Economic Lessons for Tax Policy Advisers

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Abstract

This paper aims to provide tax policy advisers with some lessons from the general economics and public economics literatures relevant for the design of 'good tax policy' in relatively developed OECD economies such as New Zealand. It is aimed at those with limited or no background in economics (in general or in the economics of taxation in particular) who are tasked with understanding, devising or advising on, tax policy in practice. In addition to focusing on general lessons from the economics and tax theory literatures, it highlights some specific lessons for particular taxes, including personal income and indirect taxes. The paper is not intended as a guide for the design of specific tax policies, but rather provides some first-principles background, supported by examples, of how to think about setting tax policy in economically sensible ways (and avoid common pitfalls). More detailed background literature is also sign-posted.

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1.   Introduction

This paper is motivated by a recognition that many people in tax policy advisory positions are often neither economists nor tax specialists. Even those with some undergraduate training in economics typically have little or no training in the economic analysis of taxation. Nevertheless, they are often called upon to give governments advice on this substantive area of economic policy and in a form that can require careful attention to how best to communicate with politicians, ministers and senior public servants.

On the other hand, academics researching and teaching in public economics and taxation typically have little experience of tax design, or policy advice, in practice. Instead, they are trained (if trained at all!) to communicate with fellow researchers and students specialising in taxation. As a result, their economic models of taxes, empirical results and policy advice conclusions, rigorously expressed within their technical frameworks, are often not easily translated into practical tax policy 'lessons', in a language suitable for communication to non-specialists. This 'translation' task therefore falls to the policy analyst who may have little background in the 'deeper' academic analysis.

This paper therefore seeks to provide some simple 'tax lessons' from economics that, hopefully, assists with this translation. In selecting the small number of lessons discussed below from a much larger potential list, the intention is to illustrate how some basic principles can be applied to policy in practice. Mostly the text assumes limited, or no, background in economics, and especially in the economics of taxation.

Governments in all OECD countries engage in a mixture of regulating, producing and financing economic activities alongside the private sector. The balance between those three interventions varies by country, but in all cases spending by government is involved that must be financed somehow. This may be through taxation, charging user fees or borrowing (creating public debt immediately and a repayment liability later). Almost no one disputes that some, and usually most, government expenditure should be financed through taxation, and Western democratic systems formally assign 'the power to tax' to elected governments.[1] The big tax debates usually concern 'how to', 'how much' and 'from whom'? This paper seeks to distil lessons learned over recent years from various attempts by economists to answer these questions. The focus will be on the tax systems adopted in practice in major developed OECD countries, as distinct from the many less developed countries where the context for designing taxes and tax systems can be quite different.

In addition to an extensive academic literature on the design of individual taxes and tax systems, a number of tax 'reviews' in some OECD countries over the last decade or so have been undertaken. Their purpose has usually been to identify and assess problems with the current tax system, before prescribing possible improvements. Among the most prominent and substantial

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[1] Or as Brennan and Buchanan (1980; p.8) call it, 'the power to take' or 'coerce'!

reviews in the last decade are the Mirrlees Review (2011) for the UK; the Henry Review (2009) and Australian Treasury (2015) for Australia; and the Victoria University Tax Working Group, TWG (Buckle, 2010), and the New Zealand Government Tax Working Group, NZTWG (Cullen, 2019), for New Zealand. [2]

In each of those reviews, a key objective was to consider how lessons from conceptual and empirical literatures regarding 'good' tax policy can be applied to tax systems in practice in each country. The key challenges for tax design were nicely summarised by the Mirrlees Review thus:

> '*It is impossible to take 40% or more of national income in tax – as most advanced economies do – and not have major economic impacts. Most taxes influence people's behaviour in unhelpful ways and all reduce the welfare of those who bear their economic burden. The challenge for tax design is to achieve social and economic objectives while limiting these welfare-reducing side effects.*' (Mirrlees *et al.*, 2011, p.21).

As this paper seeks to provide some guidance on practical tax policy – in New Zealand and more generally – it draws on various lessons from a long-established tradition in economics as well as more recent literature, and the individual country-focused tax reviews mentioned above.

1.1 Principles versus Practice

"Yes, in principle, but in practice …" is a commonly expressed sentiment with respect to economic policy design where conceptual economic models attempting to address some policy objectives or prescriptions necessarily involve various levels of abstraction. As a result, there is always the possibility that, due to missing elements from the models, policy prescriptions turn out to be impossible or unsuitable to implement in the 'real world', or they fail to realise their objectives. This 'real world' involves political and social contexts, objectives or constraints that were not part of the original economic modelling. An important consideration then becomes how to deliver economic policy advice based on rational analysis that also recognises, and seeks to adapt to, the inherent limitations of these contexts.

This 'principle versus practice' conflict is endemic to much tax policy in particular. Taxes can be raised from different sources using a variety of methods, all with potentially different consequences for those on whom they are levied. As a result, the policy design problem of distinguishing 'good' tax policy from 'bad' (or even just 'less good') is conducted within a highly complex economic and social context such that some level of abstraction is required to make analysis of the problem tractable. The critical questions then become: how reliable are those results

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[2] The published reports of the Mirrlees Review consist of two volumes: Mirrlees *et al.* (2010, 2011), while the Henry Review documents include Australian Treasury (2008; 2009a; 2009b; and 2009c). Multiple documents produced as part of TWG (2010) and NZTWG (2019) are available at their respective websites. To avoid confusion below in referencing the two New Zealand TWGs, we label them respectively (after their chairmen) as the 2010 'Buckle Review' and the 2019 'Cullen Review'.

when they are applied to tax policy settings in practice; and how should they be adapted when practical realities mean the 'theoretical ideal' tax policy is infeasible?

This paper is primarily concerned with what tax policies are implementable, 'good' or 'bad' in practice, rather than with what these might be if the world conformed to the simplifying assumptions of the tax models behind such 'in principle' prescriptions. Nevertheless, simplified conceptual approaches and theoretical tax models are designed to give key insights into tax policy choices and their consequences – both intended and unintended – and, as such, provide a vital starting point to guide practical tax policy choices. If nothing else, they can provide a 'benchmark' against which necessary deviations can be compared and evaluated.

The paper also aims to identify how far the insights from such 'in principle' approaches can be carried over into the practical policy advice context in which governments have to make choices over which taxes to legislate, how they should be designed and who would be affected. For example, strong results are sometimes obtained from 'simple' (but technically sophisticated) tax models under restrictive assumptions which do not obviously carry over to the more complex structures or aims of tax design required in practice.[3]

A good illustration of this conflict in tax policy setting is expressed in the Australian Treasury's 2017 review of the country's petroleum resource rent tax. They noted:

> '*There is a significant amount of economic literature on the concept of a resource rent tax. However, the practical application of the tax may differ from the theoretical ideal. For example, what represents economic rent can be portrayed in a hypothetical example and might be neatly captured under a theoretically pure resource rent tax, but it is challenging in practice to design and implement legislation that will clearly capture the economic rent associated with a project without consequent budgetary risks. Economic rent will vary across projects, but the legislation applies across the industry. Moreover, it is difficult to isolate the rent associated with the quality and scarcity value of petroleum resources from the quasi-rents earned on investments in exploration and development which reduces costs.*' (Australian Treasury, 2017, p.6).[4]

The Australian Treasury quote highlights the common problem that economic concepts such as 'economic rent' may be straightforward to conceptualise but can be difficult to translate into real world equivalents and hence policy design. The present paper will consider similar issues, applied

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[3] This is not to denigrate the value of these tax models which are not designed for practical policy advice, but rather they explore conceptual tax issues and the consequences of inter-dependencies among taxes and economic outcomes. Indeed sometimes exploring the nature of the assumptions or frameworks required to generate unambiguous tax model results can serve to clarify the deviation of real-world applications from those restrictive contexts.

[4] 'Economic rent' in this context refers to the amount of profit achieved from undertaking an economic activity over and above the minimum required to keep the producer in business (or above that which could be realised in a perfectly competitive market – the so-called 'normal' rate of return).

to tax policies more broadly. Namely, how can good conceptual approaches to tax design best inform tax policy and reform in practice?

Before proceeding, the reminder of this section considers how far policies other than taxation might be used to achieve the same objectives in sub-section 1.2, then introduces some basic tax concepts in sub-section 1.3. Sub-section 1.4 considers the principles of 'good tax policy' stressed by textbooks and the country tax reviews mentioned above, and sub-section 1.5 considers possible conflicts between good policy advice based on those principles, and politicians' preferences.

1.2   Alternative Policy Options

Governments may have a mixture of political, economic and social motivations for providing some goods and services out of public expenditure rather than charging for them at the point of consumption. Whatever the motivation, they need to raise revenues, but these need not come via taxation, the compulsory extraction of income from (sub-sets of) citizens. Revenue could be raised from voluntary contributions in a similar manner to how charities are funded, or by borrowing and repaying as occurs in private housing markets. In practice, however, all developed country governments have adopted a system of taxation as the main funding source for their expenditures.[5]

This raises the obvious questions of whether there is a 'best' system of taxation to adopt and, if so, what it would be. Specifically, three key questions commonly asked are: *how much* revenue can or should be raised via taxation;[6] *who* should pay; and how can this revenue be 'extracted' from citizens *at least cost* to them (the famous: 'how to pluck the goose to obtain the maximum amount of feathers with the minimum amount of hissing'). Answering each of those questions requires a suitable framework within which to consider all relevant issues. It is the focus of many textbooks on public economics and taxation, and serves as the backdrop for the major tax reviews discussed in sub-section 1.3.[7]

First, however, it is worth briefly noting an important, prior question: namely, when should the government seek to address its policy objectives via tax-funded expenditures, and when by other means? Government policy objectives can often be achieved (or at least pursued) via more than one 'instrument' (individually or in combination), and taxation may not be the most appropriate.

For example, a policy to target obesity levels could aim to influence the 'supply-side' by establishing regulations, or industry codes of practice, or voluntary agreements with producers of obesity-linked food and drink. Alternatively, or in addition, 'demand-side' policies could be followed which aim to target consumer behaviour to encourage a move away from purchase of

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[5] Economists continue to debate how far, or what types of, public spending should be funded by taxes or by issuing public debt.

[6] Though it is typically argued (see section 2) that government expenditure and taxation decisions are, and should be, interdependent, much tax analysis assumes prior public spending decisions that determine revenue requirements.

[7] See section 4 for further reading.

those foods or drinks: educating consumers via improved product labelling, for example. Sugar taxes are often touted by public health professionals, who rarely have any tax policy expertise). But a careful set of cost-benefit analyses of these alternatives is an important pre-requisite before undertaking any such tax policy decisions, and should include consideration of the wider impacts of sugar taxes on tax settings more generally. For example, how far would they help or hinder achievement of other tax policy objectives such as redistribution, efficiency or coherence.

Debate over whether taxation is the appropriate funding source is also often associated with the public expenditure that it is intended to fund. Thus, for example, arguably public investment expenditures likely to benefit consumers in future years, or future generations of consumers, may be better funded, at least partly, by borrowing (and repaid out of future taxes) than taxes on current taxpayers. This helps to share the cost of financing of these public expenditures among the different cohorts or generations of taxpayer who will benefit from the public spending.

A practical example of this approach was the 'golden rule' adopted by the UK Treasury under Chancellor Gordon Brown from the late 1990s. This aimed to ensure that 'current' public spending (as distinct from public investment spending) should be matched by tax revenues over the economic cycle. Thus, essentially public investment is funded by public borrowing while current spending is funded by current taxes; see, for example, Chote *et al.* (2006).

While the questions of whether and when taxation is the most appropriate method of funding public expenditure is not the focus of this paper, it should be borne in mind that all tax design considerations should in principle by conducted *after* these prior questions have been addressed. In some cases, inability to design fit-for-purpose taxes in practice might make taxation a distinctly second-best instrument compared to some alternative such as regulation or education, even if an 'ideal tax' would be first-best. Recent debates over anti-obesity policy might fit into this category.

1.3 Some Basic Tax Concepts

It is useful to start with some basic tax concepts and terms that appear regularly in the economics/tax literature.

Rationales for tax interventions

The motivation for a tax can be one or more of: raising revenue to fund public spending; redistributing income (across taxpayers or over time); or seeking to change taxpayers' behaviour such as where 'market failure' is perceived to have occurred, or where individuals' actions impact directly on others such as water pollution or smoking.[8] This third tax motivation is sometimes labelled corrective taxation as it seeks to 'correct' individuals' self-interested, but socially harmful, behaviour.

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[8] In addition, changes in tax levels are sometime motivated by macroeconomic objectives of stabilising aggregate incomes over time.

Taxes and welfare benefits or 'transfers'

A welfare benefit, a form of direct payment to individuals or families usually associated with some 'status' or condition such as being unemployed, disabled or a single parent, can be analysed as a *negative income tax* since it acts essentially like a tax on income but in the reverse direction: an income transfer from government to the taxpayer rather than vice versa. Other forms of government subsidy, such as to particular firms or industries, can also be thought of, and analysed, as negative taxes. For example, subsidies to 'creative' (e.g. film) industries, designed to encourage domestic innovation or production, can serve to reduce the effective average and/or marginal tax rate on domestic film production.

Deadweight losses (DWL) of taxation

Taxes involve a financial transfer from the individual to the government (or to other individuals). In the context of taxation. DWL or 'excess burden' refers to the net cost or loss across all individuals, over and above the tax revenue raised, of making this transfer. That is, a loss to the individual that is not counterbalanced by gains to others. DWLs are a fundamental concept in tax analysis and are discussed in more detail in sub-sections 3.1-3.2.

DWLs are typically associated with government interventions that reduce efficiency either via effects on taxpayers' incomes, or the prices they face. But Waldfogel (1993) argues that the concept may also be relevant in a surprising non-tax context – the deadweight loss of Christmas – associated with buying a gift for a friends or family. He argued: '*while it is possible for a giver to choose a gift which the recipient ultimately values above its price … it is more likely that the gift will leave the recipient worse off than if she had made her own consumption choice with an equal amount of cash. In short, gift-giving is a potential source of deadweight loss*' (p.1328).

Different types of tax rate

Tax rates are usually quoted as *average* (ATR) or *marginal* (MTR) tax rates. The former refers to the average burden of tax payments as a ratio of the 'base' on which the tax is levied (such as income or expenditure), or as a ratio of the taxpayer's income. The MTR refers to the *additional* tax paid on the next dollar of income (or other tax base).

A distinction is also drawn between *statutory* and *effective* tax rates. The former refers to the rate written into legislation such as the rate of VAT (GST) or set of marginal income tax rates. Under various conditions, the effective tax rate differs from this however. It refers to the effective rate at which tax is paid when the tax base changes. For example, as income rises the statutory MTR may be, say, 25 per cent, but the taxpayer also loses some social welfare benefits at, say, 15 cents per dollar of extra (gross) income earned. The effective MTR, the EMTR, is 40 per cent since 40 cents per dollar are 'lost' out of an additional dollar of gross earned income.

Tax rate progression and progressivity

Income taxes typically demonstrate tax rate *progression*. This is the tendency for income tax legislation to set a series of income thresholds (tax 'brackets') and statutory tax rates, with MTRs higher in higher income brackets. This needs to be distinguished from a taxes *progressivity*, which refers to the redistributive properties of the tax. This depends on both tax rate progression and the nature of the income distribution. In particular how many taxpayers are liable to the different tax rates. For example, high tax rate progression will have little redistributive impact (have low progressivity) if very few people pay the higher, or lower, tax rates.

Fiscal drag

This refers to the phenomenon whereby increases in taxpayers' incomes over time lift or 'drag' them into higher tax brackets unless the tax thresholds are indexed to increase at the same rate as the taxpayer's income. Income increases can be decomposed into increases at the rate of general price inflation plus (or minus) changes in 'real' income. Hence indexation of tax thresholds at the rate of inflation can remove this element of fiscal drag, but not the effects of real income increases. Even if all tax thresholds were indexed to the average overall increase in incomes, fiscal drag still occurs for those whose incomes grow faster than the average, raising their ATR (and their MTR if they cross a tax threshold).

Tax-inclusive and tax-exclusive tax rates.

Tax rates can be expressed, and written into legislation, in either of these two forms. For example, if the price of good X, is $100 and a $20 tax is levied on it. The tax could be expressed as a tax-exclusive rate of $v = 20/100 = 0.20$ or 20%. In this case the tax rate is expressed as a ratio of the price before tax. But it could alternatively be expressed as a tax-inclusive rate of $v' = 20/120 = 0.1667$ or 16.667%. The relationship between the two rates is: $v' = \{v/(1+v)\}$. It is common practice for income tax rates to be set in legislation as tax-inclusive rates – where MTRs are specified as a fraction of gross income; i.e. *inclusive* of tax to be deducted. By contrast expenditure taxes like VAT (GST) are usually set as tax-exclusive rates – as a fraction of the goods price *before* tax is added.

Unit excises and ad valorum taxes

When tax rates on goods are set as a fraction of the unit price they are sometimes described as *ad valorum* ('according to value') taxes, since the legal tax liability varies with the value (price times quantity) of the good. An excise tax (such as on alcohol or tobacco), on the other hand, is usually set as a tax amount *per unit* of the good; for example, $0.50 per unit (litre) of alcohol, or per cigarette. In such cases the rationale for unit taxes is often a desire to elicit behavioural responses thought to be specifically related to the *units consumed* rather than the amount spent (for example reducing the units of tobacco or alcohol consumed to improve health or reduce behaviour

with 'external effects', like intoxication). However a side-effect is that higher quality units, sold at higher prices, face a lower *effective ad valorum* rate.[9]

Tax allowances/deductions and tax credits

A tax allowance or deduction (the two terms are often used interchangeably) differs from a tax credit because an tax allowance is defined as a deduction against the tax base, such as income, whereas a tax credit is deducted from the tax liability. For example, with an income tax rate, t, and an allowance of amount, A, that can be deducted from income before tax, y, then tax liability, T, is: $T = t(y - D)$. If instead a tax credit amount, *C*, is available, deductible from the income tax liability, then tax paid is now: $T = ty - C$. The tax credit, C, is deducted after the income tax liability has been determined whereas the allowance, D, is deducted before the income tax liability is determined. For a given dollar value, say $C = D = \$100$, C is worth more to the taxpayer than an allowance since tax liability is reduced (net income is increased) by C with a credit, but only by tD with an allowance.

A further distinction can be drawn between a 'refundable' and a 'non-refundable' tax credit. A tax credit is said to be non-refundable when the credit cannot exceed the tax liability; that is, $C \leq ty$. A refundable tax credit, on the other hand can exceed ty, so that the taxpayer becomes entitled to a tax rebate (a negative tax payment). In this latter case the tax credit is, in effect, simply a transfer to the taxpayer. Family-related tax credits in the UK and New Zealand, for example, are refundable and therefore have this 'transfer' property.

VAT (GST) exemptions and zero-rating

In an attempt to remove or reduce VAT liability for some goods (for a variety of reasons), VAT legislation often distinguishes between 'zero-rated' and 'exempt' goods. Zero rating means the 'final' good is not taxed on its sale price (the VAT rate is zero) but allows credits for the VAT paid on inputs. If instead a good is VAT-exempt, the final good price is not taxed good, but the firm cannot claim a credit for the VAT paid on any inputs. Hence, define $VA = (p_qQ - p_mM)$ where VA = value added, Q = final output quantity, M = intermediate input quantity and p_q, p_m. are the respective prices inclusive of any VAT. With zero rating, both prices include no VAT, whereas with exemption only p_q includes no VAT. As a result, VAT exemption implies that some VAT is effectively levied on goods that are notionally VAT-free since they cannot claim back VAT embedded with the price paid for their inputs, p_m. In the UK for example, children's clothes and most foodstuffs are zero-rated, while financial services and education are exempt.

Tax capitalisation

This refers to a change in the price of an asset in response to a change in the tax treatment of that asset (or indeed, other assets). For example, a new annual tax levied on a residential property,

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[9] This is sometimes countered by setting higher unit taxes on higher quality products such as on cigars versus cigarettes.

such as property Rates in New Zealand or the Council Tax in the UK, implies an on-going tax liability for owners over future years. As long as the tax is expected to be in place this represents a tax liability much larger than the annual impost. As a result, the sale price of the property (its asset value) might be expected to fall reflecting this higher future cost of holding the asset. The tax is 'fully capitalised' in the price when the asset's value changes by the full amount of the new tax liability. Tax capitalisation can affect assets that are not similarly taxed, for example when a tax is levied only on property within an urban boundary, the price of neighbouring properties outside the boundary often rise in price as buyers seeks to obtain an (almost) equivalent assets but without the tax liability. Obviously, if complete, this 'arbitrage' process can fully negate the attempt to avoid the tax and it results in the price of an asset which would appear to have no tax liability, effectively bearing some burden from the tax.

Tax expenditures

These describe losses of tax revenue when tax laws allow special exemptions, deductions or credits against income, or some other tax base. This can also include losses when deferral of a tax liability is allowed. The somewhat counter-intuitive term 'tax expenditures' reflects both the fact that various taxpayer expenditures are often treated as tax-deductible and because the policy objective that motivates the lost tax revenue could often be achieved instead by some government expenditure rather than a tax concession. For example, raising the incomes of low earners via a tax credit against their income tax liability (resulting in lower tax revenues in government accounts) could be achieved instead by a similar welfare benefit payment (treated in government accounts as an expenditure item).

Tax evasion and avoidance

Economic analysis of tax compliance distinguishes between tax planning, tax avoidance and tax evasion. Though the first two terms are sometimes used interchangeably to refer to legal mechanisms used by taxpayers to reduce their tax liabilities, tax 'avoidance' is sometime used to infer activity that while strictly allowable within the legal tax code, is a deliberate attempt to get around the intention of that code. The term tax 'evasion', on the other hand, typically refers to illegal action to reduce tax liabilities. Tax authorities' compliance regimes will therefore typically levy fines or other penalties on evading taxpayers, and seek to change legislation to outlaw schemes that are seen as essentially or solely for tax avoidance. Tax planning is more generally seen as a legitimate mechanism to ensure that more highly-taxed activities by a taxpayer are not unnecessarily substituted for similar, but lower-taxed, activities.

