Tax, Welfare and Work Incentives[1]

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INTRODUCTION

Over the last decade Irish tax policy has undergone dramatic shifts. As the economy boomed in the early 2000s, income tax rates were reduced, tax credits were increased and the standard rate band was widened. Social welfare benefits were increased substantially over the same period. However, with the onset of the crisis in 2007-2008, the taxes that the government had increasingly relied upon during the boom years – such as stamp duty and capital gains taxes – collapsed, creating an urgent need for new revenue generation. The introduction of income levies - later replaced by the Universal Social Charge - significantly increased the revenue from taxes on income.[2] Welfare payments, particularly for those of working age, were reduced.

What has been the impact of these changes on financial incentives to work? This is the issue tackled here. One question of interest is how policy changed after the advent of the crisis. But the baseline implicit in this question is the tax and welfare system just before the advent of the crisis i.e., circa 2008. The nature of this baseline is itself open to question: the balance struck between income and other taxes at that point appears not to have been a sustainable one. Honohan (2009), proposed that the fiscal crisis

> "could best be addressed by looking back a few years to where we had been at the turn of the millennium in terms of shares of taxation and spending in GNP. Those years define the end of the thoroughly healthy and sustainable path of aggregate activity" (Honohan, 2009, p. 3)

We agree that policy circa 2000 provides a benchmark of considerable interest – but would argue that it should not be treated as a "golden age" to be precisely replicated. For this reason, we provide, where possible, information on a selection of years between 1987 and the present day to give a more rounded picture of where Ireland's tax/transfer system stands, and where it has been.

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[1] Assistance from Michael Savage is gratefully acknowledged.

[2] See Appendix for a detailed breakdown of the changes to tax and welfare policy from 2000 to 2011.

We examine the impact of policy changes on two main measures of the financial incentive to work (each defined in more detail in later sections). The incentive for unemployed persons to take up employment is most often measured using the "replacement rate" (RR) – the ratio between net income out of work and net income when in work. There are two aspects to replacement rates. A high replacement rate can be seen as attenuating the reward from employment; but from another perspective a high replacement rate can be seen as indicating effective income support for those who lose their jobs. For those in employment, the incentive to progress – through working longer hours, or with greater skill or effort – is measured by the marginal effective tax rate (METR). This indicates what proportion of an increase in earnings is taxed away, either through an increase in tax and/or social insurance contributions, or a reduction or withdrawal of social welfare benefits. Calculations of replacement rates and marginal tax rates are frequently undertaken for a small number of illustrative families. We will show that this approach can be misleading, and that a well-established alternative – measures based on simulating the situations of families in a large scale nationally representative survey – provides a more comprehensive and reliable picture.

Using this approach we undertake analyses which show:

- The impact of recent austerity measures on the financial incentive to work

- The combined impact of boom/bubble and austerity measures over the period 2000 to 2011.

The remainder of the paper is structured as follows. Section 2 sets out the basic concepts and measures used, and how they are implemented. Section 3 turns to the replacement rate measure, and examines first of all some results using the "example households" approach, identifying a number of features underlying the approach which are not commonly recognised and limit its usefulness. New results using the microsimulation approach are presented, and compared with outcomes for earlier years. Section 4 examines the "incentive to progress" as measured by marginal effective tax rates (METRs), again focusing on the impact of policy changes between 2000 and 2008, and the austerity measures since then. The main findings and conclusions are drawn together in the final section.

MEASURING WORK INCENTIVES

Here we describe the broad concepts underlying the replacement rate and marginal effective tax rate measures; and outline some of the key issues which arise in implementing the measures. (Further details can be found in Callan et al. 2007, on which this section draws extensively). The unit of analysis in both cases is the nuclear family, defined as a single person or couple, together with their dependent children.

Thus, we examine the incentives facing both husbands and wives, with their partner's labour market participation held constant; and in so doing, we take into account the overall impact of the change on family income. Adult children are regarded as separate decision making units, but the impact of the household means test ("benefit and privilege") applying to young adults living with their parents is taken into account.

Replacement Rates

The financial incentive for an individual to move from unemployment into employment depends on the family's disposable income[3] when the individual is unemployed and the family's disposable income when the individual is employed. A narrow focus on the individual's own net income would fail to take account of the possible impact of an individual's taking up employment on the social welfare entitlements and/or income tax liabilities of his or her spouse or partner.

The replacement rate summarises this information by taking out-of-work income as a proportion of in-work income at the level of the family unit:

$$RR = 100 * \frac{Out\ of\ work\ family\ disposable\ income}{In\ work\ family\ disposable\ income}$$

For example, an individual might find that his or her income when unemployed is €150 per week, but that on taking up a job that disposable income would rise to €300 per week. The replacement rate in this situation would be 50 per cent.

