OXFORD

How much tax do the rich really pay? Evidence from the UK

Arun Advani,* Helen Hughson,** and Andy Summers***

* University of Warwick Economics, CAGE, IFS, III, UK, e-mail: a.advani.1@warwick.ac.uk
** University of Warwick, UK, e-mail: helen.hughson@warwick.ac.uk
*** LSE Law, III, IFS, UK, e-mail: a.d.summers@lse.ac.uk

Abstract

Using anonymized administrative data on the population of UK taxpayers, we show that—in line with high-profile anecdotes about the tax affairs of the rich—effective average tax rates (EATRs) decline at the top of the distribution of income and capital gains. We also document substantial variation in EATRs within remuneration level: a quarter of those in the top 1 per cent pay headline rates, while another quarter pay at least 9pp less than the headline rate. Most of this effect is driven by the composition of remuneration, with investment income having lower tax rates and capital gains having lower rates still. If all individuals with income above £100,000 paid the headline rates, this would raise tax revenue on income and gains by £23 billion on a static basis, an increase of 27 per cent in the tax paid by this group.

Keywords: inequality, horizontal equity, effective tax rates, capital gains tax
JEL classification: D63, H23, H24

I. Introduction

Political debates around taxation of the rich tend to focus on the 'headline' rates of the taxes that are most salient with the public—in particular, the statutory tax rates on earnings from employment, which cover the bulk of income for most taxpayers. Seen in these terms, the UK's personal tax system is highly progressive, with marginal income tax rates rising from zero for those on the lowest incomes (below £12,500) up to 45 per cent for the highest earners (above £150,000), or 47 per cent once employee National Insurance Contributions (NICs—a payroll tax) are included. However, a steady stream of media exposés has revealed the extremely low tax rates being paid (remitted) by some rich individuals. These stories indicate a very different picture in which, far from rising with income, taxes become semi-optional for at least some of those at the very top.

In the US, recent leaks of tax data coordinated by Pro Publica have shown more systematically the low tax rates paid by particular individuals at the very top of the US income distribution. This analysis measures the tax actually paid by each individual—as reported on their tax return—and expresses it as a percentage of their total income (including accrued capital gains) to give their 'effective average tax rate' (EATR). The findings document a large gap between EATRs and headline rates of tax: for the top 25 wealthiest individuals, the EATR was just 3.4 per cent when accrued capital gains—measured by changes in their estimated wealth—are included (Eisinger *et al.*, 2021). Even excluding accrued gains, it was only 15.8 per cent (Kiel *et al.*, 2021).

In this paper we provide new evidence for the UK, using administrative tax data to measure EATRs at the individual level for the first time. In simple terms, our measure of EATRs expresses the amount of tax actually paid—after accounting for different tax rates on different types of income, and reliefs that reduce the final tax bill—as a percentage of total taxable income and realized capital gains. As well as providing new evidence on how progressive taxes are on average at the top ('vertical equity'), we are also able to explore how much tax rates vary among those at similar levels of income ('horizontal equity'). Our access to complete microdata on individual incomes, gains, and tax paid also allows us to pinpoint what drives these differences across individuals. This step is essential in designing policies that can remove unjustified horizontal inequities.

We highlight three main findings. First, consistent with anecdotal evidence, EATRs are declining at the top of the income distribution. The mean EATR peaks at 38 per cent for individuals with remuneration (taxable income plus realized capital gains) of £500,000, and then declines to less than 30 per cent above £3 million, at least 17pp below the 'headline' average rate: the statutory rate that applies to earnings from employment (47 per cent). When considering only income, the mean EATR does not decline, but remains flat at 42 per cent on incomes above £1 million.

Second, using administrative microdata we show that there is substantial variation in EATRs across individuals with the same level of taxable income or remuneration. While the mean EATR for individuals with £3 million in income is 42 per cent, 5pp below the headline average rate on earnings, half of individuals are within 1pp of that headline rate. The low mean is driven by a small share of individuals with dramatically lower rates: 10 per cent of individuals with £3 million or more in income paid 37 per cent or less. When capital gains are included, the range of EATRs is much wider: almost a quarter of those with £3 million or more in total remuneration paid no more than 12 per cent, fully 35pp below the headline rate.

Third, we document that most of the gap between effective and headline rates comes from the differential statutory rates that apply to the returns to capital. Of the 20pp gap between mean effective and headline rates for someone who has £3 million or more in remuneration, 95 per cent comes from compositional effects: this remuneration largely comes in forms that have lower statutory rates than the headline tax rate on earnings. Of the remainder that comes from the use of tax reliefs, most is driven by tax reliefs for charitable giving and investment incentives.

Our findings emphasize the importance of differential statutory rates across different forms of income in creating both horizontal and vertical inequality. While the use of complex reliefs is often emphasized in explaining the tax affairs of the wealthy, we show it is basic structural differences in the main rates that are most important in creating the dispersion in EATRs on income. A further important structural issue concerns forms of income and gains that are exempt from tax altogether, which we are unable to account for in our main analysis since we rely on data collected via administration of the existing tax base.

In complementary work, Yagan (2023, this issue) studies EATRs for the 400 wealthiest individuals in the US, focusing in on the issue of accrued gains in particular. He uses changes in reported wealth in the Forbes 400 as a measure of gains, and then imputes total tax paid using a crosswalk between wealth and income. For the individuals he considers, he finds that unrealized gains imply single-digit EATRs in the US, which is lower than we find when accounting only for realized gains in our measure of total remuneration. However, in comparing these figures, it is also worth noting that our ranking of individuals is by income (including gains) rather than wealth, and we describe EATRs across a much wider group of individuals.

Our focus on horizontal equity also provides some empirical colour to an older literature, going back to Musgrave (1959), which argued from a principled standpoint whether horizontal equity was a relevant and distinct social welfare criterion. This debate, largely conducted between Kaplow (1989, 1992) and Musgrave (1990, 1993), after earlier contributions from Feldstein (1976) and Stiglitz (1982), centred on whether horizontal equity was an independent principle to be considered in the evaluation of policy, or whether it was fully implied by other welfarist considerations. Summarizing that debate, Repetti and Ring (2012) conclude that while horizontal equity should not be seen as an independent principle, it is useful in requiring 'a government to articulate a justification for any tax policy that imposes "different" taxation' on otherwise similar people. Seen in that context, since our work shows that existing UK tax policy is failing to achieve horizontal equity, there is a strong need for clearer justification as to the benefits that are being attained by this.

The rest of this paper proceeds as follows. Section II outlines the options for calculating EATRs, and sets out both our definition and rationale. Section III describes our data and context. In section IV we show how EATRs vary by level of income, and in section V we highlight the variation *within* income levels. Section VI unpacks these findings, to show what about the tax returns of the richest individuals drives their low (and variable) EATRs. Section VII concludes with some discussion of the implications for policy.

II. Approaches to measuring tax rates

(i) Defining the effective average tax rate

Approaches to measuring average tax rates entail three main choices.

First, one must decide what to use as the denominator in the calculation. In principle, this issue raises questions about the best way to measure an individual's welfare (for example, based on their income or consumption, annually or over their lifetime, etc) and, relatedly, how to define the ideal base for direct taxation.[1] In practice, researchers are heavily constrained by data availability, which limits the choice to various definitions of income that are already in use for administrative and/or survey purposes: for example, taxable income (used for income tax), 'Canberra' income (typically used in household surveys), or the household sector of national income (used for National Accounts). All of these definitions depart in several ways from the economic concept of 'comprehensive income'—particularly in that they omit accrued but unrealized capital gains. Such differences must be borne in mind when comparing studies that use different definitions, and when assessing whether and how finding low EATRs indicates an objection to the current tax system.

Second, there are various choices over which taxes to include in the numerator of the calculation, and how to assign these to individuals (the question of 'incidence'). As we discuss further below, the main distinction is between statutory and economic incidence: i.e. whether taxes are assigned to individuals on the basis of who is statutorily liable for the tax, or whether instead some attempt is made to determine empirically who actually bears the economic cost of the tax. In principle there is no coherent intermediate position between these, although in practice it is conventional to rely on the assumption for some taxes—but not others—that economic incidence happens to track statutory incidence such that no separate estimation of the actual cost of the tax is required.[2]

Third, it is necessary to decide a time period over which income and taxes paid are measured. In principle, one might ideally assess this over each person's lifetime, but again in practice some concession must inevitably be made to data availability. When using tax data, it is most straightforward to adopt the period used for income tax purposes, which is typically one year. However, for sources of income that are 'lumpy', i.e. received infrequently over periods greater than one year, this approach could have the effect of distorting the 'typical' income and tax rate that the individual faces. Consequently, as far as practicable it is helpful to aggregate income and taxes paid over a longer time period. One inevitable drawback of this approach, for the purpose of assessing changes in tax rates over time, is that it may merge together the impact of multiple tax regimes occurring over the relevant period.

Having made these three choices, the EATR is calculated as relevant taxes paid over the chosen period divided by the relevant income received in that period. This can be constructed at the individual level, and then aggregated over groups of individuals if desired.[3]

(ii) Benchmarking the effective average tax rate

The baseline for comparing these EATRs is usually the average rate that an individual would be expected to pay assuming very simple tax affairs—for example, an individual who only receives earnings from employment and does not claim any tax reliefs besides the standard non-taxable allowance. We refer to this as the 'headline' rate. This rate typically serves as the ceiling or maximum tax rate that an individual might pay, although in principle it is possible for effective tax rates to exceed this level if, for example, the statutory tax calculation disallows some forms of loss or expense that reduce the individual's net income (in the denominator) without reducing their corresponding tax liability (in the numerator). In practice, as we show in this paper, effective tax rates—based on taxes actually paid—are more often significantly lower than the headline rate.

In this paper we refer to the statutory tax rate that applies to earnings from employment as the 'headline' rate because this is the most common form of income, even at the top. In the UK, as elsewhere, the statutory rates that apply to other forms of income are different, and in particular are lower.

One way of drawing comparisons across countries and over time is simply to look at each of these statutory rates in isolation. For example, the OECD produces statistics comparing statutory tax rates across its member countries.[4] Apart from payroll (or social security) taxes, which are aggregated with income tax, these tax rates are reported

---

[1] See further, e.g. Meade *et al*. (1978, ch. 3) and Banks and Diamond (2010).

[2] For example, while the divergence between the statutory and economic incidence of corporation tax has been studied extensively (in part, because it is clear that the economic incidence cannot ultimately be on companies), most distributive analyses of tax burdens adopt the assumption that the economic incidence of income tax is fully on the recipient of the income.

[3] A further question is one of how this aggregation should be done. The two main approaches are a democratic mean—constructing the EATR for each individual and then taking the mean—and a plutocratic mean—constructing the mean of the numerator and denominator separately within the group, and then taking the ratio of the means.

[4] https://www.oecd.org/ctp/tax-policy/tax-database/.

separately for each tax base. The statutory average rate in each case is calculated by taking the tax that would hypothetically be paid assuming no claim for reliefs or other deductions, and expressing this as a share of the corresponding taxable base, for example taxable income or taxable gains. Taxes are assigned on the basis of statutory incidence.