Tax responsiveness elasticities

In the economics of taxation it is emblematic that levying taxes affects the behaviour of those taxed, often with further effects on non-taxpayers. *How* each responds is fundamental to outcomes of interest such as taxpayers' wellbeing, incomes, employment, tax revenue and so on. Consider

the simplest tax revenue expression as $R = tZ$ where R is revenue, t is the tax rate and Z is the base on which tax is levied. It follows that changes in R can be expressed as:

$$dR = Zdt + tdZ \tag{1}$$

Equation (1) captures two components: revenue impacts of changes in the tax rate and in the tax base. Considering how these components are affected by a change in the tax rate, dividing by dt (1) becomes:

$$\frac{dR}{dt} = Z + t\frac{dZ}{dt} = M + B \tag{1'}$$

This now displays two components of the tax rate change. First, a 'mechanical effect' of the tax, $M = Z$. This is the direct revenue impact of a one unit change in the tax rate, dt, with no behavioural response: M depends solely on the size of the initial tax base, Z. Second, a 'behavioural effect', $B = t(dZ/dt)$, captures the extent to which the tax base responds to the change in tax rate, translated into revenue via the tax rate, t. The terms in (1') are often re-written in 'elasticity' form; that is as proportional changes such that $\frac{dR/R}{dt/t} = 1 + \frac{dZ/Z}{dt/t}$, and are referred to respectively as the 'revenue elasticity', $\eta_{R,t}$, and the 'behavioural elasticity', $\eta_{Z,t}$, associated with a tax rate change. The sign and size of $\eta_{Z,t}$ is the focus of much empirical attention to assess the impact of changes in tax rates or other tax parameters. If $\eta_{Z,t}$ is bigger than one then revenue can actually fall when the tax rate is increase; the so-called 'Laffer Curve effect'.[10]

The sign and size of these elasticities will depend on the specific tax base and type of response of interest; for example, changes in hours worked, employment, consumer spending, smoking incidence, tax avoidance, total earned income, taxable income etc.[11] As with any price change, these responses to tax rate changes can be decomposed into an income effect (usually positive) and a substitution effect (usually negative). The income effect captures the response to the loss of income or purchasing power due to the price (tax) increase; the substitution effect captures the response to the fact that the taxed activity has now become relatively more expensive, and hence less attractive. If both effects operate, the sign of the overall effect is ambiguous in principle, and two key tasks of empirical evidence are identifying the dominant sign of the elasticity in practice its magnitude.[12]

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[10] The term refers to an alleged empirical relationship between the marginal tax rate and tax revenue collected, with a hypothesised maximum revenue somewhere between the two extremes of 0% and 100% tax rates, and zero revenue raised at both extremes. How useful the curve is, and where the revenue-maximising rate might be observed, are matters of some debate in the public finance literature. The curve is associated with US economist Arthur Laffer, advisor to US President Reagan (and more recently President Trump); see Laffer (2004).

[11] In the case of the elasticity of taxable incomes (ETI), the literature has tended to examine the responsiveness of taxable income to changes in $(1 – t)$, rather than t. See Saez *et al*. (2012) for an extensive survey of evidence.

[12] Responsiveness is said to be 'inelastic' when the (absolute) value of the elasticity, such as $\eta_{Z,t}$, is less than 1, and 'elastic' when the value exceeds 1.

Public goods

In the economics literature, the term 'public goods' does *not* refer to goods supplied via public expenditure, such as 'free' education or health care. Rather, they are defined by two key properties: non-excludability and non-congestion (sometimes called non-rival). *Non-excludability* refers to the property whereby provision by or for one person necessarily also provides it for others. Classic example are national defence services and lighthouses. Because of this non-excludable property, across a defined population, government often produce such goods or services, because otherwise this characteristic is likely to lead to a under-provision for the population as a whole.

Non-congestion refers to the property that greater consumption of the good or service by on person does not reduce the amount consumer by another: consumers are not 'rivals'. One ship enjoying the reef-warning benefits of a lighthouse does not diminish the benefit for any other ship in the vicinity. This reference to location serves to emphasise that some goods may have partial public good qualities such as via a degree of congestion. Thus, a public road, for example, that is open to all motorists can display public good characteristics until it becomes congested with too many cars such that each motorist's travel 'benefit' is infringed by the presence of others.

Due to their properties, provision of public goods through conventional private markets is often difficult or impossible not least because of problems setting suitable market prices for such goods. As a result some form of community cooperation or provision may be beneficial. For this reason, governments often provide such goods (and others) 'free' at the point of consumption, funded out of tax revenues. They therefore provide one motivation for levying taxes. However, government often provide many other types of good via public expenditure including 'private' goods and 'mixed public/private' goods. Private goods could include such items as employment insurance while health and education can be 'mixed' depending on their specific characteristics.

1.4   Principles of Good Tax Policy

The characteristics of a "good" policy in general are often summarised in two key qualities – achieving the target(s) of the policy efficiently while avoiding unintended consequences. Applying these to tax policy in particular leads to a number of specific objectives or principles of a good tax system.[13] As well as being addressed in numerous public finance textbooks, several versions of (usually five or six) principles have been set out by the tax reviews mentioned above.

The Buckle Review (2010) identified six objectives or principles:[14]

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[13] For further discussion of tax policy objectives, principles and 'rules of thumb' see the critique of the New Zealand TWG by Creedy (2010).

[14] The Cullen (2019) TWG also adopted those principles and added two further principles of 'predictability' and 'certainty' noting that 'taxpayers should be able to understand clearly what their obligations are before those obligations are due', Cullen (2019, p.28). However, these two additional 'principles' might readily be subsumed within principles 1 and 5 above.

1. *Efficiency* – minimising distortions in the use of resources both currently and as they impact on future economic outcomes.

2. *Equity* – achieving economic outcomes, or tax burdens, that are regarded as 'fair' or equitable.[15] This includes both 'horizontal equity' (those with the same economic resources are taxed the same amount) and 'vertical equity' (those with more resources pay more).

3. *Revenue integrity* – minimising opportunities for tax avoidance.

4. *Fiscal adequacy* – raising sufficient revenue to fund government expenditure plans – both currently and sustainably into the future.

5. *Minimising compliance and administration costs* – avoiding unnecessary waste of resources in the tax collection process.

6. *Coherence* – ensuring that settings for individual component taxes are coherent within the tax system as a whole.

Buckle (2010) proposed principles 1 to 5 could be regarded as the key objectives of individual taxes within the system, with principle 6 providing a broader system-wide objective. Alm (2018, p.3) suggests that tax policy can be suitably summarised via just three key principles – efficiency, equity and revenue adequacy (principles 1, 2 and 4 above). These features of a good tax system are similarly reflected in the Henry Review report for Australia. They categorise desirable tax system objectives as: equity, efficiency, simplicity, sustainability and policy consistency; see Australian Treasury (2009a, p.17).

In the UK case, the Mirrlees Review offered a slightly different way of conceptualising a 'good tax system'. They began by suggesting that:

> "*The way we formulate the objectives of a tax system is to say that for a given distributional outcome, what matters are:*
>
> - *the negative effects of the tax system on welfare and economic efficiency – they should be minimized;*
>
> - *administration and compliance costs – all things equal, a system that costs less to operate is preferable;*
>
> - *fairness other than in the distributional sense – for example, fairness of procedure, avoidance of discrimination, and fairness with respect to legitimate expectations;*
>
> - *transparency – a tax system that people can understand is preferable to one that taxes by 'stealth'.*
>
> *... simple, neutral, and stable tax systems are more likely to achieve these outcomes than are complex, non-neutral, and frequently changing systems. But simplicity, neutrality, and stability are desirable because they promote these ultimate outcomes, not in their own right.*

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[15] These two alternative tax equity objectives need not be consistent. For example, setting what is regarded as a 'fair' distribution of the tax burden across households, may nevertheless not lead to a post-tax income distribution across households that is perceived as 'fair' if it cannot sufficiently counteract inequities of an initial pre-tax income distribution.

A good tax system will not just limit negative effects on efficiency. It will also promote economic welfare by dealing with externalities which arise when one person or organization does not take account of the effects of their actions on others." Mirrlees *et al.* (2011, pp.22-23).

Having detailed the key tax policy objectives, they concluded: '*The challenge ... [is] to design a tax system that can raise the revenue that government needs to achieve its spending and distributional ambitions whilst minimizing economic and administrative inefficiency, keeping the system as simple and transparent as possible, and avoiding arbitrary tax differentiation across people and forms of economic activity.*' Mirrlees (2011, p.471).

Despite the different number of principles and language used to describe them by the various reviews, there is clearly a lot of agreement regarding the broad framework that should guide the setting of the tax system and specific taxes within it. Crucially, taxes need to deliver on several policy objectives simultaneously which frequently involve trade-offs – as well as cases where pursuing some objectives may be complementary. This suggests careful consideration needs to be given to *when* and *how* (and how *not*) to use tax instruments. While previous analyses by economists have sometimes led to conflicting or ambiguous advice regarding good tax design, there are also numerous lessons of practical relevance that would attract wide agreement. These are explored in sections 2 and 3.

However the various principles or objectives are specified or combined, nothing in economic theory can guide the necessary choices of policy makers concerning the weights that should be attached to each objective. These require crucial *value judgements* over which there may be debate concerning *whose* values should determine, or proxy for, society's priorities (however that may be defined or identified), or weights attached to the various objectives. Certainly, it should not be those of the legal or economic designers of the tax system.

Unfortunately, this has not stopped some economists and policy advisers from advocating a particular tax reform based apparently on sensible principles, but which either implicitly or explicitly reflects their own preferences over, say, equity versus efficiency. It is perhaps for this reason that government-sponsored tax reviews in particular appear more vulnerable – in both their membership and reform conclusions – to reflecting the specific preferences of their membership or sponsoring politicians. It might be hoped that review teams composed of government officials and academics would be less vulnerable to those implicit 'biases' and display greater independence. Even here, however, personal biases can be hard to avoid.

Nevertheless, it is clear from the above discussion that the recent tax reviews adopted a broadly similar framework of 'rational policy analysis' and, from that, agree on similar principles or objectives for a good tax system. These did not simply emerge from the reviewers' own thinking, but are based on a long history of thinking about how taxes should be designed and levied to maximise social welfare, detailed consideration of which is beyond the scope of the current paper.

1.5 Rational Policy Analysis versus Political Priorities

The tax principles in sub-section 1.4 form part of what is sometimes referred to as a framework for 'rational policy analysis' within which to evaluate tax policies. However, tax advisers may face constraints from their political 'masters' who favour different approaches. In this context an important distinction needs to be drawn between policies that are economically sensible (within the constraints of what is feasible and supported by evidence) and policies that are politically implementable.[16] In the first instance it is not the role of the tax policy adviser to prejudge what tax settings politicians will, or will not, be willing to pursue. Politicians and ministers can have a variety of both self-interested and socially responsible notions of what they want to achieve with tax policy. These will often reflect their own value judgements regarding the outcomes of those policies such as who gains and who loses.

It is, however, vital that tax analysts offer policy choices based on sound economic analysis whilst recognising implementation constraints. These should clearly delineate the 'normative' value judgements involved in policy choices from the 'positive' dimensions such as supporting evidence or design properties, and should be as free as possible from their own value judgements. This way, they can hope to guide political decision-makers towards policies that will achieve their economic and social objectives as fully as possible and with fewest undesirable side-effects.

Two political dimensions in particular should be recognised. First, when considering possible new taxes or tax reforms, self-interested ministers will often consider whether such action would risk too much 'political capital' in the form of voter backlashes. As a result they may prefer policies that minimise political risks, while economic analysis identifies that such risk-minimising policies are economically much further way from optimal than an alternative policy. Avoiding presenting ministers with the alternative option on the grounds that 'ministers would never adopt it' is not a good reason for treating it as 'not practical'.

Second, politicians across the political spectrum can readily express policy preferences based on limited knowledge of their underlying merits and demerits. Examples on the political left include a determination to adopt a highly redistributive policy while denying or ignoring efficiency consequence, or favouring a politically popular redistributive tool when the same outcome could be achieved more efficiently by an alternative.

Examples on the political right include a, usually false, belief that lowering tax rates will lead to higher revenues (because existing, high tax rates put taxpayers on the 'wrong side' of the Laffer Curve described above). Both such cases need testing by rigorous analysis and frank advice. It is

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[16] 'Economically sensible' is not synonymous with 'financially worthwhile'. Economically sensible policies here refer to those that have been evaluated to be socially worthwhile, for example, after being subjected to a cost-benefit analysis that recognises, and seeks to value, outcomes for society as a whole. Since assigning values to those economic and social outcomes requires value judgements, these need to be clearly identified and tested against alternative value judgements, for example over acceptable or targeted levels of inequality.

important that ministers recognise the adverse outcomes of their political preferences even if they decide subsequently to go ahead. In this case, the more rational or closer-to-ideal policy may not be politically acceptable, but it is vital that it is part of the policy menu presented as implementable in principle and in practice. These kinds of politically appealing policy proposals too often form part of election manifestos to help the relevant party get elected to govern but, unfortunately, before they have had access to direct official advice.

The above points can be illustrated in the simple diagram in Figure 1. This uses a two-dimensional 'policy space' to depict policy success according to two characteristics. These are: how close the policy is to an ideal or 'reference' policy structure (explained below) on the *x*-axis, and the policy's 'political acceptability' on the *y*-axis.[17] This policy space captures the notion that key to a policy's success is (i) the ability of the policy to deliver fully on its intended (economic and/or social) objectives; and (ii) the probability that the policy is adopted politically as 'official policy'. The latter is proxied here by how far the political decision-takers perceive that legislating the policy will affect their probability of re-election.[18]

Figure 1   The Policy Space
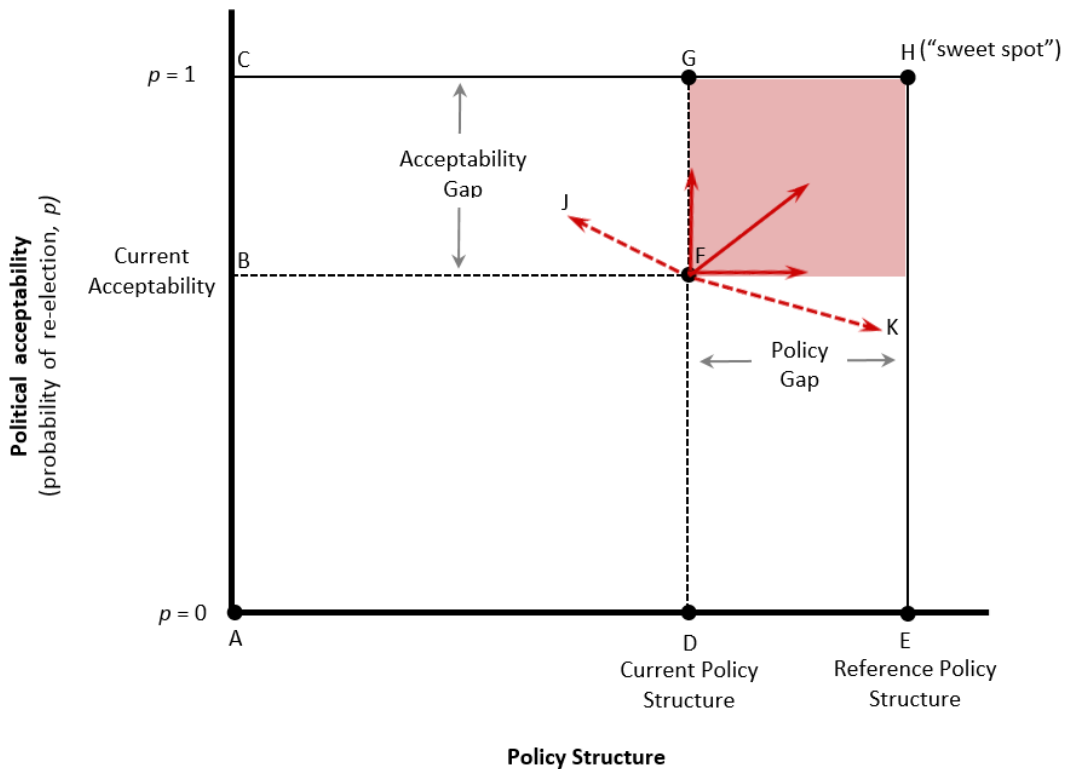
In Figure 1, point F represent the hypothetical *status quo* policy stance. This may be less than the politician's ideal on the line CH, such as at G, where the current government has inherited a predecessor's policy position, for example. Of course, almost no policy is likely to be perceived as *guaranteeing* re-election (on the line CH). The 'reference policy' – captured by the line EH – is that which is regarded by advisers as best able to deliver on all its stated objectives.

This is what policy advisers should strive to achieve. It is, of course, inevitable that an ideal or reference policy will be determined in part by value judgements, such as those involving trade-offs between multiple policy objectives. In this case, policy advisers need to recognise, and present, a number of possible reference policies – perhaps represented by a rectangular area of reference policies around EH (not shown in Figure 1).

Policy advice should seek to move policy from F to a point on EH. The reference policy at H might be regarded as a policy 'sweet spot' since it delivers on all its objectives and is highly likely to be legislated politically. In this sense, policy options that move in a north-east direct are likely to be the most successful. However, in devising a menu of policy options it is important that advisers do not ignore policies that shift from F towards a point such as K in Figure 1, since this goes a long way towards achieving the 'ideal' even if the current government regards it as less desirable.

Equally importantly, politicians' re-election imperatives all too readily create a temptation to propose policies that move towards J rather than K in Figure 1. These are policies that undermine, rather than enhance, the integrity of current policy and should be resisted by advisers. As one senior New Zealand public servant is alleged to have expressed it: 'our job is not to tell politicians what they want to hear but what they ought to do. If they disagree with us and insist on doing something we think is stupid, our job is to tell them the least stupid way of doing it'.[19] In terms of Figure 1 this might be thought of as discouraging policies that move left from F, especially when such policies aim mainly to improve electoral popularity, towards the line segment CG.

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[19] This sentiment, if not the wording, is sometimes attributed to Henry Lang, the respected New Zealand public servant, and Treasury Secretary from 1968-77. If so, it may have been at least partly based on Lang's experience of Prime Minister Muldoon's attitudes and policy choices. According to Holmes (2007, p.44), following a meeting with Muldoon, Lang wrote in his diary: 'his ignorance was exceeded only by his breathtaking arrogance'.

## 2.	Some Simple Lessons from Economics

The frameworks that economists adopt to analyse specific areas of tax policy have produced a mixture of agreement, debate and disagreement over suitable or 'best' approaches to tax design. Nevertheless, some lessons have been learned over past decades of analysis and evidence, which command a high degree of agreement. This, and the next, section respectively offer a selection of lessons that have emerged from general economic analysis and from analyses directed specifically at improving tax policy. This section illustrates ten general lessons.

### 2.1	Legal and Economic Incidences Often Differ

It is something of an economists' mantra that it is the economic incidence of a tax that matters for economic policy choices and this is not necessarily the same as the legal incidence. That is, whoever is required by law to pay the tax is not usually the same as who *effectively* bears the burden of the tax. The latter is determined by the ability of those legally liable to pass the tax on to others, for example, via prices passed forward to customers or back to employee wages in the case of taxes for which companies are legally liable. Since a key outcome by which taxes are typically evaluated is their (re)distributional characteristics, the economic burden is what matters but this will be obscured from simple descriptive measures of who pays the observed tax revenues.

For example, data on tax revenues collected from a tax on housing rents legally incident on landlords would show a completely different legal incidence than if the same tax was instead legally levied on, and hence paid by, tenants. However, the true economic incidence will depend on how rents change after the tax is levied, whoever is legally liable. Importantly, the incidence cannot be inferred from the person observed to pay the tax. For example if landlords are legally liable but tenants' rents rise, no tax will *appear* to have been paid by tenants. Instead, the incidence would be at least partly captured by changes in non-tax variables such as the rent, incomes, prices or spending patterns of those to whom the economic incidence was shifted.

Note that the above argument is not necessarily saying that the legal incidence is *irrelevant* to the economic incidence. The costs of passing on legal incidence may vary depending on which entity is made legally liable, and that may therefore influence how much of the tax is passed on to others.[20] Kopczuk *et al.* (2016), for example, show that, for fuel taxes levied in the US, the amount of tax collected (and evaded) varied depending on where in the supply chain it was legally applied.

In general the incidence of a tax will most likely 'stick' with (be unable to be passed on by) the taxpayer who is least able to respond to the imposition of the tax by changing their behaviour – the factors whose responses are 'inelastic' (see sub-section 1.3). For example, a tax on company

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[20] An earlier version of Kopczuk *et al.* (2016) argued that: 'the canonical theory of taxation holds that the incidence of a tax is independent of the side of the market which is responsible for remitting the tax to the government. However, this prediction does not survive in certain circumstances, for example when the ability to evade taxes differs across economic agents.' (Kopczuk *et al.*, 2013, p.1).

profits may be shifted back to employees' wages or forward to the firm's customers, or 'stick' with the shareholder-owners, and where membership of these three groups may overlap. If employees have few other employment opportunities while customers have alternative untaxed products to switch to, the economic burden is more likely to be incident on employees. High customer loyalty, on the other hand make them more vulnerable to bearing the tax burden. Likewise, if the company's shareholders can readily alter their share portfolios towards lower taxed alternatives, they are more likely to be able to shift at least some of the burden onto consumers or employees.

2.2   People, Not Companies, Pay Tax

In addition to recognising that companies may be able to shift their legal incidence to customers or employees, it is important to be aware that the final incidence of a tax can *never* be with a company as an entity. Companies are ultimately owned by people – their shareholders. To the extent that the company cannot or does not pass on the incidence of their legal tax obligations to customers or employees, their shareholders bear the burden. This may be both direct owners of the company's shares and indirect owners such as the recipients of pensions paid from a pension fund holding the company's shares.

Two critical points follow from this. Firstly, arguments along the lines of 'by cutting corporate tax the government is favouring companies over workers' are spurious. The issue for any tax is: which combination of workers, consumers and capital owners are paying the tax? When corporate taxes change, the impact on individuals (including non-workers) is much more complex than the simplistic 'companies versus people' argument would suggest.

Secondly, when the *indirect* or ultimate ownership of a company is recognised, the distribution of the tax burden across individual or household incomes may be quite different from the distribution across the direct (often more wealthy) owners. Pension funds invested in company shares are a common example – the beneficiaries of those funds can be a mixture of high, middle and low income earners. Hence when the corporate tax burden is allocated to those indirect shareholders, quite different conclusions on redistribution can be reached.

2.3   Consider Taxes Within a Broader Set of Policy Options

When an economic problem identified in public policy debates warrants a policy solution, a common first reaction is 'levy a tax on it', or 'it needs a subsidy'. Common examples are taxes on polluters, sugary drinks producers, fatty foods, or tax relief for female sanitary products, fresh vegetables, or first home buyers. Such responses suffer from at least two problems. Firstly, a tax system's coherence matters a great deal (discussed below), and *ad hoc* adding or subtracting of new taxes or allowances to that system risks undermining its coherence unless carefully thought through.

Secondly, there are often alternative policies that governments can use to deal with a given economic problem. The most obvious is usually a change in regulatory settings. This might include setting a minimum wage rather than social welfare payments or income tax credits. Or legislated sugar content for some products. Comparing the costs and benefits of the various options, including taxes, is vital if the 'policy space' is not to become cluttered with a variety of taxes that were designed with only their individual-specific objectives in mind.

2.4   Taxes have Intended and Unintended Consequences

There are few, if any, economic policy interventions that simultaneously can fully resolve the perceived 'problem' that the policy is designed to deal with, *and* have no effects on any other outcome. The first is a problem of *target (in)efficiency*; the second is a problem of *unintended consequences* which in some contexts are referred to as '*by-product distortions*'. Taxes are especially vulnerable to such unintended consequences. Since taxes are a form of compulsory extraction of an individual's private financial resources, not surprisingly they give rise to attempts, both legal and illegal, to minimise those financial losses by changing behaviour.

These *behavioural responses* by taxpayers are vital for the amount of revenue that the tax raises (typically less than the intended 'no behaviour' effect of the tax) and for the achievement of other objectives of taxation such as redistribution, efficiency of revenue raising, compliance costs, and administrative simplicity. Below are three examples of unintended, or at least often unforeseen, consequence of taxes.

Example 1:

Tobacco excise (a so-called 'corrective tax') is typically designed deliberately to elicit a behavioural response – namely, to reduce 'undesirable' smoking activity and thereby reduce addiction and adverse health consequences. But it can have the unintended consequence of being highly regressive due to greater incidence of smoking within poor families. Unintended consequences, however, are not necessarily all 'bad'. Consider a policy that sets a higher tax rate on cigars (which, being more expensive, are generally smoked disproportionately by the better off). This could have the 'double benefit' of reduced smoking (the direct target of the policy) and a *positive* unintended consequence of being progressive across the income scale. However, this policy may have its own unintended consequence if, for example, the higher cigar tax rate encourages a switch to cigarette smoking – with possibly poorer health outcomes than cigars.

