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POLICY PAPER

The Structure of Ireland's Tax System and Options for Growth Enhancing Reform

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Abstract: This paper explores the structure of Ireland's tax system. Considerable attention is given to GDP and GNP as measures of Ireland's taxable capacity but how appropriate are either of these measures given the structure of Ireland's economy and how does the structure compare internationally? The paper also examines the distribution of income tax and the threshold for the top marginal rate as a percentage of the average wage and identifies Ireland as an outlier internationally in terms of the rapid progression to the highest marginal rate. Consideration is then given to the microeconomic and macroeconomic impacts of various forms of tax what lessons emerge from the literature in terms of growth enhancing reforms to the overall tax structures and how that might apply to Ireland. The results of simulations suggest permanent increases in GDP and employment from a revenue neutral shift from labour to consumption or property taxes.

I INTRODUCTION

As Ireland prepares to exit its EU/IMF programme of financial assistance at end-2013, attention is turning to the economic strategies that Ireland could pursue over the medium term. A central issue is how the economy's

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growth potential can be increased in order to provide greater employment opportunities and sustainable improvements in living standards. This imperative requires that policies across a range of areas be examined with a view towards assessing whether growth-friendly changes could be made having regard to wider societal objectives. This paper seeks to contribute to this discussion by analysing the role, both positive and negative, that the specific area of taxation policy can have on economic growth.

After a period of significant fiscal adjustment, it is worth reviewing where Ireland's tax structure stands in an international context. Cross-country differences in overall tax levels largely reflect societal choices as to the appropriate level of State provision in the economy and the resulting levels of public spending.[1] However, investigating how tax structures could best be designed or altered to promote economic growth is a key issue for tax policy making. As acknowledged in the *Mirrlees Review* by the Institute of Fiscal Studies,[2] improvements in tax structure and design can reap very valuable dividends in terms of increased economic efficiency and greater fairness. It is therefore relevant to look at the structure of Ireland's tax system in an international context (see Section II).

As well as comparing the tax structure with that of peer countries, this paper considers what can be learned from the microeconomic literature on optimal taxation and the macroeconomic interaction between tax policy and economic growth (see Section III). The paper then considers the types of growth friendly tax reforms that emerge from the literature on tax and economic growth (see Section IV). An obvious issue that emerges from the discussion is whether scope exists to pursue growth friendly reforms to the tax structure in Ireland and what the impact of these reforms on employment and economic growth might be. Results from two macrosimulation models on the output and employment impacts are presented in Section V.

Whilst the purpose of the paper is to stimulate thought and discussion on how tax policy can contribute towards improved economic performance, it should be acknowledged that a trade-off can exist between growth-orientated tax policy and equity and progressivity concerns. This paper does not attempt to address this trade-off, although it notes the highly progressive nature of the Irish personal income taxation system by international standards.

[1] Johansson *et al.* (2008).
[2] See *Mirrlees Review: Tax by Design*, Section 1.

II STRUCTURE OF TAXATION IN IRELAND

High taxation levels are often regarded as an important contributor towards low employment levels and unsatisfactory economic performance in Europe.[3] High taxes on labour and corporate income can discourage labour supply and demand, and reduce incentives for investment and human capital formation. Accordingly, some commentators recommend a substantial reduction in tax levels, particularly on taxes on employment, to revitalise European economies.

On the other hand, some EU Member States have been able to combine relatively high levels of taxation with a strong economic performance and low unemployment. This indicates that the determination of the optimal aggregate level of taxation is not straightforward.

A number of broad arguments have been put forward as regards the size and distribution of the tax burden in Ireland in recent years. Some observers have argued that the burden of taxation is too low and that scope exists to raise the level of taxation as a share of output, whereas others have argued that there is no further scope for fiscal adjustment on the revenue side. In a related debate, some have suggested that the tax burden on labour is too high while others have argued that the burden is not high enough on high earners. Very little comment has addressed the potential for (revenue neutral) shifts in the structure of taxation in Ireland.

The discussion that follows seeks to present data on the structure of the tax system and, in the process, identify whether evidence can support any of the arguments referred to above. It also seeks to identify whether opportunities exist for a shift in the structure. The paper does not seek to address wider normative issues regarding the optimal size of the State.

2.1 *The Overall Tax Burden*

The tax burden in Ireland is generally expressed as a share of gross domestic product (GDP). GDP is an estimate of the total value of all final goods and services produced within a country in a given year and is generally regarded as an appropriate measure of the tax base. Using GDP as the relevant tax base, Ireland had one of the lowest tax burdens in the EU-27 in 2011, the most recent year for which outturn data are available.[4] On this basis, it might appear at first sight that Ireland has the capacity for generating greater tax revenue by international comparisons.

[3] European Commission (2008).
[4] European Commission (2013).

An alternative measure of the tax base is a country's gross national product (GNP). While GDP measures the total output of the economy in a period, i.e. the value of work undertaken by employees, companies and self-employed persons, this work generates incomes but not all of these incomes remain the property of residents (and residents may earn some income abroad). The total income remaining with Irish residents is GNP and it differs from GDP by the net amount of incomes sent to or received from abroad. The difference between GDP and GNP is the factor flow to/from abroad and in Ireland's case the factor flow out of Ireland is very large and negative. Ireland's GNP is therefore less than its GDP.

As shown in Callan *et al.* (2013), after Luxembourg, Ireland had the largest difference between GDP and GNP in Europe in 2011 when GDP represented 124 per cent of GNP, with the rest of the EU-27 in a range between 97 per cent (Denmark) and 108 per cent (Czech Republic). Due to this difference some commentators (McCarthy 2004, 2010) have argued the lower potential tax yield from net factor outflows means that GNP should be preferred.[5]

Another view is that the "true" base for Ireland is likely to be somewhere between GNP and GDP. The Irish Fiscal Advisory Council (IFAC) used a linear regression to empirically estimate an economic relationship between tax revenues and output.[6] Using this approach IFAC suggested a 'hybrid' measure of GNP plus 40 per cent of net factor flows, in other words GNP plus 40 per cent of the difference between GDP and GNP.

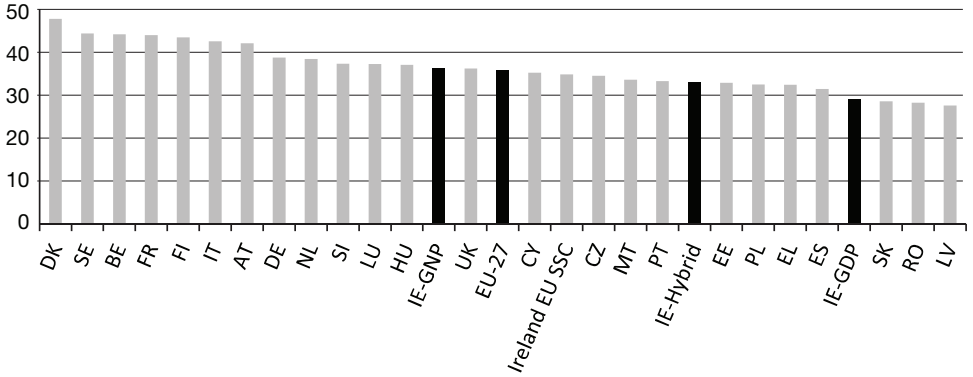
Figure 1 below looks at the tax burden as a share of economic output for the EU-27 in 2011 with three bases used for Ireland; GDP, GNP and the IFAC hybrid measure. Ireland would have a tax burden in excess of the European average if GNP was used as the relevant base and just below the EU average using IFAC's hybrid approach.

Thus from a purely benchmarking perspective, the capacity for Ireland to raise additional revenue as a share of output depends on one's view as to the appropriate measure of the tax base taking into account the structure of the Irish economy and the size of factor flows out of the country.

Sticking with GDP as the relevant base it is worth asking what it is that results in Ireland looking like an outlier in such benchmarking comparisons. Figure 1 above includes social security contributions (SSC) as a tax revenue. SSC in Ireland at 5 per cent of GDP are the second lowest in the EU-27 after

[5] However as shown in Fitzgerald (2013) GNP itself has been distorted in recent years by the arrival of re-domiciled UK Plcs since 2008 which are estimated to have added up to 4 per cent to the level of GNP in 2012, while having very little impact on GDP.
[6] IFAC (2012).