While statutory average rates are relatively straightforward to calculate, there are several key drawbacks to relying on them for comparisons across countries and over time. First, statutory rates do not take any account of differences in the composition of income (potentially including gains) received by individual taxpayers. Second, they also take no account of tax reliefs that reduce the taxpayer's final liability. Both of these factors mean that the 'effective' tax rate that individuals pay can differ significantly from the headline rate—the statutory rate that applies to earnings from employment. In other words, a focus on the headline rate assesses the tax system as if all taxpayers have a single source of income and claim no reliefs, rather than on the basis of the taxes actually paid.

The recent innovation of 'Distributional National Accounts' (DINA) seeks to address this concern by allocating all income—according to the National Accounts definition of income—and all taxes paid by individuals (and transfers to individuals), in proportion to the distribution of income and taxes observed using tax data (Piketty *et al.*, 2018; Alvaredo *et al.*, 2020). The national accounts definition of income is in most respects broader than the definition of income used for income tax purposes (i.e. 'taxable income'): for example, it includes retained corporate profits and other income sources that are not liable to income tax. DINA also accounts for all taxes, whether or not those taxes are assessed on personal income, allocating taxes to individuals in the same way as the income sources on which the taxes were levied. The resulting difference between pre- and post-tax income, expressed as a share of pre-tax income, can then be interpreted as an effective tax rate.

Although the literature that uses the DINA approach (Fesseau and Mattonetti, 2013; Piketty *et al.*, 2018; Alvaredo *et al.*, 2020; Auten and Splinter, 2022) provides important evidence on how effective rates vary with total income *on average*, it has not yet addressed the extent of variation between individuals at the same level of income. This aspect is important because—as we show in this paper—such variation can be substantial at the top of the income distribution and matters both for welfare analysis and policy purposes (Musgrave, 1959; Repetti and Ring, 2012). To overcome this limitation, we use administrative tax microdata to measure the taxes actually paid by all individuals with incomes above £100,000, allowing us to explore how much effective tax rates vary even among those at similar levels of income, as well as across different income levels.

III. Data and methods

(i) Data and context

We study effective tax rates using administrative tax data from the UK tax authority (HMRC). These data are collected from the universe of personal tax returns filed for tax years 2008 to 2018,[5] supplemented by data from HMRC's 'Pay-As-You-Earn' (PAYE) system, which covers all income tax payers who did not file a tax return (as well as many who did file a return).[6] By combining the data from tax returns and PAYE records, we obtain full coverage of the universe of UK taxpayers. In our analysis, we only include individuals who were tax resident in the UK in the relevant year, excluding individuals who filed as non-resident.

Individuals who file a personal tax return are required to provide information on both their income and realized capital gains. Individuals are typically only required to report income and capital gains that are 'assessable' for tax, meaning effectively sums that are within the scope of the relevant taxing legislation and not entirely exempt. Consequently, for reasons of data availability, the definitions of income and gains that we use for computing EATRs in our main analysis exactly track the administrative definitions of what is taxable.[7]

Taxable income includes earnings from employment, trading profits from unincorporated businesses (sole traders and partnerships), and all taxable income from savings and investments—for example, interest, rent, dividends, and other investment income such as gains in life insurance policies. For tax purposes, capital gains are assessed on realization (i.e. when an asset is sold), and broadly are computed as the difference between the cost of the asset when it was acquired and its value on disposal (i.e. sale or other transfer). Taxable gains include gains on most types of assets, subject to the exceptions explained below.

---

[5] The UK tax year begins on 6 April every year. We show data from tax years 2007–8 to 2017–18. Throughout this paper, we refer to the latter year for shorthand.

[6] In the UK, only around one-quarter of taxpayers are required to file a tax return, since filing is generally not required for those whose only source of income is earnings from which tax has been deducted at source.

[7] In Appendix C, we show how far these results are affected by the inclusion of one particular source of non-taxable income and gains—relating to taxpayers who are resident but not domiciled in the UK ('non-doms')—where we are able to draw on imputations developed in previous work.

The statutory tax rates applied to income depend on its type. Earnings from labour (i.e. employment and trading profits from unincorporated businesses) are liable to income tax at a marginal rate of up to 45 per cent, plus NICs of 2 per cent.[8] Investment income from interest, rent, and other sources (excluding dividends) are charged the same rate of income tax, but no NICs are payable. Dividends are charged at lower rates of income tax (up to 39.35 per cent), and are similarly exempt from NICs.

Capital gains are much more lightly taxed than income, with rates varying between 10 and 28 per cent depending on the type of asset and the income of the taxpayer. The 28 per cent rate applies to residential property (other than main homes) and the 'carried interest' of fund managers. The main rate of 20 per cent applies to all other assets, including listed and unlisted shares, tangible assets such as collectibles, and intangible assets such as business goodwill and intellectual property. Gains in business assets that qualify for Business Asset Disposal Relief (BAD Relief, previously known as Entrepreneurs' Relief)—where the recipient is an employee or director of the business—attract the lowest tax rate of 10 per cent.

(ii) 'Missing' income and gains

Compared with the Haig–Simons comprehensive definition of income—which effectively encompasses all accretions to wealth (including accrued but unrealized gains) from any source—there are several important sources that are 'missing' from the data we use to calculate EATRs. The main sources of 'missing income' are set out in detail by Summers (2019). These include, for example, all income from tax-exempt investments (e.g. ISAs), the foreign income/gains of 'non-doms' (individuals who are resident but not domiciled in the UK), retained profits held within firms (unless realized as a capital gain), inheritances and gifts, and income that is underreported due to tax avoidance schemes and evasion.

Our focus on taxable income also results in an uneven treatment of pension contributions depending on how the contribution was made. Where contributions are made out of post-tax income (for example, into a private pension scheme), these are given relief against income tax but without affecting gross taxable income. However, contributions into some types of occupational pension schemes are deducted from the employee's wages pre-tax (i.e. prior to operation of PAYE), and are therefore not reported to HMRC. In this case, the amount of the employee's pension contribution is effectively missing from their measured income. This could lead us to underestimate the gross incomes, and overestimate the EATR, of (some) employees relative to other types of taxpayer.

Since these sources of income are entirely missing from the data collected from tax returns, it is generally not possible to include an estimate for them at the individual level, as would be required for the purpose of analysing the variation in EATRs across individuals on the Haig–Simons definition. In the case of the foreign income/gains of non-doms, in Appendix C we use individual-level imputations of unremitted investment income and gains, derived from existing work by Advani et al. (2022a), to show the impact on EATRs of including this additional imputed income/gains in the denominator for total remuneration.

The main sources of 'missing gains' are realized gains on non-taxable assets, including individuals' main homes and assets held within ISAs or other tax-exempt products. Corlett et al. (2020) provide evidence on the aggregate size of these omissions. Additionally, there are various reasons why taxable gains may not be reported due to the amount, timing, or nature of the realization. In some cases (e.g. transfers between spouses, or sales of business assets eligible for rollover relief or gift holdover relief), the problem is mainly one of timing: we do not see the gain when it is initially realized, but the full accrued gain will eventually be reported when a subsequent taxable disposal occurs. However, in other cases the accrued gain permanently escapes tax: for example, gains realized in small amounts (below the exempt allowance), any transfers made on death or to a charity, and gains realized only after an individual has emigrated.[9]

Ideally, we would include all of this missing income and gains in the denominator (i.e. total income/remuneration) that we use to calculate EATRs. Excluding these missing sources undoubtedly biases EATRs upwards because these sources are not subject to tax so the effective tax rate on them is zero. It also makes the distribution of EATRs appear less regressive, since mechanically individuals who have these sources are identified to have both a higher EATR and lower income plus gains than they really do. Whether this effect is large depends on whether the share of missing income and gains makes up a larger share of total income/remuneration for those on the highest taxable incomes. There is some evidence to indicate that this is the case—see for example Corlett et al. (2020) on gains, and Advani et al. (2022b) on income—but further work is required in this area using new data sources.

---

[8] The 2 per cent rate of NICs applies to all labour income above £50,000. Below that threshold, the rate varies according to whether the source is employment or trading profits of an unincorporated business (self-employment or partnership).

[9] In related work, Yagan (2023, this issue) studies EATRs for high-wealth individuals. He includes accrued gains in his measure of income, but this necessitates focusing only on the small group of individuals for whom that information is (partially) known via the Forbes 400 Rich List, mainly due to their substantial shareholdings in large public companies.

(iii) Calculating EATRs

We calculate an individual's effective average tax rate (EATR) as the percentage of their total taxable income, or taxable income and gains ('total remuneration'), that they pay in tax. We refer to the *effective* average tax rate because our measure combines multiple taxes and tax bases, rather than simply looking at each tax in isolation, and also takes into account tax reliefs that can reduce the tax actually paid.

As an individual's EATR depends on where their money comes from, and what deductions and reliefs they claim, EATRs can vary even for people with the same total remuneration. We therefore refer to the *mean* EATR (or the EATR 'on average'), which gives the average EATR for people with a specific level of income or remuneration.[10] Likewise, we refer to specific percentiles of the distribution of EATRs around a given level of income/remuneration, for example the median (p50) or 90th percentile (p90) of EATRs among those receiving a particular income/remuneration level.

For the purposes of capturing the entire distribution of EATRs in the cross-section, we group individuals earning above £500,000 into bins of 500, while those earning between £100,000 and £500,000 (of whom there are far more) we group with others earning at the nearest £10,000. Thus, statistics cited as a specific level of income or remuneration (e.g. £3 million) in fact reflect a narrow range of observations around this level. In Figure 3, we show the evolution of EATRs over time at specific points in the distribution; for these charts we group individuals earning within 5 per cent of the stated level of income or remuneration.

We estimate two main EATR series:

- for our *'income' series*, we calculate the total income tax, Class 1 primary (employee), and Class 2 and Class 4 (self-employed) NICs paid, as a percentage of total taxable income reported;
- for our *'total remuneration' series*, we also add capital gains tax paid to the numerator, and total taxable gains to the denominator.

Our approach takes account of all taxes paid on taxable income and gains at the personal level, based—as we explain in the next subsection—on the concept of statutory incidence. We do not include either corporation tax or Class 1 secondary (employer) NICs in our main analyses, because the statutory incidence of these taxes is on firms. The taxes that we cover accounted for around 41 per cent of total UK tax revenues in 2018 (HMRC, 2022*a*). Individuals pay many other taxes including VAT, council tax, fuel duty, air passenger duty, etc; additionally, taxes paid by firms, such as employer NICs, corporation tax, and business rates, must also ultimately be borne by individuals (although not necessarily by UK residents).

Our focus on taxes that are statutorily incident on income and gains is still instructive for two main reasons. First, personal direct taxes are conventionally thought to be among the most progressive elements of the tax system. Taxes such as VAT and council tax are not designed or claimed to be progressive, but personal direct taxes are believed to be where most of the redistribution in the tax system occurs. Our analysis investigates the extent to which existing taxes on income and gains do in fact achieve this aim.