Standard microeconomic theory suggests that an increase in the wage rate faced by an individual has two distinct effects (Duncan and Giles, 1997)[4] :

- a higher net wage means that the individual would have more to gain from an additional hour of employment (a positive substitution effect).

- the wage increase also means that individual needs to work fewer hours to obtain the same net income (a negative income effect).

In general, the balance between these opposing effects is ambiguous. But where the individual is unemployed (or not employed) there is no income effect, as there is initially no wage income. Thus theory predicts a positive incentive effect associated with a higher net wage – and both the replacement rate and the average tax rate are

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[3] Disposable income is cash income from all sources – including wages and salaries, profits, pensions, interest, dividends and welfare payments –net of taxes, levies and social insurance contributions.

[4] See Duncan and Giles (*ibid*) for a graphical illustration of the argument.

reduced, if the net wage increases. However, if non-employment income rises (e.g., an increase in child benefit), theory predicts that the impact on labour supply will be negative. The replacement rate measure increases, in line with the theoretical prediction .

Replacement rates have been in widespread use in policy debate (see, most recently, NESC, 2011). Consequently, it is this measure which is used in the remainder of the paper.

Marginal Effective Tax Rates

The term "marginal tax rate" is most commonly used to refer to the income tax rate applying to extra earnings or other income. Rates of social insurance contribution are often taken into account as well. But in terms of the overall financial reward for additional earnings, welfare recipients and their spouses or partners often face an additional factor. Some or all of a benefit paid to one partner may be withdrawn (either smoothly or in a "stepped" fashion) as the earnings of the other partner increase. For a more comprehensive measure of financial incentives to work, therefore, it is necessary to go beyond measures based purely on direct taxes and to take into account rules governing the withdrawal of benefits.

The "marginal effective tax rate" (METR) is designed to provide such a comprehensive measure. The exact size of the margin – the increase in gross earnings – could be chosen in various ways. For a particular margin, the METR tells us how much of an increase in earnings is absorbed by increased tax payments, PRSI deductions and/or withdrawal of social welfare benefits (including those of a spouse or cohabiting partner). This provides a measure of the strength of the incentive for individuals to increase their earnings somewhat – whether by increasing the extent of working time (e.g., increased hours, a second job) or the intensity of work effort (e.g., seeking promotion, piece-work bonuses).

Marginal effective tax rates can be calculated as follows:

$$METR = 100 * (1 - \frac{Change\ in\ Disposable\ Income}{Increase\ in\ Gross\ Earnings})$$

For instance, suppose an individual taxpayer receives an additional €100 per week in gross earnings, leading to an additional €70 in disposable income. His/her METR is then calculated as 1 – (70/100) = 30%.

An METR of 100 implies that all of the additional earnings are lost in tax or other deductions, whereas an METR of zero means a taxpayer keeps all additional earnings. Accordingly the higher the marginal effective tax rate, the weaker the financial incentive to progress.

In practice, there can be a trade-off between the incidence of high replacement rates and the incidence of high effective marginal tax rates. If policy focuses on reduction or elimination of the "unemployment trap"[5] posed by very high replacement rates, then this may require considerable support for those with low earnings potential. But in order to reduce the cost of such support, a high benefit withdrawal rate may be imposed (as is the case, for example, with the Family Income Supplement scheme, which reduces the benefit by €6 for every €10 increase in income). Thus, high effective marginal tax rates on those at low incomes may, because of cost considerations, be linked with income supports providing strong financial incentives to take up paid employment.

METRs can be defined over different margins. A small margin, €1 per week (approximating what Adam et al. (2006) term a "point" marginal tax rate) can be useful in making comparisons with some other work. However in practice, labour force participants are unlikely to see such a small increase in earnings as a result of additional effort. Immervoll (1994) applies a fixed percentage increase in earnings.[6] This may be useful when comparing those in full-time employment, but it is less so when examining part-time workers. For part-time workers the most relevant margin may be moving from part-time to full-time work: in this case they might see an increase in gross earnings of close to 100% rather than the 3 to 5% used by Immervoll. In this paper we use a third approach (following Callan et al., 2006). This involves increasing gross earnings by a larger fixed step – usually resulting in a higher percentage increase for part-time workers than full-time workers. . The amount used is an additional €100 per week applied to gross earnings. This amount reflects approximately an extra day and a half of work at the minimum wage, an extra day of work at a slightly higher wage of €12.50 per hour, or an extra half-day at €25 per hour.

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[5] This term has commonly been used to describe situations in which unemployed persons would gain little, if anything, in cash terms, by taking up employment.

[6] Immervoll (1994) adds on 3% to gross earnings in an effort to simulate an additional hour worked for a typical full-time employee.

