they are more attractive, and more valuable, to those on higher rates.

[19] See Table A1 in the appendix.

[20] We find similar figures using the narrower definition of pension contributions. In this case the median gross income of contributors is €46,120 while for non-contributors it is €21,218.

[21] Taking the example of the median contribution, an annual total pension contribution of €3,300 for 40 years will provide an annual pillar 2/pillar 3 pension income of approximately €5,200. Combined with the state pillar 1 pension, this gives a replacement rate of 37.5 per cent for a median pension contributor. Seventy per cent of this retirement income is the pillar 1 pension.

[22] In effect contributions are deducted before income tax liabilities are calculated.

Table 5 shows results from the microsimulation on the distribution of pension contributors (employee and individual contributions) by marginal tax rate; the Irish system comprises a standard and higher income tax rate. It finds that over 70 per cent are on the higher rate compared to about 30 per cent on the standard rate. In contrast, the majority of those with work income, from employment or self-employment, have a lower income and pay tax at the standard rate. In 2014 a single earner entered the higher tax rate at an income of €32,800, a couple with one income entered at €41,800 while a couple with two incomes entered at €65,600 (Revenue Commissioners, 2013). Our analysis also finds that among those at the standard income tax rate the median contribution is €939. Among pension contributors at the higher tax rate the median contribution is more than two-and-a-half time this annual amount at €2,536.

Table 5: Profile of Pension Contributors by Marginal Income Tax Rate, 2014

Marginal Tax Rate	*All with Work Income*	*Pension Contributors*
Standard (20%)	57.8	29.4
Higher (41%)	42.2	70.6
Total	100.0	100.0

Source: Authors' analysis from SILC 2014.

Note: There are no exempt income earners as income tax is liable from the first € of earnings. However, this may be offset in situations where tax credits exceed income tax liabilities.

Combining these marginal tax simulations with pension contributions data allows us to examine the distribution of tax expenditure supports across the income distribution. Table 6 reports these results for both the comprehensive and narrower categories of pension contributions. The regressive incidence of pension tax expenditure in benefitting high earners is immediately apparent as under either categorisation 53 per cent of the supports for private pensions accrue to earners in the top decile of the income distribution. Between 19 per cent and 20 per cent of the benefits accrue to those in the ninth decile. In total, nearly three-quarters of pension tax expenditure is concentrated on contributors who are in the top two deciles of the income distribution; these correspond to those earning well above average earnings (€35,006). Virtually none of the subsidies benefit those in the bottom half of the income distribution. The bottom two deciles get less than 0.75 per cent of the subsidies while the third and fourth deciles receive 1-2 per cent. In total the bottom five deciles receive less than 7 per cent of the tax expenditure supports for pension contributions.

Middle income contributors in the sixth to eighth deciles, who account for 30 per cent of those in employment, receive around one-fifth of the pension

contribution subsidies. This group, in particular, seem disadvantaged given that their average work income comfortably exceeds more than twice the annualised value of pillar 1 pensions. The small levels of tax relief they receive implies low contributions and future challenges around achieving adequate income replacement rates after retirement.

In Table 7 we compare the average gross earnings of pension contributors across the income deciles with those for all earners. Notably, the median pension contributor resides within the ninth decile of the income distribution under both contribution categorisations. The results reflect the higher earnings profile of pension contributors right across the income distribution and further highlight the concentration of tax supports among those on the highest incomes in Irish society.

Table 6: Distribution of Tax Support for Pension Contributions by Income Deciles, 2014

	Employee, Employer for Employee and Individual		*Employee and Individual*	
Decile	*€ million*	*% of total*	*€ million*	*% of total*
Bottom	2.83	0.24	2.83	0.43
2	2.50	0.21	2.00	0.30
3	10.01	0.85	7.22	1.09
4	20.94	1.78	14.35	2.16
5	31.04	2.64	15.59	2.35
6	47.30	4.03	33.82	5.09
7	74.00	6.30	40.74	6.13
8	118.38	10.08	67.61	10.18
9	245.00	20.85	128.41	19.34
Top	622.87	53.02	351.43	52.93
Total	1,174.86	100.00	664.00	100.00
Gini		57.7		60.9

Source: Authors' analysis from SILC 2014.

Notes: Deciles are for equivalised disposable income. Analysis uses Irish equivalence scale.