Second, the principle of 'horizontal equity' suggests that personal direct taxes should be designed to be equal across individuals with the same ability to pay (Musgrave, 1959). This implies that two individuals with the same total remuneration should face the same EATR. If they do not, then this can also generate economically inefficient incentives to restructure remuneration to benefit from lower tax rates. Our analysis addresses these issues of equity and efficiency by exploring variability in EATRs across individuals at the same level of remuneration.

(iv) Tax incidence

Economists recognize an important distinction between 'statutory' and 'economic' incidence. The statutory incidence of a tax depends on the legal structure of the tax system. Statutory incidence is on whichever legal person is liable to pay the tax according to the relevant legislation; this could be an individual or a company. In other words, it is on whoever is responsible for 'paying over' the tax to the tax authority, as a matter of law.[11] Similarly, the statutory incidence of a tax relief is on whoever is legally entitled to the benefit.

---

[10] We take the democratic mean across all individuals within a given income or remuneration 'bin', meaning that we give each individual within each bin equal weight. Since the bin widths we use are relatively small, individuals within a bin have similar denominators in their EATR calculation, meaning our results are not very sensitive to whether we take the democratic or plutocratic (equal weight per pound received) mean.

[11] Sometimes more than one legal person may be liable as a matter of law. For example, s6(3) Social Security Contributions and Benefits Act 1992 provides that employees are liable for Class 1 primary ('employee') NICs and employers are liable for Class 1 secondary ('employer') NICs. However, this is stated to be without prejudice to Schedule 1, which provides that, in most circumstances, employers shall 'be liable in the first instance to pay the earner's primary contribution, on behalf of and to the exclusion of the earner'. Nevertheless, since the employee is the legal person ultimately liable to pay Class 1 primary contributions (in the event that the employer does not), we treat the statutory incidence as being on the employee; this is also consistent with common perception, since primary but not secondary Class 1 NICs are shown as a deduction on employees' payslips.

By contrast, the economic incidence of a tax reflects the idea of who 'really' pays, which may not be the same as the legal person liable to pay. First, economic incidence can only ever be on individuals, never companies; consequently, we must always look through a company's legal form to its individual shareholders, workers, suppliers, or customers etc. Second, economic incidence requires a counterfactual analysis, specifically: by how much would an individual be better/worse off if the tax in question were decreased/increased? Economic incidence therefore relies on causal identification of behavioural responses to the tax.

The choice of approach to incidence has been the subject of recent controversy in the tax and inequality literature (Saez and Zucman, 2019; Kopczuk, 2019). As a matter of pure principle, we acknowledge that economic incidence is the most relevant concept for thinking about the effects of the tax system on people's living standards.[12] However, as we explain in detail in Appendix A, there are significant practical difficulties with implementing EATR estimates based on economic incidence. Given these difficulties, we think that statutory incidence provides a more transparent benchmark, which we complement by testing sensitivity to alternative assumptions about incidence.

(v) Tax reliefs

Tax reliefs are measures that have the effect of reducing an individual's final tax liability after their gross income assessable to tax has been calculated. From the perspective of the tax calculation, there are two main ways in which tax reliefs can operate. First, 'deductions' operate by reducing the amount of income that is charged to tax; these can be thought of as a 'disregard' of some part of the individual's assessable income. By reducing the top slice of income, deductions have the effect of giving tax relief at the taxpayer's marginal rate, so are worth more (in absolute terms) to taxpayers who would otherwise be paying the highest rates. Second, 'reliefs' operate by reducing the individual's final tax liability after the initial charge to tax has been calculated; these can be thought of as a 'credit' against the tax bill.

We attribute tax reliefs using the same approach as for taxes, i.e. based on their statutory incidence. For gift aid relief (gifts to charity) and pension relief (contributions into a pension scheme), 'basic rate' relief equal to 25 per cent of the actual gift or pension contribution is given 'at source', meaning that these sums are transferred from HMRC directly to the charity or pension provider. Following statutory incidence, we do not attribute these benefits to individuals, i.e. this element of the relief is not counted as reducing an individual's EATR. By contrast, the additional tax relief on gifts and pension contributions for 'higher' and 'additional' rate taxpayers, is claimed directly by individuals through their tax return and so we do include this element of the relief in the EATR calculation.

Higher/additional rate relief is available to all those with total income above the higher rate threshold (currently £50,000). Consequently, all of the individuals covered by our results are entitled to tax relief on gifts and pension contributions claimed through their tax return, as well as the basic rate relief provided at source. If gifts and pension contributions as a share of income increase as income increases, then our approach of ignoring basic rate relief (following statutory incidence) will overstate mean EATRs at the highest income levels by more than at lower levels, compared with an approach that would attribute this relief to individuals and so reduce the net tax reported as having been paid.

(vi) Foreign taxes

Broadly there are two possible approaches to the treatment of foreign taxes when calculating EATRs: (i) ignore foreign taxes paid ('UK-only' approach) or (ii) include foreign taxes paid ('worldwide' approach). The UK-only approach is appropriate for assessing each individual's contributions to UK tax revenues, but the worldwide approach is more suitable for assessing an individual's personal 'tax burden' (i.e. the amount of tax they are paying overall). Whichever approach is chosen, the approach should be applied consistently to both the numerator and denominator; i.e. if the numerator excludes (includes) foreign taxes paid, then the income/gains to which that tax relates should also be excluded (included).

For our estimation of EATRs, we adopt the worldwide approach, as far as possible given data limitations. In practice, this means that we include all foreign taxes that an individual has paid, provided that they claimed foreign tax credit relief (FTCR) in the UK. FTCR is available in most cases where the UK has a Double Tax Treaty with the foreign country that deducted the tax. In the relatively few cases where FTCR is not available, the income and gains are reported in the UK net of the foreign tax already paid; consequently, we are unable to account for these taxes in our numerator, although nor do we include this element within the gross income/gains in our denominator. Our calculations of revenue from reform take a UK-only approach.

---

[12] We do not rely on the recent suggestion by Saez and Zucman (2019) that statutory incidence is superior in principle for the purpose of assessing incidence as a snapshot (distinct from assessing effects of reform).

IV. Vertical inequality

Headline average tax rates on earnings increase progressively with income. At £100,000 in total earnings, the headline average rate is 34 per cent; this reaches 40 per cent at £150,000, then 45 per cent at £500,000, and finally reaches 47 per cent for those with total earnings above £3 million. Analysis of the progressivity of the tax system often focuses on these rates because earnings from employment and self-employment make up more than three-quarters of all taxable income; this is true both for the taxpayer population as a whole, and even just among those with incomes above £100,000 (see Figure D6).

However, an individual's effective average tax rate (EATR) will only match these headline rates if all income is received in the form of earnings (charged to income tax at the main rate plus employee NICs), and no tax reliefs are claimed. In fact, many individuals at the top of the distribution receive a substantial proportion of their remuneration as dividends or in the form of capital gains, both of which are taxed at lower rates. Some people also claim substantial tax reliefs, which can reduce their final tax liability further.

Accounting for these features of the tax system, we find that, in practice, EATRs do not rise steadily with income, as the headline rate would suggest. Figure 1(a) compares the headline average tax rate—the statutory rate on earnings—with the mean EATR on income only or on total remuneration (income plus gains).

On income only, in 2018 the mean EATR across the whole taxpayer population peaked at 43 per cent for individuals with total income of £1.3m, and was then broadly flat above this. The difference compared with the headline rate is driven mainly by changes in composition of income, as we explain further below (Figure 6). In particular, as total income increases, a larger share of income tends to come from dividends—which are taxed at the dividend rate of 39.35 per cent—or other investment income—which is taxed at the income tax rate of 45 per cent but attracts no NICs.

In relation to dividends, one might object that our measure does not take account of corporation tax paid on profits prior to distribution. In Appendix B, we show that although accounting for taxes paid at the firm level does increase the overall level of EATRs, it does not significantly affect the trend along the distribution, which is still flat and then declining at the top. This is because, as well as accounting for corporation tax, if departing from statutory incidence then one should also include employer NICs. This has the effect of raising the EATR of those with earnings from employment, which are more prevalent lower in the distribution.

The rich also receive substantial amounts of remuneration in the form of capital gains, which, as noted earlier, are much more lightly taxed than income. More than 90 per cent of all taxable gains go to individuals with total remuneration (income plus capital gains) above £100,000, and individuals in the top 1 per cent of incomes (above £125,000) receive an average of £47,000 in gains in addition to their income (Advani and Summers, 2020).

Taking into account taxable gains as well as income, EATRs peak at 38 per cent at remuneration of £500,000. At this level, effective rates are already almost 7pp below the average rate on earnings of the same amount. The personal tax system is regressive above £500,000: above this point, effective average rates on total remuneration start declining, even as the headline rate continues to rise.

This striking finding is driven mainly by the extremely low (10 per cent) tax rate on gains covered by BAD Relief. The scope of this relief has since been curtailed by the March 2020 budget, which reduced the lifetime cap on this relief from £10 million to £1 million. This reform will raise effective tax rates for those with the largest gains in future, although at 20 per cent, these gains will still be taxed much less than earnings.

One worry with expressing EATRs on total remuneration including capital gains is that gains tend to be 'lumpier' than income. Consequently, although individuals show a low EATR in the year in which they realize gains, this may not be representative of their longer-term position. To partially address this concern, in Figure 1(b) we repeat our analysis but using 5-year averages of the numerator and denominator for each individual to construct the EATR.

When looking at income only, the level of EATRs actually shifts lower when taking a 5-year average, albeit only by around 2pp, with no change in the trend across the distribution. This is largely because—as shown in Figure 3—EATRs were generally lower in the period 2014–16 than in 2018, mainly as a result of the lower dividend rates before 2017. Including these earlier years entails a reduction of EATRs using the 5-year average, which dominates any impact of smoothing income.