Implementing the Measures

Microsimulation modelling provides a means of analysing the replacement rates facing individuals[7] on the basis of detailed micro-level data gathered in a large-scale household sample. Essentially, the tax-benefit model is first used to simulate the disposable income of the nuclear family unit (sometimes termed tax unit) when the individual is unemployed. This involves simulation of the relevant social welfare unemployment compensation and of income tax liabilities, as well as the universal child benefit. The counterfactual situation, where the individual is employed, is then modelled. Again, the tax-benefit model is used to estimate the disposable income the tax unit would have in that situation, taking into account changes in social welfare entitlements and tax liabilities, and, where relevant, entitlement to Family Income Supplement (FIS) – the social welfare benefit targeted at low income families depending on wage earnings. In these calculations the gross earnings of the spouse are held constant, but their net earnings or benefit receipt may be affected by their partner's employment status. The replacement rate is then calculated as the ratio of family income when out-of-work to family income when in work.

A key issue in measuring replacement rates is what level of earnings should be assumed for those who are not currently in paid work. One approach is to use a particular gross earnings level – such as (some proportion of) average industrial earnings – as the prospective earnings for all those not currently in work. This approach is often used in the context of "example household" calculations. For example, the OECD produces estimates of replacement rates at average wages and at 67 per cent of average earnings. However, this takes no account of the variation between individuals in the wages that they can reasonable expect to earn in the labour market. For example, the same wage is used for someone who has dropped out of school with no qualifications and for a graduate. Empirical studies employing micro-data to examine incentive effects and search behaviour typically use a predicted wage which takes into account such individual characteristics. This is the concept used in our microsimulation approach (following earlier work by Callan et al. 1994). Potential earnings for the unemployed are predicted on the basis of their age, sex, educational qualifications and marital status. There is a well-established correlation between these variables and potential earnings.

Our analysis suggests that the average potential earnings of the unemployed in Ireland – predicted on the basis of the above characteristics – are close to two-thirds of average wages. However, there is considerable variation around this figure, which can only be taken into account in the microsimulation approach. The "example

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[7]   As noted earlier, the calculations for each individual incorporate the net impact on the income of the nuclear family e.g., if one spouse/partner earns more, this may have an impact on the benefit or tax payable by the other spouse.

households" approach uses the same wage for all individuals, and can explore the sensitivity of results to that assumed wage – but it is always the same wage for all individuals.

In this paper we concentrate exclusively on replacement rates facing those who are currently unemployed and in receipt of Jobseeker's Benefit or Jobseeker's Allowance. However, earlier work shows that examination of replacement rates facing those currently *employed* or currently not in the paid labour force are also of interest, and these areas will be examined in future work.

The appropriate treatment of Family Income Supplement (FIS) is also an issue. Entitlement to FIS is modelled by SWITCH on the basis of the parameters of the scheme, and FIS entitlements can be included as part of in-work income in the calculation of replacement rates. However, the take-up of this scheme appears to be particularly low, with perhaps only one-third of those entitled actually in receipt of the payment (Callan et al., 2005). For this reason we present detailed results on the basis of a low take-up assumption, under which one in three of those entitled to FIS is attributed that benefit. Because FIS is a small scheme, the numbers in receipt of FIS in surveys such as the Survey on Income and Living Conditions (SILC) are rather small. This means that detailed analysis of the determinants of non-take-up, such as can be undertaken with the UK's large-scale Family Resources Survey, is not possible here. So although take-up is likely to be higher for larger entitlements, our analysis is based on a simple random assignment to the take-up and non-take-up categories.

REPLACEMENT RATES

As noted earlier, much attention is given to calculations of replacement rates for specific families (sometimes termed "example households"). The most well known and systematic application of this approach is found in OECD publications, such as *Taxing Wages*, with further detail provided in the OECD's online databases. Initially, OECD focused on the measurement of the tax/benefit position of the average production worker. This approach was further developed to look at the position of workers at different proportions of average economy wide earnings – 67%, 100% and 150%. Now *Taxing Wages* also includes family benefits paid as cash transfers – some of which are income-tested. The main publication deals with 8 household types which differ by income level and household composition e.g., a single earner couple on average wages, or single person on 67% of average wages. As the OECD says, these data on tax burdens and cash benefits "are widely used in academic research and the preparation and evaluation of social economic policy-making".

However, a degree of caution is needed in interpreting such figures. For example, the OECD figures suggest that the long-term replacement ratio in Ireland is higher than the short-term ratio. This result arises because in most countries, short-term ratios are based on insurance benefits, and do not include social assistance; while for long-term ratios, the reverse applies. As a result, calculations of the short-term ratio across all countries – Ireland included – do not include social assistance benefits. So for Ireland, the short-term calculations exclude the Rent and Mortgage Supplement (RMS) scheme, while the long-term ratio assumes receipt of this supplement. Given that basic payment rates are equal for Jobseeker's Benefit and Jobseeker's Allowance, the finding of higher long-term replacement rates is readily explained.