These results while stark are unsurprising. They echo the findings of Hughes and Nolan (2000) and Hughes (2000) who first establish the distributive nature of these tax expenditures for Ireland using 1994 household survey data. Looking only at employee contributions they found that over 60 per cent of the tax expenditure on pensions was concentrated on the top 20 per cent of the income distribution. Subsequently Callan *et al.* (2009) found that 74.1 per cent of the tax relief for employee and self-employed contributions in 2005 was concentrated in the top quintile. Outside Ireland similar assessments have highlighted the regressive nature

Table 7: The Average Earnings of Pension Contributors by Income Decile, 2014

Decile	*All Earners*	*Contributors: Employee, Employer for Employee and Individual*	*Contributors: Employee and Individual*
Bottom	€8,329	€14,709	€14,709
2	€11,949	€17,466	€18,874
3	€15,899	€24,727	€25,469
4	€17,544	€30,987	€30,901
5	€21,184	€32,287	€31,610
6	€23,649	€36,713	€36,628
7	€29,098	€39,607	€38,769
8	€35,098	€44,936	€44,294
9	€44,204	€53,293	€53,300
Top	€73,086	€84,571	€83,770
Mean	€35,006	€54,800	€53,818
Median	€26,507	€46,129	€46,120

Source: Authors' analysis from SILC 2014.
Note: Deciles are for equivalised disposable income. Earners data are calculated as the average employment and self-employment income per individual with non-zero earnings in each decile.

of pension tax incentives including Agulnik and Le Grand (1998) for the UK, Burman *et al.* (2004) for the US, and Antón (2007) for Spain. Our results echo the observations of Sinfield (1997: 20) twenty years ago who, in critiquing the "upside-down" nature of tax expenditure, noted that:

> *The benefit is greater, the higher the income and the higher the marginal tax rate which is avoided as a result of the tax mechanism. The greatest beneficiaries are those who have the least needs by any measure used in social policy analysis.*

The availability of data on employer contributions offers a new insight into the effect and division of employer pension supports. Overall, these marginally decrease the regressivity of the system, with the Gini coefficient three percentage points lower.

4.3 Examining Reforms

Reforms to this system of supporting pension contributions has been a focus of research and policy proposals for much of the last decade.[23] For the most part these

[23] For example, see Stewart (2005), McCashin (2005), Hughes (2005), the Irish Congress of Trade Unions (2005), Department of Finance (2006), Commission on Taxation (2009), Government of Ireland (2010), Stewart (2011a), Social Justice Ireland (2013) and OECD (2014).

have highlighted the regressive nature of these structures, the large recurring costs of their continuance, and the potential to raise and use additional taxation revenue from this area. These views have been countered by pension industry representatives, in particular suggesting that the current system assists middle income earners to maintain their living standards in retirement (Society of Actuaries in Ireland, 2012).

Ireland's fiscal crisis in 2008, and subsequent austerity measures, brought particular attention to these supports. A programme for financial support for Ireland from the EU, ECB and the IMF (Troika) was agreed in 2010 and included a commitment, first proposed in the Government's own National Recovery Programme, to phase out marginal tax relief for pensions so that tax relief would be given only at the standard rate of tax (Government of Ireland, 2010).

As part of the Government's Budget for 2011 the Finance Minister noted that

> *the incentive regime for supplementary pension provision will have to be reformed to make the system sustainable and more equitable over the long term* (Department of Finance, 2010a).

Given that policy objective, over the remainder of this section we report the results from the simulation of a number of alternative policy options, in particular assessing their distributive and cost implications.

Table 8 summarises the results of this analysis. Our results are benchmarked against the distributive and tax forgone cost estimates for the narrower definition of pension contributions in Table 6. Our focus on employee and individual contributions (not employer contributions on behalf of employees) reflects the approach of policy considerations in this area which have tended to assume it possible to alter these contribution mechanisms rather than those from employers. A broader based reform, while more complex than those we examine here, would yield larger revenue changes than those reported in Table 8.

We find that adjusting tax supports so that they are only available at the standard rate for all pension contributors would almost half the revenue forgone cost of these tax expenditures. Our estimates are first-round effects and do not reflect the impact of any second-round effects, including behavioural changes among contributors or policy impacts from any alternative use of the saved resources. The median value of tax relief on contributions falls by over 51 per cent and the Gini coefficient, measuring the distribution of the tax relief, decreases by just over 3.5 percentage points.

As an alternative to standard rating contribution reliefs, various reports have pointed towards offering relief at a hybrid rate, between the standard and higher marginal tax rates, or increasing the relief for all contributors to the higher rate.[24]

[24] These include Commission on Taxation (2009), Department of Social and Family Affairs (2010) and Society of Actuaries in Ireland (2012).