Figure 1: *Tax as a Share of GDP, 2011*



Source: Taxation Trends in the EU, European Commission (2013) and author's calculations.

Denmark,[7] and are less than half the EU-27 average of 11 per cent and just under half the OECD average of 9 per cent.[8] In some countries, social insurance is a genuine form of insurance whereas in others (such as Ireland) the link between contributions and benefits is less clear-cut. Given this heterogeneity it is worth benchmarking Ireland against other countries SSC excluded to compare how 'core' taxation compares in an international context.

Figure 2 below presents total taxation as a share of GDP without SSC. At 24 per cent of GDP it is clear that after stripping out the impact of SSC Ireland's 'core' tax burden is in line with the EU average of 25 per cent, and is above the EU average when the alternative measures of economic output are used.[9]

2.2 *Labour Taxes*

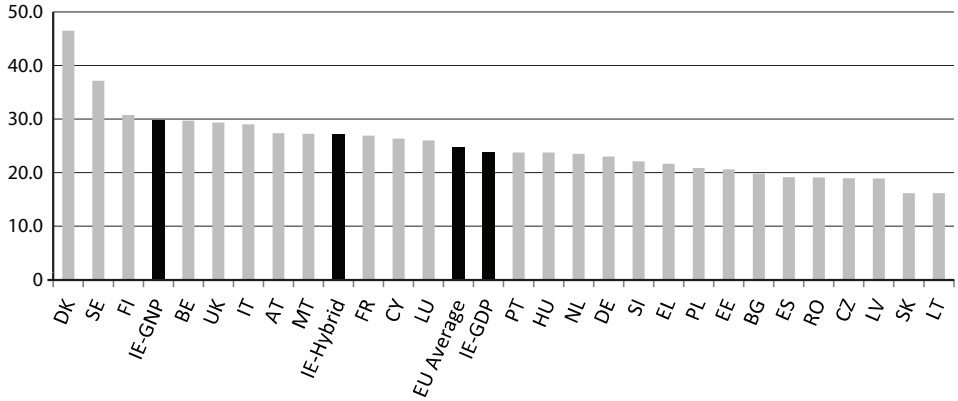
At €19 billion in 2011, labour taxes in Ireland represented 12 per cent of GDP. This placed Ireland as the fifth lowest in the EU-27 and approximately five percentage points below the EU-27 ratio. Such an outcome is consistent with the findings from the economic literature on the need to keep the overall tax burden on labour low (Prescott, 2004) and the EU trend of shifting the tax burden away from labour (European Commission, 2013).

[7] There was a total of €7.9 billion in contributions in Ireland in 2011, with €5.5 billion in employer contributions, €2 billion in employee contributions, and €0.3 billion in contributions by self-employed and non-employed.

[8] See *Taxation Trends in the European Union* and OECD *Revenue Statistics*.

[9] Similarly, if Ireland's level of SSC as a share of GDP were at the EU average of 11 per cent it would add an additional 6 per cent of GDP to the tax burden and bring Ireland up to the EU average.

Figure 2: *Tax as a Share of GDP Excluding Social Security Contributions, 2011*



Source: Taxation Trends in the EU, European Commission (2013) and author's calculations.

In the same year labour taxes accounted for 42 per cent of total taxation, a share in the mid-range of EU Member States but below the EU average of 47 per cent. As with the preceding discussion on total taxation, a cross country comparison is somewhat distorted by the inclusion of SSC in this measure.[10]

When SSC are excluded Ireland's labour taxes at 7 per cent of GDP would exceed the EU average of 6 per cent. Similarly, the share of total taxation would stand at 24 per cent as against the EU average of 16 per cent. This shows that the 'core' burden of taxation on income is relatively high in an EU context and that the lower headline level is explained by SSC.

Table 1: *Taxation on Labour as a Share of GDP and Total Taxation, 2011*

	Ireland %	*Ireland's Rank in EU-27*	*EU Average* %
Share of GDP			
Labour including SSC	12	23	17
Labour excluding SSC	7	8	6
Share of Taxation			
Labour including SSC	42	19	47
Labour excluding SSC	25	3	16

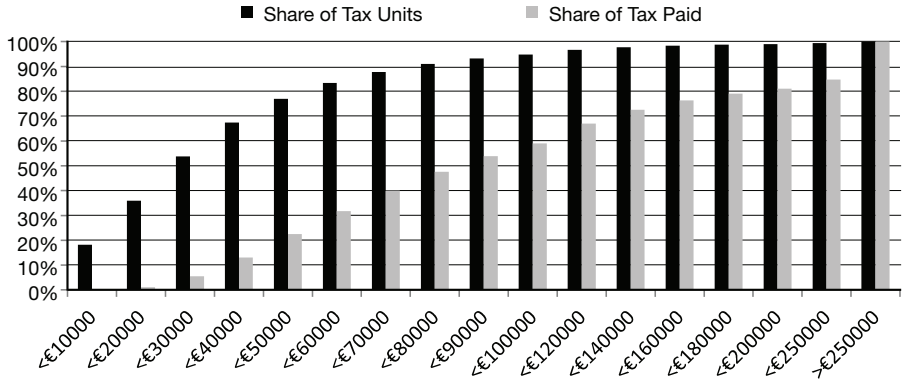
Source: Taxation Trends in the EU, European Commission (2013).

[10] The *Mirrlees Review* by the Institute for Fiscal Studies did not regard UK SSC (NIC) as a true SSC and instead regarded it as a tax on labour. It argued that for some countries the SSC is a pure SSC and for others a tax.

Whilst the analysis above benchmarks Ireland's tax burden on labour against other European Union Member States it is worthwhile also to look at how the burden is distributed by income levels and how this compares internationally.

In 2012 the top 1 per cent of earners, roughly equating to tax units with income in excess of €200,000, paid 19 per cent of income taxation including the universal social charge (USC) in Ireland. The top 5 per cent of earners, which equates to tax units with income in excess of about €100,000, paid approximately 40 per cent of income tax and the USC and the top 23 per cent of tax units, with income in excess of €50,000, paid approximately 77 per cent of tax and USC.[11] It is clear, therefore, that the burden of taxation mostly falls on higher paid tax units.

Figure 3: *Cumulative Income Tax and USC Paid by Income Level, 2012*



Source: Author's analysis based on data from the Revenue Commissioners.

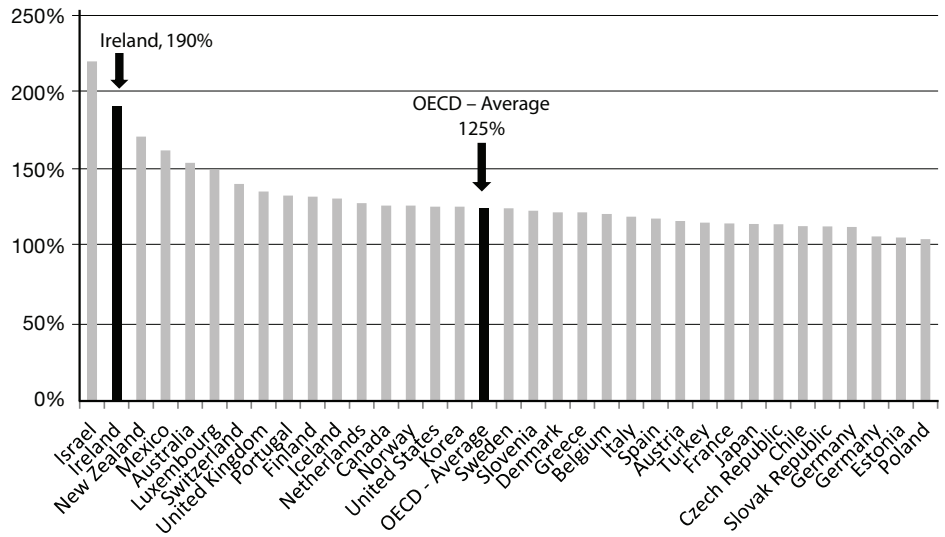
According to OECD data,[12] the Irish income tax system is one of the most progressive in the world, as measured by the OECD metric of comparing the ratio of the tax wedge of a single individual at 166 per cent of the average wage

[11] The most recent year for which data is disaggregated by the Revenue Commissioners into single and married tax units is 2010. In that year 77 per cent of single tax units which represented a gross income of €35,000 or less, contributed 15 per cent of all tax paid by that cohort, while for married (jointly assessed) tax units 79 per cent of tax units, representing a joint gross income of €75,000 or less contributed 23 per cent of all tax paid by that cohort. Overall, for that year the first 78 per cent of tax units contributed 18 per cent of tax, or equivalently the last 22 per cent of tax units paid 82 per cent of all tax. The year 2010 included the income and health levies but not the USC or the changes in income tax credits and bands that were introduced in Budget 2011 and are represented in Figure 3.