But this does not correspond with reality in two key aspects. First, the Rent and Mortgage Supplement scheme is open to the short-term unemployed. Second, and crucially, only 1 in 8 of those on unemployment compensation schemes is actually in receipt of RMS. Faced with a choice of either including RMS or excluding it in replacement calculations, it would make more sense to exclude it.[8] For this reason we compare short-term replacement rates for Ireland and other countries in Table 1, ranking from lowest to highest.

Table 1: OECD Measure of Short-Term Replacement Rates, Selected Countries, 2007

Country	Replacement Rate
	%
United States of America	56
United Kingdom	57
Ireland	60
Austria	62
Germany	66
Sweden	71
Denmark	78
Netherlands	78
Switzerland	80

Source: OECD.

As Ireland attempts to recover from the public finance crisis, comparisons with countries in a strong fiscal position are of particular interest. The experience of such countries may help to provide guidance along the path towards a sustainable fiscal

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[8]   A better approach would be to include it only where it is relevant – where the unemployed person receives it. This is possible with a microsimulation approach, and is implemented later in this paper.

adjustment. For this reason we have focused mainly on those European countries with a strong fiscal position, along with the UK and the US. The short-term replacement rate for Ireland in 2007 was towards the lower end of the scale, close to those of the UK and the US. The highest replacement rates were to be found in Scandinavia, the Netherlands and Switzerland, with Germany and Austria in intermediate positions.

Both OECD results and earlier microsimulation analyses (Callan et al. 2007) indicate that replacement rates in Ireland tend to be lower for single people than for married couples, and that married couples with children have the highest replacement rates. NESC (2011) point out that an analysis of the Live Register in 2010 (Figure 1) shows that more than half of the unemployed were single, and that unemployed persons who are married with children constituted about 1 in 6 of all the unemployed. Simple averaging across family types, which does not take account of the preponderance of single persons with low replacement rates, can therefore be misleading.

Figure 1: Recipients of Jobseeker's Benefit/Allowance Classified by Family Type
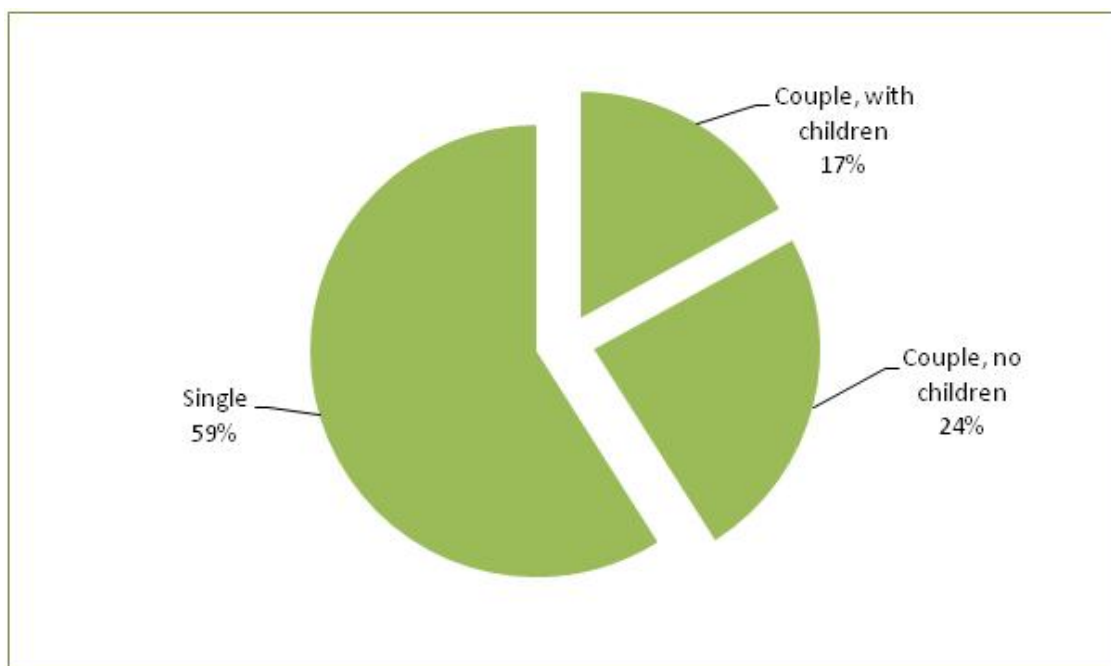
Source: NESC (2011), Table 5.6.

Given that almost 60 per cent of unemployed people in Ireland are single, it is useful to compare the replacement rates of single unemployed people across countries. (Table 2, again ranked lowest to highest). For single people, on this short-term measure of the replacement rate, Ireland has the lowest rate of this set of countries. At the lower level of wages (2/3 of average wages) the Irish figure is again the lowest of this group of countries, at about three-quarters of the rates for Germany and the

US, and a little over half of the highest replacement rates (Denmark and Switzerland).