Example 2:

In New Zealand, which has no tax-free zone at the bottom of the income tax schedule, it is common to hear calls for the introduction of such a tax-free zone to help those on the lowest incomes (the target). But *all* taxpayers benefit from the tax-free zone, and benefit at *a higher rate* the further they are up the income tax schedule. A tax-free zone of $10,000, for example, is worth

an extra $1,000 of retained income to someone paying a marginal tax rate (MTR) of 10 cents in the dollar, but it is worth $4,000 for someone higher up the income tax scale with an MTR of 40 cents in the dollar. The important point here is that a tax-free zone nominally applied to the *first* $X of income actually affects tax liability via the *last* $X of income.

Example 3:

Governments often subsidising higher education to support the children of poor families towards career improvement (the target). In New Zealand's case this has recently involved 'no fees' for all new tertiary students. But, given the tendency for the children of middle- and high-income families to participate in higher education in greater proportions, this policy risks providing *even more* subsidy to those better-off families. It can therefore represent a high cost, via the by-product distortion, of achieving (or seeking to achieve) its intended target.[21]

2.5 The Coherence or 'Congruence' of the Tax System matters

Even if some initial *status quo* tax system design is coherent, in many countries tax systems evolve over time as annual budget decisions seek to tackle a variety of new problems for which a tax solution is proposed. The consequence can readily be one of an incompatible or incongruent set of taxes that have no underlying strategic objective or unifying framework. At a minimum they distort an initial system with strategic design so that over time it becomes increasingly *ad hoc*.

Coherence requires that the various parts of the tax system are working toward a common set of objectives such that one tax does not undermine the ability of another tax to achieve its objective. In addition, coherence requires that there is a unifying framework on which the tax system is based. This could be an agreed set of objectives or rationale for the tax system. In the previous section we discussed the key objectives adopted by many tax systems.

In some cases those objectives involve conflicts or trade-offs; for example, a more efficient tax structure my conflict with a more redistributive one. This need not involve any incoherence, provided it is clear that the system is designed to achieve these multiple objectives. However, the system would be 'incoherent' if it involves unnecessary trade-offs whereby, for example, improvements in meeting *both* the above objectives could be achieved by redesigning the system. Two examples of a lack of coherence follow.

Example 1:

A common rationale for a tax system is that a dollar of income should be taxed at the same rate regardless of the *source* of that income (regular wages, bonuses, rental or interest income, profits,

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[21] An important caveat to this argument is that support for an apparently regressive subsidy scheme may be justified where higher education raises productivity levels of the non-educated. This also serves to emphasise the importance of considering potential indirect, as well as direct, consequences of such policy interventions.

capital gains etc.). This is the familiar argument that all 'Haig-Simons' income should be included in the tax base, as discussed in sub-section 1.3.[22] An alternative rationale is that different income sources are taxed at *different rates* – perhaps because the economic (inefficiency) consequences of applying the same rate would be severe. This leads some countries, for example, to tax 'capital' income (the return on investment) differently from 'labour' income (the return to working). This is the 'dual tax system' found in some Nordic countries. Clearly it would be incoherent for a given tax system to adopt both rationales. Yet many countries, including New Zealand, now simultaneously try to avoid taxing some income sources at different rates, while effectively setting different tax rates across others.

Example 2:

Saving, especially for retirement, is often encouraged via expenditure taxes or lower savings-related income tax rates. A typical rationale is that tax relief helps to compensate for alleged myopic behaviour that leads to taxpayers being financially under-prepared for retirement and hence placing an undue burden on the state for aged support. Suitable tax regimes suggested include little or no taxation on income saved for retirement at the time the income is earned (and saved). Then, when the pension is paid during retirement, it is taxed like any other income. An alternative approach taxes income in the normal way when it is earned and saved but gives tax relief when the pension is received. These are sometimes referred to as 'EET' and 'TTE' systems – where E = exempt, T = taxed. The first letter refers to the regime when the income is initially earned and saved; the last letter refers to the taxation of income in retirement (the pension) and the 'middle T or E' refers to the period between initial earning and retirement where the financial accumulation within the pension fund is either taxed or exempt.[23]

There is much debate about the 'best' form of taxation of retirement savings but, regardless, it would be incoherent to tax some retirement savings vehicles using one 'model' while adopting a different model for other retirement savings vehicles. Such incoherence would simply encourage taxpayers initially to save mainly via an EET scheme, then switch into the TTE scheme before retirement, hence effectively avoiding all taxation. Unfortunately, New Zealand like various other countries, displays an element of this incoherence in its pension taxation regime, especially since the introduction of the KiwiSaver retirement savings scheme.

Example 3:

Sugar taxes: a common argument from public health professionals (not economists!) proposing taxes on fizzy (sugary) drinks to combat obesity, is that 'we must start somewhere'. However, independently of the efficacy of *any* aspect of tax policy to combat obesity, the 'start with a fizzy

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[22] See Alm (2018) for an exposition and critique of the Haig-Simons approach to personal income taxation.
[23] There are numerous variants of these two approaches involving the use of lower tax rates ('small t'; e.g. EtT) applied at some stages rather than full exemption or full taxation.

drinks tax' could hardly be a worse suggestion from the point of view of the coherence of tax policy. Constructing or maintaining a coherent tax system is much like designing a complex multifunction building – individual rooms or floors cannot be designed in isolation without compromising some aspects of the building's purpose and integrity.

2.6   Taxes and Expenditures Need to be Considered Together

Discussion of appropriate design, or reform, of a tax system rarely include consideration of government spending, except perhaps with respect to government transfers spending such as unemployment or sole parent benefits, which are better thought of as negative taxes.

But government expenditures share a number of objectives in common with the tax system, most obviously to achieve particular equity outcomes. Hence it is important that taxes, and their design, are not be considered in isolation from other parts of the government's budget. For example, from the late 1970s the UK economist Julian Le Grand has argued that the progressivity of the UK tax system was undermined by the fact that much of the collected revenue was effectively returned to high income earners via government spending on health and (especially higher) education; see Le Grand (1978, 1982a,b), Gemmell (1985). This arose because high income families more regularly used the public health service or made most use of the more expensive health treatments, and were also much more likely to go to university.

The regressive effect may not have been intended but it had a by-product effect of conflicting with redistributional objectives of the tax system. Thus, just as it makes sense to consider the redistributional properties of the tax system *as a whole*, so the government *budget* as a whole may need to be considered to avoid designing incoherent components.

2.7   No Observed Change Does Not Mean No Effect

A common, but incorrect, intuition might suggest that if there was no observable change following a tax policy change, there cannot have been any effect. However, in various situations economic analysis can lead us to expect countervailing effects and these may cancel each other out, leaving no net effect. In the case of taxation the most common are where income and substitution effects of a tax change exactly or approximately counterbalance each other.

Example 1:

Consider an increase in a marginal income tax rate. It is expected to have both an income effect (encouraging increased work to replace the lost income) and a substitution effect (discouraging additional work because the returns to working – after-tax wages – have fallen). Where this results in no observed change in employment or participation in the labour force, it is tempting to conclude that the tax had no effect; hence no need to worry about adverse labour market effects of the tax. But by most measures the tax will certainly leave income earners feeling worse off, or with 'lower

utility'; see 3.1 below.[24] Such utility outcomes are not so easily measured (or publicised) as employment changes and, therefore, are often not 'observed' or discussed in policy debates.

Example 2:

The introduction of a new tax may lead to no revenue but still have important effects, such as when a new 'corrective' tax is designed to discourage some activity. It may generate no revenue precisely because it succeeds in eliminating the activity. Failing to generate any revenue does not mean the tax was ineffective – quite the reverse! Taxation to stop pollution or smoking are obvious examples though these rarely succeed in eliminating the activity in question. Indeed they can all too readily become a reliable source of revenue to governments that they are reluctant to give up even when health concerns merit changes to make smoking less attractive.

Example 3:

A new capital gains tax may not raise much revenue because earning income as capital gains may previously have been used to avoid income tax. After the introduction of the tax this method of avoidance is no longer worthwhile; hence more revenue is raised from the taxation of other income rather than via the taxation of capital gains. An example of this would be where company profits can be paid out as dividends or held inside the company to accumulate as capital gains via share price increases. When capital gains become taxable, more income may be paid out as dividends since the tax-motivated distinction has disappeared, and dividend 'income tax' revenue rises rather than capital gains tax revenue. The revenue-raising success of the capital gains tax should not therefore be judged solely from the resulting capital gains tax revenues.

2.8   A Taxpayer Can Respond to a Tax Change of which They are Unaware

A related – and again fallacious – argument sometimes heard in policy advice circles runs along the following lines: 'there cannot be any reaction to a tax change if the taxpayer is not aware of the change'. Two examples illustrate why this conclusion can be wrong.

Example 1

Consider the case of a welfare benefit recipient who experiences an increase in their *effective* marginal tax rate (EMTR), of which they are unaware, when the withdrawal of their benefit begins to take effect at a particular income level. The alleged inevitable non-response to this jump in the EMTR is fallacious because the benefit recipient in this case may readily make their weekly

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[24] Economists often define 'utility' as the satisfaction obtained from consuming a set of goods and services, x_i ($i = 1 ... n$): thus $U = U(x_1, x_2, ..., x_n)$. Higher income expands the consumption opportunity and hence is usually associated with higher utility. However, 'consumption' can include such satisfaction-enhancing items as leisure or 'environmental protection'. Further, the utility gained from consumption may be conditional on a vector of other relevant factors, Z, such that we can write: $U = U(x_1, x_2, ..., x_n; Z)$. The vector Z might include, for example, factors that in recent years have been included in indices of wellbeing, such as family relationships, culture, social connections, safety etc.; see, for example, King *et al.* (2018) and https://wellbeingindicators.stats.govt.nz/.

household earning and consumption decisions based on the week-end balance in their bank account. This, in turn, is impacted by the EMTR change on the income paid into it. They may be responding *directly*, perhaps with a lag, to the evidence that their bank balance is now lower without being sure why this has occurred. But they are clearly responding *indirectly* to the change in their tax rate, even if they are totally unware of that change.

Example 2:

Reacting to a tax change of which the taxpayer is unaware is especially relevant in the case of changes in goods prices that tend to fluctuate over time for non-tax reasons. Common examples are petrol and heating fuels that depend on the notoriously volatile world price of oil. Thus, when petrol prices change at the pump it is difficult for consumers to distinguish changes in pre-tax market prices from the post-tax effect of changes in fuel duties. But they might be expected to react to a given change in the price at the pump even whilst being unaware of the tax component of any change.

The key feature of both these examples is that taxpayer-consumers seeking to maximise their utility might reasonably be expected to respond to changes in their after-tax-and-transfers income and the prices of the private goods and services they consume out of that income. Being aware of the *sources* of these changes seems unlikely in general to be necessary in the taxpayer's decision to adjust behaviour, and certainly it should not be supposed that lack of awareness of a tax change prevents a response.

2.9   All Income Inequality Measures Involve 'Inequality Aversion' Value Judgements.

All tax changes involved gainers and losers and interpersonal comparisons cannot be avoided in evaluating policy decisions, though the value judgements involved are rarely made explicit. In the case of inequality effects of tax policy, the search for simple-to-understand, easy-to-communicate inequality measures, often leads policy advisers and politicians to select relatively unsophisticated measures. Despite acknowledged imperfections in those measures, they are often treated as objectively quantifying the extent of inequality. However, this can never be the case with any measure involving interpersonal comparisons. These are inevitably required by individual- or household-based indices of inequality of such quantities as income, wealth or consumption.

Consider one of the most commonly quoted income inequality indices: the Gini coefficient – which measures inequality on a scale of zero to one, representing complete equality to complete inequality (one person has all the income). A common error by analysts using the Gini index is to presume that there is no user's 'inequality aversion' implicit within the construction of the index. This stands in contrast to the more complex Atkinson Index of inequality, for example, which requires the person calculating the index explicitly to consider the appropriate degree of aversion

to inequality to embed within the calculation. In fact, the Gini embodies a quite extreme implicit inequality aversion parameter.

The Atkinson inequality index (see Creedy, 2016, and Creedy *et al.* 2018, for expositions) applies weights, in a social evaluation function, to individuals within the income distribution, with weights declining as individual incomes rise across the distribution. The rate at which these weights decline reflects the degree of aversion to inequality. However, it has also been shown that the Gini index can be derived in the same way as the Atkinson index but where the implicit social evaluation function takes a somewhat different form; see Creedy *et al.* (2018, p.23).

In particular, within the Gini coefficient, the weights applied are based on the reverse-rank of each individual. That is, across *n* individuals, the richest individual's income is given a relative weight of $1/n$, while the poorest individual is given a weight of 1; that is *n*-times the weight of the richest individual. Clearly this embodies a quite specific, and relatively extreme, weighting scheme, but is based on rank positions not income levels; hence, doubling only the richest person's income does not affect their weight in the Gini calculation.[25] Implicitly, and often unintentionally, it represents the user's inequality value judgements.

Furthermore, as Creedy *et al.* (2016, pp.23-24) point out: '*both Gini and Atkinson measures, by giving relatively little weight to the highest incomes in the overall evaluation, are not very sensitive to changes in top incomes. Stability shown by overall inequality measures may therefore be quite consistent with higher top income shares'*. It follows, therefore, that acknowledging 'inequality aversion' is crucial to establishing both the extent of inequality and redistributional objectives. One means by which these value judgements may be teased out is the well-known 'leaky bucket' experiment; see Amiel *et al*. (1999) for a general description and Creedy *et al.* (2020) for a New Zealand tax application.

2.10 Microeconomic and Macroeconomic Approaches to Tax Policy can Conflict

As should be obvious from the discussion in sub-section 1.4 above, the 'standard' economic principles of good tax policy are essentially microeconomic in nature and, in particular are derived within a framework based on standard welfare economic principles of utility maximisation. Macroeconomic approaches to policy design have also sought, since at least the 1970s, to incorporate what are usually referred to as 'microfoundations', derived from the same framework in which 'representative agents', including taxpayers maximise their utility. Nevertheless, many current macroeconomic models embody somewhat tenuous connections with this framework.[26] In addition, Musgrave (1959) – one of the pioneers of modern public finance – famously divided the

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[25] For example, with New Zealand's population of over 4 million, in a population-wide Gini, the income of the richest person is given a weight of less than one-four-millionth of the weight on the poorest person's income.
[26] For an early survey of the 'microfoundations of macroeconomics' debate, see Weintraub (1977), and Wren-Lewis (2018) for some recent rethinking.

objectives of tax policy into three key 'branches': allocation, distribution and stabilisation.[27] This third branch is explicitly macroeconomic in nature and refers to the role of fiscal policy to help stabilise the macroeconomy over economic cycles or in response to idiosyncratic disturbances.

It is important to recognise that, just as the microeconomic objectives of tax policy such as efficiency and equity often conflict in their prescriptions for tax design, so too can macroeconomic objectives such as stabilisation of aggregate income levels over time. This role for fiscal policy, and its tax component, was downplayed for much of the period from the 1980s till the 2008-09 global financial crisis (GFC). During that period at least, monetary policy was generally seen as the primary instrument to achieve stabilisation, with tax/fiscal policy design allocated the task of dealing with the microeconomic trade-offs integral to raising tax revenues.

Nevertheless, both prior to, and after, the GFC, various macro-level prescriptions for tax policy have been proposed that are often in conflict with those arising from micro approaches, or at least involve significant trade-offs. These are in addition to the inevitable conflict that arises when an additional policy objective (or 'target') is added but with no additional policy 'instruments', thus putting Tinbergen's famous rule that achieving a set of policy outcomes "needs at least as many instruments as targets" under further strain.

Example:

Time-varying VAT (GST) rates are one example of a tax policy sometimes suggested to help achieve macroeconomic stabilisation objectives that contravene key microeconomic policy design principles. Claus and Sloan (2008) provide an evaluation, and Brook (2011) some discussion, of the macroeconomic case in the New Zealand context. The idea is to vary the rate of VAT (or GST) between GDP upturns and downturns as a form of counter-cyclical fiscal policy. Whether this would be effective is open to doubt (see Claus and Sloan, 2008; Buiter, 2006, for discussion).

Of more concern for tax policy design are the potential unintended consequences at the micro, taxpayer level. Indeed, reporting on internal Treasury analysis, Brook (2011, p.41) warns that, in addition to various downside political risks, 'using fiscal policy tools in such an active counter-cyclical manner would imply substantial efficiency and compliance costs'. More specifically, Claus and Sloan (2008, p.6) highlight numerous adverse impacts of a variable GST, noting in summary that an 'overarching policy principle is that GST does not distort between current and future consumption, in that GST does not affect decisions to spend now or spend later... This principle would be violated with the introduction of a variable GST rate'.

This is not the place to debate the merits of macro versus micro motivations for fiscal policy in general or variable GST in particular. However, the above highlights an important lesson: that *if* fiscal policy involving tax parameter settings is to be used for macroeconomic purposes, there is

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[27] Musgrave's framework is more encompassing than just taxation, covering all 'public economy', including revenues, expenditures and debts of government. See Musgrave and Musgrave (1989) for details.

considerable potential for this to undermine the underlying microeconomic prescriptions for a well-designed tax system. Analysts should therefore be aware that the trade-offs involved here could turn out to be greater than the trade-offs inherent across some of the microeconomic tax policy principles discussed earlier.

3.   Fifteen Lessons from Tax Analysis

As well as economics in general offering insights that are applicable to the analysis of a system of taxation, public economics includes analysis of taxes in general as well as analysis and prescriptions for individual taxes, such as taxes on personal and corporate income, labour, capital and consumption. This section examines a number of more general lessons from the analysis of taxation and tax systems.

3.1   Welfare Losses are the Most Comprehensive Metric of the Costs of Taxation

Politicians and commentators often like to measure the impacts of taxes on tangible, salient outcomes such as employment, consumer spending, saving, investment or output (typically GDP). However, tax theory suggests that the full cost of tax changes should be measured as the cost of compensating taxpayers for their loss of welfare ('utility') as a result of the tax. This provides a more comprehensive and appropriate metric. These costs – the deadweight losses – also provide a measure of the efficiency of different taxes since they capture the extent to which resources are used, and wasted, in the process of raising revenue.[28]

The 'cost' of the utility loss of utility resulting from the tax change can be measured in the following way. Consider a tax on good X that raises the price of the good from p_0 to p_1. The cost can be quantified by asking: what is the maximum amount that the individual would be prepared to pay to avoid the tax and associated price change? However, this welfare loss measure – often labelled the 'equivalent variation' (EV) – does not represent the total loss since the tax revenue, R, could be used for (assumed beneficial) government spending or redistributed to others.

The net cost to the taxpayer can therefore be measured by the 'excess burden': $EB = EV - R$ of the tax. Except for lump-sum taxes (that, by definition, induce no distortions to behaviour; hence $EB = 0$), EB is always positive. Similarly when a tax *change* occurs, the welfare effect of the tax increase can be assessed by the *marginal* excess burden, MEB: $\Delta EB = (EV - \Delta R)$.[29] Thus, the excess burden (or deadweight loss, DWL) of a tax can be characterised as the extent to which a taxpayer feels 'worse off' when a tax is levied, even after they have (hypothetically) been compensated for the income loss that arises from the tax revenue they pay. This marginal effect is often measured as a proportion of the tax revenue raised, and referred to as the marginal welfare cost of the tax: $MWC = (EV - \Delta R)/\Delta R$, or the marginal cost of funds: $MCF = EV/\Delta R = MWC + 1$.

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[28] These additional (welfare) costs of raising each $1 of revenue are broader than the administrative and compliance costs that are also often involved in raising tax revenue. These latter costs can be important and may be part of the efficiency costs of taxes to the extent that they involve 'wasteful' resources (that could be used productively elsewhere in the economy) and therefore induce deadweight losses.

[29] In this case EV measures the difference in utility between before and after a tax change, rather than comparing a 'tax versus no-tax' situation.

The intuition behind this is easily demonstrated in Figure 2 which shows the quantity and price of good X. An individual's demand for a good X depends inversely on its price, and is shown by the line segment BF between p_0, the sale price in the absence of a tax, and the new higher price, p_1, when the tax is introduced. With the tax included in the price, demand falls from F to B and tax revenue is equal to the area BDp_0p_1 is raised.

It might be thought that the triangle BFD in Figure 2 captures the excess burden, or deadweight loss, of the tax – since it measures the difference (in dollar terms) between what the individual was willing to pay for good X over and above what was actually paid before the tax was imposed, and which is now lost after-tax. However, the fall in demand along the ('Marshallian') demand curve segment, FB, includes the loss of income due to the tax paid, whereas the excess burden measure needs to take account of the income compensation discussed above. This can be captured by redrawing the ('Hicksian') demand curve segment, FC, showing demand after (hypothetical) compensation for the income loss.[30] This compensated demand curve is steeper than FB because, if consumers were compensated for the loss of income due to the tax, their demand would fall by less when the price rises (or, equivalently, rise by less when the price falls).

<div align="center">Figure 2   The Excess Burden of a Tax</div>
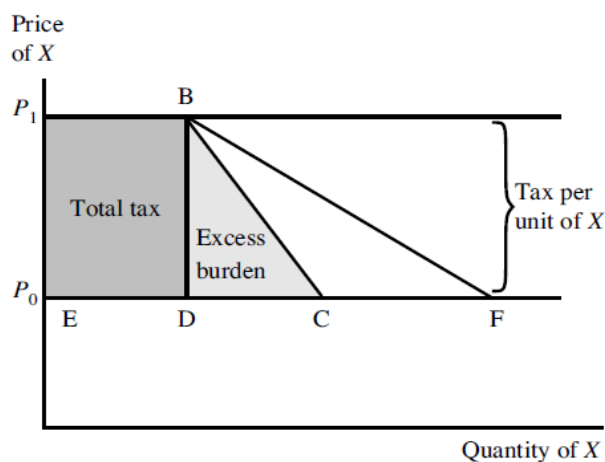
<div align="center">Source: Creedy (2004, p.456)</div>

As a result, the excess burden of the tax is measured by the area of the smaller triangle, BCD, rather than BFD. An important inference from this is that the EB is not measured by the observed change in behaviour, but the compensated change – which is *unobserved* unless there are no

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[30] The two demand curves are named after the two economists associated with them: Alfred Marshall (1842-1924) and Sir John Hicks (1904-1989). Note that the compensated demand curve pivots about the point B since this captures the taxpayer's 'starting point' (when considering compensation) after the tax has been imposed.

'income effects' of the tax. Hence using observed behavioural change as a guide to the marginal excess burden of a tax change risks exaggerating its size.[31]

Example 1:

Various contributions to the academic tax literature, as well as papers from tax policy institutions, have sought aggregate measures of the EBs or MEBs of various taxes for groups of taxpayers in different countries. A useful example is the set of marginal welfare cost (MWC) estimates by the Australian Treasury to enable comparisons across a number of taxes. These are shown in Figure 3. Of course, numerous caveats are warranted surrounding the modelling, reliability and comparability of these estimates. But they serve to highlight the orders of magnitude that these welfare metrics of the tax system can produce as well as differences among taxes.