[12] OECD (2013a).

with an individual at 66 per cent of the average wage.[13] Using this approach Ireland's progressivity score of 190 per cent was the second highest in the OECD after Israel.

Figure 4: *OECD Progressivity Measure, Single Tax Payers, 2012*



Source: OECD (2013a), *Taxing Wages 2013.*

This outcome is not surprising given the low effective tax rates at the low end of the income distribution. According to OECD data, the effective rates of tax on workers (including SSC) for a single individual in Ireland are below the OECD average at both 66 per cent of the average wage and at the average wage, and only converge with the OECD average at 166 per cent of the average wage. When SSC are excluded the effective rates at 66 per cent of the average wage are still below the OECD average and converge at the average wage. The effective rate on an individual at 166 per cent of the average is almost 7 per cent higher than the OECD average.

In terms of the entry points to core income tax (excluding USC and SSC), Abbas (2012) identified the entry point to core income tax of €16,500, which corresponds to 51 per cent of the average wage, as being by far, the highest in the OECD. The next closest ratio according to Abbas is 27.6 per cent in Italy, with the average for both OECD and English-speaking economies being 9 per cent. If USC were included the entry point in Ireland in 2012 would reduce to

[13] These income levels were approximately €54,400 and €21,800 based on an average wage of €32,600 in 2012.

Table 2: *Effective Rates of Taxation, Single Individuals, No Children, 2012*

	66% of Average Wage %	*100% of Average Wage* %	*166% of Average Wage* %
Income tax (including USC) and SSC			
Ireland	11.5	18.0	31.5
OECD average	21.1	25.1	30.5
Income tax only (including USC)			
Ireland	8.7	14.8	28.0
OECD average	11.2	15.3	21.3

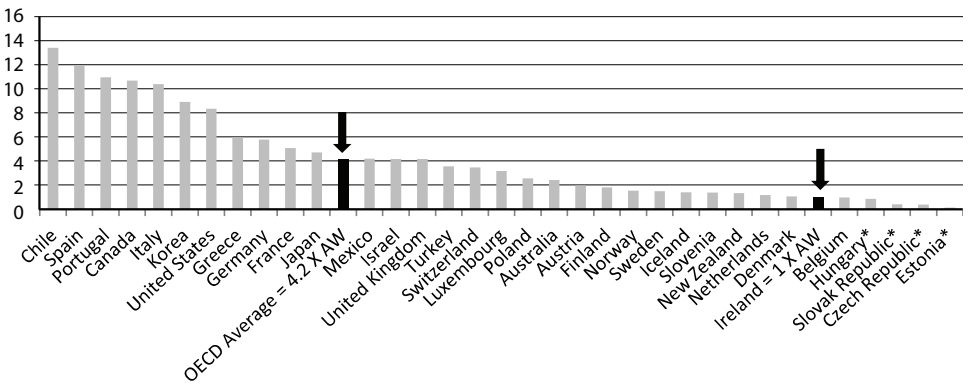
Source: OECD (2013a), *Taxing Wages 2013.*

€10,036 which, at just under one-third of the average wage would, remain unusually high.

Against this Ireland has one of the lowest entry points, as a multiple of the average wage, to the top marginal tax rates (MTR) in the OECD. Ireland's top marginal rate of 52 per cent including SSC, and 48 per cent excluding SSC, begins at the average wage.[14] Excluding the four countries that operate a flat tax system (Estonia, Czech Republic, Slovakia and Hungary), Ireland in fact has the joint lowest entry point to the top MTR in the OECD.

In short, entry to core income tax in Ireland is relatively high but progression to the highest marginal rate is relatively swift.

Figure 5: *Threshold for Top Marginal Tax Rate as a Multiple of the Average Wage, Single Tax Payers, 2012*

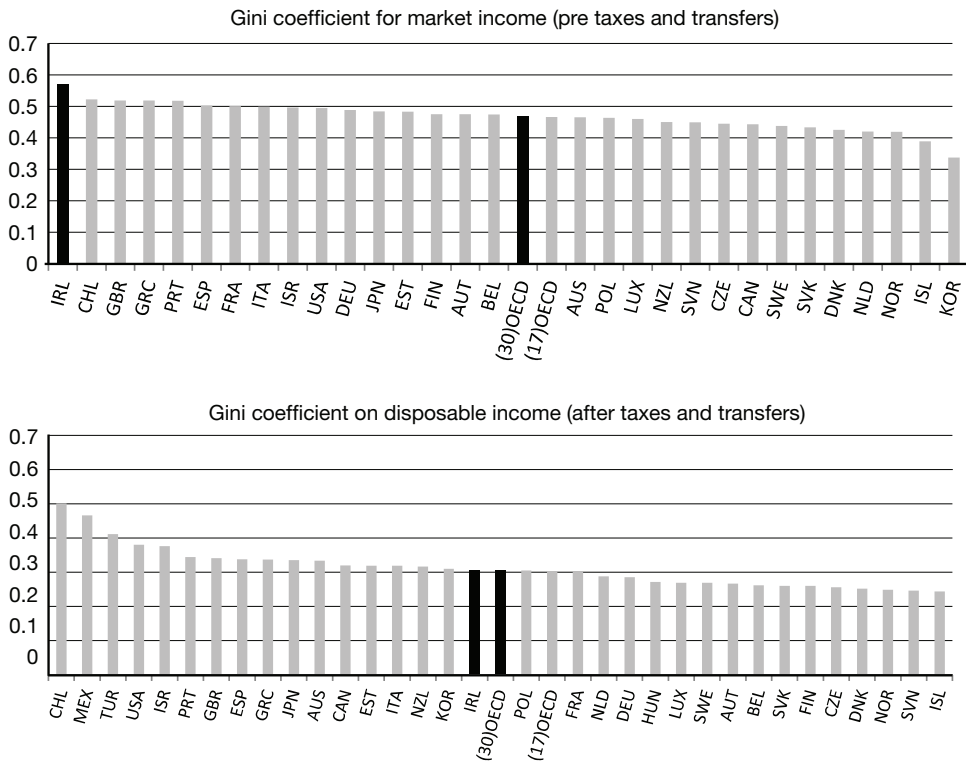


Source: OECD (2013a), *Taxing Wages 2013.*

[14] The top marginal tax rate commences at €32,800 while the average wage in 2012 was estimated by the OECD (2013a) in *Taxing Wages 2013* as €32,626.

Finally the role played by the taxation (and benefits) system in achieving redistributive objectives should be acknowledged. For Ireland the Gini coefficient, which is a measure of income inequality,[15] when calculated after accounting for taxation and social transfers, is in line with the OECD average suggesting less inequality than the average OECD economy.[16] However, when estimated before taxes and transfers – i.e., on the basis of market incomes only – Ireland has one of the highest Gini coefficients in the OECD. This illustrates the very significant impact that Ireland's taxation (and benefits) system currently has in redistributing income.

Figure 6: *Gini Coefficient for Market and Disposable Income, 2010*



Source: OECD (2013b), *Income Distribution Database, 2013.*

[15] The Gini coefficient is a number between 0 and 1 representing income distribution in a population. Zero being the case where everyone has the same income and one the case where one individual has all the income. It is commonly used as a measure of income inequality.