Table 2: Short-Term Replacement Rates for Single Persons without Children, Selected Countries, 2007

Country	Replacement rate at 67% of Average Wage	Country	Replacement Rate at 100% of Average Wage
	%		
IRELAND	46	IRELAND	33
United Kingdom	55	United Kingdom	38
Austria	55	Sweden	48
Germany	60	United States	51
United States	60	Austria	55
Sweden	69	Denmark	60
Netherlands	76	Germany	60
Switzerland	81	Switzerland	71
Denmark	84	Netherlands	74

Source: OECD.

The calculations above are based on Jobseeker's Allowance payment rates for single people of €186 per week in 2007, rising to €198 in 2008. However a structural change was introduced in 2009/2010, with lower rates of Jobseeker's Allowance payable in respect of claimants under the age of 25. By 2010 the maximum payment rate for those aged 18 to 21 was €100, while the rate for those aged 20 to 24 was €150. About 24 per cent of all *claimants* of Jobseeker's Allowance would have been affected by this reduction in maximum payment rates.[9] A smaller proportion of those actually receiving Jobseekers' Assistance would be in this age category, precisely because the reduction in potential entitlement makes it less likely that they will qualify for a payment. Correspondingly, the replacement rates facing individuals aged under 25 have been reduced.

It is clear from this that there is considerable variation in the replacement rates along a number of dimensions:

- Replacement rates vary widely across different family types

- Replacement rates are also sensitive to assumptions regarding the wage which an unemployed person can earn

- Variations in benefit payment rates, for example, based on age and/or family circumstances also have a significant impact on replacement rates

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[9]   CSO (2011) Live Register August 2011.

- Replacement rates depend on whether or not the individual is eligible for housing-related support such as the Rent and Mortgage Supplement scheme

The number of examples can be expanded to find measures appropriate to different circumstances. But this is cumbersome, complex and difficult to summarize in terms of the numbers of people in different situations. Microsimulation provides a better method of profiling replacement rates across the population. This has been used in Ireland, in the UK (where the Institute of Fiscal Studies has regularly published such profiles e.g., Adam and Browne, 2010) and, in the context of marginal tax rates, , within the OECD (Immervoll, 2004).

Table 3 summarises the distribution of replacement rates, as estimated using the microsimulation method (outlined in Section 2, and described in more detail in Callan *et al*., 2007). Key features of this method are that variations in benefit entitlement due to age, family type or household circumstances are taken into account, and variations in the wage that can be expected in the labour market are also captured by predicting the wage on the basis of age, highest educational qualification, gender and marital status. Potential entitlements to Rent and Mortgage Supplement are included in the calculations.

Table 3: **Estimated Distribution of Unemployed Persons in Receipt of Jobseeker's Benefit or Assistance by Replacement Rate Category, 2011**

Replacement Rate Category		
More than	**Less than**	**%**
	< 20%	5.3
>20%	< 30%	13.0
>30%	< 40%	18.8
>40%	< 50%	20.5
>50%	< 60%	19.2
>60%	< 70%	4.4
>70%	< 80%	5.9
>80%	< 90%	7.8
>90%	< 100%	1.6
>100%		3.4
		100.0

While the distribution spans a wide range, about three-quarters of the recipients of Jobseeker's payments face a replacement rate of less than 60 per cent and over half face a replacement rate of less than 50 per cent. At the other end of the scale, just over 3 per cent face a replacement rate of more than 100% (i.e., would receive more

net income when unemployed than when in work). There are no single people in this situation – it arises only for those who are married. In about half of these extremely high replacement rates (over 100%), Rent and Mortgage Supplement plays a key role: without this supplement, or if housing support were provided in a more neutral manner as between those in and out of employment, the replacement rate would be below 100%. The structure of the Rent and Mortgage Supplement scheme means that it is not, in normal circumstances, available to those who are in full-time work.

How does this distribution compare with that in earlier years? We provide two perspectives on this Table 4. First, we provide figures for 1987 and 1994, based on SWITCH modelling of the unemployed populations in those years. Second, we examine how the actual 2011 situation compares with what would have obtained if policies in 2000, and in 2008, had simply been indexed in line with wage growth/wage decline over the intervening years.

Table 4: Distribution of High Replacement Rates, 2011 and Earlier Years/Alternative Policies

Year	1987	1994	2000, Uprated by 52%	2008, Downrated by 3.7%	2011
Above 70%	36.4	37.3	13.3	26.2	17.7
Above 80%	22.5	15.3	9.8	19.2	12.8
Above 90%	9.4	6.2	3.5	10.3	4.0
Above 100%	4.0	1.6	0.8	5.4	3.4

Note: 1. 1987 and 1994 estimates based on SWITCH analyses of data for the respective years. Other estimates based on SWITCH analyses of 2008 SILC data, uprated to 2011.

Sources: 1987 and 1994 from Callan et al. (2007). Later years, new analysis using SWITCH model, based on CSO SILC 2008.