Figure 3   Marginal Welfare Costs from Selected Australian Taxes, 2009
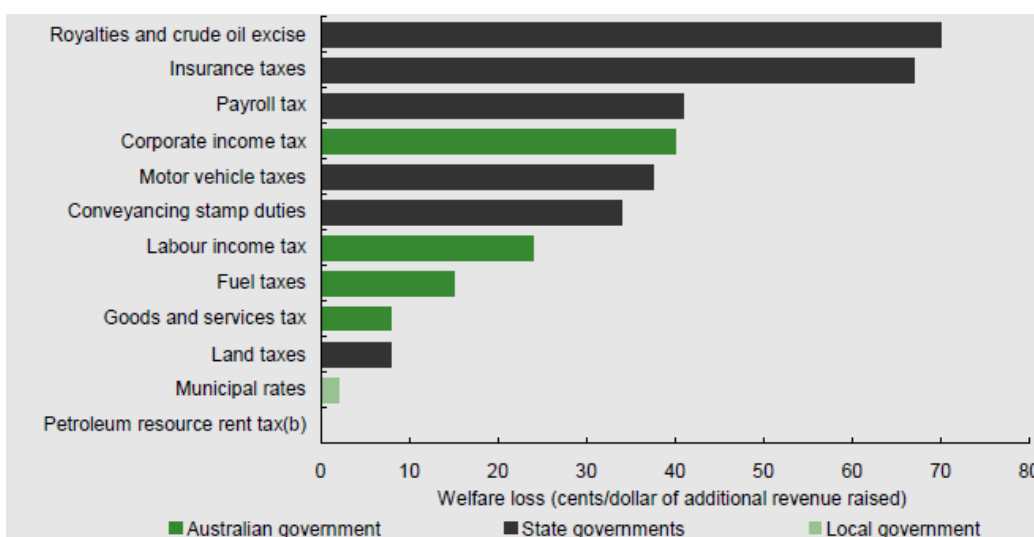
Source: Adapted from Australian Treasury (2009a, p.13).

The estimates suggest, for example, that some taxes – such as royalties and insurance taxes – can have very high MWCs, at around 70-80% of the additional revenue they raise. Taxes on income can also be substantial (around 25-40%), while GST and land taxes have relatively low welfare costs (under 10%). These welfare costs were estimated at the tax rates that were current in 2009 in Australia. However, given the discussion at 4.2 below, it is also important to be aware that if marginal tax rates were set substantively higher or lower for any of those taxes, MWC estimates would be quite different.[32]

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[31] But see Creedy (2004, p.458) for an empirical method to obtain the EB from estimates of the Marshallian demand curve.

[32] In addition, since all MWC or EB estimates are made under various assumptions about, for example, the incidence/shifting of the tax, it is important to have a sense of the reliability of each estimate, which can differ across taxes. Thus ranges of estimated values and/or confidence intervals are useful extensions and can assist policy choices.

Example 2:

Saez *et al.* (2012) and Hendren and Sprung-Keyser (2019) provide two calculations of excess burdens for top rates of income tax in the United States. Both studies use a formula specific to top income tax rates to approximate marginal welfare costs.[33] This is given by:

$$MCF = \frac{1-\tau}{1-\tau-\tau a \eta_{TI}} \tag{2}$$

where τ is the top income tax rate, a is a parameter that measures the shape ('thickness') of the income distribution among top earners, and η_{TI} is a measure of the responsiveness of top (taxable) incomes to changes in the tax rate, τ, (more specifically, to changes in the 'retention rate', $1-\tau$). For most economies examined, a is generally in the range 1.5 to 2.5 and most ε_{TI} estimates put it in the range 0.1 to 0.8.

Saez *et al.* (2012, pp.8-9) show that, setting $a = 1.5$ for the US and assuming $\eta_{TI} = 0.25$ (which, they argue, is an approximate mid-point estimate for the US), the top US tax rate in 2009 of 42.5% had an MCF = 1.38; that is MWC = 38%, or for every additional \$1 of revenue raised from the top tax rate an additional 38 cents are 'lost' via deadweight costs.

Hendren and Sprung-Keyser (2019) consider different US-based tax reform scenarios and find much higher welfare costs. These relate to the reduction in the US Federal income tax rate from 70% to 50% in 1981, and a subsequent increase in rates in 1993 from 31% to 39.6%. Adopting somewhat different values of $a = 2.299$ and $\eta_{TI} = 0.311$, they estimate that the MCF was infinite in 1981 (overall revenue *increased* by *reducing* the marginal rate to 50%, so these tax rates were highly inefficient), while MCF = 1.85 for the 1993 reform (MWC = \$0.85 per \$1).[34]

The above results serve to emphasise that the efficiency costs of setting high income tax rates need to be assessed carefully, are situation and tax system specific, but can be very high in some circumstances. Particularly where *effective* marginal tax rates are high – which can apply at the bottom, as well as the top, of the tax schedule due to interactions with social transfer systems – the excess burdens of the income tax can be especially important for tax policy design.

3.2 Deadweight Costs of Taxes Increase Disproportionately with Higher Tax Rates

This result follows naturally from 3.1 and, in fact, it is possible to go further: for small tax changes excess burdens increase approximately in proportion to the *square* of the tax rate; for example, doubling the tax rate approximately quadruples the EB, or raising the tax rate by 5% (e.g. from 30% to 31.5%) increases the EB by approximately 25%.

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[33] This approach, based on the η_{TI} term, however typically assumes there are no income effects of the tax.

[34] Note that these MCF values - suggesting large efficiency benefits from reducing high top income tax rates - may be quite different from 'optimal' top tax rates; the later involving a complex trade-off between efficiency costs and distributional gains from higher top tax rates.

Example 1:

This can be demonstrated by adapting Figure 2. Figure 4 shows the same compensated demand curve BC as in Figure 2. This is now shown as due to a tax per unit of 2*t* yielding, as before, the excess budget triangle BCD. Now consider a tax per unit of *t* instead of 2*t*, which increases price to P_1 rather than P_2. In this simple linear case, this results in an excess budget given by triangle HCG, which can be seen to be one-quarter the size of BCD. Thus, equivalently, if the tax per unit doubles from *t* to *2t*, the excess burden is four times as large.[35] Note also that revenue will *less than double*, to KBDE (which is less than twice LHGE), when the tax rate doubles. An important insight that follows from this is that it will often be more efficient (lower EB) to levy a tax rate of *t* on two goods than to levy a tax rate of *2t* on one good; providing an efficiency rationale more generally for 'broad tax bases with low tax rates' rather than *vice versa*.

From Figure 4 it can also be inferred that demand and/or supply curves that are steeper (less responsive to price changes) will be associated, other things equal, with smaller DWL triangles. If behaviour adjusts less in response to a tax rate increase (after allowing for suitable income compensation), we can often be less concerned about possible efficiency costs (but see 2.7 above).

Figure 4   Deadweight Losses of Higher Tax Rates
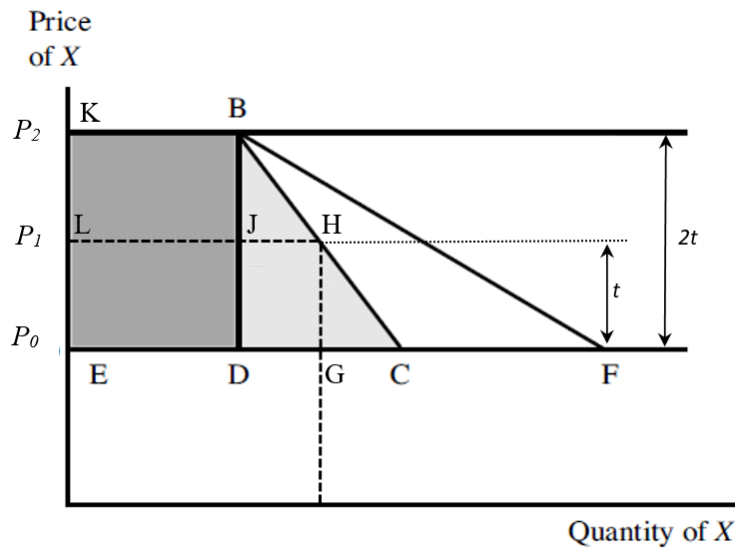
Example 2:

Given the link to the square of the tax rate above, an approximation of the excess burden of a tax on a good (based on the Equivalent Variation welfare measure), relative to post-tax expenditure, can be obtained as (see Creedy, 2004):

$$EB/E \approx (|\eta|/2)t^2 \tag{3}$$

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[35] This result is of course only approximate; it depends on the linearity or otherwise of compensated demand curves.

where E is post-tax expenditure, t is the tax-inclusive rate and $|\eta|$ is the absolute value of the (compensated) elasticity of demand. This shows that, for a given post-tax expenditure (in the case of goods taxes), the size of the excess burden can readily be approximated from knowledge of the tax rate and (half) the demand elasticity, suitably adjusted for income effects.

Consider a GST rate of 15% applied to all goods (so that behaviour is not further distorted by switching between taxed and untaxed goods). If the compensated (Hicksian) elasticity of demand across all goods is –0.5 then the excess burden is approximately 0.25 x 0.15^2 = 0.0625, or 6.25% of the observed goods expenditure after the tax is imposed. This halves if the demand elasticity is halved to –0.25, and so on.

This also clarifies why *income taxes* may be expected to be associated with higher distortions and excess burdens. Even if the 'demand elasticity' – in this case, the compensated elasticity of taxable income with respect to the tax rate – is thought to be higher for income taxes compared to GST, the impact of the square of the tax rate will have a magnified effect for typical marginal income tax rates around 30% to 40%.Creedy (2004, p.461) shows that the equivalent approximation to equation (3) for income taxes is:

$$EB/Y \approx (|\eta|/2)\{\tau/(1-\tau)\}^2 \tag{3'}$$

where in this case Y is the after-tax income of the taxpayer, and τ is the tax-*exclusive* rate – the form in which the marginal income tax rate is typically stated in income tax legislation. Consider, for example, $\tau = 0.30$; then the tax element in (3') is $\{\tau/(1-\tau)\}^2 = 0.184$. However, if $\tau = 0.40$; then $\{\tau/(1-\tau)\}^2 = 0.444$. That is, as the income tax rate increases by a third, $(0.4 – 0.3)/0.3$, the tax component of (2') more than doubles: 0.184 to 0.444. From (3'), with an elasticity of $|\eta| = 0.5$ together with $\tau = 0.4$, $EB/Y \approx 0.111$, or 11% of post-tax income. Of course, measured as a percentage of *tax revenue* raised (rather than after-tax income), as in the MWC and MCF measures, the welfare cost percentage is much higher.

3.3 Policy to Minimise Distortion Costs Should Equate MWCs Across Different Taxes

The intuition behind this result is fairly straightforward; namely that if the welfare costs per dollar of revenue are higher for some taxes than others, then the efficiency with which the tax system can raise an additional dollar can be improved by reducing tax rates on items with high MWCs and increasing them on those with low MWCs. When all MWCs are equal there is no further scope for changes in tax rates to improve efficiency. This argument also hints at the well-known 'inverse elasticity' rule for setting indirect tax rates. As the formula in equation (3) highlights, other things equal, EBs will be higher where (the absolute value of) the demand elasticity is higher. Thus taxing goods at higher rates that are in relatively inelastic (compensated) demand, and vice versa, enhances tax efficiency.

The inverse elasticity rule, associated with Ramsey (1927), shows that, under certain conditions (which include ignoring distributional objectives), indirect tax rates should be set in inverse proportion to their elasticities of demand. The Ramsey analysis was extended by Atkinson and Stiglitz (1972, 1976) and Ahmad and Stern (1984). They showed that, when distributional characteristics of each good's consumption are taken into account (the extent to which goods are consumed differently by rich and poor), an equivalent efficiency principle can be established whereby, across all individuals, the marginal *social* welfare cost per dollar of revenue for each tax rate is equalised. This uses social 'welfare weights' to capture the relative contributions of different individuals to social welfare; for example, giving greater weight to lower income individuals or households.

A key advantage of this Ahmad and Stern approach is that only a few pieces of information are required to implement it: essentially effective tax rates on each good (or group of goods), own-price demand elasticities for each good, but only *aggregate* cross-price demand elasticities, and the social welfare weights attached to the household types of interest.[36] This last element will depend on the decision-maker's aversion to inequality and is clearly 'value laden' (see 2.9).

It is important to recognise, as discussed further at 3.13 below, that this result, whereby optimal indirect tax rates could be set with reference to their efficiency and distributional characteristics, holds in the absence of income taxation. Other results in the literature, notably Atkinson and Stiglitz (1976), following Diamond and Mirrlees (1971a,b) and Diamond (1975), show that setting different tax rates on goods according to their distributional characteristics can be inferior to uniform rates when a progressive income tax is feasible.

Example:

Creedy (1999) applied the Ahmad and Stern (1984) analysis to Australian indirect taxes. His application has the particular advantage that it allows the demand elasticities across commodity groups to vary by household type, for example by household income group. Creedy showed that for Australian indirect taxes before the introduction of GST, there was a case for raising some taxes and lowering others. For a decision-maker who does not care at all about redistribution (zero aversion to inequality) results supported raising the effective tax rates on, fuel, food, health services and (untaxed) housing. However, with relatively high aversion to inequality, tax rates on those commodities would instead be *reduced*. Of the sixteen commodity groups studied, inequality aversion appeared to have no effect on the desired direction of tax rate reform for a subset of five.

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[36] It is important to use effective, not statutory, tax rates where there are taxes on goods, such as energy, that are inputs into other goods production. Of course, this does not apply to value-added type taxes where input costs can be expensed against the tax.

3.4 Avoid Taxing Transactions

A standard efficiency result from tax theory suggests avoiding taxation of transactions, primarily because this taxes the inputs, as well as the outputs, of economic activity. Notably this is one efficiency result where any equity trade-offs are largely absent. Most commonly used transactions taxes are those on property. For example, stamp duty (or conveyance duty) is typically applied to the property sale price and hence discourages people from moving between properties with consequent effects on employment mobility. The UK has one of the highest property transaction taxes in the OECD (see Figure 5) which until recently also had the undesirable characteristic that the average rate 'jumped' substantially at selected house price values. This is the so-called 'notch' problem (see 3.5 below) and creates a strong disincentive for individuals to engage in transactions just above those price levels and may encourage tax evasion.

For transactions taxes applied to businesses, there is the additional effect that, since input costs are not exempt, businesses that involve longer supply chains are more heavily taxed (more input is not tax-relieved). This further distorts incentives by encouraging firms to bring upstream stages of production in-house when it would otherwise be more efficient to buy them from other, specialist firms.

<u>Example 1:</u>

Financial transaction taxes (FTTs) have been proposed by various advocates, especially after the global financial crisis, as a means of reducing 'unwarranted' (risky) financial transactions and also to raise revenue in, what is claimed to be, a relatively painless way by keeping the tax rate per transaction *very* low but across a very large tax base. On the surface, therefore, it can appear to be an example of (a generally favoured) 'broad base, low rate' tax.

However, as Burman *et al*. (2016) show, though the more extreme arguments for, and against, an FTT are generally overstated, the argument that an FTT could raise large amounts of revenue at low distortion cost are specious. They also argue that while evidence of (undesirable) reduced volumes of transactions is clear, evidence of (desirable) reductions in excess volatility are generally absent. That is, the broad base of the FTT is achieved at the cost, as predicted, of interfering substantively with normal commercial transactions, in part because the FTT fails to allow credits for legitimate input costs.

<u>Example 2:</u>

Despite the acknowledged design flaws inherent in transaction taxes, most OECD countries levy them to some extent, typically as easy revenue-raising devices. Property or financial transactions are the most common examples. Figure 5 shows the ratio of property tax revenue to GDP across OECD countries and the breakdown between various types. It can be seen that both the level and the composition of those taxes vary considerably across countries. Recurrent property

taxes – such as local council residential property 'Rates' in New Zealand, or 'Council Tax' in the UK – can be seen to dominate in most countries. These are generally regarded as relatively less distortionary – because they tax the *flow of services* from property (that, as imputed rental income, would otherwise generally remain untaxed).

Figure 5 also shows that the share of (more distortionary) non-recurrent and transaction taxes within the property tax total varies across countries. Following the 1990s reforms, New Zealand has almost no such taxes, whereas countries such as Australia, the UK ('GBR'), Italy and Turkey rely relatively heavily on them.

Figure 5   Breakdown of property tax revenues in OECD countries in 2016 (% GDP)
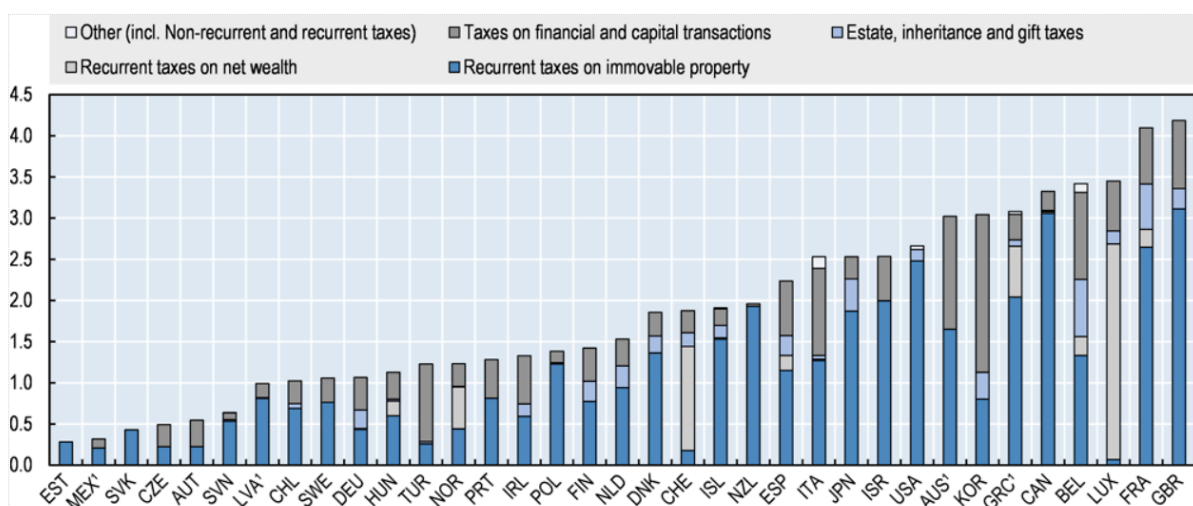
Source: OECD Revenue Statistics Database

Example 3:

Best and Kleven (2018) have examined the responses of the UK housing market to the UK's property transaction tax (stamp duty) and presence of 'notches' in its structure. They obtain two interesting findings. Firstly, the stamp duty is 'highly distortionary across a range of margins, causing large distortions to the price, volume, and timing of property transactions'. Secondly, however, partly as a result of the first effect: 'temporary transaction tax cuts are an enormously effective form of fiscal stimulus. A temporary elimination of a 1% transaction tax increased housing market activity by 20% in the short run (due to both timing and extensive responses)'; Best and Kleven (2018, p.157). The example of 'notches' in the UK tax is discussed in 3.5 below.

3.5   Minimise 'Kinks' and Avoid 'Notches' in Tax Schedules.

It is self-evidence that different taxpayers facing different tax rates for the same type of tax (for example income tax rates at different income levels), or the same taxpayer facing different tax rates across different taxes for which they are liable, have incentives to shift tax burdens wherever

possible towards the lower-taxed regimes. However, since equity objectives often motivate some rate progression in tax schedules, preventing 'income shifting' becomes potentially important. Such income shifting is more likely (and more rewarding to the taxpayer) where there are large, discrete changes in *marginal* tax rates, MTRs ('kinks'), and especially where there are large discrete changes in *average* tax rates, ATRs, ('notches') in the tax schedule.

Wherever possible, those kinks and notches should be avoided or minimised. 'Tax kinks' refer to kinks (slope changes) in the taxpayer's budget constraint due to changes in the MTR that they face, while 'tax notches' refer to tax-induced discontinuities in the budget constraint. Personal income taxes commonly give rise to kinks due to a set of (usually increasing) MTRs as incomes rise across various tax thresholds or brackets. Decreasing MTRs are also common where the income tax and transfer systems interact, mainly at lower income levels.

Notches are more often found in welfare benefit system, corporate income taxes or property transaction taxes where, for example, if the property sale price exceeds $100,000 the property tax rate rises from 1% to 2% on the *total* sale price, not the increment above $100,000. As a result, the tax rate is 2% ($200) for a property that sells for $100,001 but 1% ($100) for a sale price of $100,000. A characteristic of a notch, therefore, is that the increase in price which (as usual) makes the taxpayer better-off before tax, makes him or her *worse-off* after-tax. A tax kink, on the other hand, merely results in a smaller fraction of any *increment* in before-tax income being retained after-tax.

Tax notches sometimes also occur with indirect taxes such as GST or VAT, where 'small business' thresholds are commonplace – that is, where businesses only become required to register for GST above a threshold level of firm *sales or turnover*. In New Zealand this is set at $60,000. As a result, as a firm's annual turnover rises from just below, to just above, $60,000, a new GST liability at 15% of their value added will result even though their value added, or gross profit, may have remained unchanged.

Example 1:

An example of a 'kink' in an income tax schedule is given in Figure 6. This shows marginal and average tax rates of the NZ personal income tax in 2020. As with most multi-step income taxes marginal rates rise discretely at various income levels (in this case $14,000, $48,000 and $70,000) and with MTRs rising from the lowest rate of 10.5% to a top rate of 33%. These MTRs are charged on income earned above each threshold, As a result, the associated average tax rate increases regularly with no such discontinuities. Rather the ATR begins to rise somewhat more steeply when income increases above each MTR threshold. It is the discrete MTR 'jumps' that give rise to 'tax kink bunching' described below.

Figure 6   The NZ Income Tax Schedule
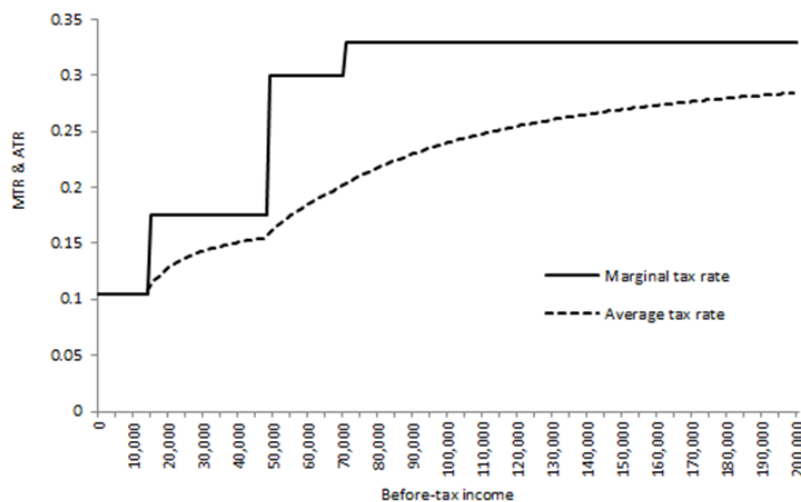
Example 2:

The UK's Stamp Duty Land Tax is levied on the transactions value of residential property when it changes ownership (as recorded by the UK's Land Registry), at various percentage rates of the sale price, depending on value, with the percentages rising across several 'price bands'. Until December 2014, these percentage rates were charged on the *full sale price*, not on the price above each threshold in the schedule.[37]

The stamp duty schedule for 2012-13 is shown in Figure 7, where it can be seen that the absolute amount (in £s) jumps at each tax rate threshold as the tax liability increases in five steps from 0% below £125,000 to 7% over £2 million. These jumps imply that the after-tax receipts are *lower* for a house sold, for example, for £250,001 compared to one sold for £250,000 due to the tripling of the tax payment from £2,500 to £7,500.