[16] See OECD (2013b), *Income Distribution Database, 2013*, see http://www.oecd.org/social/inequality.htm

2.3 *Consumption Taxes*

Consumption taxes which include VAT, excise taxes and other consumption taxes account for on average 12 per cent of GDP in the EU-27 compared with 10 per cent of GDP in Ireland which is the second lowest level amongst EU Member States after Spain. Using the IFAC hybrid measure or GNP brings the ratio for Ireland to within one percentage point either side of the EU average. As a share of total taxation, Ireland is at the mid-point of the EU Member States at a level equal to the EU average. In terms of VAT (i.e., excluding excise and other consumption taxes), Ireland also has one of the lowest shares of GDP but a share of taxation in line with the EU average.[17]

Table 3: *VAT and Consumption Taxes, 2011*

	Ireland %	*Ireland's Rank in EU-27*	*EU Average* %
Consumption Taxes			
Share of GDP	10	14	12
Share of Taxation	35	26	34
VAT			
Share of GDP	6	26	8
Share of Taxation	21	15	22

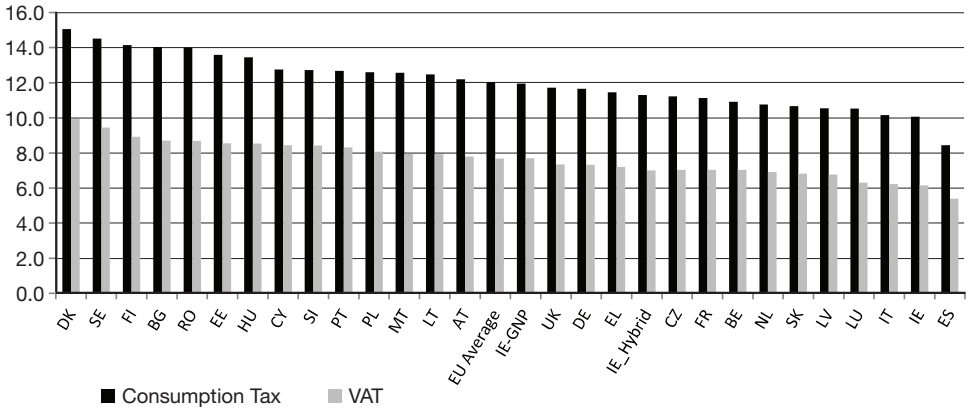
Source: Taxation Trends in the EU, European Commission (2013).

Thus for both VAT and consumption taxes in general, Ireland appears to have a low yield as a share of GDP but a share of total taxation in line with the EU average. This fact was noted by the European Commission (2012)[18] in pointing out that the potential exists to shift towards consumption taxes and away from taxes that are more harmful to growth, a topic that is returned to in Section IV.

For comparison purposes VAT and consumptions taxes are presented as a share of GDP, GNP and the IFAC hybrid in the cross-country comparison in Figure 7. This shows that using GDP as the relevant tax base Ireland's share of consumption taxes is quite low but closer to the EU average using the alternative measures.

[17] VAT receipts in Ireland increased in 2012 following an increase in the standard rate from 21 per cent to 23 per cent. Whilst data on other EU member states are not publicly available with respect to 2012, Ireland's VAT as a share of GDP in 2012 remained constant relative to 2011 at 6 per cent.
[18] See Table 5.8, European Commission (2012).

Figure 7: *Consumption Tax and VAT as a Share of GDP, 2011*

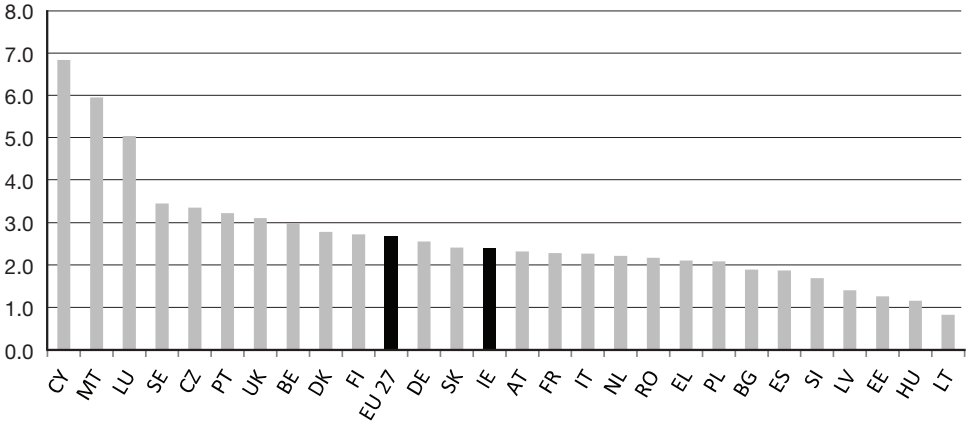


Source: Taxation Trends in the EU, European Commission (2013) and author's calculations.

2.4 *Corporate Income Tax*

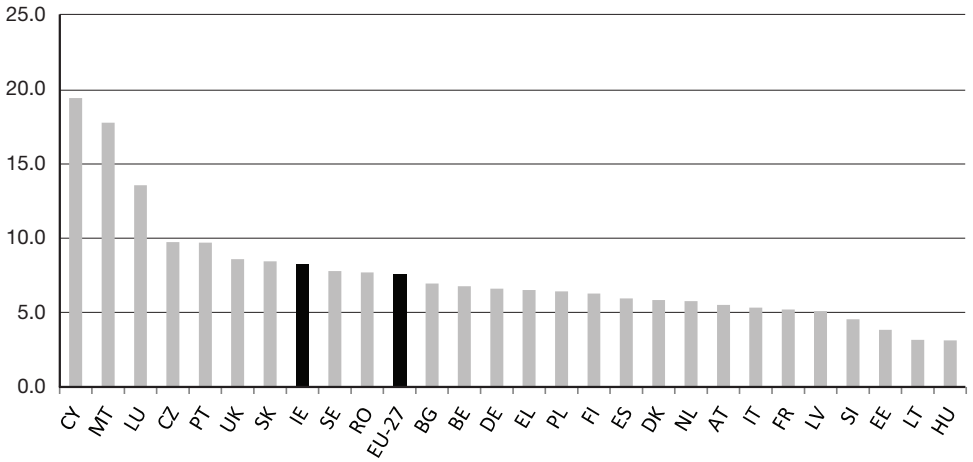
As a share of GDP the amount of corporate income tax collected in Ireland at 2.4 per cent of GDP in 2011 was only marginally behind the EU-27 average of 2.7 per cent. As a share of total tax revenue Ireland's outcome of 8.3 per cent placed it eighth highest in the EU and higher than the EU average of 7.5 per cent (see Figures 8 and 9 below).

Figure 8: *Corporate Income Tax as a Share of GDP, 2011*



Source: Taxation Trends in the EU, European Commission (2013) and author's calculations.

Figure 9: *Corporate Income Tax as Percentage of Total Taxation, 2011*



Source: Taxation Trends in the EU, European Commission (2013) and author's calculations.

A link appears to exist between the size of a country's financial sector, as measured by share of value added, and the relative importance of corporation tax, both as a share of GDP and the country's overall tax base. For instance the five largest financial sectors relative to the own country gross value added in 2011 were in Luxembourg, Ireland, Cyprus, the United Kingdom and Malta. These countries also had relatively large corporation tax shares.

2.5 *Environmental Taxation*

Under the ESA-95 classification, environmental taxes refer to transport (excluding fuels), energy (including transport fuels) and pollution/resources taxes.

As a share of GDP, environmental taxes were about 2.6 per cent in 2011, a level equivalent to the EU average, and at €4.1 billion equated to approximately 9 per cent of total taxation, as against the EU average of 7 per cent, and represented the sixth highest share of taxation in the EU.

2.6 *Property Taxation*

Property taxation in Ireland in 2011 was accounted for by a transactional tax in the form of stamp duty on non-residential and residential property, and two recurring charges in the form of a non-principal private residence charge and commercial rates levied by local governments on commercial premises.