Comparison with estimates from 1987 and 1994 indicates that the incidence of high replacement rates (above 70% or above 80%) is much less in 2011. Indeed, the figures for 2011 are closer to those for the indexed 2000 policy than to these earlier years. The main exception to this is that while the proportion facing replacement rates above 90% is similar as between the actual 2011 and indexed 2000 policies, more of this sub-population faces replacement rates higher than 100%. In responding to this issue, it is important to remember that this is a small (less than 4%) element of the overall unemployed population; and that the nature of housing support, provided through the Rent and Mortgage Supplement scheme, plays a significant role in this regard. While the causes of these exceptionally high replacement rates deserve further investigation, it must be borne in mind that these are exceptional, and not representative of the replacement rates faced by most unemployed people.

It would be interesting to compare the distribution of replacement rates, as estimated by similarly structured microsimulation models, across countries. There seems to be little published comparative work in this area. Immervoll (2004) examines some marginal and average tax rate measures for those in employment, but the replacement rates facing the unemployed are not covered. Estimates based on the IFS model (e.g., Adam et al. 2006 and Adam and Browne, 2010) do not seem to report results separately for the unemployed. Obtaining comparable results is likely to require a harmonized approach, such as that employed by the EUROMOD project (Sutherland et al., 2010). We are currently investigating the scope for comparative research in this area.

MARGINAL EFFECTIVE TAX RATES

Marginal rates of income tax are often treated as the "headline numbers" for marginal tax rates. The standard rate of tax has been constant, at 20 per cent, since 2001. The higher rate of tax changed once over that period, with a reduction from 42 per cent to 41 per cent in 2007. However, the effective marginal tax rates actually faced have changed much more over the period. This is partly due to the introduction of levies and their replacement by the universal social charge; but also due to changes in the width of the standard rate band, which affect the numbers facing different marginal rates of tax.

In the past, it has been possible to track some of this evolution using official statistics on the numbers of taxpayers at different marginal rates of tax. (Revenue, Statistical Report of the Revenue Commissioners). While these do not capture the complexities of the broader effective tax rate measure outlined in Section 2, they have provided the most comprehensive picture of marginal tax rates, narrowly defined, over a long period. Tables provided by the Revenue/Revenue Commissioners' annual *Statistical Reports* detail the numbers of tax payers paying at the lower and higher rates of tax. However, we argue that recent changes to the computation of these numbers mean that there is now a structural break in the series, with the information for the most recent years no longer reflecting the economic concept of "marginal tax rate". The detail of our argument is given in Appendix 1.

The figure below illustrates the percentage of those facing tax at the higher rate in Ireland from 1994. The significant downward trend observed in the Revenue's estimates around 2004 reflects a change in the calculation of this percentage; at this time those whose nominal tax liability at the higher rate of tax was fully covered by their tax credits were re-classified as having a marginal tax rate equal to the standard rate of tax. The rationale for this approach is given in a technical appendix in Budget 2007. Re-estimating these numbers using the old method shows that no major fall

in those paying at the top rate of tax has occurred (illustrated in the figure below as "Own Estimates"). [10]

Figure 2: Percentage of Taxpayers Facing Income Tax at the Higher Rate

Aside from these measurement issues, the income tax rate alone is considered in this analysis. For a more comprehensive picture of the tax rates faced by individuals, we need to consider not only income taxation, but also social insurance and the withdrawal of social welfare payments.

Distribution of Marginal Effective Tax Rates

We estimate the distribution of marginal effective tax rates in 2011 under three different policy scenarios.[11] In each case, we use data from the CSO's SILC for 2008, adjusted to represent the 2011 situation in terms of demographics, employment and unemployment, and earnings levels. We model the situation under the actual 2011 policy to give an estimate of the current situation. We then compare that with two policy alternatives: one in which the 2000 policy is uprated in line with wage growth between 2000 and 2011. Simply using the 2000 policy unadjusted would not be informative. Uprating in line with wage growth ensures that the average tax rate for 2000 is maintained in the 2011 scenario. Similar considerations apply to 2008 policy,

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[10] As can be seen in the graph, our estimates track the Revenue figures between 2002 and 2004, just before the change in definition.

[11] In this paper METRs are simulated for all employees (both full-time and part-time). Self-employed persons are excluded, as they are not included in some UK analysis with which we make comparisons. More particularly, the METRs facing farmers depends on the extent of use of the Farm Assist scheme, and the details of its means test, which are difficult to capture using the survey data. For these reasons they are omitted from the current analysis.

though in this case policy has to be "downrated" to reflect wage decline over the period 2008 to 2011. We use the OECD series for average wage growth, supplemented by *Quarterly Economic Commentary* figures for recent years. Thus, 2000 policy parameters are increased by 52 per cent, while 2008 policy parameters are reduced by 3.7 per cent.