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[37] This 'notch' condition was removed in 2014 such that, thereafter higher rates of tax were payable on the amount of the property value received in excess of each threshold. This represents one of very few changes in recent UK tax policy that unambiguously replaced a less efficient, with a more efficient, tax structure.
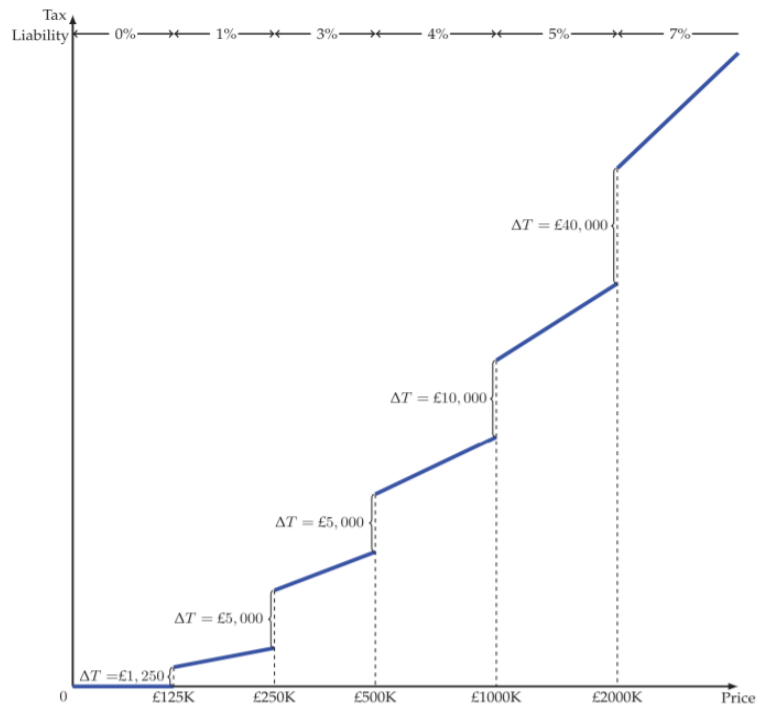
Figure 7   The UK Stamp Duty Schedule

FIGURE 1
Stamp duty schedule in 2012–13

Source: Best and Kleven (2018, p. 166)

The expected effects of such tax kinks and notches on behaviour are illustrated in Figures 8A and 8B respectively. These show the distribution of earnings before tax (in black, dashed), and the equivalent distributions (in blue) after a tax kink has been imposed in the form of a higher MTR above an income threshold, z^*, in 8A, or above a tax notch in 8B.

Figure 8A shows that the tax kink encourages taxpayers above z^* to shift to the left, with the result that some taxpayers bunch up against the threshold z^* from above. Those previously in the region $z^*+\Delta z$, now bunch instead at z^*, while some of those previously above $z^*+\Delta z$ also move down (reduce their incomes) to replace some of those that are bunching at z^*. Of course, in practice such bunching is never so precise and taxpayer 'spikes' in the income distribution are usually observed around the tax thresholds.[38]

Figure 8B shows that the notch case is somewhat different. The key difference is that *no-one* is expected to locate in the segment just above the threshold (labelled 'density hole') – the income levels where they would be worse-off after tax – and instead bunch just below. As with kinks, various 'frictions' that limit taxpayer movement may lead to some taxpayers observed in the

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[38] For evidence on income tax kink bunching, see Alinaghi et al. (2019, 2020) for New Zealand, Chetty *et al.* (2013) for the US and Chetty *et al.* (2011) for Denmark.

'density hole' but this segment could be expected to have more 'missing mass' compared to a tax kink case (with correspondingly more individuals below the threshold). Kleven and Waseem (2013) provide examples of this for income tax paid by the self-employed in Pakistan.

Figure 8   Impact of Tax Kinks & Notches on Earnings Distribution

8A – Tax Kink   8B – Tax Notch
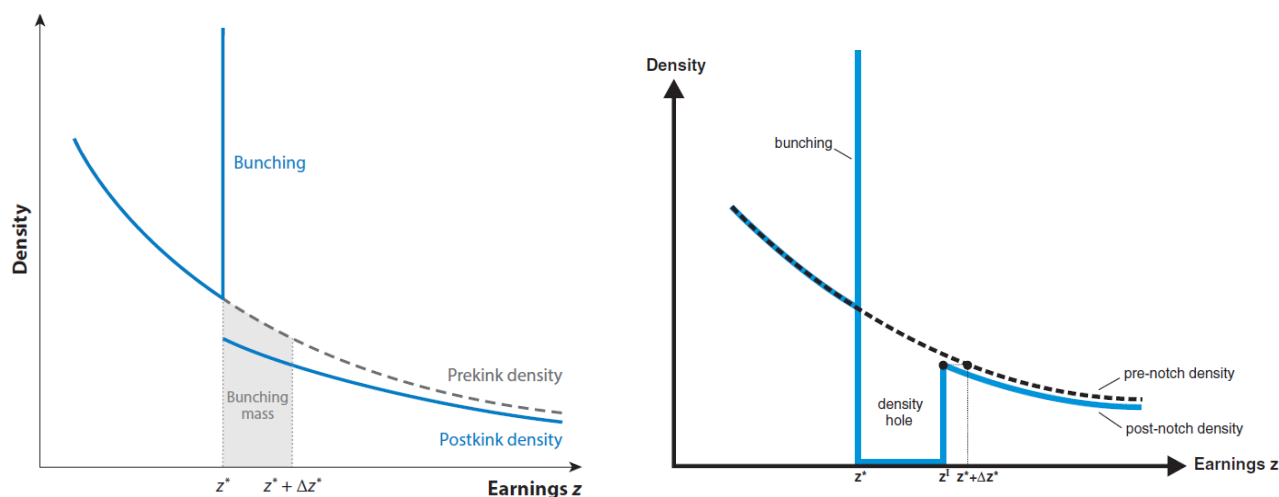
Source: 8A: Kleven (2016, p.439); 8B: Kleven and Waseem (2013, p.675)

3.6   Avoid Taxing Income Differently when Earned Through Different Legal Forms

Just as taxing different goods and services at different rates of GST creates tax-induced distortions in consumption patterns, so taxing different sources of income differently can also create distortions. The 'legal form' in this case refers to the nature of the legal entity for tax purposes. For example, whether it is an individual or a household subject to personal income tax or in receipt of income transfers; or an incorporated business subject to the company taxation schedule; or (in New Zealand's case) a family trust subject to the trust tax regime.

There are various legitimate reasons for taxpayers to earn income in alternative legal forms, such as the limited financial liability offered by incorporation, or the ability to ring-fence assets for family members' education or charities. Ideally, tax should distort those choices as little as possible, by taxing them similarly. In addition, 'fairness', in the form of horizontal equity – treating similar taxpayers similarly – is often seen as relevant to this case.

A major problem in most OECD countries, however, is that while personal income tax rates typically demonstrate progression, company tax regimes often adopt one marginal 'flat' tax rate, or a small number set independently of the personal tax regime (usually combined with various deductions). Thus, in many OECD countries, with company tax rates set lower than the top rate of personal income tax, there is an incentive for top rate taxpayers to earn income through companies provided the difference is not subsequently taxed (for example, where it is passed on in dividends and taxed at personal rates).[39] Conversely, low-rate personal income taxpayers may pay higher rates of tax if they earn income through a company – an especially relevant consideration for low-earning family members within small family businesses.

This 'lesson' therefore implies care is needed over the trade-off between setting higher personal income taxes to achieve redistribution, but lower corporate tax rates to encourage, for example, the location, or amount, of company investment. Many OECD countries have sought to live with this contradiction by maintaining a substantial personal-corporate tax rate difference, while setting up complex rules around the (re)characterisation of different forms of income that minimise 'leakages' to the company tax regime.

Example 1:

As part of the radical tax reforms in New Zealand in the early 1990s the government 'aligned' the top personal, corporate and trust tax rates at 33%, thus achieving a key efficiency objective that (largely) avoided different tax rates by legal form. However, subsequent decisions to raise the top rate of personal income tax (to 39% in 2001) and reduce the corporate tax rate (to 30% in 2007 and 28% in 2011) began to erode this alignment.

Nevertheless, as Figure 9 shows, after the top personal rate was reduced again to 33% in 2011, the personal-corporate rate difference in 2018 was just 5 percentage points. New Zealand therefore had the equal lowest difference in the OECD (along with Mexico). From April 2021, however, the top personal rate was again increased to 39% but with no change in the trust (33%) and company (28%) rates. The personal-corporate rate difference thus more than doubled to 11 percentage points. Such large differences in tax rates across legal forms, if they are not accompanied by carefully drafted, comprehensive anti-avoidance legislation, are likely to lead to a loss of integrity as taxpayers find ways to shift their incomes towards the lower taxed forms.

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[39] An 'Imputation' system is one mechanism used whereby, the difference between the corporate tax paid on dividends before distribution is 'imputed' (credited) to the personal taxpayer, with the difference between the corporate and personal tax liability paid on distribution.

Figure 9   Top Personal and Corporate Tax Rate Differences, 2018
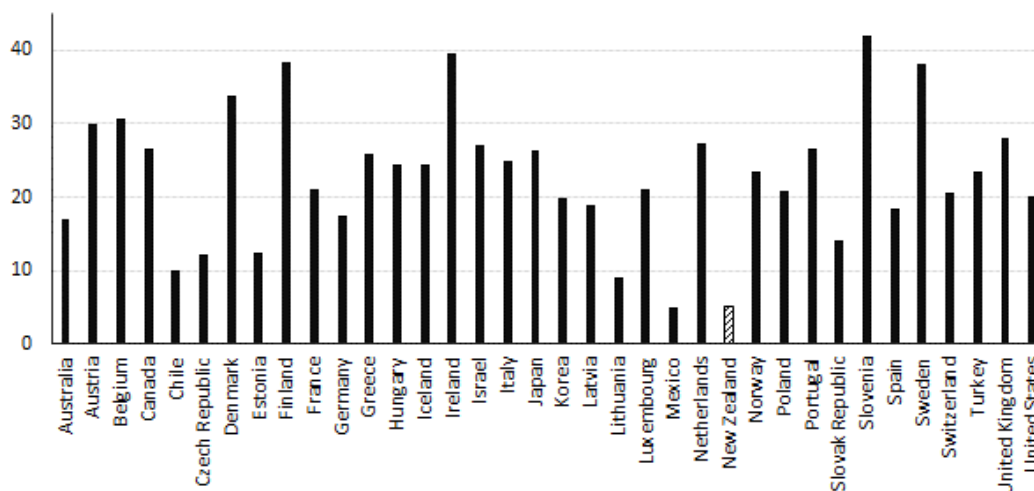
Source: OECD.Stat

Other OECD countries, by contrast, typically have a 15-25 percentage point difference in those rates with some, such as Ireland, having a corporate rate almost forty percentage points below the top personal rate. It has been argued that the relatively low difference in New Zealand meant there was less need for 'protective' measures to prevent income shifting across legal forms facing different tax rates. However, even with the 5 percentage point difference between 2011 and 2021, evidence suggests New Zealand's apparent lack of laws limiting income re-characterisation has given rise to easier income shifting than intended. NZTWG (2018b, section 4) and Gemmell (2020) show that, after the top personal tax rate and the trust rate were 're-aligned' at 33% in 2010, but the corporate rate was not aligned, noticeably divergent trends occurred between income earned through trusts and income passing through small closely-held companies.

Example 2:

The removal of alignment in New Zealand in 2001, whereby the top personal rate was increased to 39% while the trust and company rates remained at 33% (the latter subsequently reduced to 30% in 2008) created substantial opportunities for the legal form of income declaration to change for tax purposes – encouraging incorporation and the growth of trusts. NZ Treasury (2009) provides some evidence that this occurred. They note that '*following the increase in the top personal rate in 2000, the number of company income tax returns grew at almost 10% p.a. over 2000-06 compared to only around 4% p.a. over 1993-2000. The increase in profit growth rates is much less ... suggesting that it was small (low profit) companies that grew most after 2000*'. (NZ Treasury, 2009, pp.16-17).

In addition, if this tax-motivated incorporation was encouraged by the 39% rate, compensating *slower* post-reform growth of *unincorporated* firms would be expected. The evidence also appears to support this – the numbers of unincorporated businesses grew more slowly, and their combined income actually fell, over 2000-06, whereas both had grown strongly before 2000. A similar reaction might be expected following the April 2021 reforms to the top personal rate.

Example 3:

Crawford and Freedman (chapter 11 in Mirrlees *et al.,* 2010) provide interesting evidence for the UK on the effect of personal-corporate tax rate differences on small firms and the self-employed; see especially section 11.3.3. Two changes in particular in the rules around corporate tax in the UK created strong incentives for the self-employed to incorporate: the adoption of a zero tax rate in 2002 for companies with less than £10,000 turnover, and changes in 2007 to tax rules to limit avoidance of social security taxes by 'managed service companies' (MSCs) in 2007. MSCs (which were unincorporated) were set up to provide 'umbrella' oversight/management services for groups of self-employed individuals rather than each being employed directly. Figure 10 shows the dramatic climb in numbers of firms incorporating from 2002 following the 0% corporate rate (which was soon abandoned), and the huge spike in incorporation in 2007 after the MSC legislation was announced, as the self-employed sought to avoid possible prosecution for tax evasion.

Figure 10   Incorporation Episodes in the UK
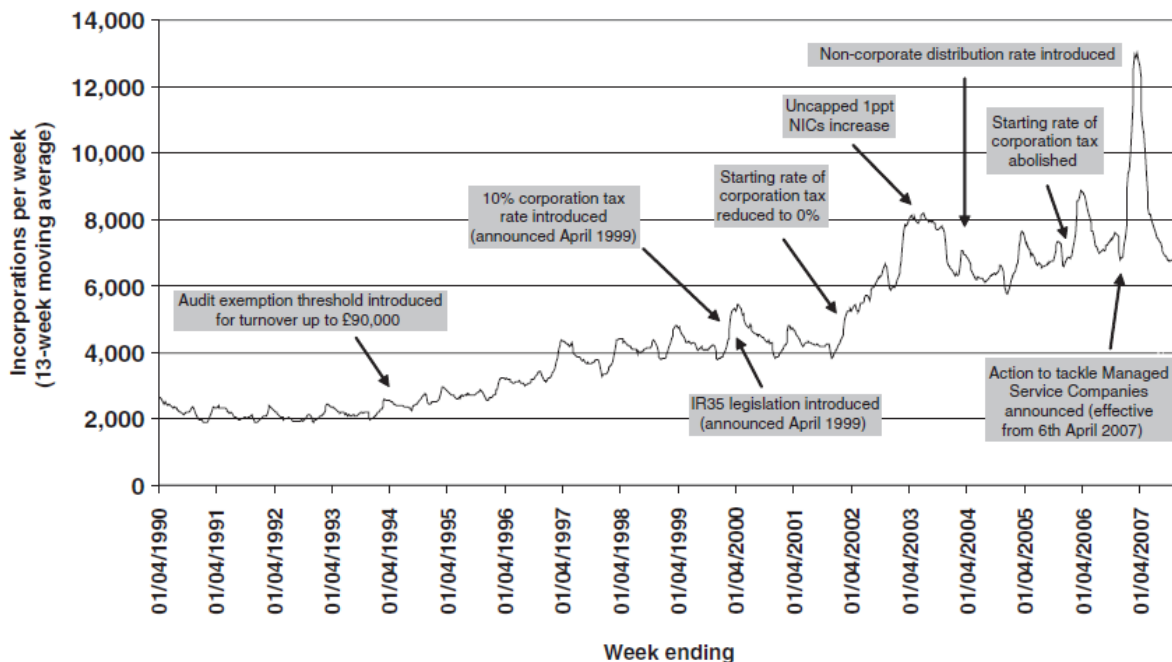
*Source*s: Mirrlees *et al.* (2010, p.1057)

3.7 Achieving Tax Efficiency Should Include Administrative and Compliance Costs

The tax reviews discussed in section 2 highlighted tax policy objectives that include maximising efficiency and minimising compliance and administrative costs. In thinking about efficiency, economists have often abstracted from compliance and administrative dimensions, preferring to concentrate on the more analytically tractable forms of 'real' economic behaviour that can be traced directly to their effects on taxpayers' welfare. However, clearly compliance costs incurred by the taxpayer affect their welfare and administrative costs reduce net tax revenue.[40] Compliance and administrative aspects in this context include such arrangements as tax filing and withholding, information reporting and tax auditing, all of which may be expected to involve resource use and impact on both taxpayers' and tax authorities' behaviour.

As the three examples at 3.6 above illustrate, *how* the tax system is administered, and the detailed design of tax legislation, can be important for the behavioural responses that are encouraged. This has led recent literature to seek to incorporate tax administration aspects specifically into economic models of behaviour; see Slemrod and Gillitzer (2013), Keen and Slemrod (2017). As Slemrod and Gillitzer (2013, p.93) put it, traditional economic approaches to tax analysis have tended to proceed as if 'taxes magically collected themselves'! Instead, they recognise 'the realities that taxpayers are liable to lie, cheat, steal and find scams of various kinds, that all this (and even being honest) is costly to them, and that it is also costly for governments to try to stop them' (Keen, 2016, p.461).

Keen and Slemrod (2017) subsequently added a tax administration dimension formally to models of optimal tax design, so that tax policy is set to minimise distortions due to both policy-related and administrative limitations. They show, for example, that just as traditional tax analysis (see 3.3 above) has stressed the efficiency of equating the marginal social cost of raising a dollar of tax revenue across different taxes (by setting the various marginal tax rates accordingly), an analogous result can be obtained by treating administrative margins akin to tax rate margins. That is, various administrative 'instruments', such as the tax audit rate, can be treated analogous to a tax rate instrument and adjusted so at produce the maximum welfare gain. This, in turn, has led Keen (2013) and others, when measuring tax gaps (the difference between tax legally owed and tax actually collected) to distinguish between 'policy gaps' and 'compliance gaps' – the latter being a function of *implementation* effort and success (rather than policy).

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[40] Mirrlees *et al.* (2011, p. 122) report estimates for the UK which suggest that government administration costs for working-age benefits and tax credits are around 4%, or 4 pence for every £1 spent, with income tax collection costs around 1.2% or revenues collected. In New Zealand overall costs of Inland Revenue (IR) as a whole were around 1.1% of total revenue collected, of which personnel costs are 0.7%, although IR also administers some government transfers such as family tax credits and student loan debts; see NZ Inland Revenue (2019)

Keen and Slemrod (2017) also show that 'optimal tax administration' can be analysed within the same framework as 'optimal tax policy'. In this context, the key variable increasingly used empirically to measure the impact of (income) tax rate changes on behaviour (and taxpayer's welfare under some circumstances) is the elasticity of taxable income (and hence revenue) to changes in the tax rate.[41] This can be extended to incorporate an 'enforcement elasticity of tax revenue': the revenue responsiveness to an administrative intervention, such as increased auditing, third-party reporting, pre-populating of tax returns, etc. This latter elasticity arises because the optimal tax compliance gap is not zero, for similar reasons that optimal pollution levels, in the presence of mitigation costs, are not zero.

The size of that optimal compliance gap can however be determined in conjunction with information about the marginal costs (adverse taxpayer responses) and benefits (higher tax revenues) of different tax rates and different rates of compliance enforcement. To improve tax efficiency, tax rates and enforcement efforts cannot be set independently. This allows Keen and Slemrod (2017, p.134) to answer the question: 'is it better to raise an additional dollar of revenue by raising tax rates or by strengthening tax administration so as to improve compliance'?

Of course, it is immediately obvious that responses to tax rate changes might be conditional on the administrative (e.g. enforcement) regime and *vice versa* – tax policy and compliance gaps are not independent. A crucial feature of these models, therefore, is that neither the elasticity of taxable income, nor the enforcement elasticity, is *immutable*.[42] Thus, if taxpayer responses to a change in tax rates appear to be undesirable – for example due to evasion – it may be that altering the legal and administrative structure of the tax can change either or both of those elasticities in desired directions.

<u>Example 1:</u>

The preceding discussion suggests that some standard lessons from traditional tax theory need to be adapted in the presence of tax evasion or other deviations of administrative or compliance arrangements from the 'benign' or silent role they have traditionally played in such models. An example can be found in the structure of corporate taxes in principle and in practice. Results from traditional tax theory suggest efficiency gains from two features. (A) Setting the corporate tax base such that all deductions against gross profit can be expensed in the year in which they are incurred (the so-called 'cash-flow' tax; see Mirrlees *et al.*, 2011, chapter 17). (B) Tax losses are treated

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[41] Following Feldstein (1995) the elasticity is usually defined with respect to '1 minus the (marginal) tax rate' so that it is expected to be positive.

[42] This stands in contrast to the elasticity of labour supply with respect to the tax rates, for example, which is typically modelled as the result of (immutable) preferences between work and leisure. That is, changing tax rates may change an individual's choices between amounts of work and leisure, but it is assumed not to change the nature of their preferences over these – the shape and position of their indifference curves.

symmetrically with positive profits – a tax rebate for a loss should match the tax payment for an equivalent amount of profit.

Feature (A) avoids distorting firms' cost by making them wait to claim fiscal depreciation over (sometimes many) subsequent years, and avoids investment biases when different fiscal depreciation rates across assets do not perfectly match assets' economic depreciation rates. Feature (B) aims to avoid discouragement of risk-taking by firms due to a fiscal imbalance in net rewards between investment success and failure, if profits and losses are not treated symmetrically.

However, deviations from both features (A) and (B) are commonplace in most OECD countries' corporate tax regimes, partly reflecting their desire to minimise the risk of firms 'gaming the system'. In case (A) for example, an unscrupulous firm could undertake substantial investment, receive the full immediate tax relief, then declare bankruptcy (having first spirited away, or spent, the tax refund). While in principle the assets could be sold and the tax authority reclaim the tax relief, this is a complex process, is unlikely to return all of the tax relief, and will depend on where the tax authority sits in the queue of creditors. In case (B), since it is very much easier for any firm so inclined to make a loss than to make a profit, for how long does the revenue authority continue to make cash payments to a persistently loss-making firm? Unsurprisingly, these and numerous other aspects of corporate tax activity mean that theories of tax efficiency that ignore such constraints are unlikely to deliver implementable tax policies.

Example 2:

Recognising, in the presence of evasion or (legal) avoidance, that additional revenue could be raised by devoting more resources to compliance enforcement, a *common fallacy* is to argue that it is worth spending up to a $1 to raise an additional $1 in tax revenue, since overall tax revenue would rise. Indeed revenue authorities readily make a case to their Finance Ministers to fund new compliance initiatives on the basis of some revenue/cost ratio exceeding one (or some other, arbitrary number greater than one).

NZ Inland Revenue (2019), for example, show that they pursued special compliance initiatives, for which they were given specific additional Budget funding, which 'focused on ageing debt, returns not filed by the due date and child support debt' (p.93). This is claimed to produce a return on investment (RoI) in 2018-19 ranging from $2.23 to $5.60 per $1 invested. Further additional funding to investigate 'the hidden economy, property compliance and complex technical issues, including aggressive tax planning' (p.95) is recorded as producing an RoI range of $2.57 (fraud) to $9.58 (property compliance); and an overall RoI of $6.89.[43]

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[43] NZ Inland Revenue (2019, p.43) reports: '*For 2018–19, our overall return on investment for our investigations activity was $7.54:$1 against the performance measure target of $7.00:$1. We identified $985 million in tax position differences this year and closed 12,305 cases. Our Budget-funded initiatives contributed $200.4 million to the total tax differences identified*'.