A household charge was introduced on all residential properties in 2012 and in 2013 this was replaced by a market value 'band based' recurrent tax on

residential property. The non-principal private residence charge will be removed in 2014 coinciding with the first full year of the recurring tax on residential property known as the local property tax (LPT).

The 2011 benchmarking data presented in Table 4 below, therefore, relates to a year in which Ireland did not have a recurring tax on all immovable property and with transaction-based taxes at a cyclical low. In any event, as a share of GDP, Ireland's property taxes as a whole, (i.e., including the transactional stamp duty tax) and recurring taxes on immovable property, were in line with the EU average and were above the EU average in terms of the share of total taxation.

Table 4: *Property Taxes as Share of GDP and Taxation, 2011*

	Ireland %	*Ireland's Rank in EU-27*	*EU Average* %
Property Taxes			
Share of GDP	1.2	10	1.3
Share of Taxation	4.0	8	3.6
Recurring Taxes on Immovable Property			
Share of GDP	0.9	8	0.8
Share of Taxation	3.2	6	2.3

Source: Taxation Trends in the EU, European Commission (2013).

While Ireland may have had a high share of property related taxation relative to other European Union Member States, Abbas (2012) shows that, when compared with other English speaking OECD countries,[19] Ireland has a comparatively low level of property taxation, especially for recurrent taxes on immovable property. With a similar ratio to GDP in 2010 as 2011 (0.9 per cent), Ireland compared unfavourably with the average of 3 per cent of GDP for the group of English speaking economies cited by the author; with the share of recurrent property taxation in total property taxes of 57 per cent well below the 83 per cent in these economies.

Norregaard (2013) outlines the benefits of higher recurrent property taxation on immovable property which include the relatively stable source of

[19] The English speaking countries referred to by Abbas were the United Kingdom, the United States, Canada, Australia and New Zealand. The author used these countries as a comparator group given the relatively similar share of personal income taxation (including SSC) as a share of government revenue in Ireland (47 per cent) and average for this group (45 per cent). By way of contrast the small European, large European and OECD average for the personal income tax share in 2011 was 56 per cent, 59 per cent and 53 per cent respectively.

revenue from this source, which is important in small open economies with volatile tax bases such as Ireland. The volatility and cyclicality of tax bases in small open economies is particularly relevant for Ireland given that the transactional nature of Ireland's property taxes prior to the introduction of the local property tax in 2013 has been shown to have been highly cyclical (see Callan *et al.*, 2010).

III ECONOMIC THEORY OF TAX POLICY AND ECONOMIC GROWTH

Taxation can impact on the economy through microeconomic and macroeconomic channels. The macroeconomic factors are discussed in greater detail below and relate to the drivers of economic growth, labour supply and participation, capital formation and total factor productivity. Before this it is worth discussing the microeconomic aspects of taxation through its impacts on individual incentives and decisions as it is the aggregate impacts of these decisions that drive the macroeconomy.[20]

3.1 *Microeconomic Principles of Taxation*

The microeconomic principles of taxation relate to the impacts that taxation can have on individual's decisions and the 'deadweight' losses that can arise from distortions to these decisions caused by taxation. Tax systems with high marginal rates and narrow bases create larger distortions relative to those with low rates and wide bases.

Estimates for the size of the deadweight loss from income taxation in Ireland were computed by Honohon and Irvine (1987). The authors estimated a deadweight loss of 1.73 times the revenue raised in Ireland in the 1980s under certain assumptions regarding the elasticity of labour supply and the levels of redistribution of the revenues raised. Whilst the estimates may not be readily applicable to Ireland's income tax system today, they are illustrative of the high social cost of raising revenues with high marginal rates and narrow bases. The lessons from this research have recently been reflected in the work of the Commission on Taxation (2009) which stated in its approach to tax reform that lower tax rates and broader bases were preferable to higher rates on narrow bases.

A key goal for tax design should be to reduce the deadweight cost of taxation across the system. Taxes disrupt the economic signals that prices send in market economies by driving a wedge between the price paid by the

[20] The foregoing discussion relies heavily on the insights and learnings from *Mirrlees Review: Tax by Design* of the Institute of Fiscal Studies.

buyer of a good or service and that received by the supplier. Income tax results in employers paying more for an hour of work than employees receive, while consumption taxes result in retailers receiving less for a product than customers pay. By increasing prices and reducing quantities bought and sold, taxes impose a cost on consumers and producers alike. The sum of these welfare costs almost always exceeds the revenue that the taxes raise – the difference is referred to as the deadweight cost of taxation.[21]

An established framework for considering the impact of taxation on an individual's decisions involves analysing the impact of income and substitution effects. When a tax is introduced or increased, an individual's after tax income declines, making them comparatively poorer, and thereby incentivising greater labour supply to maintain the same after tax income. Thus increases in average rates increase incentives. This is referred to as the income effect. However, at the margin the increased tax reduces the return to labour which incentivises less labour supply. Thus increases in marginal rates reduce incentives. This is referred to as the substitution effect as individuals are incentivised to substitute from labour to leisure. The income and substitution effects have the opposite impacts on an individual's incentives, however, most empirical work suggests that the substitution effect dominates.[22]

Taxing negative externalities can promote welfare by internalising the costs of the externality into an individual's decision,[23] for example the taxation of social or environmental 'bads', such as tobacco, alcohol or carbon. Taxation can also remedy market failure, such as underinvestment by the private sector in R&D relative to the socially optimum level.

An optimal tax is one which is neutral to decisions and in the process minimises deadweight effects.[24] The principle of neutrality was one of the guiding principles of Ireland's Commission on Taxation (2009).[25] A neutral tax

[21] Two other costs of taxation include compliance and administrative costs.

[22] See *Mirrlees Review,* Section 2 the "Economic Approach to Tax Design".

[23] An externality represents a cost or benefit from an activity that does not accrue to the individual or organisation carrying out the activity. A negative externality includes costs such as pollution or noise which have to be borne by others but not those who carried out the activity that created the externality, while a positive externality may include the benefit to society from R&D investments by private companies. Because the costs of a negative externality (or the benefits of a positive externality) are not priced in the cost of the action that created the externality, private individuals or organisations will over-produce these costs relative to the socially optimum level (or under produce in the case of positive externalities).

[24] As well as requiring that a system be neutral, optimal taxation also requires the system to be simple and stable (see *Mirrlees Review*, Section 2, the "Economic Approach to Tax Design", pp. 40-44).

[25] The other guiding principles of the Commission on Taxation (2009) were equity, flexibility, simplicity, evidence-based approach and pragmatism.

system treats similar activities in similar ways, in other words individual's decisions should not be distorted in respect of different forms of consumption, income or savings.[26] A neutral system minimises welfare losses arising from these distortions.

An individual's labour supply decisions can be impacted by the non-neutral treatment of earned and non-earned income. A consumer's expenditure basket can be distorted by different VAT rates for similar goods and services. Other examples of a non-neutral system include differential taxation of debt and equity and differential taxation of owner occupied housing and other assets. In a limited set of circumstances a departure from neutrality can be a good thing, in particular to remedy a market failure (e.g., the taxation of environmental or social bads, incentives for business expenditure on R&D, lighter taxation of goods which are complementary to work such as childcare costs), or to create incentives for pensions savings.

Optimal tax theory balances efficiency losses against a government's desire for redistribution and the need to raise revenue. A progressive system will set taxes on earnings at higher rates for higher earners, but higher tax rates impose distortions and disincentives. An income tax system is optimal when the gain through redistribution, and raising revenue, exceeds the deadweight cost from lowering labour incentives.

Optimal taxation does not always support taking distributional effects into account when considering taxation on goods and services – e.g., by using differentiated rates. If taxes on earnings are well designed they can do the "heavy lifting" as far as achieving progressivity is concerned. If progressivity is achieved in the income tax system the rest of the system should focus on efficiency.