The distributions of METRs under 2011 policy and indexed 2000 and 2008 policies are illustrated in Table 5. Examining the situation under an indexed 2000 policy first, we can see the distribution of METRs is quite concentrated; 90% of all METRs lie between 20 and 50%, with the highest numbers observed in the 20-30% and 40-50% regions. These regions correspond to the standard and high rate of tax, plus a few percentage points for social insurance contributions and levies. In fact, about 93% of METRs lie below 60%. The small proportion facing higher METRs must also be facing some additional factor. This could be the withdrawal of a welfare benefit – either for themselves or for a spouse – or a move from below to above an income exemption limit, which triggers a PRSI contribution or levy on the whole of their earnings, so that the liability jumps from zero to a significant amount.

Table 5: Distribution of METRs under 2000, 2008 and 2011 Policy

METR	2000 Policy, Indexed by Wage Growth (52%)	2008 Policy, Indexed by Wage Decline (3.7%)	2011 Policy
(%)	(%)	(%)	(%)
<=10	6.1	8.8	4.5
<=20	4.1	8.0	4.3
<=30	32.7	27.1	12.9
<=40	3.5	5.9	25.5
<=50	33.6	41.7	14.3
<=60	13.3	2.4	30.8
<=70	3.8	2.0	2.5
<=80	0.8	1.1	1.4
<=90	0.7	0.3	0.9
Over 90%	1.6	2.7	3.1
Total	100.0	100.0	100.0

A similar distribution is observed for 2008 policy, although there are significantly more people with a METR of below 20 in particular. This reflects increases in tax credits during these years, as policy was focused away from income tax revenue and towards boom-related revenues.

The most striking difference can be observed comparing 2000 and 2008 policy with that prevailing in 2011. A much larger number of people are now facing METRs in the 30-40% and 50-60% regions, marking a clear upward shift in the distribution. The most obvious explanation for this shift is the Universal Social Charge (and earlier income levies) introduced in the wake of the financial crisis in 2009.

Table 6 illustrates the distribution of the changes in METRs observed between the 2 years, clarifying that vast majority of changes in METRS observed between 2008 and 2011 policy are between 5 and 10 percentage points in magnitude, reflecting the Universal Social Charge which replaced the levies.

Table 6: Distribution of the changes in METRs under 2000, 2008 and 2011 Policy

METR	2000 Indexed to 2011 Policy	2008 Indexed to 2011 Policy
(%)	(%)	(%)
≤-10	13.0	1.6
>-10, ≤ -5	4.8	8.7
> -5, ≤ -2	1.0	0.9
> -2, ≤ 2	14.9	3.6
> 2, ≤ 5	26.1	9.8
> 5, ≤ 10	23.4	61.8
> 10	16.8	13.5
Total	100.0	100.0

However there are a substantial number seeing a decrease in their METR between 2008-2011 policy and 2000-2011 policy, with significant numbers having a decline of up to 10 per cent. Some of these cases represent public servants, whose pay was reduced via the pension levy ("Pension Related Deduction") and explicit pay cuts. In some cases these reductions could have brought incomes below the threshold for the higher rate of income tax. The bulk of the cases, however, arise from the introduction of the Universal Social Charge, which moved away from the exemption limit structure of the Health Contribution. There was a "kink" in the schedule, which meant that net income could decline as gross income increased. This implied very high METRs over this range. The USC meant that individuals paid more, but faced a lower marginal rate of tax (defined to included social insurance, levies and USC) on increments to income.

CONCLUSIONS

The recession and the crisis in the public finances have seen unemployment rise sharply while taxes on those in employment (including the Universal Social Charge)

have risen sharply. There has been concern that this combination may weaken the financial incentive to move from unemployment into employment, and selective examples have been used to support this argument. We showed how such examples can be misleading, failing to take into account the range of factors affecting both benefit entitlements and potential earnings in work. Results using a microsimulation approach and a large scale nationally representative sample point to quite different results. The replacement rate – the ratio of out-of-work to in-work income, one of the standard measures of work incentives – was below 70 per cent for more than 8 out of 10 unemployed people in 2011. Only a small minority – about 3 per cent – faced replacement rates of over 100 per cent.

Looking at changes over time, we found that the incidence of high replacement rates (over 70% or 80%) was greatest in 1987 and 1994 and lowest in 2000. Between 2008 and 2011, the incidence of high replacement rates fell. For example, the proportion with replacement rates above 70 per cent fell from 26% to 18% (as against the low of 13% in 2000). These results suggest that measures taken already between 2008 and 2011 have served to maintain a significant financial incentive to work for most unemployed people. A small minority are faced by higher replacement rates, requiring a targeted response rather than one which penalises all those who are unemployed (On this point, see NESC, 2011)[12]. Our earlier work on this topic (Callan et al 2007) pointed to two aspects which deserve further attention. First, the Rent and Mortgage Supplement scheme rules out those who are in full-time employment, with no corresponding support for those in low-paid employment. Second, the medical card scheme is also of an "all-or-nothing" nature. The proposals of the Expert Group on Resource Allocation and Financing in the Health Sector (2010) involved a tapering of entitlements which could avoid the sharp loss often associated with moving from unemployment into employment.