By what standard should these RoIs be judged? They clearly far exceed anything normally associated with commercial annual RoIs where a 50% return would be huge ($1.50 per $1 invested). These revenue-related RoIs cannot be compared with commercial RoIs because the revenue versions involve real resource costs (the investigators' salaries, building and IT rentals etc.) whereas the revenue raised is merely a transfer of resources from the taxpayer to the government. In addition, the resources used for this compliance exercise will normally have been drawn away from other productive activity such that the total resources in the economy could be less – if the compliance enforcement activity is less productive than the alternative that was substituted. The contrast with a commercial RoI is clear when it is appreciated that the latter involves the use of real resources to produce *additional* real resources – assuming such investments are only undertaken when worthwhile (generating a positive return).

For these reasons, there is no single number or RoI than can identify the 'correct' allocation of resources to tax compliance. Like other choices over how much government transfer spending is worth undertaking, this is essentially a political choice over how much resource to divert from the private sector, or elsewhere in the public sector, to increase the transfers associated with tax compliance enforcement. Where resources used for compliance enforcement would otherwise be idle, the cost may be low, but can be very high where productive private sector activity is displaced.

3.8   It is Sensible to Use Either Households or Individuals as the Tax Base, but not Both

Setting tax policy inevitably involves inter-personal comparisons, raising the question: how should personal 'units' be defined: individuals, households or families?[44] If tax policies are to be 'fair', then 'fair among whom'? The issue can be broken down into two components.

(1) When we think about maximising the welfare for a group of people, is it reasonable to think of each person's welfare as independent of each other, or do families (or households) seek to maximise their joint welfare? Effectively, do members share resources within the family sufficiently to be treated as one unit?

(2) Are there distinct 'sharing economies' (of scale) within a family or household? Doubling membership does not normally involve a doubling of resource use – which means that achieving equity in the (re)distribution of resources (e.g. via taxation) requires these economies to be recognised. This is often pursued by measuring the number of 'adult equivalents' in a family.

In numerous OECD countries, including New Zealand, income taxation is generally levied on the individual, whereas social transfers and tax credits are disbursed to families. This latter choice may reflect both perceived sharing economies and a view that 'families' should be the target of the tax-transfer system, especially those where there is joint parental responsibility for children. The individual basis for income taxation is another typical policy choice (though in the US married

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[44] A household is often defined as people living at the same private address but not necessarily sharing familial (e.g. parent/child, sibling) relationships.

taxpayers can file jointly) and means that each member of a partnered couple is taxed according to their own income levels, at the relevant marginal rate, not that of their joint income.

There is a clear, at least conceptual, inconsistency between family-based welfare payments that seem to recognise the welfare and sharing economy benefits of being a 'family unit', while the personal income tax system does not. Can they be reconciled, and are there sensible, pragmatic reasons for the differences? With an observed tendency towards individual taxation of income over time, is there a case for more individual-based systems of assessment for transfers?[45]

These two 'separate versus joint' approaches could be reconciled if either income taxes were levied on joint incomes or transfers were based on individual, not family, incomes. Unfortunately, there are substantive conceptual difficulties with both cases. Firstly, basing social transfers on individual incomes makes little sense where these are designed to minimise hardship of those in receipt, and especially where this involves children. It makes little sense to offer the same financial safety net to a low income or unemployed individual residing within a wealthy family to those who have no such family. Equally, whereas a low income sole-parent may merit financial support, this is less obvious when that parent is partnered with a high earner or wealthy individual.

Could income taxation be joint instead? An advantage of joint taxation is that both partners face the same (effective) marginal tax rate, which seems appropriate if 'family income' is fully shared.[46] Thus, is it equitable for a low income secondary earner in a high income household to be able to keep a larger fraction of her after-tax income than her partner, or than a couple earning the same total income but where only one partner earns?

However two important issues arise with joint income taxation. Firstly, for various efficiency and equity reasons it is often desired to encourage more secondary earners within a family (often, but not exclusively, women) into the labour market.[47] Taxing each individual in the family separately, ensures that lower (secondary) earners potentially face a lower MTR, which acts as a tax incentive to participate in paid work and/or work more hours. This advantage is lost with joint taxation.

Secondly, with ageing populations affecting many OECD countries such that the ratio of retired individuals to working age population is rising, there is a strong fiscal budgetary case for encouraging greater labour force participation to ensure sufficient tax revenues to fund ever-growing state pension liabilities. As with the previous point, this is facilitated if individuals are taxed separately rather than jointly. However, it should also be acknowledged that, with joint taxation, a common MTR ensures that income sharing within the family is not motivated by tax

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[45] See Brewer *et al.* (2011, section 2.4) for further discussion.

[46] 'Effective' marginal tax rates may differ from statutory rates here due to abatement (or 'withdrawal') rates of transfers. This can often add 25 percentage points or more to statutory income tax rates; see sub-section 1.3.

[47] This argument applies to secondary earners of either gender but empirically these are more often female.

avoidance or evasion – when some of the primary earner's income could otherwise be shifted for tax declaration purposes to the secondary earner with a lower MTR.

3.9   Don't Hypothecate Individual Taxes to Specific Public Spending Items

Hypothecation in this context refers to when revenue raised from specific taxes is 'hypothecated' (earmarked or pre-assigned) for specific spending purposes, usually related to the source of the tax. Thus, for example, fuel or other transport-related taxes may be assigned to road spending; carbon taxes may be assigned to environmental spending; or an earmarked tax for health spending – for example because this earmarking is thought to increase taxpayers' willingness to pay it.

A specific example was the increases in UK 'National Insurance Contributions' brought in by UK Finance Minister ('Chancellor') Gordon Brown in 2002, to pay for a substantial increase in funding for the National Health Service (NHS). Of course, without a direct link to the health spending budget in subsequent years, it was largely irrelevant which taxes were deemed to fund growing NHS spending. Or, as Paul Johnson of the Institute for Fiscal Studies put it, regarding suggestions of a hypothecated health tax in the UK: 'any serious attempt at hypothecation is almost bound to end up being little more than an exercise in deceiving the voters'.[48]

Standard economic efficiency results suggest that such tax hypothecation is inefficient and potentially harmful. Why would this be the case? There are four reasons.

(1) With earmarking, future increases in spending automatically mandate increased tax revenue, such as via higher tax rates. However, as discussed above, this may not be the most efficient or most equitable way to raise tax funds. The UK's television license 'fee' to fund the BBC, for example, is driven by decisions within government over how much additional BBC spending is justified, and the license fee, at a fixed value per year, is regressive. The result can be an incoherent set of taxes that undermines achievement of other tax policy objectives.

(2) Where the hypothecated tax provides a 'buoyant' source of revenue (i.e. revenues rise faster than the tax base such as income), this can lead to spending growth that would not be chosen in a straight competition with other spending priorities, and thus encourages wasteful spending.

(3) An argument sometimes used in support of earmarking a tax to particular spending is that it may generate a greater willingness to pay by taxpayers when they can see the benefits they receive, such as new or improved roads. In this context the hypothecated tax is a form of 'benefit tax' whereby only those who use (benefit from) the roads pay the tax. However, in that case (except where the spending is on 'public goods')[49] user-charges, directly related to individuals'

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[48] See his Times newspaper article on 22 January 2018, available at https://www.ifs.org.uk/publications/10348.
[49] Economists define 'public goods' as those with characteristics of (i) non-rivalness (consumption by one does not reduce consumption by others) and (ii) non-excludability (provision for one person effectively provides for all).

consumption benefits, are usually a more direct and efficient means of funding. Taxes on transport, for example, such as vehicle registration fees, do not relate directly to the amount of travel, while fuel excises – which are related, albeit imperfectly, to kilometres travelled – cannot deal directly with congestion problems (a common, but fallacious, rationale for hypothecated vehicle taxes).

(4) In some cases taxpayers' willingness to pay in (3) may not be for personal benefit but more accurately represent a 'willingness to redistribute', such as funding for public health services largely consumed by others. However, in this case it is unlikely that a particular hypothecated tax will be the best means of achieving redistribution, especially where a willingness to pay for health services available to others is more realistically a proxy for a more general willingness to redistribute income to those on lower incomes (even if in specific groups such as the elderly). In such cases a general progressive income tax and targeted spending is often a more effective alternative.

Example:

The UK's television license fee was introduced in 1946 to fund the re-opened (after World War II) British Broadcasting Corporation's television and radio services. The initial fee was £2 (around £85 in 2019 prices) and reached £154.40 in 2019; see Figure 11. At introduction, it can be thought of as a user fee since the BBC was the only TV service available and only a few (relatively well-off) people had a television. (Since TV broadcasts could then be thought of as a public good, and therefore difficult to charge for directly to individuals, charging for ownership of a television receiver arguably provided a convenient, equitable and efficient charging mechanism at that time).

As Figure 11 shows, since 1946 the annual fee in real terms has been fairly volatile, partly reflecting the impacts of annual inflation and partly the periodic negotiation process with the government over future fee levels. Also, as more households acquired a television from those early years, the average household cost (licence payment) rose quickly, first as more households acquired a black and white television, and subsequently as they increasingly acquired a colour televisions. By the 1990s therefore, on average, approximately each UK household pays the equivalent of one colour fee (multiple televisions at an address only require one fee to be paid).

Public spending on national defence or police forces are often regarded as 'public goods', though they can sometimes be subject to congestion thus violating characteristic (i). 'Publicness' may also be geographically restricted to particular localities: e.g. residents in City A do not benefit from street lighting in City B.

Figure 11   UK Television License Fees 1946-2019
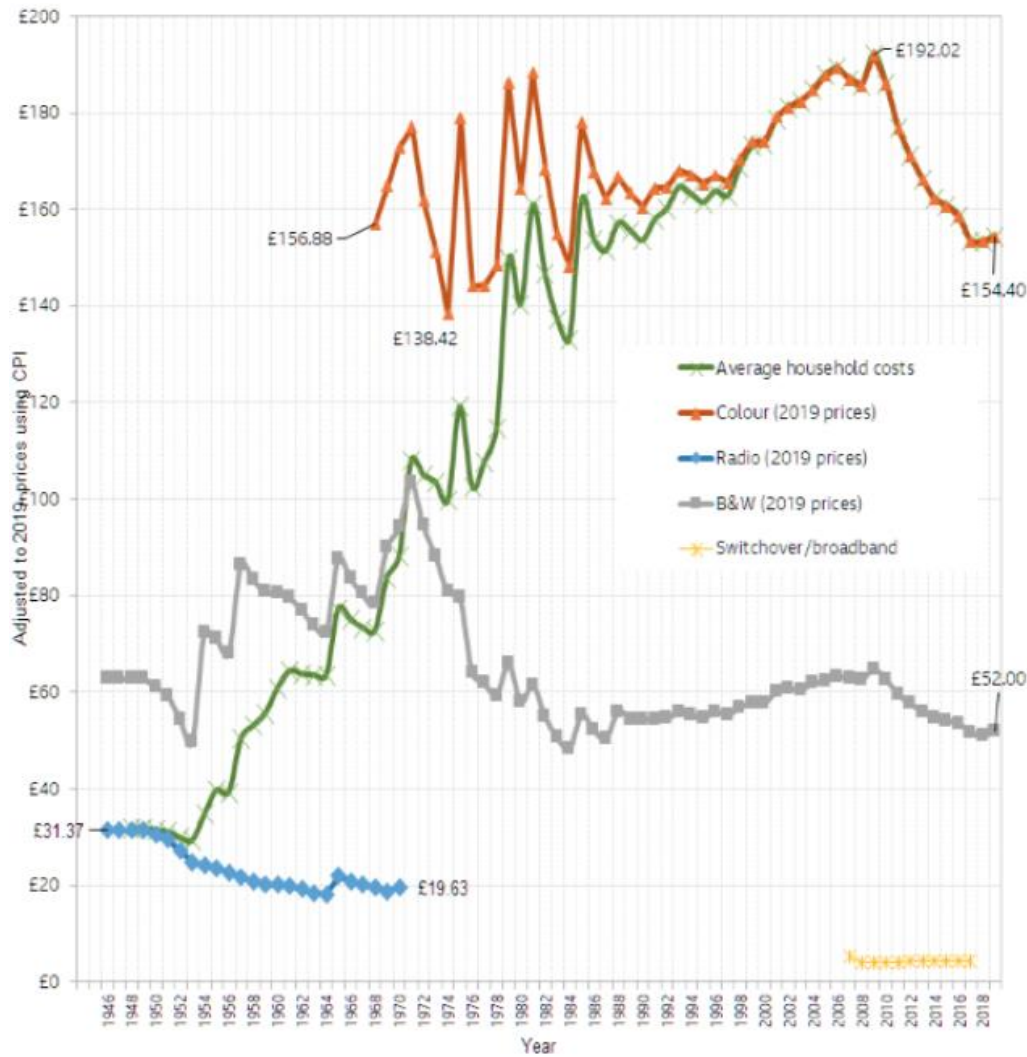
With the introduction on non-BBC TV channels – starting with ITV in 1955 – and the proliferation in recent decades in alternative technologies for watching television programmes, the BBC license fee is now simply a fixed-fee-per-household tax. Nevertheless this directly funds a public service that seems to have little claim to a different funding mechanism than any other type of public spending negotiated within government. Hypothecation would appear to have delivered an idiosyncratic, regressive BBC tax-funding source that has demonstrated exactly the kinds of sclerotic characteristics that are alleged to be associated with such taxes. And, of course, the BBC has a vested interest in supporting a policy which maintains the status quo, hypothecated funding system.

3.10 Land is *not* Fixed in Supply. Hence Land Taxes are *not* 'Lump-Sum'

"*... that part of the property tax which falls on unimproved land is widely thought to be neutral. Since the supply of land is fixed, the tax is said to be unavoidable. Land-owners, therefore, are not induced to change their land-use plans when the tax is imposed, or its rate changed. This view of the tax on land is badly mistaken.*" (Mills, 1981, p.125). [50]

As discussed in section 3, how far the economic incidence of a tax is 'passed on' (or passed back) from the legally liable agent depends on the price elasticities of demand and supply for the taxed good. This applies in factor markets just as in goods markets. Further, a good or factor in perfectly (infinitely) inelastic demand is expected to bear the full incidence of the tax. Hence, where multiple goods or factors could *potentially* bear the incidence of a tax it is usually those that are relatively fixed that will *actually* bear the incidence.

This argument has been used to suggest that, since 'total land area is fixed' (though some geographers might disagree) it represents a fixed factor of production (and consumption in the case of residential land) and hence can be taxed without incidence shifting. It follows from this that there is no distortion to land markets and no deadweight losses (excess burdens) associated with taxing land. Taxing land would therefore be close to the economist's definition of a 'lump-sum tax', and thus ideal from an efficiency perspective.[51] Before considering why the above arguments may not be correct, note two other important aspects.

Firstly, the argument over 'fixed supply/lump-sum taxes' applies to land, not to *property* (land plus structures), since the structures built on a piece of land involve economic decisions that can clearly be distorted by taxes (such as whether, and how high/wide, to build; type of dwelling etc.).

Secondly, the absence of tax-induced distortions (deadweight losses) – even if accepted – does not imply an absence of economic effects. For example applying a tax to one particular form of asset in fixed supply can be expected to reduce its price (by the full amount of the tax) and has no deadweight cost – there is no DWL triangle in Figure 1. However, unless *all* assets are in fixed supply, the fall in spending on the taxed asset after its price falls involves some shift to or from other assets. These certainly represent indirect changes in investment (and possibly consumption

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[50] Mills (1981, p.125) goes on to explain: '*it is true that a tax on land income is neutral but this does not extend necessarily to a tax on capitalized land value, or changes therein. The reason is that the discounted sum of payments with the latter tax is not invariant to the intertemporal characteristics of the income stream produced by land. Among options with equal present value, it is greater for income streams skewed to the distant future than for those skewed to the near future*'.

[51] A background paper for 2009-10 Victoria University Tax Working Group in New Zealand, for example, states: '*a land tax does not distort investment behaviour as it applies to land which is in fixed supply. This creates a tax liability regardless of whether or how well the land is used. As the supply of land is perfectly inelastic (fixed in supply), market prices depend on what purchasers are prepared to pay rather than on the expenses of land owners. Accordingly, land taxes cannot be passed on and would be borne by land owners at the time the tax is announced*.' TWG (2009, p.2).

behaviour) brought about by the tax on the land asset with potential downstream effects on goods production.

Returning to the main issue, while economists cannot change geography, it is certainly *not the case* that land – *as relevant to many economic contexts* – should be treated as 'fixed', nor any associated taxes regarded as 'lump-sum'. What matters for economic activity is the supply of available land, not the total stock. In many countries 'unregulated land' is almost non-existent – that is, land where the owner can use it in any way they want. Rather land available for use is typically governed by planning regulations such as for residential, industrial, agricultural, recreational etc. purposes. Because of these designations, land is not a uniform factor – it performs different economic functions in different uses even without 'improvement'.

These designations are also not immutable: for example, urban building limits can be relaxed to allow more houses to be built close to a city; former industrial land can be re-zoned as residential; recreational National Parks are created by legislation; special industrial zones can be created. As a result the supply of land for *any given economic purpose*, is often heavily constrained by planning or other regulations, but is not necessarily fixed.

This led Lees (2015, p.ii), following Cheshire and Sheppard (2005), to note that 'price premiums show shortages in land supply for particular land uses at particular locations. So allowing land regulation and zoning decisions to respond to these price signals is likely to increase efficiency'. That is, because all land is subject to some form of regulation, relaxing those for particular land uses can reduce DWLs created by regulation. Of course, it can be argued that these DWLs are the result of regulation, not 'variable' land supply. But for the purposes of land investment decisions, these two 'factors' (land and land-use regulations) are inseparable. Similarly, land considered by investors as suitable for residential development is sometimes a function of publicly-provided amenities or transport connections. As these change, *potential* residential development land becomes viable in use.

Therefore, whether or not land should be considered as fixed in supply, and land taxes as lump-sum and thus highly efficient, will depend on the context. Where a 'close to fixed supply' (perhaps over a limited time horizon) assumption seems reasonable, then it is appropriate, at least as an approximation, to infer that (a) any land tax is incident on the land owner at the time of imposition regardless of who is legally liable; and (b) it will not distort the owner's use of the land. This may be most commonly the case where goods (some types of farming perhaps) are produced by land as a specific factor – that is, where the land input cannot be substituted by capital or labour. This may then be associated with a relatively low elasticity of supply of land *in production* (use).

Such a situation can also give rise to *location-specific rents* to the land-owner, for example because some land has unique or unusual properties such as suitability for particularly valuable crops such as vines. In this case, these rents provide a highly efficient source of tax revenue since,

by definition they are rents (incomes) conferred by *ownership*, not activity (a tenant vintner could expect to have any rents earned from the vines expropriated by the landlord). Even here, however, it needs to be established that the apparent unique 'location specific' properties of land for specific vines are not effectively in competition with vines in other parts of the country or in other countries. How unique in the wine market is 'Central Otago Pinot', such that it can command a special premium over other New Zealand and foreign wines?

Alternatively, where a particular land type can be expanded or contracted such a 'fixed' assumption would not be appropriate. Thus, in contrast to the case in the previous paragraph, when land inputs are highly substitutable by other factors, land is effectively no longer in fixed supply. This can occur over time, for example in agriculture, if new technologies render some previously unusable land capable of being brought into use, or some land being substituted by capital (e.g. intensive milking sheds replacing open-air milking; battery-farmed versus free-range eggs). Thus, when considering long-run properties of taxes, the assumption of fixed land supply may be less reliable than over the short-run. In addition, if land and other factors are more substitutable in production in some economic activities than others, then a tax on land may induce a shift in the structure of production away from land-specific goods, thus having allocative effects that are 'non-neutral'.

Example 1:

If land is truly fixed in (economic) supply then any change in taxation of land should be reflected in a commensurate change in its price. That is, the tax should be 'fully capitalised' in the land price – a 10% tax on the value of land generating a 10% fall in the land price. Partial capitalisation would imply that some of the tax incidence can be passed on to others. Unfortunately, tests of this full capitalisation hypothesis specifically with respect to land, as distinct from property, are hard to undertake since land values, separate from the value of the structures on it, are not widely available.

Nevertheless, evidence on the extent of capitalisation of property taxes can provide some insight. Sirmans *et al.* (2008) provide a review. Notwithstanding a variety of testing methodologies of varying degrees of reliability, they conclude that for property taxes *partial* capitalisation is the predominant result in the literature, though some evidence does point to full capitalisation. While this conclusion may not carry over to land taxes/prices, it suggests some caution is warranted before treating land taxes as effectively without distortions.

Example 2:

Most cities have legislated 'urban planning boundaries' which restrict the expansion of building development outside the boundary. This in effect confers location-specific 'rents' on the owners of property inside the boundary compared to those just outside. Those 'rents' usually take the form of price premiums for land inside the boundary.

For New Zealand, Grimes and Liang (2009) examined the impact of the city of Auckland's 'metropolitan urban limit' (MUL) on land prices on either side of the MUL. Since Auckland is a 'polycentric' (as opposed to monocentric) and coastal city, prices for land plots do not simply decline the further away they are from the city centre, but rather it has several 'zoning boundaries' reflecting its diverse geography. This makes Auckland a useful candidate to examine the impact of land planning regulations on prices. Grimes and Liang (2009) find substantial zoning effects with land just inside the MUL around ten times the price of land just outside it.

While this evidence does not directly address the issue of distortionary effects of land taxes, it does suggest that land prices respond very strongly to land zoning regulations and therefore taxes levied on urban-only, or residential-only, land would potentially distort land use choices. While a uniform per-hectare tax levied on all land (and with uniform planning regulations) could mostly avoid these distortions, such a tax is essentially impractical.

Finally, none of the foregoing discussion precludes a variety of distributional effects from land taxes, nor changes in the allocation of capital across assets classes, when only one asset, land, is taxed. Indeed evidence from various sources suggests that taxing land could combine *relatively* efficient properties with a substantial degree of progression. However, as a tax on a specific asset, land taxes often contravene horizontal equity considerations. TWG (2009, pp.10-14), Coleman and Grimes (2010, section 6) and NZTWG (2018c) provide further discussion and some evidence on the distributional properties of land and property in New Zealand.

3.11 The Redistributive Properties (Progressivity) of a Tax Depend on How *Average*, not *Marginal*, Tax Rates Vary with Income.

Some taxes distort behaviour more than others. They are therefore less suited to achieving redistribution due to the efficiency cost that has to be traded-off. Equally, some taxes (sometimes the *same* taxes!) are better able to achieve redistribution because they can target the richest or poorest individuals or households more readily.

Two lessons emerge from this. (i) It is not sensible to aim to achieve redistribution through all of the various taxes within the system; but rather designate those taxes (and other policies) for redistribution that can achieve it most effectively. (ii) It is redistribution achieved by the tax system *as a whole* that matters, not individual taxes.

Where income redistribution is the objective, most public finance economists would agree that it is most efficiently achieved by a combination of progressive income taxes and social transfers to those on low incomes (effectively negative income taxes). This is despite the potentially high efficiency costs of income taxes (as with the tax kinks discussed above), because income taxes and transfers can target high and low incomes directly. However, this also reinforces why careful design of the income tax-transfer structure is crucial.