3.2 *The Macroeconomics of Taxation on Growth*

By distorting individual decisions, taxation can impact on economic output (Y) and growth by affecting any of the three components of output that are described in the production function below, namely human capital (L), physical capital (K) and total factor productivity (A):

$$Y = F(L, K, A)$$

[26] In this discussion neutrality relates to decisions within a particular activity, e.g., within consumption decisions, rather than across activities such as consumption and leisure. Individuals will not be neutral between various forms of consumption if there are differential forms or rates of consumption tax applied. Of course an individual's decisions between consumption and leisure may be distorted even with a common rate of consumption tax as the individual may favour more or less consumption relative to leisure. Only a single lump sum tax will maintain neutrality between consumption and leisure. The author thanks the anonymous referee for valuable comments in this regard.

The early literature on growth focused only on human and physical capital with productivity considered to be exogenous (i.e. determined outside the model). The key finding from these 'exogenous' growth models was that growth occurs only through the accumulation of capital, which itself is determined by the level of savings and depreciation in an economy. Additions of capital to a fixed supply of labour result in decreasing returns to capital over time and a long run limit on the growth in living standards. Chamley (1986) and Judd (1985) showed in the exogenous model the link between capital formation and savings leads to a long run optimal tax on capital income of zero. Consequently all taxation should fall on labour income under these models.[27]

The drawback of the exogenous growth model is that it ignored the critical driver of permanent increases in growth, namely productivity. Endogenous growth models allow for sustained growth and explain its sources. These endogenous models focus on the drivers of total factor productivity and include explicit models of improvements in human capital, learning by doing, innovation, technology transfer.

According to Myles (2009), the common property of endogenous growth models are that choices are made by economic agents, these choices lead to productivity growth and they can be influenced by economic policies such as taxation. This allows the effects of taxation to be traced through the economy and an assessment to be made as to possible impacts on growth. For instance an increase in taxation reduces the returns to investment (in both physical and human capital) and R&D. Lower returns mean less accumulation of human and physical capital and innovation in terms of productivity, and hence a lower rate of growth.

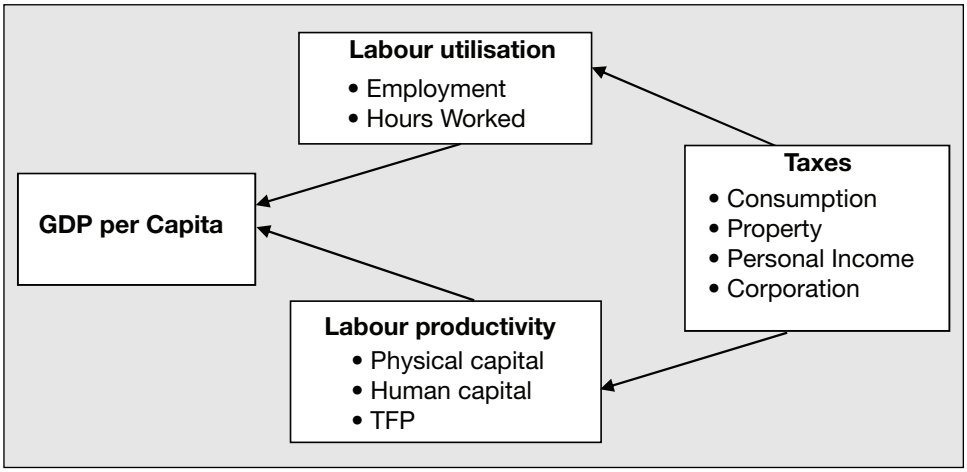
Taxes that have a smaller negative impact on the economic decisions of individuals and firms are less negative for economic growth. The economic literature and empirical work by the OECD suggests a tax and economic growth hierarchy with recurrent taxes on immovable property being the least distortive tax instrument in terms of reducing long-run GDP per capita, followed by consumption taxes and other property taxes as well as environmentally-related taxes, personal income taxes and corporate income taxes (see Johansson *et al.,* 2008). Viewed against this hierarchy, recent policy changes such as the elimination of tax expenditures, the raising of consumption and other indirect taxes and the introduction of a local property tax, may be regarded as growth friendly initiatives.

It is useful to think of how the structure of the tax system can impact on GDP per capita in terms of a framework described by the OECD. GDP per capita can be impacted by affecting the amount of hours worked in the

[27] See Myles (2009) for a derivation of this outcome.

economy (labour utilisation), and the amount of output that is produced per hour (labour productivity) or both (see below).

Figure 10: *How Taxes Affect the Determinants of Economic Growth*



Source: OECD (2010), *Tax Policy Reform and Economic Growth*, OECD Tax Policy Studies.

The discussion below considers the impact that individual taxes have on the determinants of growth. The lessons from this section and those from the structure of the Irish tax system are brought together later in the paper (see Section V).

3.2.1 Property Taxes

Recurrent taxes on land and buildings have a small adverse effect on economic performance. This is because these taxes do not affect the decisions of economic agents to supply labour, to invest in human capital, to produce, invest and innovate to the same extent as some other taxes.

As buildings and land are highly visible and immobile, these taxes are difficult to evade, and the immovable nature of the tax base may be particularly appealing at a time when the bases of other taxes become increasingly internationally mobile. For a further discussion see Heady (2009) or Callan *et al.* (2010).

Norregard (2013) argues that taxation of immovable property is highly efficient (in terms of collection and the difficulty for individuals to evade), benign on growth and to the extent that property taxes are based on market values are regarded as equitable. However, Norregard also acknowledges their

unpopularity which relates to their visibility and difficulty in terms of avoidance.

3.2.2 Consumption Taxes

Consumption taxes are neutral with respect to saving as, in the absence of rate changes, they apply the same rate to current and future consumption. They, therefore, do not affect the supply of funds for investment and physical capital formation.

Consumption taxes have a lower impact on labour supply incentives than direct taxes, for equivalent revenue, as they are paid out of expenditure financed by both labour income and non-labour income.

Consumption taxes tend not to be progressive and, therefore, have a lower impact on growth per unit of tax revenue than progressive income taxes which tend to vary with income. However, changes in consumption taxes lower the purchasing power of real after tax wages and, therefore, impact labour supply in the same way as labour taxation. Whilst this principle is undoubtedly true in the long term consumption taxes may be less harmful in the short term with evidence from behavioural economics suggesting consumption taxes result in less negative incentives than income taxes even though the impact on the actual household budget would be equivalent.[28]

3.2.3 Personal Income Taxes

Personal income taxes are seen as more harmful to growth than consumption taxes. They are generally progressive, with marginal tax rates that are higher than their average rates. This means that they discourage growth more per unit of tax revenue than consumption taxes which do not vary with income.

Tax progressivity through higher top marginal tax rates affect both labour utilisation and productivity, thus suggesting a non-trivial trade-off between tax policies that enhance GDP per capita and distributional objectives.[29] In addition, the tax wedge between labour cost and take-home pay is found to have a negative effect on the employment rate and thus labour utilisation.[30]

[28] See Blumkin *et al.* (2012) .

[29] Controlling for human capital, the OECD's growth regressions (OECD, 2010) point towards the sizeable adverse effects of progressive income tax schedules on GDP per capita. Results show that for an average OECD country if the marginal tax rate were to decrease by 5 percentage points, thus decreasing the progressivity of income taxes, the estimated increase in GDP per capita in the long run would be around 1 per cent.

[30] Nickel (2004) found that a 10 percentage point increase in the tax wedge reduces employment by around 1 per cent to 3 per cent of the working age population, while OECD (2005) found that a reduction of the tax wedge in an average OECD country would increase the employment rate by 3.7 percentage points.

Top marginal statutory rates mainly affect productivity with a negative relationship between top marginal tax rates and the long run level of total factor productivity (TFP).[31] By affecting the relative price of labour and capital, i.e., through non-neutral treatment, high marginal tax rates can lead to inefficient reallocation of inputs, lowering the efficiency of production inputs, i.e. lowering TFP.[32]

Hours worked have also been shown in the literature to be modestly responsive to labour taxes while labour market participation is much more responsive (Heckman 1993; Blundell *et al.,* 1998).