On the other hand, smoothing over 5 years does result in a significant change in the distribution of mean EATRs on total remuneration (i.e. including gains) for those with remuneration above £2 million. When looking at a single year, mean EATRs decline by around 7pp between £2 million and £10 million in total remuneration. By contrast, when smoothing over 5 years this trend reverses: EATRs rise by around 4pp between £2 million and £5 million and remain largely flat above that. This is most likely explained by the effect of BAD Relief on gains, which during this period had a lifetime cap of £10 million. Individuals with more than £2 million in average remuneration each year over the 5-year period can have benefited from BAD Relief on only up to £2 million per year. Any remuneration

(a) Average, 2018

(b) Average over 5 years (2014–18)
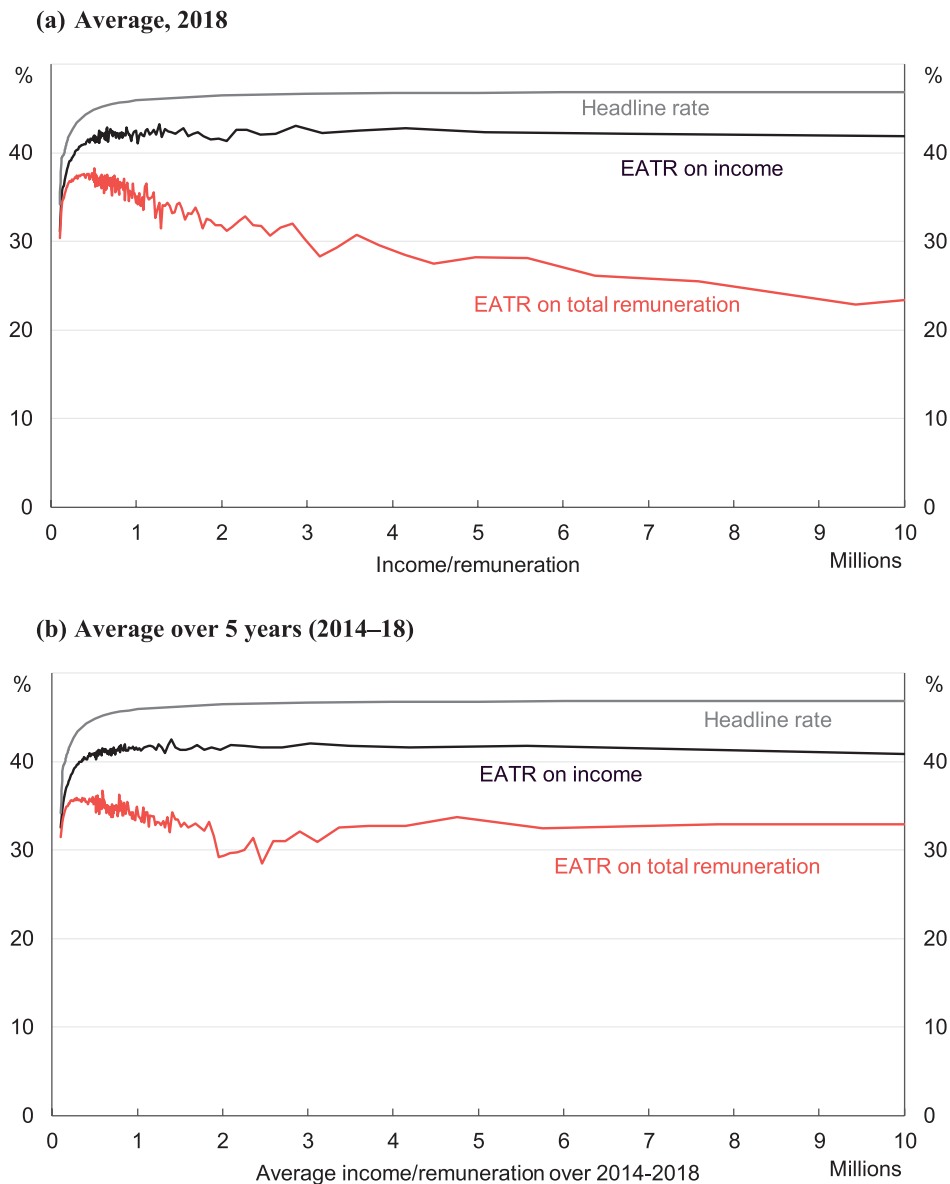
Figure 1: Effective average tax rate (EATR) on income and on total remuneration.

Notes: Constructed using data on income and gains going to individuals with over £100,000 in income or total remuneration (income plus gains), (a) in 2018 or (b) averaged over 5 years from 2014 to 2018 (for years where an individual is present in tax data). 'EATR on income' shows the effective rate on income only. 'EATR on total remuneration' shows the effective rate on income plus gains. 'Headline rate' shows the statutory rate on earnings.

Source: Authors' calculations based on HMRC administrative datasets.

beyond this would have been taxed at a higher rate than the 10 per cent rate associated with BAD relief, driving up their average EATR over the period.

V. Horizontal inequality

(i) Variation in tax rates among the rich

There is substantial variation in EATRs even among individuals with similar levels of total remuneration. This is because an individual's EATR depends on the composition of their remuneration (and how these components are

taxed) and the tax reliefs that they claim. Substantial variation in EATRs is observable for just the income liable to income tax and NICs (Figure 2(a)). While the headline rate of tax approaches 47 per cent for total incomes over £3 million, only around half of all high earners pay an effective rate close to the headline rate; 10 per cent of taxpayers earning in the same region pay an EATR of 37 per cent or less. Similar to the findings of Auerbach and Hassett (2002), the dispersion in EATRs rises with income.

As capital gains attract a lower tax rate than other forms of income, the distribution of EATRs accounting for gains is even more diffuse. One-quarter of those with total remuneration between £3 million and £5 million pay close to the headline average rate for earnings (approaching 47 per cent at that level of income), but another quarter have EATRs less than 13 per cent—equivalent to the headline rate on someone earning £17,500 from

(a) EATR by total income

(b) EATR by total remuneration
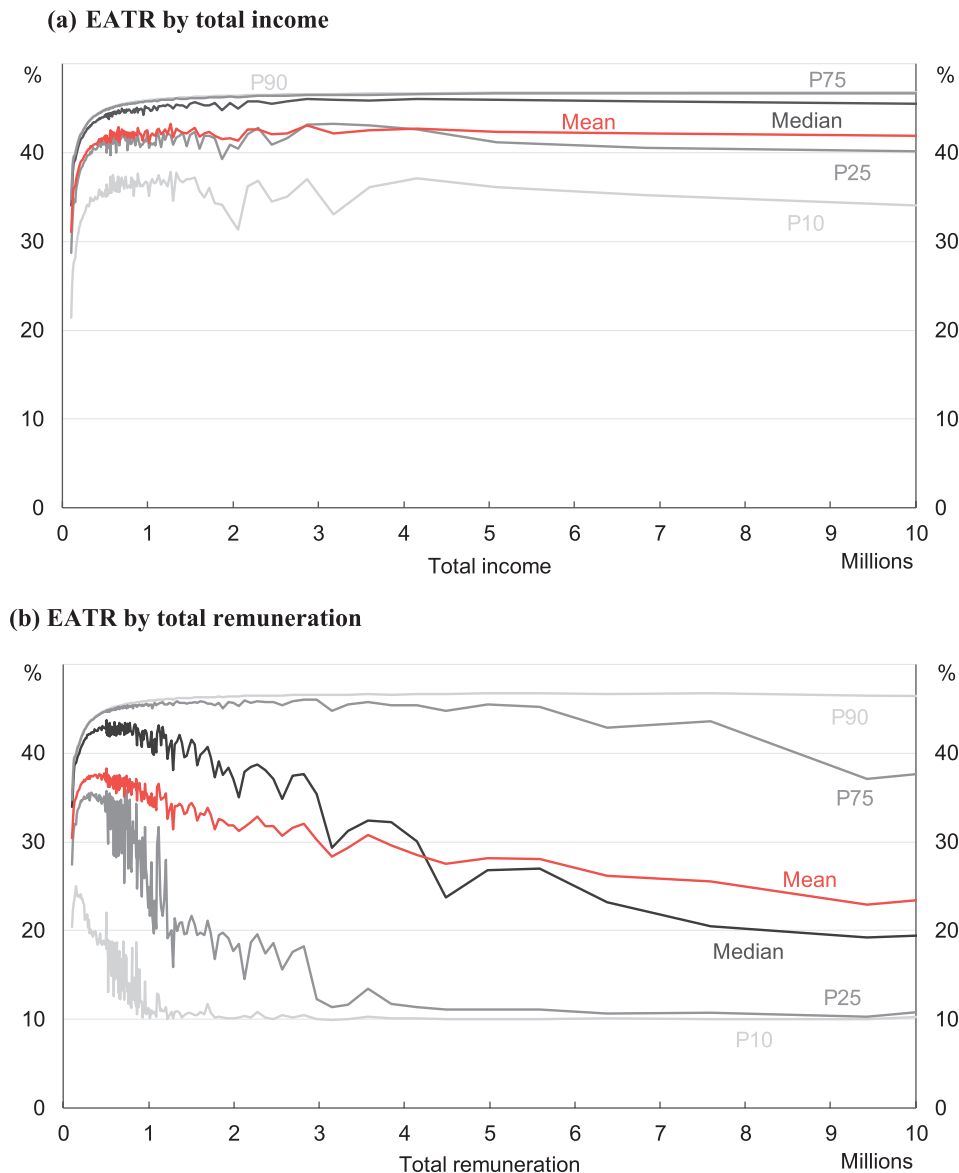
Figure 2: Distribution (mean and percentiles) of EATRs, 2018.

Notes: Constructed using data on income (and, for panel (b), capital gains) going to individuals with over £100,000 in income or total remuneration (income plus gains) in 2018. 'Mean' shows the average (mean) EATR at different levels of income/remuneration. 'Median' shows the median EATR at different levels of income/remuneration, and 'P*XX*' shows the *XX* percentile of EATR at any given level of income/remuneration.

Source: Authors' calculations based on HMRC administrative datasets.

employment (Figure 2(b)). One in ten people with total remuneration over £1 million pay a lower effective average tax rate than someone earning just £15,000 (less than 11 per cent); this proportion rises to one in four of those with total remuneration between £4 million and £10 million.

These exceptionally low rates are driven by gains eligible for BAD Relief taxed at 10 per cent, which has since been capped at £1 million of qualifying gains. However, even if it were abolished entirely, EATRs for this group would at most be the same as someone earning £26,000 (20 per cent), given the low main rate of tax on capital gains (20 per cent) after the tax-free allowance.

(ii) The effects of policy on the distribution of EATRs

Various reforms have taken place over the period since the financial crisis. Overall, the picture is of rising EATRs over the period for most individuals, especially at relatively low levels of remuneration within the top. However, at higher levels of remuneration there is much more variation in how EATRs have changed over time.

The effect of changes in the top (marginal) rate of income tax is clearly visible. For incomes above £150,000, this rate was increased by 10pp from 40 per cent to 50 per cent in 2011, then lowered again by 5pp to 45 per cent in 2014.

For those with total remuneration of around £200,000, the 2011 reform raised EATRs by around 4pp, and this effect was broadly similar across all parts of the distribution of EATRs. This impact is consistent with what one would expect if individuals were fully exposed to the reform, given that only around £50,000 of income would be taxed at this higher rate.

At £500,000, the impact of the 2011 reform is larger on average—as one would expect given that a larger share of income is taxable at this additional rate—but is also more variable: the median individual experienced an increase of 8pp, while one-tenth of individuals faced virtually no change in EATR.

For those with total remuneration of around £2 million, the impact of the increase in the top rate of income tax in 2011 appears distinctly bifurcated: the upper quarter of taxpayers (by EATR) pay almost an additional 10pp following the reform; in other words, the increase in headline rate is almost entirely 'passed on' to their EATRs. However, the lower quarter of taxpayers conversely evidence a decline in their EATR. This is driven by a combination of dividend forestalling—i.e. bringing forward dividend payments to the year prior to the tax increase—and individuals shifting their source of remuneration from income to gains after the reform (Miller *et al*., 2021). These responses both change the EATRs paid by individuals, and the composition of which individuals have remuneration around £2 million after the reform.