Table 8: Simulations of Alternative Policy Approaches to Pensions Tax Supports, 2014 Basis

	Baseline 2014 – marginal rate € million	*All Relief at Standard Rate € million*	*All Relief at 31% € million*	*All Relief at Higher Rate € million*	*Earnings Limit €72,180 – marginal rate € million*	*Earnings Limit €52,800 – marginal rate € million*
Revenue foregone cost of the tax relief by income deciles						
Bottom	€2.8	€2.8	€4.3	€5.7	€2.8	€2.8
2	€2.0	€2.0	€3.1	€4.1	€2.0	€2.0
3	€7.2	€4.8	€7.5	€9.9	€7.2	€6.9
4	€14.3	€9.0	€13.9	€18.4	€14.3	€14.3
5	€15.6	€10.8	€16.7	€22.0	€15.6	€15.6
6	€33.8	€20.8	€32.3	€42.7	€27.3	€25.9
7	€40.7	€25.2	€39.0	€51.6	€39.7	€38.8
8	€67.6	€37.9	€58.8	€77.7	€66.9	€65.7
9	€128.4	€64.0	€99.2	€131.2	€124.7	€121.2
Top	€351.4	€172.9	€268.0	€354.4	€319.3	€296.9
Total	€664.0	€350.1	€542.7	€717.7	€619.9	€590.0
Change		–€313.9	–€121.3	+€53.7	-€44.1	–€74.0
Nominal value of the tax relief						
Mean	€1,290.40	€680.40	€1,054.63	€1,394.83	€1,204.80	€1146.69
Median	€810.84	€395.53	€613.07	€810.84	€684.60	€684.60
Gini	60.9	57.2	57.2	57.2	58.2	56.3

Source: Authors' analysis from SILC 2014.

Note: Average earnings for all employees in 2014 was reported as €36,090. Twice this amount is €72,180. The statutory minimum wage in 2014 was €8.65 per hour and our simulation assumes a value equivalent to 39 hours work per week for 52.18 weeks of the year.

In different ways, both proposals are intended to limit contribution reductions from higher earners and to simultaneously enhance the attractiveness of pension contributions among standard rate income earners. The effectiveness of these proposals is dictated by our earlier findings (see Table 5) showing the dominance of higher rate income taxpayers as pension contributors. A hybrid rate tax relief of 31 per cent for all contributions reduces the value of tax supports for most contributors and increases it for those on lower earnings. It would provide an almost 20 per cent saving in tax support costs and see a 25 per cent fall in the median tax relief value. Distributively, the outcome is better than the baseline (2014 system) but equivalent to the standard rate option. Conversely, giving tax relief at the higher

rate for all taxpayers increases the overall cost of the contribution tax reliefs by just 8 per cent; a small increase dictated by the limited number, and low value, of contributions from standard rate taxpayers. The value of the mean tax relief rises by 8 per cent and the median remains unchanged. While the distribution of tax relief is fairer than the baseline position, in the context of policy objectives intended to build a more efficient and sustainable contribution framework a more expensive option is unlikely to find much support.[25]

As an alternative to altering marginal tax rates we model two further policy pathways. Both reduce the overall amount of earnings an individual can use to avail of tax relief on pension contributions while retaining the existing contribution age limits and the marginal tax relief structure. We choose thresholds equivalent to twice average earnings in 2014 and to three times the annual value of the statutory minimum wage for a full-time worker in that year. As these are relative thresholds they would move over time reflecting changes to the societal earnings structure.[26] Both options reduce the median value of relief by 15 per cent and the overall cost by 7 per cent and 11 per cent respectively. The impact of these reforms is concentrated on 2-3.5 per cent of contributors, mainly within the top income decile where 70 per cent and 74 per cent of those experiencing a reduction in their contribution amount are located. The Gini coefficient falls by almost 3 and 4.5 percentage points respectively, the latter a greater equity adjustment than the previously discussed changes. However despite these improvements, the decile distribution data continue to highlight the concentration of reliefs in the top quintile, with more than 70 per cent of tax supports flowing to contributors in these deciles.

Collectively, these simulations highlight some potential for state savings and equity improvements. However, these policy options do not, in and of themselves, counter the underlying problem highlighted earlier that for most, pillar 2 and pillar 3 pension participants' contributions remain small, and for most other earners outside the public sector there are no contributions to either pillar.

V CONCLUSION

Supporting contributions to pillar 2 and pillar 3 pensions through the taxation system have been the cornerstone of pensions savings policy in Ireland for some time. The aim of this paper has been to examine the effectiveness of that tool in

[25] We estimate that the cost of each of these reforms could be a further 2-3 per cent lower when account is taken of standard rate income tax payers who do not possess sufficient income tax liabilities to benefit from all of the tax relief offered at these higher rates.