Capital income taxes affect investment and entrepreneurship through savings and firms' financing. Taxes on personal capital income affect private savings by reducing their after tax return. As the income from savings are taxed as well as the income that is generated from those savings, personal income taxes can discourage savings (and investments) and are seen as more harmful to savings than consumption taxes which are generally seen as neutral to savings.

3.2.4 Corporate Income Taxes

The OECD research suggests that corporate income taxes are the most harmful for growth as they discourage the activities of firms that are most important for growth: investment in capital and productivity improvements. Corporate taxation affects the rate of capital accumulation, by reducing the after tax return on capital investment, and hence GDP per capita.[33]

As with labour taxes corporate income taxes can distort relative factor prices and result in misallocation of resources, or by reducing the after-tax return from innovative activities thus discouraging investment in R&D. Further, by negatively affecting foreign direct investment and the presence of multinational companies corporate taxes can hinder technology transfers.[34]

[31] See Box B.2 in OECD (2010).

[32] Regression results presented in OECD (2010) show top marginal personal income tax rates have a more negative effect on TFP in sectors characterised by high firm entry rates. Employer and employee SSC have a more negative influence on TFP in industries that are relatively more labour intensive. .

[33] OECD regressions found that increases in the tax-adjusted user cost of capital are found to reduce investment at the firm level and the effect on firm-level investment is stronger in more profitable industries. This is also confirmed in industry level regressions.

[34] OECD regressions show a link between corporate taxes, R&D incentives and TFP. While earlier OECD work shows an adverse effect of corporate taxes on FDI with a one percentage point increase in a country's corporation tax rate shown to reduce FDI stocks by 1 per cent to 2 per cent (OECD, 2007).

IV GROWTH ORIENTATED TAX POLICY REFORMS

Arising from the theoretical and empirical literature on tax and growth, economists have proposed growth orientated changes in the structure of tax systems. Such reforms can be described as those that relate to reforms within one tax type, for instance widening a given base and lowering headline rates, or shifting the tax burden from more harmful taxes such as corporate and personal income taxes towards consumption and property taxes (see OECD, 2008 and 2010 and EC, 2008, 2010 and 2012).

OECD (2010) presented empirical and theoretical evidence that there could be gains in terms of long-run GDP per capita from increasing the use of consumption and property taxes relative to income taxes without changing overall tax revenues.[35] This shift would have larger impacts on GDP per capita if it was in the form of cuts in marginal personal income tax rates rather than increases in thresholds (although the latter would be more effective at reducing inequality).

4.1 *Shifts from Income to Consumption Taxes*

Consumption taxes are less harmful to growth as, relative to personal income taxes, they have a neutral impact on savings and investment. In the long-run a revenue-neutral shift from personal income to VAT/consumption taxes may not have much effect on the average total taxes paid by a typical employee as the impact on their real net wages are equivalent, although recent research in the field of behavioural economics has challenged this view.

Since personal income taxes are generally more progressive than consumption taxes this reform would reduce the marginal tax rate of a typical worker and thereby increase labour supply incentives through a positive substitution effect. Whilst this may promote economic growth it would do so at the expense of making the tax system less progressive. If transfer payments are not index-linked, there could be positive labour supply impacts,[36] although this would cause a worsening in poverty and equality outcomes.

A shift towards consumption taxes does not imply an increase in the top rate of VAT as the shift could be achieved by raising or eliminating reduced VAT rates.[37] Reduced rates on consumption taxes are an inefficient way of reducing income inequality and promoting progressivity.[38] Higher income

[35] See Annex B OECD (2010).
[36] European Commission (2008).
[37] It is worth noting that a common rate of VAT applying to all of consumption may allow for a substantially lower rate than today's standard rate of 23 per cent as items at the lower rates are relatively more price elastic than those at the standard rate.
[38] See *Mirrlees Review*, OECD (2010), European Commission (2008, 2012).

households consume relatively more of lower taxed goods and thereby disproportionately benefit from reduced rate goods. The deadweight costs of using consumption taxes to achieve equality and redistributive objectives are therefore quite high.[39]

It is because of this deadweight cost that the income tax and benefits system is the appropriate place to target redistributive objectives. By broadening the VAT base through eliminating or reducing the level of reduced VAT rates, scope would exist to better target expenditure measures to those who need them, whilst also allowing for a reduction in the headline rate. For example, the *Mirrless Review* estimated that the UK could eliminate most reduced and zero-rate VAT while compensating every household through the tax and benefits system to leave them as well off as they were before whilst raising an additional £3 billion for the exchequer.[40]

4.2 *Shifts from Income to Property Taxes*

A shift towards taxes on property appears to be even better for growth than a shift towards consumption taxes as it would not impact on labour supply decisions and would have the advantage of being highly efficient and, in the case of market value based property taxes, equitable (Norregaard, 2013). The OECD (2010) cite an additional benefit of increasing taxation on immovable property as shifting some investment out of housing into higher return investments and so increase the rate of growth.

Despite the relative gains of a property tax based shift, OECD (2010) note that the scope for switching revenue to recurrent taxes on immovable property is limited because these taxes are particularly unpopular. This latter point is acknowledged by Norregaard (2013) who attributes their unpopularity to their transparency and the relatively limited scope for tax avoidance and evasion.

V OPTIONS FOR IRELAND

As described in Section II the burden of labour taxation is only low when GDP is used as the tax base and when SSC are included in the comparison. Excluding SSC or using an alternative base to account for the economic structure of Ireland shows the burden on labour to be relatively high.

[39] An exception to the argument in respect of reduced VAT rates can apply to goods that are complements and substitutes to labour. Differentiated consumption taxes can encourage work if goods and services that are complementary to work – e.g. transport and childcare – are taxed at a lower rate than those that are substitutes to work – e.g. leisure activities.

[40] See "Broadening the VAT Base", *Mirrlees Review: Tax by Design*, Institute of Fiscal Studies (2011) UK.

The burden on consumption is, however, low in a European context and the burden on immovable property is low relative to English speaking OECD countries.

Within labour taxation the entry point to core income tax, is relatively high. Effective rates of tax are also low relative to the OECD at income levels below the average wage. While the marginal rate in Ireland may not be an outlier in an OECD context, the entry point to the top marginal rate is the lowest for progressive income tax systems. Ireland is also an outlier in terms of the progressivity of its income tax system. Estimates included in OECD (2010) point to adverse effects of highly progressive income tax schedules on GDP per capita through both lower labour utilisation and lower productivity partly reflecting lesser incentives to invest in higher education.

The theory and structure would, therefore, suggest that there may be gains for Ireland by reducing the burden of taxation on labour, and the strongest impacts would be from changes in marginal rates through positive substitution effects. Such a reform may involve moving the entry point to the top marginal rate away from the average wage, thereby incentivising greater labour supply through positive substitution effects, or from reducing the top marginal tax rate. The options for reform could be achieved by a revenue neutral shift towards consumption or property tax.

5.1 *Simulating Tax Shifts*

Reforms in the structure of the taxation system through revenue neutral shifts from labour to consumption or property have been simulated in the literature to raise the rate of growth in an economy. For instance Myles (2009) concludes from a review of the literature of tax reforms on growth that "… almost all the results support the claim that a move from income taxation to consumption taxation will raise the rate of growth". The results of recent simulations of tax shifts for Ireland are now discussed.

The effects of taxes on GDP have been simulated using the European Commission's *Quest III* Model.[41] *QUEST III* is a New-Keynesian Dynamic Stochastic General Equilibrium (DSGE) model used by the Commission's staff in policy analysis.[42] It has previously been used by the

[41] See European Commission (2008).

[42] The key features of the model are: a fraction of households are liquidity constrained; prices and wages adjust with lags; monetary policy is determined using a Taylor Rule; and, debt is stabilised by means of a gradual adjustment in labour taxes. The model uses region specific estimated parameters for the Euro Area and the US, as well as calibrated parameters for the rest of the world. Individual countries are distinguished from the rest of the Euro Area only by using country-specific information on their size, their degree of openness, their bilateral trade linkages as well as their employment, tradable sector and government shares. There are no country specific

Department of Finance in the context of an analysis of the impacts of structural reforms.[43]

The Commission's simulations use three baseline scenarios, a coordinated tax shift from labour to consumption for the whole Euro Area, a unilateral tax shift by a large Member State (Germany) and, a tax shift by a small Member State (Ireland). Each of the models confirm that the tax shift would have a positive impact on GDP and employment. In the short run the gains are larger for a unilateral shift due to competitiveness effects. The simulations are designed to be revenue neutral.