Finally, the trend in EATRs over time also shows the impact of the 7.5pp increase in the dividend rate in 2017. This is manifested as a dip in EATRs in 2016, the year prior to the reform, as individuals brought forward dividend payments (which are taxed at a lower rate than other forms of income), followed by an increase in 2017.

VI. What drives low effective tax rates?
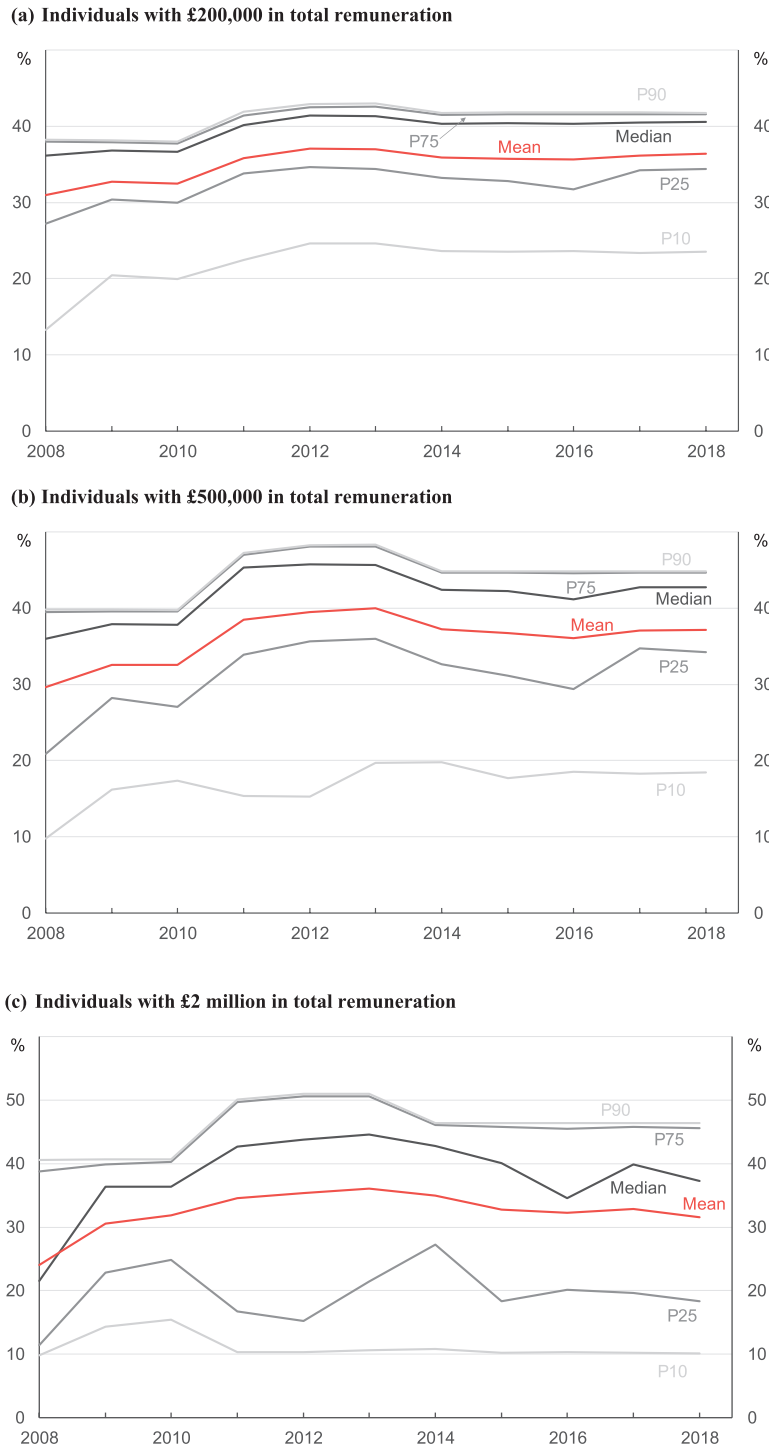
(i) Income composition across the distribution

Ranking individuals by total remuneration, those closer to the top have (on average) a larger share of their income derived from sources which are subject to lower tax rates. This is especially clear for capital gains (see also Advani and Summers, 2020), but also dividends and other investment income, while earnings make up a relatively smaller share of income for this group.

Figure 4(a) shows that individuals within the top decile, but outside the top 1 per cent, benefit very little from these low rates, because they receive between 80 and 90 per cent of their total remuneration in the form of earnings, and almost all of the rest in the form of other (lower taxed) forms of income, rather than gains.

As Figure 4(b) shows, this pattern persists even within most of the top 1 per cent. Only within the top 0.5 per cent does the share of earnings within total remuneration fall below 80 per cent. The most striking difference is for the top 0.1 per cent compared with all those below. Within this group, earnings represent less than half of total remuneration on average, with investment income making up 10 per cent and gains around 40 per cent. Of these gains, around half (20 per cent of total remuneration) were taxed at the lowest rate of 10 per cent. This pattern is partly driven by the lumpy nature of gains, as seen in the comparison of EATRs in Figures 1(a) and 1(b). But a substantial minority regularly receive large gains: Advani and Summers (2020) show that one in six individuals receiving more than £100,000 in 2017 had received at least as much on average over the previous 4 years.

(ii) Income composition by job type

With the exception of pension contributions (see Figure 7 below), employees have relatively little choice about how to structure their remuneration; almost all of the benefits provided by their employer, whatever their legal form, are
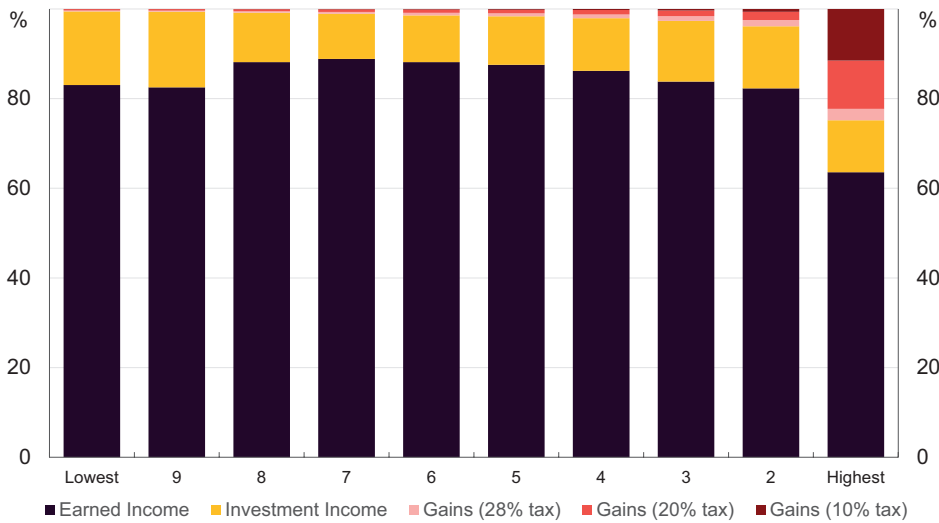
(a) Individuals with £200,000 in total remuneration

(b) Individuals with £500,000 in total remuneration

(c) Individuals with £2 million in total remuneration

Figure 3: Change in EATRs over time, by level of total remuneration.
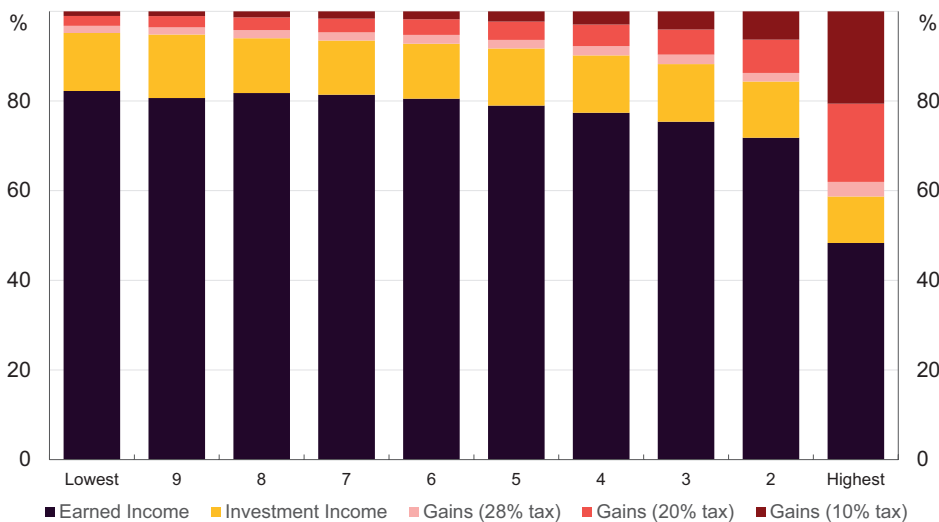
Notes: Constructed using data on income and capital gains going to all individuals with total remuneration (income plus gains) within +/–5 per cent of the stated level, over the period 2008–18. All lines show the EATR on income plus capital gains. 'Mean' shows the average (mean) EATR at different levels of remuneration (income plus gains). 'Median' shows the median EATR at different levels of remuneration, and 'P*XX*' shows the *XX* percentile of EATR at any given level of remuneration.

Source: Authors' calculations based on HMRC administrative datasets.

(a) Within top decile

(b) Within top 1%

Figure 4: Share of total remuneration taxed at different rates, by level of total remuneration, 2018.

Notes: Constructed using data on income and capital gains going to individuals with total remuneration (income plus gains) within the top 10 per cent (1 per cent) of all taxpayers in 2018. Taxpayers are grouped by decile of remuneration within the top 10 per cent (1 per cent). 'Earned income' includes employment, self-employment, and partnership income. 'Investment income' includes income earned on savings, property, and dividend income. Gains taxed at 28 per cent include residential property and carried interest. Gains taxed at 10 per cent are those qualifying for BAD relief. All other gains are taxed at 20 per cent. Shares of income calculated as plutocratic (equal weight per pound received) shares.

Source: Authors' calculations based on HMRC administrative datasets.

taxed as earnings, meaning that they are liable to income tax at the main rate, plus NICs. By contrast, those who perform their work in other ways—particularly as business owners—and those who do not work at all but live off investments, have a lot more flexibility to take their remuneration in forms that are taxed at lower rates.

To investigate how the rich structure their remuneration, we look at all those in the top 1 per cent by total remuneration and identify each individual's largest income source out of the following: employment income; self-employment trading profits; partnership trading profits; income from state and private pensions; and

investment income (e.g. interest, rent, dividends). Where an individual's single largest income-source is dividends and they also report being a director of a closely held company, we reallocate them to a distinct sixth category of business 'owner-manager'.

Figure 5 shows the structure of remuneration for each of these categories. By definition, investors and owner-managers have investment income as their largest single source of remuneration. However, it is striking how little remuneration comes from earned income, taxed at an effective rate up to 47 per cent. Among investors and owner-managers in the top 1 per cent, less than 10 per cent of remuneration comes from earnings. For investors, more than 50 per cent of all remuneration is in the form of capital gains, and 20 per cent is from the most lightly taxed form of gains. For owner-managers and pensioners in the top 1 per cent, gains make up 40 per cent of total remuneration; for owner-managers, more than half of this (24pp) comes from gains taxed at 10 per cent.