In assessing the progressivity (how much redistribution is achieved) of a tax or tax system, a common design mistake is to suppose that tax rate 'progression' (a structure of low-to-high marginal tax rates as incomes rise) is required. Rather, the extent of redistribution depends on (a) how far the *average* tax rate (ATR) increases with income; and (b) how many people are affected at each rate – the shape of the pre-tax income distribution.
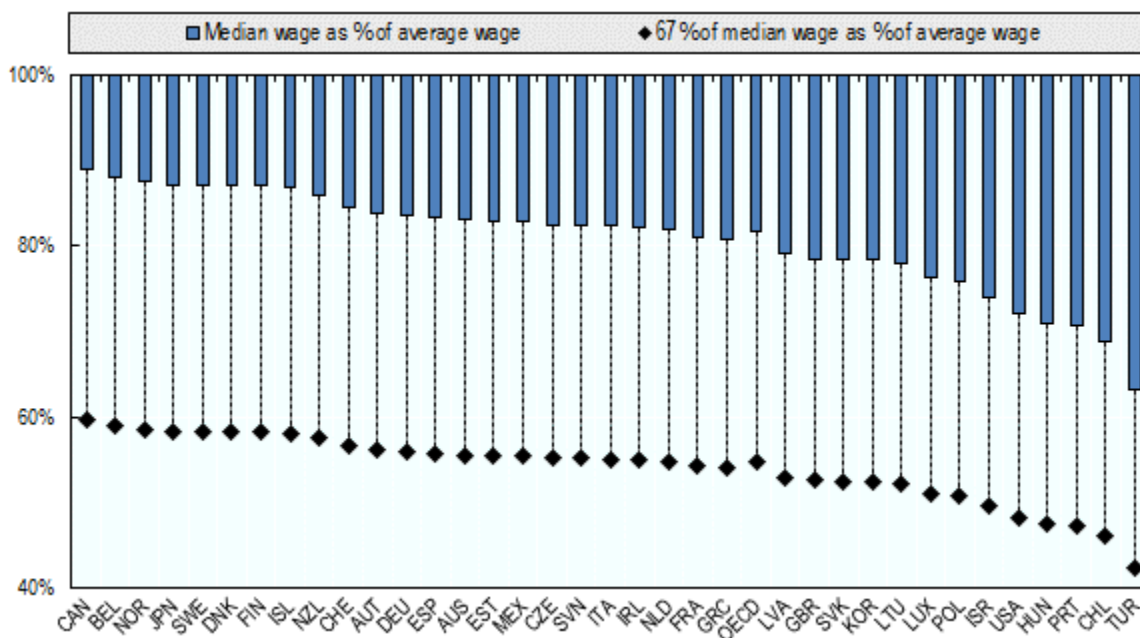
Example 1:

Consider a hypothetical example in Figure 12, which compares a 'benchmark' case based on marginal income tax rates (MTRs) in the 2018-19 New Zealand structure, with a constant ('flat tax') MTR – set at 22% in Figure 12. The figure also assumes a uniform $5,000 transfer to each taxpayer in the benchmark, and $6,500 in the flat tax case. This slightly larger transfer amount in the flat tax case allows a closer alignment of the ATRs in the two cases but is not crucial.

Figure 12   Average and Marginal Income Tax Rates
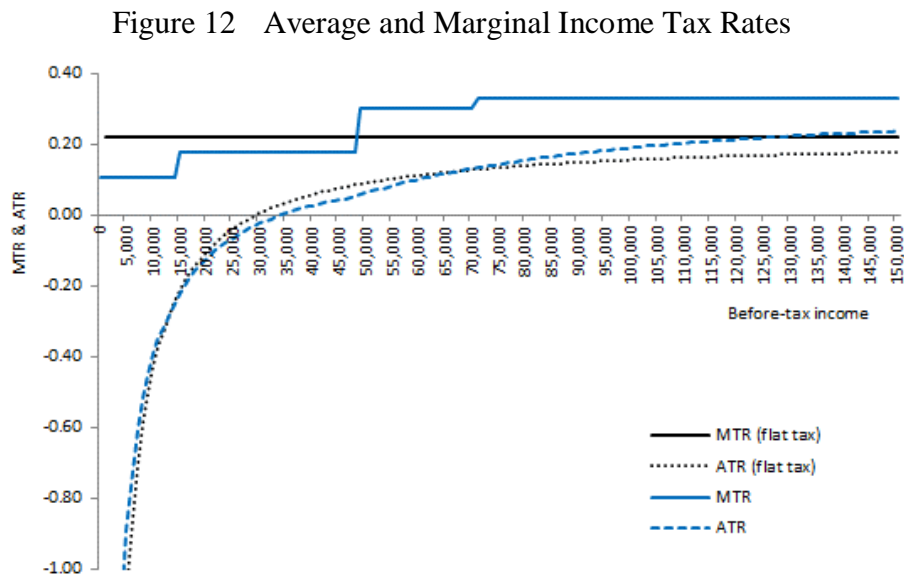
It can be seen from Figure 12 that the resulting ATR profiles are very similar, especially at the lower end of the income scale. Thus, the extent of progressivity of the income tax and transfer system in both cases is very similar despite a single MTR in one case. Of course, there is no attempt here to ensure that both these alternatives are 'revenue-neutral', but it serves to highlight the fact that a structure of increasing MTRs is certainly not a necessary condition to achieve substantial redistribution.

Figure 13   OECD Median versus Mean Wages, 2018

Example 2:

It is sometimes claimed that, compared to other OECD countries, New Zealand's income tax system during 2011-20 was not highly redistributive due to the narrow set of statutory MTRs from a lowest rate of 10.5% to a top rate of 33%, the latter applying from around 1.2 times the average wage; see Inland Revenue (2016).[52] However, this excludes the system of individual and family tax credits, which are 'refundable' (paid to the taxpayer even when the credit exceeds any income tax liability), and which therefore act like an income tax rebate.

One metric sometimes used to make this case is a comparison across OECD countries of the difference in the Gini coefficient between pre-tax, and post-tax or post-tax-and-transfers, income; see NZTWG (2018, p.7). The difference for New Zealand is somewhat smaller than the OECD average. However, this ignores other indicators of (low) pre-tax inequality in New Zealand; hence the tax system is required to do less 'heavy lifting'. For example, OECD (2019) shows – see Figure 13 – that the ratio of median-to-mean incomes in New Zealand (another inequality indicator) – is one of the lowest out of 36 OECD countries (9th lowest) with values similar to Canada and the main Scandinavian countries.

Data in Table 1, from OECD (2019), shows that the average tax rate on a single taxpayer on the average wage is 18.4%, the second lowest in the OECD. This largely reflects the lack of social security taxes (levied on employees or employers) in New Zealand, unlike almost all other OECD countries. However, it is also clear from the table that for taxpayers on less than the average wage,

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[52] A new top rate of 39% on incomes above $180,000 was introduced from April 2021.

and especially where there are children in the family, average tax wedges are especially low, and often negative or close to zero for those in receipt of child/family tax credits. In fact, across all the categories of average- or below-average-wage taxpayers in Table 1, New Zealand's average income tax wedges rank among the lowest in the OECD.

The message is reinforced when considering average income tax burdens across the deciles of the income distribution; see NZTWG (2018a, p.7). This indicates that, on average within each of the lowest four deciles of the personal income distribution, income taxes paid (less government cash transfers received) as a proportion of income are *negative* (taxpayers are net recipients, not payers, of income tax/transfers revenue), with the fifth decile almost paying zero net income tax.

Table 1   Personal Income Tax Rates across OECD Countries, 2018

	Average tax wedge* by type of earner, 2018					
	------- Single person -------		One-earner couple:	---------------- Two-earner couple ----------------		
% of AW: No. children:	100% (167)% 0	67% 2	100% 2	100% & 67% 2	100% & 33% 2	100% & 33% 0
New Zealand	18.4 (24.0)	-20.5	1.9	18.4	17.1	16.6
NZ rank (1st = lowest)	2nd (3rd)	1st	1st	2nd	4th	2nd
OECD Ave.**	36.1 (40.4)	16.0	26.6	33.1	30.8	34.8

* The OECD 'tax wedge' is defined as the sum of the personal income tax and social contributions paid by employees and employers, minus cash benefits, as a proportion of the labour costs for employers.

** The OECD average is based on 36 counties. 'AW' = average wage.
See https://www1.compareyourcountry.org/taxing-wages/en/0/all/default

Source: OECD (2019).

3.12 Some Taxes Redistribute Income More Over the Life Cycle than across Individuals

All OECD governments use tax policy variously to redistribute income from higher to lower income individuals, and to encourage taxpayers to save income whilst working towards a period of retirement when otherwise they will be more dependent on the state for their living standards. This latter aspect implies that such taxes (or tax breaks) facilitate redistribution towards the taxpayer's own future, or 'life cycle redistribution'.

Most measures of the redistributive properties of the tax system, however, are annual 'snapshots' of redistribution across taxpayers at a single point in time, such as Gini coefficients based on annual income distributions. This ignores the well-known tendency for annual income measures to be characterised by greater volatility than is reflected in longer-run income measures. It also cannot measure redistribution within a taxpayer's lifetime.

This raises the two questions. (i) What does redistribution across taxpayers look like if longer-run income measures are used? (ii) Is most redistribution by the tax system essentially 'within taxpayers' rather than 'between taxpayers'? If the answer to (ii) is yes, then the traditional perception of taxes as redistributing from 'rich' to 'poor' is misleading.

Example 1:

On question (i) studies for a number of countries have examined income inequality measures such as the Gini coefficient and Atkinson index over different accounting periods, from annual to lifetime – though the latter inevitably involves elements of simulation due to limited data. Figure 14 shows how the Gini coefficient of taxable incomes in New Zealand changes when the period over which it is estimated is extended from one year to twelve and nineteen years (beginning in 1994 and 2001). It is immediately clear that longer-run Gini measures are substantially lower than their annual equivalents and that the value tends to decline smoothly and non-linearly as more years are added. In the NZ case, with 19 years of data the Gini profile is beginning to flatten out suggesting that lifetime income Ginis would not be much lower than those shown at the 19th year; indeed much of the flattening has occurred within a decade.[53]

Figure 14   The Gini Coefficient and the Accounting Period
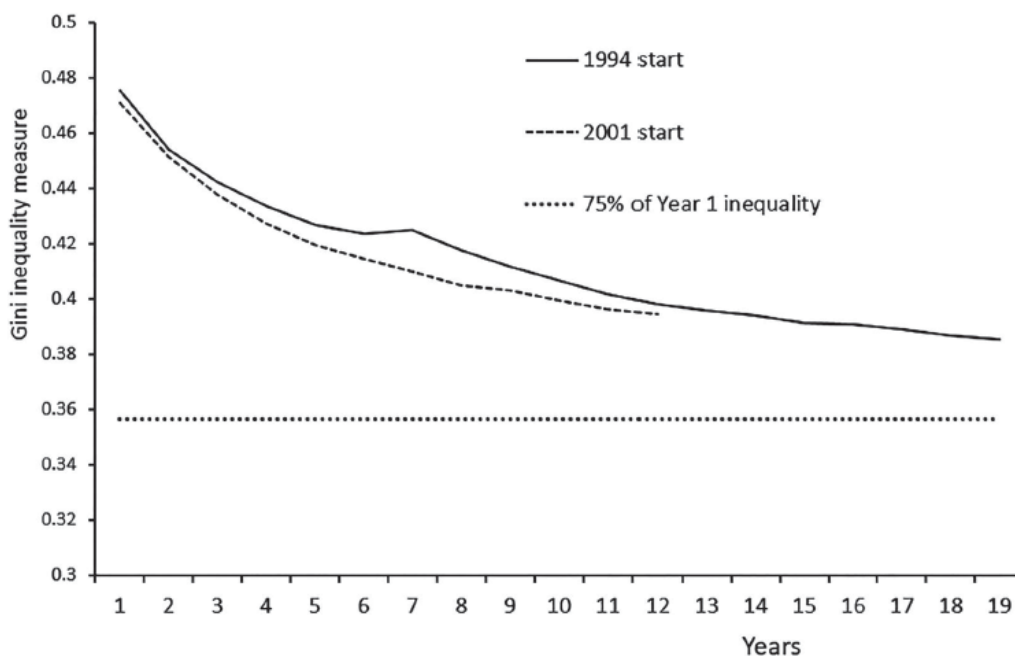
Source: Creedy et al. (2019, p.8)

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[53] Creedy *et al.* (2019) also provide results for the Atkinson inequality index, finding that the extent to which the extended accounting period reduces the index depends on the degree of inequality aversion assumed. The slight 'uptick' at the 7th year in the 19 year Gini profile in Figure 14 reflects the impact of the 2001 tax reform on incomes liable for the new 39% top income tax rate.

Table 2, from Levell *et al.* (2015) provides similar information for the UK. This takes a single cohort – the 'baby-boom' cohort (for which there is almost complete data) – and simulates lifetime income Gini indices. This shows, for example, that the lifetime gross income Gini is only about 57% of the equivalent annual value. This difference is smaller for net incomes suggesting that the direct tax-transfer system more substantially affects this inequality measure at the annual level. The gap widens again when indirect taxes are included suggesting, plausibly, that consumption taxes have greater lifetime, than annual, impact on inequality.

Table 2 Gini Coefficients for Annual and Lifetime Incomes, UK, 2015

Horizon:	Gross income	Net income	Net income less indirect taxes
Annual	0.493	0.298	0.337
Lifetime	0.281	0.224	0.239

Note: Life-cycle and annual data simulate a 'baby-boom' cohort, born 1945-54. Taxes and benefits are calculated on an annual basis and are equivalised using the Modified OECD equivalence scale. 'Net income' includes the effect of direct taxes and benefits; 'net income less indirect taxes' includes indirect taxes such as VAT and excises. Individuals are assumed to face the 2015/16 tax and benefit system throughout life, uprated in line with average earnings.

Source: Adapted from Levell *et al.* (2015, p.30).

Example 2:

Question (ii) – is most redistribution by the tax system essentially 'within taxpayers' rather than 'between taxpayers' – has also been examined in some detail for the UK by Levell, *et al.* (2015). They consider redistribution both through the tax system and through the UK system of welfare benefits including pensions. To do so, they compare actual redistributions with two 'equal distribution' counterfactuals: one in which each individual receives the same constant lump-sum amount of 'net taxes' (taxes paid less benefits received), and one in which net taxes are set at a constant proportion of gross income for all individuals. They then examine the proportion of total estimated fiscal redistribution that is *intra*-personal.[54]

Their results are summarised in Figures 15A and 15B. Figure 15A shows the share of redistribution that is intra-personal – for all individuals, and for a 'characteristics' breakdown (e.g. by gender, whether part of a couple or not, by educational qualification etc.); Figure 15B shows a breakdown by deciles of (equivalised) lifetime net income. Both Figures show that, whether the 'lump-sum' or 'proportional' definition of 'no redistribution' is used, almost 60% of all redistribution is intra-personal (just over 40% inter-personal).

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[54] The Levell *et al.* (2015) exercise is limited to public spending on transfers and so excludes other public spending categories such as health and education that also can be expected to have both intra-personal and inter-personal redistributive properties.

Figure 15A   Intrapersonal vs Interpersonal Redistribution (by characteristic)
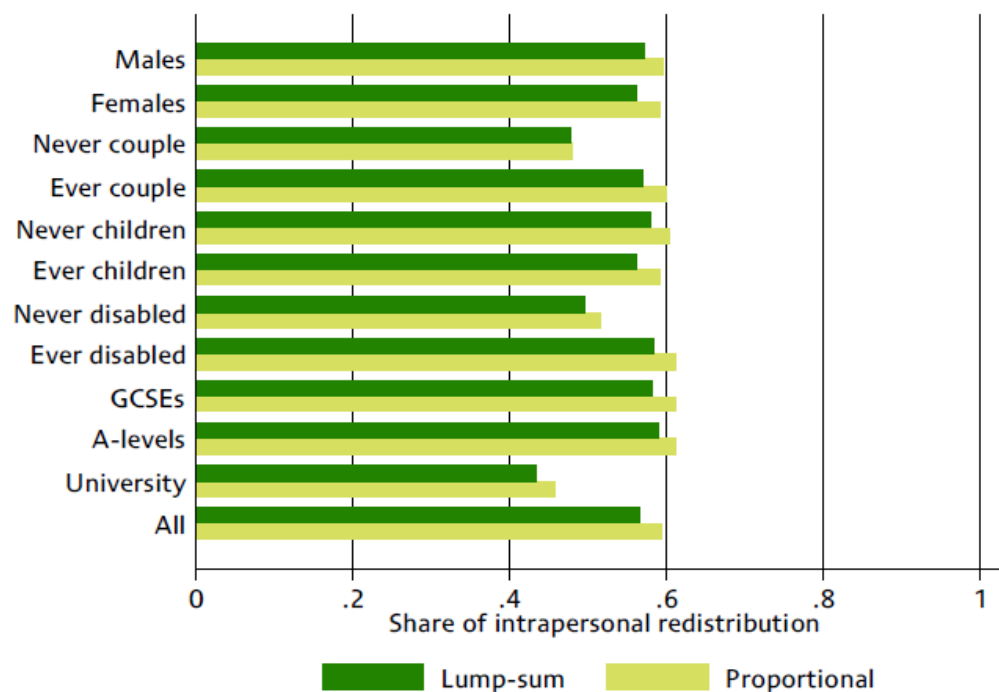
Source: Levell *et al.* (2015, p.28)

Figure 15B   Intrapersonal vs Interpersonal Redistribution (by lifetime income decile)
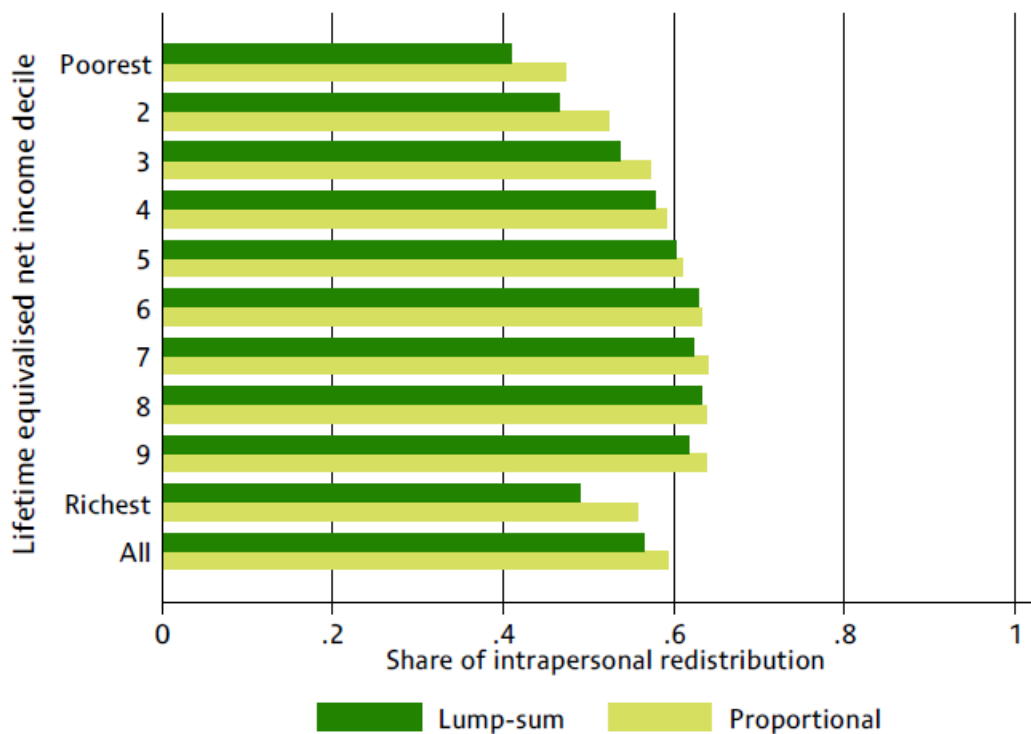
Source: Levell *et al.* (2015, p.29)

Figure 15A suggests that the share of intra-personal distribution is greater for couples compared to singles and is especially low for university educated individuals – this latter effect because such individuals tend to earn higher incomes that are then redistributed more to lower income groups. In Figure 15B, by decile, with the exception of the lowest two, and the highest, the intra-personal redistribution share appears to be similar across deciles to the average for all individuals: around 55-60%.

These results should give fiscal policy-makers pause for thought as they suggest that, contrary to a common presumption, well over half of the apparent annual redistribution achieved by the tax and benefit system may simply be reallocating income across time for the same individuals rather than from the long-term or lifetime-rich to the lifetime-poor. Of course, reallocating income to smooth consumption over time for individuals is an important characteristic of a well-functioning social welfare system. But, the important point here is that how far a tax and public expenditure system helps 'the poor' has to be specified, and measured, carefully before drawing conclusions about its redistributive properties. Much of the fiscal system appears to assist individuals to save for their own future, as distinct from helping others concurrently.

3.13 Don't use VAT (GST) as a Redistributive Tax

As noted at 3.3, one of the most commonly quoted 'tax rules' is the so-called Ramsey (1927) rule which suggests that, for maximum efficiency, taxes on goods and services should be set in inverse proportion to their elasticities of demand. Hence: luxuries taxed lightly, necessities taxed heavily.[55] This can be interpreted as implying non-uniform VAT rates, for example, but tends to result in lower tax rates on items, such as leisure pursuits, more consumed by the better-off and higher rates on necessities such as some foodstuffs and some transport modes. However, the result ignores distributional motivations for taxes and the administrative and compliance costs aspects of levying taxes at different rates across a range of goods and services. These, and further problems identifying a large number of demand elasticities in the absence of tax, represent huge informational requirements that are likely to be beyond the capability of most tax authorities.

In practice, therefore, arguments over appropriate VAT (or GST) rates have focused on the case for uniform rates versus variable rates that avoid taxing, or tax more lightly, those goods consumed especially by lower income taxpayers. This raises two important aspects: should indirect (VAT) tax rates be set to assist with redistribution?; and can substantial redistribution be achieved via variable rates?

The answer to the first question depends, not surprisingly perhaps, on what other tax instruments are available. As noted in 3.3, following Diamond and Mirrlees (1971a,b) and

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[55] The rule was subsequently amended by Corlett and Hague (1953) to accommodate the case where some goods are complementary with others and some 'goods', such as leisure, cannot be taxed directly. See Thomas (2020) for a cogent summary of this literature.

Diamond (1975), Atkinson and Stiglitz (1976) showed that setting different tax rates on goods according to their distributional characteristics can be inferior (in terms on effects on utility) to uniform rates when a progressive income tax is feasible.

That is, if two taxes are available to raise revenue, and both have different distortionary and redistributional properties, it makes sense to target each tax at the objective (minimum distortions; maximum redistribution) that it can most effectively deliver. Thus, redistribution is most efficiently achieved by a progressive income tax structure while a VAT is targeted at raising revenue relatively efficiently with a uniform rate, without (or only a few) exemptions.

By analogy, consider a country trying to maximise its number of Olympic gold medals across two disciplines. For example, two New Zealand athletes – Valerie Adams and Lisa Carrington – won gold at the London 2012 Olympics in the shot put and sprint canoeing respectively. Would they have achieved this success if the two competitors had swapped sports and trained for those instead? Almost certainly not, because they chose the sport that maximised their chances of success given their body type, genetics, coaching support, interests, etc. In other words, each competitor was most efficient at delivering medals in their chosen sport due, part at least, to innate or situational 'properties'.

So what makes the 'properties' of indirect taxes like VAT less suited to redistribution than income taxes? A clue is in the name 'indirect', when a 'direct' tax on income is available. Trying to tax income disproportionately by taxing spending instead has to rely on different spending patterns across richer and poorer consumer. And, although it is often the case that people on lower incomes spend proportionately more on some consumption items such as foodstuffs than those on higher incomes, the differences are typically much smaller than the differences in income. Exempting food from VAT, for example, may help the poor disproportionately but, in absolute dollar terms, richer taxpayers get a much larger benefit.