The results for Ireland which are described in detail in European Commission (2008) are summarised below. The model assumes that benefits and transfers are index linked. The shift results in an increase in GDP and employment of 0.2 per cent and 0.25 per cent five years after the reform.

Table 5: *Results From QUEST III Model of a 1 Per Cent of GDP Shift from Income Tax to Consumption Tax*

Years After Reform	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*	*Year 10*	*Year 20*
GDP	0.12	0.17	0.19	0.2	0.2	0.2	0.19
Employment	0.14	0.22	0.24	0.25	0.25	0.23	0.21

Source: European Commission.

As a check against the outputs from the *QUEST III* simulations, which may not be perfectly calibrated for the Irish economy, the results of an existing structural model of the Irish economy are used.[44] The *HERMES* model was first estimated in the 1980s and is described in Bradley *et al.* (1993) and the most recent specification of the model is described in Bergin *et al.* (2013). The model is based on a detailed empirical literature on the behaviour of the Irish economy. In respect of a 'tax shift' the key features of the Irish economy relate to why the incidence of taxation differs between direct, indirect and property taxes.

[42] (*contd.*) behavioural estimates for individual countries, but the estimates obtained for the Euro Area are imposed. For a detailed description see Ratto, M., W. Roeger, Veld, Jan. 2008. "*QUEST III*: An Estimated Open-Economy DSGE Model of the Euro Area with Fiscal and Monetary Policy", *Economic Papers* 335.

[43] See Department of Finance (2011).

[44] The author would like to thank John FitzGerald for undertaking the reported simulations.

As described in Bergin *et al.* (2013), *HERMES* models the wage setting mechanism as a bargaining process between firms and workers over the real after tax wage. Irish manufacturing output prices are assumed to be determined primarily in the world market place and as such cannot easily be altered to respond to Irish cost conditions. In other words, Irish firms trading internationally tend to be price takers. Labour supply is assumed to be elastic with labour demand relatively inelastic such that in the medium term the incidence of labour taxation falls mainly on employers rather than employees.[45] As Irish exporters do not have the ability to pass on higher input costs on the world market the medium term impact of higher labour taxes is a loss of competitiveness for Irish firms with a consequent fall in output and employment.

While the medium term impact of an increase in indirect taxes for workers is assumed to be equivalent to an increase in direct taxes, indirect taxes affect a wider population than direct taxes, such that some of the incidence remains with the household sector with a lower consequent impact on competitiveness. The incidence of property taxes falls entirely on the household sector as the ability of workers to avoid the tax by reducing labour supply is limited.

The first set of results presented below simulate a €1 billion increase in revenue from property taxes offset by a cut in income tax sufficient to keep the general government deficit unchanged each year. The results from *HERMES* are symmetric and linear and as such the results can be scaled up or down to reflect a greater or lesser shift than that modelled. Transfer payments are not index-linked in the *HERMES* simulation results presented herein but the model does allow for indexation.

Because property tax has a much more limited impact on the labour market than personal taxation the net effect of the change is to raise the growth rate and reduce the unemployment rate. The results indicate 0.32 per cent increase in the GDP, a 0.43 per cent increase in employment and a 0.14 per cent reduction in unemployment after 5 years.

Table 6: *Results from HERMES Model of a €1 Billion Shift from Income Tax to Property Tax*

Years After Reform	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
GDP (%)	0.00	0.16	0.26	0.32	0.32
Employment (%)	0.00	0.11	0.26	0.41	0.43
Unemployment rate (change)	0.00	–0.07	–0.08	–0.12	–0.14

[45] For a discussion on the elasticity of labour supply in Ireland see Honohon (1992).

The table below reports the results of a simulated shift to VAT from income taxes using the *HERMES* model. It simulated an increase in VAT offset by a reduction in income tax, both scaled to roughly bring in *ex ante* €1 billion. Because personal taxation primarily affects those working and VAT affects a wider population, the switch results in lower wage rates, higher employment and higher output in the medium term. The results indicate that real GDP would be 0.38 per cent higher than the no policy change baseline after five years, with employment 0.43 per cent higher and unemployment 0.21 per cent lower.

Table 7: *Results from HERMES Model of a €1 Billion Shift from Income Tax to VAT*

Years after Reform	*Year 1*	*Year 2*	*Year 3*	*Year 4*	*Year 5*
GDP	0.00	0.17	0.30	0.42	0.38
Employment	0.00	0.11	0.26	0.41	0.43
Unemployment rate	0.00	–0.09	–0.17	–0.24	–0.21

The results of both shifts are consistent with the literature and also with the results of the *QUEST III* simulations and all show an increase in short and medium term GDP and employment and a reduction in the unemployment rate arising from the shift.

The simulations do not give any guidance on how to implement the shift and a few considerations are required.

First, in terms of property taxes, a shift of €1 billion toward property taxes would suggest a two fold increase on the forecast for a full year yield of €500 million for the local property tax. If a lower shift were considered the results would need to be scaled back proportionately. As the results from *HERMES* simulations are linear, this scaling is possible.

Second, an increase in consumption tax does not necessarily imply an increase in the headline rate of VAT. Efforts could be made to increase the 'efficiency' of VAT by increasing some of the lower rates. Some of the revenue generated could be used as direct expenditure through means tested benefits to compensate low income groups as per the simulations in the *Mirrlees Review* (2011)[46] and described in Section IV above. Direct cash payments are generally more efficient at relative poverty reduction given that the deadweight costs of reduced VAT rates are high.

[46] See Chapter 9 "Broadening the Tax Base", pp. 218, *Mirrlees Review.*

VI FINAL THOUGHTS

Ireland's capacity to increase its tax burden very much depends on what one views as the appropriate measure of economic output for the purposes of taxation taking into account the structure of the economy and the size of the foreign-owned sector. In terms of tax take as a share of total activity, Ireland is not an outlier when one uses GNP or the IFAC hybrid measure of output. In terms of share of GDP the Irish tax system mainly differs from the EU average in terms of SSC. Adjusting for SSC, the burden of taxation in terms of total revenues and labour taxation is in line with the EU average. In overall terms, when allowance is made for some specific features of the Irish economy and the nature of its social security system, the size and broad distribution of the tax burden across tax types in Ireland is not greatly out of line with that of other EU states.

In GDP terms, taxation of consumption is below the EU average. This suggests that there may be some scope to use consumption taxes to reduce the burden on labour. Relative to other OECD economies with a similar reliance as Ireland on personal income taxes as a share of overall government revenues, Ireland has a comparatively low level of property taxation, especially for recurrent taxes on immovable property.

The paper identified aspects of the Irish taxation system that may be harmful to growth, in particular the low entry point to the top marginal tax rate, and identified possible scope for growth enhancing reform. The reforms involve reductions in the burden of labour taxation either through base broadening within labour taxation or through a shift from consumption to property taxation. Given the constraints faced by the exchequer the reforms are presented in a revenue neutral basis. Results from macrosimulation models show positive GDP and employment gains for Ireland.

The objective of this paper is to contribute towards the discussion of tax policy in the context of economic growth. Of course economic growth is not the only consideration when it comes to tax policy. The achievement of redistributive outcomes is also of importance to policymakers. In that regard the tax and benefits system have achieved a significant reduction in inequality as measured by the Gini coefficient for disposable income.

Whilst this paper focuses mostly on changes to the structure of the tax system motivated by economic growth objectives, it does acknowledge the highly progressive nature of Ireland's income tax system with the burden of labour taxation falling to a considerable extent on higher income tax payers while low earners benefit from unusually low effective rates in an international context. Finally, it should be acknowledged that a trade-off exists between progressivity and economic growth.

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