It is important to note, as we describe in Advani and Summers (2020), that owner-managers are largely individuals who could otherwise be classed as self-employed but have for tax purposes 'incorporated' (set up a company through which they trade). By doing this they can pay themselves in the form of dividends or gains instead of earnings. Flexibility to engage in this kind of 'repackaging' is more available to individuals in some industries: highly paid bankers cannot easily set up as independent bankers, while highly paid consultants can more easily set up independent consulting firms.

(iii) Use of tax reliefs

There is often a concern—based on a handful of high-profile anecdotes—that tax reliefs can be used strategically by individuals on higher incomes to significantly reduce their effective tax rates (see, for example, Yossman, 2021). Some tax reliefs are structural: for example, income tax relief on pension contributions serves to ensure that pensions are not taxed both on the way 'in' and the way 'out'. However, other reliefs are intended exclusively to achieve incentive effects, such as encouraging investment. Although a list of 'non-structural' reliefs is published by HMRC (2021), including an estimate of their cost (in forgone revenue), the efficacy of such reliefs in achieving their stated objectives is often not measured (NAO, 2020).

We find that, on average, tax reliefs—as we define them below—only make a small contribution to the overall difference between headline and effective rates among those with the highest levels of remuneration. As Figure 6
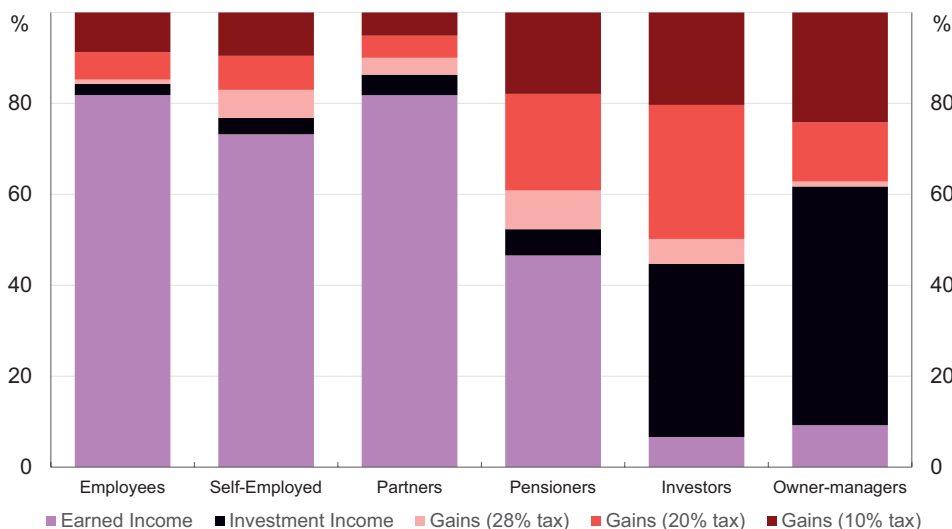
Figure 5: Share of total remuneration taxed at different rates, by main income source, among individuals in the top 1% by total remuneration, 2018.

Notes: Constructed using data on income and capital gains going to individuals with total remuneration (income plus gains) within the top 1 per cent of all taxpayers in 2018. Main source of income is identified from largest income source across employment, self-employment, partnership, pension, and investment income. 'Owner-managers' are individuals whose largest income source is dividends and are also directors of closely held companies, which are defined in UK tax law as firms with five or fewer directors and/or shareholders. Individuals with no reported income but with capital gains are categorized as 'Investors'. Gains taxed at 28 per cent include residential property and carried interest. Gains taxed at 10 per cent are those qualifying for BAD relief. All other gains are taxed at 20 per cent.

Source: Authors' calculations based on HMRC administrative datasets.
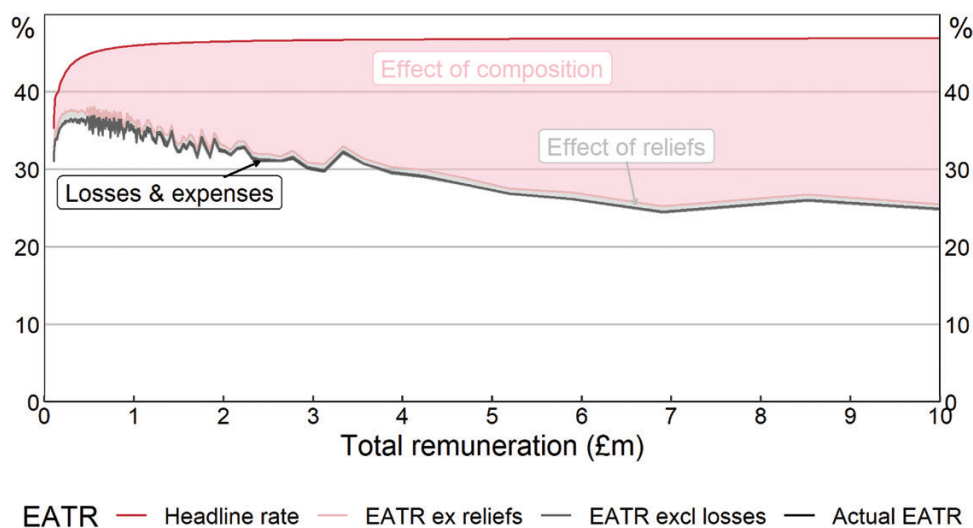
Figure 6: Share of reduction in EATR due to use of tax reliefs vs composition of remuneration, 2016.

Notes: Constructed using data on income and gains going to individuals with over £100,000 in total remuneration (income plus gains), and reliefs and deductions claimed by those individuals. 'Actual EATR' shows the effective average tax rate actually paid; 'EATR excl losses' removes loss-and expense-related reliefs and deductions; 'EATR ex reliefs' estimates the effective average tax rate that would be paid in the absence of reliefs and deductions, but with income composition remaining the same. 'Headline rate' shows the headline (statutory) rate on earnings.

Source: Authors' calculations based on HMRC administrative datasets.

shows, among individuals with total remuneration above £1 million, reliefs account on average for only around 5–15 per cent of the total difference, and this share is broadly stable across this part of the distribution of income. Shown as a share of total remuneration, the value of reliefs declines (on average) from 1.5 per cent among those with remuneration just over £100,000, to 0.5 per cent among those with remuneration of £10m (Figure 7). Overall, the variation in composition of remuneration, described above, is a much more important driver of low EATRs than the impact of tax reliefs. However, it is important to note that this finding partly depends on the fact that BAD relief is legally classified as a reduction in statutory rate rather than either a deduction or relief.

To investigate which types of tax relief are most important in reducing EATRs, we divide all of the tax reliefs that are available against income tax into one of five categories: (i) losses and expenses; (ii) pension contributions; (iii) charitable donations; (iv) investment incentives; and (v) other reliefs. For this purpose, we include not only measures that are nominally classified as a 'relief'—which provide a credit against the individual's initially calculated tax liability—but also those which allow a deduction from gross income when calculating taxable income.[13] We also include pension and charitable ('gift aid') relief for higher and additional rate income tax payers, which operates by extending the amount of income that is taxed at the lower ('basic') rate.[14]

Figure 7 shows that while pension contributions are an important source of tax relief for the 'moderately' rich, they make up only a tiny proportion of the value of all reliefs among those with income exceeding £500,000. Charitable donations and investment incentives are the two largest types of relief used by those with the highest remuneration. Contrary to popular perception, the use of investment reliefs (on average) does not rise as a proportion of remuneration among the very richest, instead remaining fairly stable among all those with remuneration over £100,000. Of course, this still implies that the very richest make the greatest use of investment reliefs in absolute terms. Losses and expenses present a particular challenge for measurement, but do not account for a substantial part of lowering of observed EATRs.[15]

---

[13] Both types of measure have the effect of reducing the final tax liability; the difference is that whereas deductions effectively provide tax relief at the individual's marginal rate, tax reliefs (properly called) instead provide a lump sum credit.

[14] For further details on how we account for this type of relief, see section III(v) above.

[15] In particular, to the extent that the losses or expenses incurred represent 'genuine' costs to the individual in the year of assessment, they ought in principle to be deducted from the denominator measure of income even if they are not recognized as reducing gross income (and so only allowed as a subsequent deduction for taxable income) by the tax system. We currently display them separately, to understand the extent to which they may be used strategically to reduce EATRs.
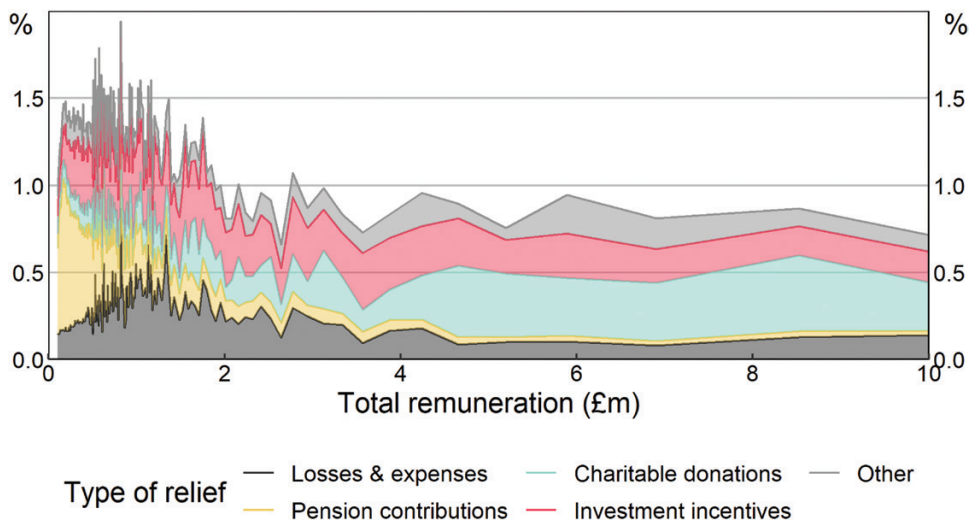
Figure 7: Value of tax reliefs as a share of total remuneration, by remuneration level, decomposed by type of relief claimed, 2016.

Notes: Constructed using data on income and capital gains going to individuals with over £100,000 in remuneration (income plus gains), and reliefs and deductions claimed by those individuals.