[26] This approach would also allow policy to adopt nominal contribution limits which included both employee, individual and employer contributions. Including the latter would remove the potential for this mechanism to be circumvented by proprietary directors and senior executives who have freedom to determine the composition of their own pension contributions.

inducing contributions from earners and to consider the distributional impact of its performance. The state resources involved are considerable, with tax supports to the pensions system costing the equivalent of 1.6 per cent of national income and 4.6 per cent of total taxation revenues per annum. The specific supports targeted at pension contributions, those reviewed in this paper, exceed €1.279 billion per annum (0.8 per cent of GNP and 2.3 per cent of total taxation revenue).

Using data from the major Irish income survey we find that approximately one-third of all earners are active contributors to pillar 2 or pillar 3 pensions. The data capture all forms of contributions, from employees and employers to occupational pensions and individuals into private pillar 3 pensions. Without employer contributions, the active participation rate falls to less than three in ten earners. However, it is the scale of contributions, rather than just the number of pension contributors, that is particularly revealing. Our analysis highlights the relatively small size of most pension contributions (nominally and as a proportion of earnings), raising clear questions around the effectiveness of the collective suite of policy instruments focused on getting people to save for their retirement.

The tax reliefs supporting these contributions are availed of at the marginal income tax rate. Despite most earners being at the lower of Ireland's two marginal rates, we find that over 70 per cent of pension contributors are higher rate tax payers. This skewed outcome is reflected in our analysis of the distributive structure of tax supports. For such a large piece of recurring social policy it is important to know where within the income distribution these resources go. We find a concentration of tax supports for contributions in the top quintile of the income distribution, with around 75 per cent of tax expenditure supports flowing to individuals in this income category. In nominal terms this group receive some €868 million of tax support per annum; it is as if the current system targets those who need least support. These regressive outcomes update the conclusions of previous studies for Ireland and for similar systems in other states.

As our findings imply reform, we have explored some alternatives to the current system. The results from a series of simulations highlight the potential to restructure tax supports and save some state resources. However, it is hard to look past the weak contribution data which stand as a core structural problem for the Irish pension system.

Using the state resources saved by some of the reforms we have considered offers the potential for the pensions system to reorientate itself towards more effective and equitable measures as a means of boosting pillar 2 and pillar 3 contributions.[27] For example, investing in enhancements to financial literacy and education offers a route to greater societal knowledge of the challenges of retirement planning and has been found to boost savings (Börsch-Supan, 2004;

[27] Others suggest a better outcome is to allocate these resources to boost pillar 1 pensions see Hughes and Stewart (2007), Larragy (2013) and Murphy (2014).

Lusardi *et al.*, 2008; Dushi and Honig, 2015; and Landerretche and Martãnez, 2013). Similarly, policies that better target public resources towards encouraging pension savings among under-participating groups, such as middle income earners, has merit. The experience of the "Riester pensions" in Germany suggest potential for such targeting and better outcomes (Börsch-Supan *et al.*, 2008). However, it is important that pensions policy begins to broaden its definition of success beyond measures of participation or coverage, to measures which more comprehensively capture the adequacy of pension contributions. More broadly, as pillar 1 welfare pensions are the most important source of retirement income for the great majority of pensioners, an objective of policy should be to establish a better balance in the distribution of public resources to focus them on low and middle income earners, who need them most, and significantly reduce tax reliefs for the highest earners, who need them least.

Ireland's relatively young demographic profile implies that the immediate policy challenges associated with high old-age dependency ratios are some way off. Ensuring the development of an effective pillar 2 and pillar 3 pension system offers an important route to minimise these. Our analysis provides strong evidence of the need for change in pensions policy if society is to be realistic about adequately pursuing an objective of adequate income for all workers in retirement. As things stand, there remains a considerable need for policy innovation to achieve this.

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APPENDIX

Table A1: Distribution of Contributions to Pensions by Contribution Amount, 2014

From – To	*Employee, Employer for Employee and Individual %*	*Employee and Individual %*
less than – €249.99	3.2	4.5
€250 – €499.99	6.6	9.3
€500 – €749.99	6.9	9.5
€750 – €999.99	4.4	7.8
€1,000 – €1,499.99	6.6	11.1
€1,500 – €1,999.99	5.5	8.2
€2,000 – €2,999.99	12.8	15.9
€3,000 – €3,999.99	12.5	12.0
€4,000 – €4,999.99	8.9	4.7
€5,000 – €5,999.99	5.3	4.1
€6,000 – €6,999.99	6.0	2.1
€7,000 – €7,999.99	4.3	2.7
€8,000 – €8,999.99	2.9	1.3
€9,000 – €9,999.99	2.5	1.3
€10,000 – €19,999.99	8.6	3.2
€20,000+	3.0	2.2
Total	100.0	100.0
Mean contribution	€5,058	€3,402
Median contribution	€3,340	€1,978

Source: Authors' analysis from SILC 2014.
Note: Analysis is for all non-zero contributions.