It is generally better therefore to use VATs to raise revenue as efficiently as possible, via a single rate and few exemptions, and allow income taxes to do the 'heavy lifting' on income redistribution via a progressive rate structure and/or via social welfare transfers to, or tax credits for, lower income taxpayers. That is, income taxes, credits and transfers can be better targeted at this objective. One reason this VAT 'target inefficiency' can be so harmful is that the erosion of the tax base due to exemptions and lower rates requires higher VAT rates, for a given revenue objective, which then leads to (disproportionately) higher excess burdens associated with the tax.

Example 1:

Thomas (2020) has studied the distributional properties of VATs across 27 OECD countries and, importantly, looking at the incidence of the tax across deciles of both (disposable) income

and expenditure.[56] Deciles of expenditure are often regarded as more representative of long-run income distributions and well-being; for example, when retirees have low current incomes but higher spending out of past savings. Results for an average across the 27 are shown in Figure 16.

Figure 16   Household Average VAT Burdens: All country Simple Average
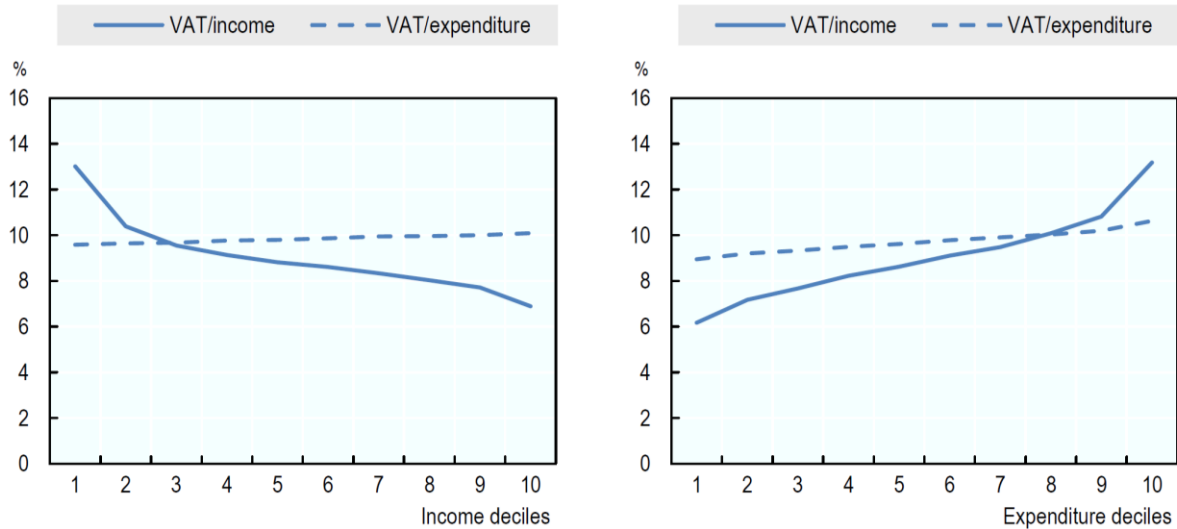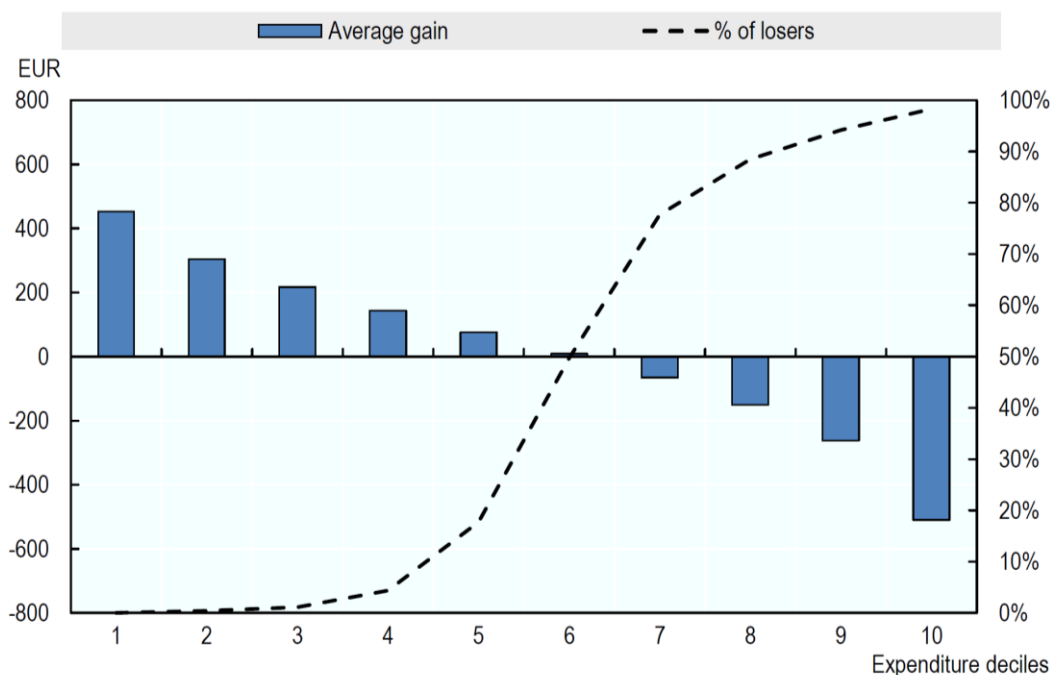

Source: Thomas (2020, p.47)

These indicate that though the ratio of VAT to income is a higher percentage at lower income deciles, as a ratio of expenditure it is roughly constant or rising with income. Using expenditure deciles as an alternative distributional comparison, VAT/income and VAT/expenditure both tend to be higher at higher incomes; that is they are progressive not regressive. The VAT regimes in most of the 27 OECD countries also typically have substantial exemptions of lower tax rates for redistributional reasons. Yet Thomas (2015) found similar results for New Zealand's GST despite New Zealand having a uniform GST rate and almost no exemptions.

Example 2:

The previous example suggests existing VATs (GSTs) are not highly redistributive – either regressive or progressive. It does not establish whether they could achieve greater redistribution than an income tax and/or social transfers system. Thomas (2020), however, also examines the distributional effects of replacing existing VAT exemptions in OECD countries with a universal (i.e. not income tested) cash transfer, and also with an income-tested transfer (received only by those below a specified income threshold). The comparisons are 'revenue-neutral' such that the extra revenue from eliminating VAT exemptions and lower rates is used for the cash transfers.

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[56] Some studies, confusingly, use ratios of gross income (before income tax deductions) which then contributes to VATs looking regressive simply because those on higher incomes have larger proportionate income tax deductions and hence proportionately less disposable income to spend on VAT-rated goods. Similarly, the more progressive the income tax, the more regressive the VAT then appears when gross income is used in the denominator.

Figure 17   Average Financial Gain or Loss by Expenditure Decile: All Countries, Reform 2

Source: Thomas (2020, p.145)

Results across expenditure deciles for the universal cash transfer case ('reform 2') are shown in Figure 17.[57] Despite the cash transfer being paid to all consumer/taxpayers, the transfers succeed in generating substantial net gains to the lower 5 deciles at the expense of the highest deciles. Furthermore, the '% of losers' shows the fraction within each decile that lose, rather than gain from the reform (due to differences from the decile average in their spending patterns). It is clear that as well as gains on average for the bottom 4 deciles, there are very few losers within them. Thus, non-uniform rates for VAT appear to be a very inefficient means of raising the incomes and spending of the poorest consumers compared to a simple cash transfer (or 'universal basic income') system.

The evidence in these two examples illustrate why the answers to the two questions posed above (should indirect tax rates be set to assist with redistribution; and can substantial redistribution be achieved via variable rates?) are both negative. In general, VATs achieve at best a small or modest amount of redistribution, and it is rarely the best tax (including negative taxes such as cash transfers) to use to achieve substantial redistribution to those on lower incomes.

3.14 A Consumption Tax such as VAT (GST) is a Tax on Labour Income and Wealth

In most OECD countries, by far the lion's share of tax revenue is raised from taxes on income and consumption, the latter mainly via VAT or GST. Explicit wealth taxes are rarer, leading to

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[57] Similar results are reported by Thomas (2020, p.145) across income deciles.

recent calls for the introduction of various forms of wealth tax to achieve greater equality. Two features of consumption taxes like VAT are often overlooked: effectively they tax earned (labour) income and existing wealth even though they are levied directly on spending.

To see this, consider how an individual worker's income is taxed – first directly by the personal income tax, and then indirectly when that income is spent. Hence, if an individual's wellbeing is related to their consumption of goods and services (among other things), then both taxes similarly reduce wellbeing by reducing their consumption possibilities.[58] The only difference is, that at the point at which the income is taxed, the VAT exempts any savings out of current income, while the direct income tax does not. It might therefore be expected that individuals' behavioural responses, other than those that are savings-related, would be similar between the two taxes. For example, it is widely recognised that personal income tax rates can affect labour supply decisions, but the same potential responses apply to consumption taxes like VAT.[59]

To see the wealth tax properties of VAT, consider individuals who save for retirement during their working lives. Their aggregate savings at retirement – representing the capital value of a potential pension – are part of their net wealth and are obviously affected by the amount of income tax paid during their working lives. However post-retirement, when their consumption is funded out of that wealth, the latter is taxed by a VAT. Additionally, any shift in tax policy away from income taxes towards VAT, results in additional tax on wealth since future income is taxed less but accumulated savings are taxed more. Retirees therefore tend to have most to lose from a direct-to-indirect tax switch unless pensions are increased to compensate (such as occurred with the New Zealand tax switch in the 2010 reforms).

Example:

Consider an individual taxpayer earning income over 40 years, starting with $100,000, growing at 2% per year, and paying income tax at an average rate of 25% over their working lives. As shown in Table 3, this person retires in year 41 and lives for another 20 years, during which time they receive a non-taxable pension payable at 25% of their final (year 40) gross income. During their working lives they save a fixed 5% of their disposable income (which earns interest at 2% p.a.), then spread the spending of the accumulated savings equally over the 20 years of retirement, to supplement their pension.

Now consider the effect of the government introducing a tax VAT at 20% from year 41 (the income tax may be cut to compensate but this has no effect on the retiree whose only income, other

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[58] Of course, estimating an overall effect on wellbeing should take into account how the tax revenues are spent.
[59] Surprisingly there is almost no empirical evidence on whether or how changes in VAT (GST) settings have labour supply effects analogous to those associated with income tax changes.

than savings, is the non-taxable pension.[60] The income and consumption profiles for this individual over 60 years are shown in Figure 18.

Table 3   Illustrating a Direct-to-Indirect Tax Switch

	Income & pension growth rate	income tax rate	savings rate	interest rate	VAT rate	pension replacement rate[*]
Years 1-40	0.02	0.25	0.05	0.02	0	n.a
Years 41-60	0.02	0	0	n.a.	0.2	0.25

[*] Pension in year 41 as a proportion of year 40 gross income.

Figure 18   Effects of a Direct-to-Indirect Tax Switch on Wealth
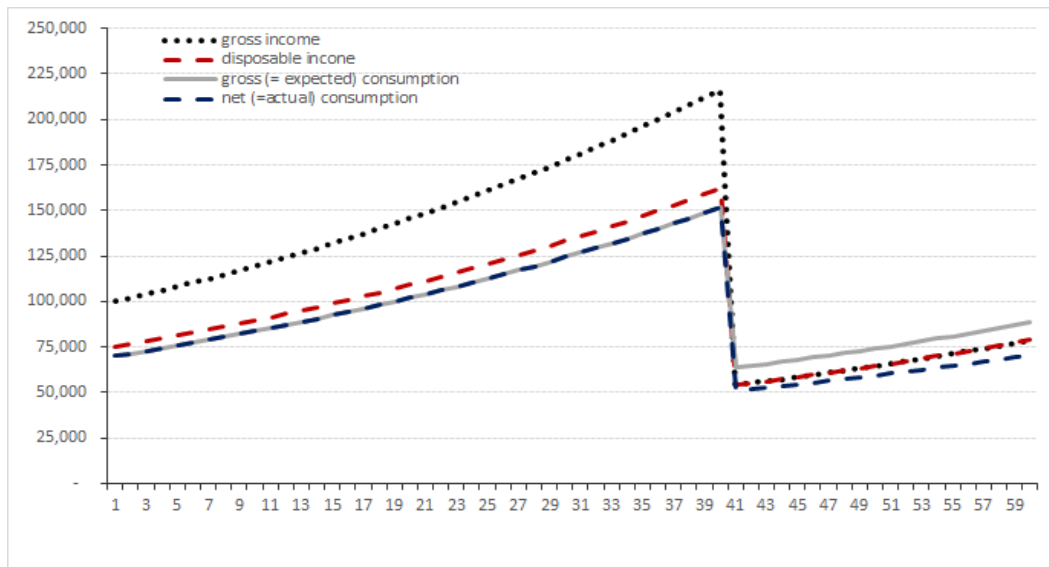
Source: Author's calculations.

It can be seen that, as expected, gross and disposable income and consumption grow during working years, reaching a gross income of $216,000 in year 40 and consumption of just over $150,000. At retirement, without the introduction of the VAT, gross (= net) consumption is expected to be around $65,000 (~40% of year 40 consumption), but when a 20% VAT rate is introduced, this reduces net consumption of around $51,000. That is, consumption in retirement is around 78% of that expected before the tax switch. This amounts to an additional tax liability on the retiree's accumulated wealth (and spending out of the pension) of around ~$300,000 over the 20 retirement years on top of the ~$1.54 million paid in income tax during their working life.

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[60] For simplicity it is assumed that the accumulated savings by year 40, that are subsequent used to supplement the pension, earns no further interest from year 41.

Importantly, in the context of calls for greater use of wealth taxes, this illustrative taxpayer at the start of their retirement would have accumulated wealth of around $380,000, or seven times their annual pension of $54,000. But this wealth, when used for consumption in later life, still leaves the pensioner with annual income only around 29% of their final working salary (with no VAT), or 23% (with VAT). Hence, with the introduction of VAT their net retirement spending is less that their non-taxable pension (at 25% of final salary) and without VAT, their wealth merely adds another 4 percentage points (of final salary) to their pension.

Thus, modest accumulated wealth held by people approaching retirement provides only a minor boost to post-retirement pension income. This highlights the importance of considering the role of accumulated wealth for different age cohorts, and particularly the potential impact of (direct or indirect) wealth taxes on households' ability to make sensible decisions around consumption smoothing across the life cycle. Especially for those post-retirement households, wealth taxes can have a devastating impact on consumption, and not simply for households considered 'wealthy'. In addition, a direct wealth tax would undoubtedly reduce taxpayers' accumulated savings – or net wealth – such that consumption possibilities in retirement are further reduced.

3.15 Both Statutory and Effective Tax Rates can be Relevant for Policy

Economists usually stress that, if tax affects economic decisions it is usually the *marginal*, not the average, rate that is relevant (unlike in measures of tax progressivity), and it is the *effective*, not statutory, tax rate that matters. Decisions to work longer hours, for example, or accept a job promotion are assumed to depend on the additional income earned net of any additional tax paid, the latter determined by the marginal income tax rate. If the additional hours or promotion also lead to a loss of some welfare benefits or tax credits at, say, 25 cents of benefit for every extra dollar earned, then the effective marginal tax rate (EMTR) is relevant and is 25 percentage points higher than the relevant statutory income tax rate. If the statutory MTR is 25% then the EMTR is double the statutory rate.

However, economists often distinguish between decisions at the intensive margin and extensive margin. The above hours/promotion decision is an example of the former. A decision to enter the work force, by contrast, is an extensive margin decision because the decision is between two discrete events – working and not working – rather than changes in the number of hours worked, At extensive margins it is the *average* tax rate that is relevant, such as whether the income received net of all taxes is more or less when working compared to not working. These extensive margin tax rates are sometimes referred to as 'participation tax rates' (PTRs) since they indicate the rate at which tax is paid when entering (participating in) employment.[61]

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[61] Bartels and Pestel (2016) demonstrate of the effects of PTRs on (German) labour force participation.

Example 1:

Corporate income taxes provide a good example of the different decisions where statutory, effective marginal and effective average tax rates can each be relevant. Firstly, effective tax rates usually differ from statutory tax rates for companies. This is because of the usual practice, when assessing profits liable to tax, of offering various deductions against the firm's gross income (revenues), such as allowing depreciation deductions for capital assets acquired and other legitimate expenses incurred in the process of doing business. Since most fiscal depreciation allowances do not equal the purchase price of the asset in present value terms (for example, because they are typically only claimed in arrears), then the effective marginal tax rate on a dollar of investment differs from the statutory marginal rate in tax legislation.[62]

In the case of corporate investment decisions, consider an example of a UK-based multinational company planning a major new manufacturing plant. If the firm has already chosen the location of this plant (say, in the UK) for non-tax reasons, then the investment can be thought of as a *marginal* investment in its UK production. The relevant tax rate is therefore the effective marginal rate of corporate income tax.[63] However, if the firm is instead choosing between building the plant in one of several countries, the *average* effective tax rate in each potential location becomes relevant to that extensive margin decision.

Alternatively, if the firm already has plants operating in several countries (or even just a legal presence is more than one country) it may be able to make choices over how much profit it declares in each country, separately from where it produces or invests. This is the familiar 'profit shifting' case whereby determining where, within a complex global supply chain, a firm's profits are earned is a difficult exercise. It is therefore vulnerable to transfer pricing and other methods by which firms have discretion over where the 'book' their profits.[64]

In this profit shifting case, it is the *statutory* tax rate in each potential profit location that is relevant since there are no tax deductions involved. The consideration is merely: where would an extra dollar of declared profits be more lightly/highly taxed? This is determined by the statutory (marginal) rate and helps explain the so-called 'race to the bottom' in international corporate

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[62] In much of the corporate tax literature the terms 'effective' and 'marginal' or 'average' are reversed in the tax rate definition, so that 'EMTR' (EATR) becomes the 'METR' (AETR), for example. This is purely a nomenclature convention.

[63] In some contexts, the marginal personal income tax rate payable by the company's shareholders may be more relevant; for example, when the return to the marginal investor/shareholder is taxed via dividends or capital gains. Relevant analysis often depends, among other things, on the precise form of the corporate tax regime.

[64] Transfer pricing refers the mechanism whereby multinational firms, operating in several countries, set the intra-firm price of inputs 'sold' from one part of the firm (in low-tax country A) to another part of the firm (in high-tax country B) artificially lower than a 'true' market price (which typically is not observable), such that the company's profit in country A from the transaction appears artificially higher.

statutory tax rates, as some countries appear to compete to attract multinational firm profits.[65] See Auerbach *et al*. (2010) for further discussion, including evidence on the impact of these different corporate tax rates.

Example 2:

Another example of the importance of different tax rates to address different tax policy questions is provided by Raj Chetty in the context of the US corporate tax regime.[66] Figure 19 shows how the relevant tax policy instrument differs according to the type of firm decision that is being analysed.

Figure 19   Corporate Decisions and Tax Policies

Source: http://www.rajchetty.com/lectures/public/
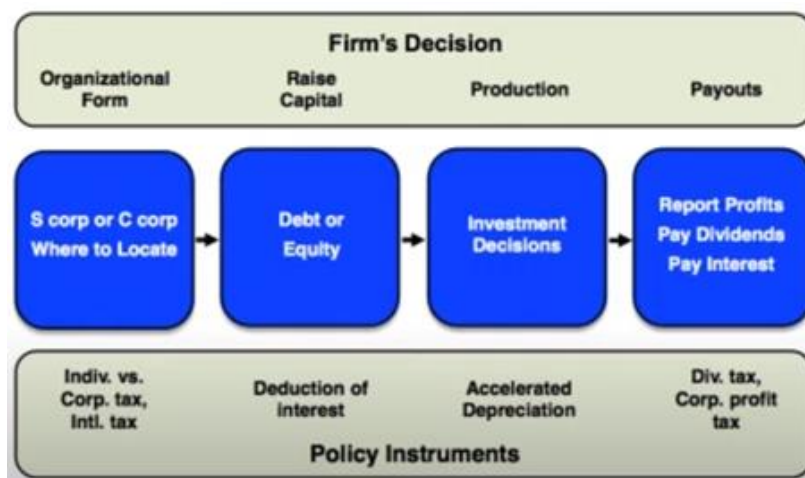
The top segment of the figure shows the four types of decision that large multinational firms make: those concerning their organisational form[67] (e.g. incorporated or unincorporated and where to locate); whether/how to raise capital (debt versus equity); production (decisions over investment) and 'payouts' (profit reporting and shareholder distributions). As the bottom segment of the figure shows, the aspects or 'instruments' of the corporate or personal tax regime that are relevant to each of these four types of decision are quite different. Thus, interest deductibility (for tax purposes) is a key instrument for investment financing decisions, while choices over organisational form are influenced by individual versus corporate tax settings, as well as by tax settings in other countries ('Intl. tax').

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[65] Of course, other things equal, a lower statutory rate typically implies a lower effective average rate, hence potentially attracting 'real' multinational investment as well as profits.

[66] The following example is from lecture topic 8 (corporate taxation) at http://www.rajchetty.com/lectures/public/.

[67] 'S-corporations' and 'C-corporations' in the US are respectively taxed via the personal and corporate income tax.

4.   Conclusions

This paper has sought to offer some lessons on 'good tax policy' as background for policy advisers interested in how economic research can influence, and has influenced, the design of individual taxes and tax systems. Of course, the lessons here are just a small selection from a vast array of possible lessons, both general and with respect to specific taxes, which inform tax policy advice. In many cases, these lessons are context-specific and do not always represent an agreed view – typically because underlying assumptions are untested or untestable. In addition, empirical evidence may be required to help decide on the merits of two competing tax policy options, such as whether a personal income tax should be reformed to be more or less progressive, or whether income-tested welfare benefits should be withdrawn at a rapid or slow rate as income increases.

Nevertheless, the tax policy lessons selected here were chosen at least in part because they are likely to achieve a high degree of agreement across tax economists. They also aim to help counter faulty intuition by those unfamiliar with economic concepts and approaches to tax design. There are, of course, many other more detailed lessons to be drawn from the economics literature on specific taxes – related to the design of personal and corporate income taxes, consumption taxes, environmental taxes, specific excise taxes (such as on alcohol, tobacco and fuel) etc. These are beyond the scope of the present paper but provide more tax-specific lessons.

To develop understanding further, useful places to start are the extensive background papers or book chapters of the four tax reviews discussed in section 1: Mirrlees (2010, 2111), Australian Treasury (2008, 2009a,b), Buckle (2010) and Cullen (2019). In addition, good undergraduate textbooks include Gruber (2019), Rosen and Gayer (2014) and Leach (2010), while the various volumes of the *Handbook of Public Economics* provide analyses at the graduate level, beginning with Auerbach and Feldstein (1985) and most recently, Auerbach *et al.* (2013). Kaplow (2011) is a technical but accessible textbook treatment; see also Slemrod and Bakija (2008). The edited volume by Auerbach and Smetters (2017) includes a set of useful chapters on various aspects of tax policy covering, for example, environmental taxation, tax compliance, capital gains taxation, and retirement savings taxes. In addition, the excellent online 2012 (PhD) lecture course on public economics by Professor Raj Chetty at Harvard University, remains relevant and available at http://www.rajchetty.com/lectures/public/.

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