Source: Authors' calculations based on HMRC administrative datasets.
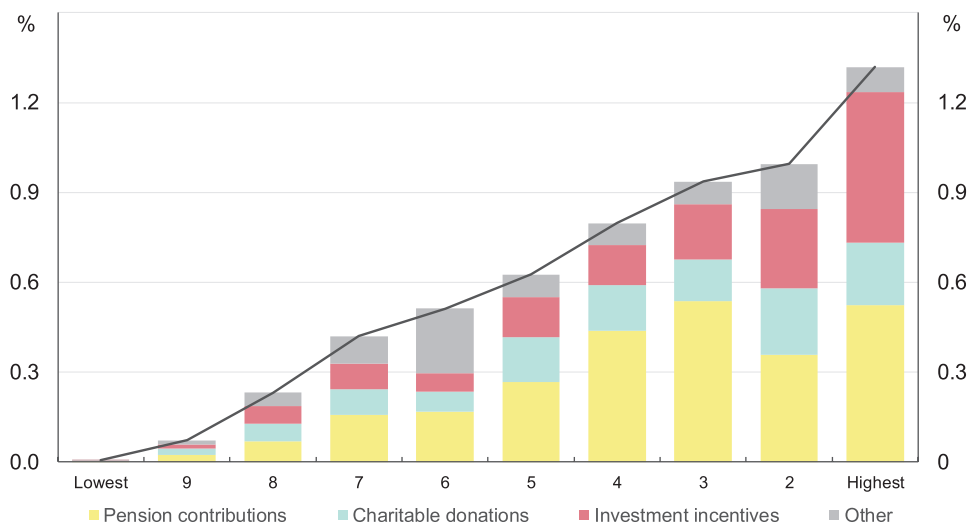
Figure 8: Value of tax reliefs as a share of total remuneration, by deciles of tax reliefs as a share of total remuneration, decomposed by type of relief claimed, 2016.

Notes: Constructed using data on income going to individuals with over £100,000 in income, and reliefs and deductions claimed by those individuals (excluding any related to losses and expenses). Black line shows total reliefs claimed, as a share of the total difference in EATR between headline rate and rate paid. Taxpayers are grouped by decile according to how much of the total difference between their actual EATR and the headline rate for their level of income is due to their use of reliefs and deductions.

Source: Authors' calculations based on HMRC administrative datasets.

Figure 8 shows instead the relative importance of these different types of relief across deciles defined by the share of the difference between headline and effective rates that is attributable to the use of deductions and reliefs. Across all deciles, reliefs associated with pension contributions are most valuable, costing around £1 billion in tax forgone per year. The contrast with Figure 7 comes from the large mass of taxpayers with remuneration between £100,000 and £500,000, who dominate the effect of the relatively small number of very high-income taxpayers for whom charitable reliefs are more important.
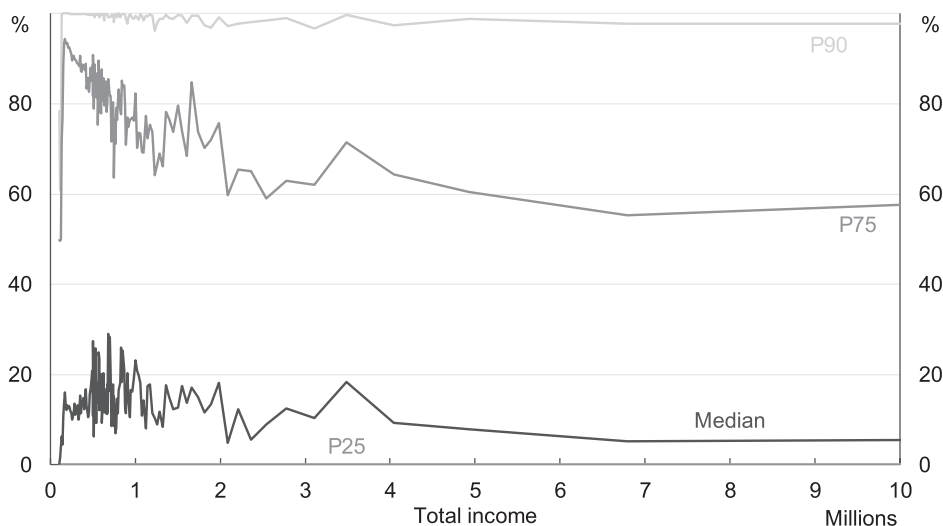
Figure 9: Share of reduction in EATR due to use of tax reliefs, by income level, 2016.

Notes: Constructed using data on income going to individuals with over £100,000 in income, and reliefs and deductions claimed by those individuals. 'Median' shows the median EATR at different levels of income, and 'P*XX*' shows the *XX* percentile of EATR at any given level of income. P25 is close to zero.

Source: Authors' calculations based on HMRC administrative datasets.

Although pensions relief is the largest component across all deciles of relief intensity, the contribution of investment incentives rises rapidly in the top deciles. At the very top it is almost as large as pensions relief.

While, in aggregate, reliefs explain only a small share of the gap between headline and effective average tax rates, for some individuals they are very substantial. Figure 9 shows percentiles of the share of the difference between headline and effective rates that is attributable to the use of deductions and reliefs, across the distribution of income. Across the entire income distribution, fully one-quarter of high-earning individuals do not claim any reliefs or deductions. For half, the reliefs claimed make up only a small share of the gap between the headline rate and the effective rates they pay. At the same time, for 10–25 per cent of individuals (depending on income level) these reliefs make up the vast majority of the reduction in the tax they pay. Adjustments to statutory rates would therefore close most of the gap between headline and effective rates for only around half of high earners, even assuming no behavioural response.

VII. Policy implications

Our findings have important implications for how we might raise more revenue from the rich. Making precise revenue estimates is difficult because these depend on exactly how the reform is implemented and the extent of behavioural responses. However, we can estimate approximately how much revenue is at stake from the current policy choices to tax some forms of remuneration at lower rates and to retain and not to cap certain tax reliefs. These estimates provide an upper bound on the additional tax that could be raised.

(i) Equalizing tax rates on different forms of income

Under the current tax system, an individual's effective tax rate depends not only on how much remuneration they receive in total, but also—to a significant degree—where it comes from. These differences in the tax treatment across different forms of income are not justified from an economic perspective (Mirrlees *et al*., 2011). They can lead to large inefficiencies as a result of individuals 'repackaging' the legal structure of their working arrangements in favour of receiving dividends and capital gains rather than earnings from employment or self-employment. The incentive to seek investment returns in the form of capital gains rather than (taxable) income results in similar distortions (Miller *et al*., 2021).

As we show in Figures 5 and 6, these disparities tend to strongly favour those at the top, and disfavour all those—regardless of income level—who are compelled as a result of their job type to receive their pay as an employee. As well as being economically inefficient, this tax preference for the rich and for business owners strikes many as unfair.

The largest discrepancy is between the tax rates on capital gains compared with earnings from employment. There is widespread public support for taxing gains at the same rate as earnings (Tax Justice UK, 2020). Such a move is not without precedent in the UK: this reform would mark a return to the approach implemented by Nigel Lawson as Conservative Chancellor in 1988, who aligned the rates of income tax and capital gains tax subject to an indexation allowance (based on RPI) for gains.

We estimate that taxing capital gains at the same rate as income from employment would raise £16 billion. These figures are based on analysis of tax data from 2018; however, they include a specific adjustment (by £1.2 billion) to account for the subsequent reduction in the lifetime allowance for BAD relief, which has already shifted £12 billion in gains from a tax rate of 10 per cent to 20 per cent.[16] Nevertheless, there are two further caveats that mean our estimate should be treated as an upper bound on the revenue that could be generated.

First, alongside the equalization of rates, we would recommend the introduction of an allowance (i.e. a deduction from the tax base) for capital gains, set by reference to either inflation or the 'normal rate of return' (NRR).[17] In combination, these would result in a major tax increase for those who are currently converting remuneration for work into the form of capital gains, because the allowance would be of little value where the base cost of the 'investment' is low. By contrast, for those making genuine capital investments, the allowance would offset—partially or fully—the increase in tax rate. Indeed, where the nominal returns were less than the rate of inflation or NRR, there would be no tax to pay under the new system.[18]

Second, this estimate does not take account of behavioural responses. Some kinds of avoidance would be made more difficult by the equalization of rates across all sources of remuneration. However, if taxpayers were pre-warned of the reform, they might bring forward realizations; or if they did not believe that the reform would be permanent, they might defer them. There would be an increased incentive to defer realizations until death, unless forgiveness on death was also removed, so removing this anomaly would be an essential element of reform. The impact on investment and other real behaviours is more difficult to predict.

A further reform that we would recommend is to equalize effective tax rates across all forms of taxable income. In simple terms, this would involve aligning the rates on trading profits (from self-employment and partnerships), dividends, interest, rent, and other forms of investment income, with the current combined rate of income tax and NICs that applies to earnings from employment. This would imply a uniform top rate of 47 per cent if excluding employer NICs, or over 60 per cent if these were included. If these rates sound high, it is worth bearing in mind that these are the taxes already paid by approximately a quarter of top earners who receive all of their remuneration from employment (Figure 2). Alternatively, it would be possible to implement a revenue neutral reform that aligned rates at a lower level.

We estimate that if everyone with total remuneration over £100,000 paid the headline tax rate that currently applies to earnings from employment (i.e. 47 per cent) across all forms of taxable income, this would raise up to £23 billion in addition to the revenue from equalizing capital gains tax rates. This equates to a 27 per cent increase in the total tax take from this group.

However, some caution is required since this figure is again a static estimate, not accounting for behavioural responses. It is also based on the crude alignment of the statutory rates incident on individuals, whereas ideally the reform should seek to align *effective* rates also taking account of employer NICs on employment income, and corporation tax on the profits from which dividends are paid. In principle, setting the appropriate rates for alignment should depend on evidence of the economic incidence of each of these taxes, but as we explain in Appendix A, relevant evidence on this is currently lacking and may be difficult to obtain.

(ii) Reforming reliefs and exemptions

There is a widespread perception by the public—fuelled by high-profile anecdotes—that the rich are able to use complex tax reliefs and other 'loopholes' to reduce their effective tax rates in ways that those on ordinary

---

[16] Treasury estimates at the time of the reform estimated the additional tax revenue to increase from £0.2 billion to £1.8 billion over 2021–5 (HM Treasury, 2020).
[17] See Advani (2021) for a longer discussion.
[18] At time of writing, we do not have the detailed data required to model the impact of such allowances on our headline revenue estimate. An estimate using aggregate capital gains statistics suggested that up to half of taxable gains would be covered by such allowances, although these are acknowledged to be likely overestimates (Nanda and Parkes, 2019).

incomes cannot. The Office for Budget Responsibility (2019), NAO (2020), and Public Accounts Committee (2020) have also all recently expressed concerns about inadequate evaluation of 'tax expenditures', meaning reliefs and other exemptions that are intended to incentivize desirable behaviours (for example, investments in early stage businesses). Despite the steps taken by HMRC and others to respond to these reports, there remains a lack of evidence on the economic benefits of many tax expenditures in relation to their costs in forgone revenue.

As we show in section VI, by far the main driver of low effective average tax rates (according to our measure) is the variation in statutory rates on different forms of income, rather than the claiming of tax reliefs against an individual's final tax bill. This might lead one to conclude that public perception is wrong, and that tax expenditures are less of a problem at the top than is commonly supposed. However, we caution against this conclusion for two main reasons.