Marginal effective tax rates have increased significantly for most workers, largely reflecting the introduction of the income levies/Universal Social Charge. The large changes observed moving from 2008 to 2011 policy are amplified by the generous, but unsustainable tax and welfare policy that was in place in 2008. Comparing the changes from 2000 policy and 2011 the changes are more muted, although an overall decrease in the financial incentive to progress is still evident.

Some points of comparison with other countries are now being investigated. The distribution of METRs by family type is broadly similar to those seen in the UK (Adam

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[12]   "….disincentives to work ….are better addressed by activation measures, including the power to reduce payments or suspend them altogether for a period of time, rather than by generalised rate reductions targeted on unemployed people" NESC, 2011

and Browne, 2010). In particular a significant number of one-parent families and couples with children, where one partner does not work, are faced with a very weak financial incentive to increase earnings. It would be interesting to extend this comparison to other countries throughout Europe; in this respect there is potential for the use of EUROMOD – the tax-benefit microsimulation model for Europe - to broaden comparisons beyond the UK.

Appendix 1: Measurement of Marginal Tax Rates

We were puzzled to find that from 2005 onwards results from our analysis, based both on SWITCH and on Revenue's IDS16 table, differed sharply from the count of top rate taxpayers in Revenues IDS17 table. (Statistical Report of the Revenue Commissioners 2008, which reports results for 2006). The concept used in SWITCH is a standard one, asking what is the marginal tax rate on the next euro of income. This tallies with the approach in Revenue's marginal tax rate table up to 2004, but figures for 2005 and subsequent years are sharply lower.

It seems that the rationale for the new approach in the Revenue IDS17 table comes from the technical appendix in Budget 2007 (pages C23 to C28 of the Budget booklet). We have looked closely at this, and find that the classification arrived at does not correspond to the standard economic concept of a marginal tax rate. The approach taken in the technical appendix is to classify as standard rate taxpayers all those who pay less tax than an amount equal to the standard rate band times the standard rate of tax. Under the new tax credit system, it is possible for a taxpayer to pay less income tax than the standard tax rate times the standard rate band, but still be facing the top tax rate on the next euro of income. In this case, the marginal tax rate in economic terms is the top tax rate. An example similar to that given in the Budget's technical appendix is repeated below in the left hand column. The amount of tax actually paid is less than the standard rate times the standard rate band. We then consider what happens if €100 is added to the taxpayer's annual income: the tax liability rises by €42, meaning that their marginal rate of tax is indeed 42 per cent.

Tax Credit Scenario		
Taxable Income	35,000	35,100
Standard Rate Band	32,000	32,000
Tax – 20%	6,400	6,400
Tax – 42%	1,260	1,302
Total Tax	7,660	7,702
Minus Tax Credit	1,630	1,630
Total Tax Due	**6,030**	**6,072**

The Budget's technical appendix makes a second argument, for an equivalence between the tax credit system and a tax free allowance based system. It is argued that the same tax relief could have been afforded to the taxpayer under an

allowance based system, at the same cost to the exchequer, and leaving him or her paying tax at the standard rate. This is true, but not the full picture. If this had been done, a taxpayer on *lower* income would have obtained less relief (see example attached, which extends the example in the Budget appendix). Instead, actual policy gave each taxpayer the same relief – this being a feature of a tax credit system – but with the corollary that the higher income taxpayer faced a higher marginal tax rate.

The left hand column of the example below simply restates the Budget appendix example. The right hand column applies the same two systems (one with tax credits, the other with TFA) to an individual with lower earnings. While the systems arrive at equivalent tax bills for the higher earner, the TFA system results in a higher tax bill than the tax credit system for the lower earner.

Tax Credit Scenario		
Taxable Income	35,880	25,000
Standard Rate Bank	32,000	32,000
Tax – 20%	6,400	5,000
Tax – 42%	1,630	0
Total Tax	8,030	5,000
Minus Tax Credit	1,630	1,630
Total Tax Due	**6,400**	**3,370**
Tax-Free Allowance Scenario		
Income	35,880	25,000
Minus TFA	3,880	3,880
Taxable Income	32,000	21,120
Tax – 20%	6,400	4,224
Tax – 42%	0	0
Total Tax Due	**6,400**	**4,224**

Our major concern here is to represent accurately the current number of top rate taxpayers, and the evolution of the proportion of taxpayers paying tax at the top rate. In this context we need to use the economic concept of the marginal rate of tax, which relates to the amount of tax paid on the next euro of income. In our view, this series should be restored, as this is the concept of greatest relevance to policy.

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