First, our analysis excludes the impact of tax *exemptions*—i.e. measures that have the effect of excluding certain forms of income or gains from the tax base altogether. This is because, as we explain in section III, the denominator that we use in our EATR calculation is necessarily limited to reported taxable income and gains. The distinction between exemptions on one hand, and tax reliefs and deductions—which we are able to incorporate in our analysis—on the other hand, is mostly a function of administrative convenience. Consequently, our analysis of deductions and reliefs should be interpreted as a lower bound on the importance of these types of measure for vertical and horizontal equity.

Second, even looking solely at tax reliefs and deductions (i.e. ignoring exemptions), our analysis shows that these are significant in reducing EATRs for some individuals, even though in aggregate they play a relatively minor role within the tax system compared with disparities between statutory rates. Figure 9 shows that for around 10–25 per cent of individuals (depending on income level), these measures make up the vast majority of the reduction in the tax that they pay compared with the headline rate on earnings from employment. This implies that some reform to reliefs would be needed to achieve perfect uniformity in the effective tax rates paid by individuals at equivalent levels of total remuneration.

Whether such uniformity is a desirable objective depends on whether the differences in EATRs that currently result from reliefs are justified. Some of the reliefs that we include in our analysis are 'structural' aspects of the tax system. For example, the tax relief that is given on pension contributions reflects the fact that pensions are taxed when they are withdrawn; although there is scope to improve this approach (Adam *et al.*, 2023), we clearly would not want to remove relief for pension contributions altogether. By contrast, some of the reliefs that we include are tax expenditures, for example on certain forms of investment. Here, the relevant question is whether the horizontal and vertical inequities that result from their use are justified by the economic benefits (if any) that they generate.

Aside from abolishing specific reliefs altogether, another option would be to cap or otherwise limit their availability. This is the approach already taken to investment reliefs, although there is room for debate about the level of existing caps. Additionally, in 2013, the Coalition government introduced a new cap of £50,000 or 25 per cent of 'adjusted total income' (whichever is greater) that applies across a range of reliefs (HMRC, 2022*b*), mainly targeted at deductions for losses on trading, property, and other investments, which could otherwise be set against other forms of income.

A more wide-ranging approach, already adopted in the US, would be the introduction of an 'alternative minimum tax' (AMT). This new tax would effectively set a floor on the effective tax rate that can be achieved by combining multiple reliefs as well as lower taxed forms of income. We estimate that if the UK introduced an AMT on total taxable remuneration above £100,000 at a rate of 30 per cent (35 per cent), this could raise around £10 billion (£14 billion). Such an approach would have the merit of directly addressing public concern with the exceptionally low effective tax rates achieved by some individuals, but at the cost of additional complexity resulting from having a second parallel tax calculation and associated difficulties in defining exactly what this should cover.

Appendix A: Further discussion on incidence

(i) Economic incidence is challenging to estimate

While economic incidence is the appropriate concept to use in principle, its estimation in practice gives rise to several difficulties. Many of these are already well-documented (for a general discussion see Fullerton and Metcalf (2002)). We outline two standard difficulties below, adding a third regarding data challenges when relying on

economic incidence to estimate EATRs. Our overarching point is that the economic incidence of a tax cannot be expressed as a single parameter appropriate for estimating EATRs; any such estimates inevitably rely on numerous simplifying assumptions, and those assumptions often lack transparency.

Empirical uncertainty

Estimating economic incidence involves assigning the cost of a tax to different groups by estimating the amount by which those groups would be worse/better off if the tax was increased/decreased. For example, to assess the economic incidence of corporation tax on shareholders, we need to know by how much the net dividends that shareholders receive would decrease if this tax was increased. Economic incidence requires a causal estimate of effects of changes in the tax rate—e.g. the extent to which firms would raise prices, reduce wages or employment, or reduce dividend payments, in response to an increase in corporation tax.

These causal estimates are subject to significant empirical challenges. Credible estimates require a quasi-experimental setting, but such settings are rarely available. This explains why very few studies have so far been conducted in the UK.[19] There is one recent study of the economic incidence of NICs (Adam *et al.*, 2019) and another of corporation tax (Arulampalam *et al.*, 2012). While these studies provide useful evidence on economic incidence, they also acknowledge substantial uncertainty.

National insurance contributions (NICs) on employees comprise an employer and an employee component. Although in practice both of these are remitted by employers, it cannot be assumed that they necessarily have the same economic incidence any more than it can be assumed that they both have the same incidence as income tax, which is also remitted by employers. The incidence of each tax will ultimately depend on the wage bargaining dynamic between the employee and employer. There are many factors affecting this dynamic, including tax salience (a function of both how visible the tax is to both parties as well as who remits) and perceptions about the fairness of the tax that may affect their willingness to pay (for example, the misperception that NICs fund their state pension and healthcare). Given the lack of clear evidence on economic incidence, we maintain our 'bright line' rule of using statutory incidence as our main specification. In Appendix B we show how our empirical results are affected by changing these incidence assumptions.

Heterogeneity

There is likely to be significant heterogeneity in economic incidence between individuals. For example, the incidence of corporation tax is very likely to be different for shareholders of large publicly listed firms compared with sole owner-managed businesses (such as personal services companies); it is also likely to vary by industry, and within industry depending on characteristics such as the market power of the firm. For example, there is evidence that under some specific conditions, employers may even share the economic incidence of income tax, which is conventionally assumed to fall entirely on employees (Kleven *et al.*, 2014).

This heterogeneity is particularly problematic if estimates of economic incidence are being used to assess how EATRs vary by income or total remuneration. It is plausible that systematic differences in behavioural responses (and hence economic incidence) between individuals are correlated with income. Accordingly, we doubt whether economic incidence can satisfactorily be expressed as a single parameter for the purpose of assessing EATRs. However, it is not straightforward to estimate multiple parameters that account for variation in economic incidence by income or remuneration, as would be required to overcome this problem. Any such estimates would also be estimated with even larger uncertainty than existing single-parameter studies.

Data challenges

Departing from statutory incidence in favour of economic incidence raises additional data challenges. As already noted, statutory incidence tracks the legal structure of the tax system and hence also administrative boundaries. By contrast, tax data are not collected or linked in ways that readily facilitate analyses based on economic incidence. In particular, in the UK, data on all taxes levied at the personal level (income tax, capital gains tax, NICs) can be linked relatively straightforwardly, whereas it is not currently possible comprehensively to link individual personal tax records to data on taxes paid at the corporate level.

This lack of data availability poses a major challenge for allocating corporation tax to individuals. Even if we supposed (implausibly) that 100 per cent of the economic incidence of corporation tax were on shareholders, we would still need to be able to determine the amount of corporation tax actually paid by each firm and then attribute these taxes to the firm's shareholders in proportion to their shareholdings. In the absence of linked personal

---

[19] There are additionally studies of the economic incidence of payroll taxes and corporate taxes in other countries, but these raise issues of external validity, particularly where other aspects of the tax system or economic setting are materially different from the UK.

and corporate level tax microdata, it would be necessary to rely on broad assumptions about the taxes paid at corporate level.

There are several reasons why these assumptions may be wrong. For dividends paid by UK companies, a natural starting point may be to assume a tax rate at corporate level equal to the UK corporation tax headline rate (currently 19 per cent). However, this approach suffers from precisely the problem that we identify in this paper—i.e. that effective rates can often be much lower than headline rates. Bilicka (2019) finds evidence that reported taxable profits are often significantly lower than accounting profits. Moreover, before 2015, the UK had a different corporation tax rate for firms with small profits, which was set lower than the main rate.

For dividends paid by foreign companies, there is no information on the amount of tax (if any) already paid at the corporate level, prior to distribution of dividends to UK residents. For example, we know that some foreign firms (e.g. Apple and Google) pay almost no corporate tax. It would therefore clearly be a mistake to assume that dividends paid by these firms to UK residents were net of 19 per cent tax already paid at the corporate level. However, since dividend income (whether UK or foreign) is not itemized company-by-company on tax returns, it is difficult to know what adjustment to make for this, even at an aggregate (let alone individual) level.

(ii) Statutory incidence is consistent with current inequality statistics

The main inequality statistics currently published for the UK are all based on statutory incidence.[20] For example, in both the Office for National Statistics and World Inequality Database income series, pre-tax income is measured as the earnings received after employer NICs but before employee NICs have been deducted; dividend income is measured as the amount distributed after corporation tax has been paid. Post-tax income is measured after all personal direct taxes have been deducted. We think that it is useful to maintain consistency with this approach when calculating EATRs, because an EATR is simply an alternate way of expressing the relationship between an individual's pre- and post-tax income.

(iii) Statutory incidence is transparent

Statutory incidence has the significant merit of being transparent and easily understood. It relies on far fewer assumptions than economic incidence and is not subject to any empirical uncertainty. EATRs calculated on the basis of statutory incidence can be interpreted using a single reference point (the tax legislation) that can be applied relatively straightforwardly. We accept that economic incidence is the preferable concept in principle; however, attempts to apply it in practice come at the significant price that it is often very difficult for readers to assess transparently how much the results depend on each of the various issues outlined above.

We therefore base our main analysis on statutory incidence but supplement this by documenting the sensitivity of our resulting EATR estimates to alternative assumptions about incidence (see Appendix B). Looking at each tax in isolation, statutory incidence typically provides a bound on economic incidence, since it assigns 100 per cent of the incidence of a tax to one particular group (e.g. employers) rather than contemplating that the incidence may be split between multiple groups. We therefore document how EATRs would differ if the opposite extreme assumption were taken: for example, if 100 per cent of corporation tax and employer NICs were assigned to individual shareholders/employees.

Appendix B: Robustness to incidence assumptions

Our main analysis in this report assumes statutory incidence when estimating individuals' effective average tax rates and comparing these with headline rates. In Appendix A, we set out several practical reasons why we think this is the most transparent and appropriate benchmark for estimating EATRs, while acknowledging that economic incidence is in principle the preferred concept for understanding the impact of the tax system on living standards. Here we test the robustness of our findings to some alternative (extreme) assumptions about incidence.

Using the same administrative data, we re-estimate EATRs based on the assumptions that:

(i) corporation tax is 100 per cent incident on individuals who receive dividends (shareholders). We gross up dividend income to account for the UK corporation tax assumed to have been paid at firm level (19 per cent of taxable profits) and add this tax to the total tax paid at personal level;

(ii) employer NICs (Class 1 secondary NICs) are 100 per cent incident on employees. Again, we gross up earnings from employment to account for the employer NICs (13.8 per cent of taxable income) and add this tax to the total tax paid at personal level.

---

[20] Office for National Statistics, *Effects of Taxes and Benefits on UK Household Income*; World Inequality Database, fiscal income series.

Figure B1 shows that when we assign both corporation tax and employer NICs to individual shareholders/employees, this results in a level shift upwards of EATRs by about 5pp. The overall trend is very similar, although (as Figure B2 shows in more detail), adding both corporation tax and employer NICs raises EATRs by around 1pp more for those on incomes just over £100,000, compared with those on higher incomes.

Figure B2 shows separately the percentage point impact on EATRs of adding corporation tax and employer NICs separately (as well as both together). Corporation tax has a larger impact on mean EATRs at higher incomes, but employer NICs is more important overall.
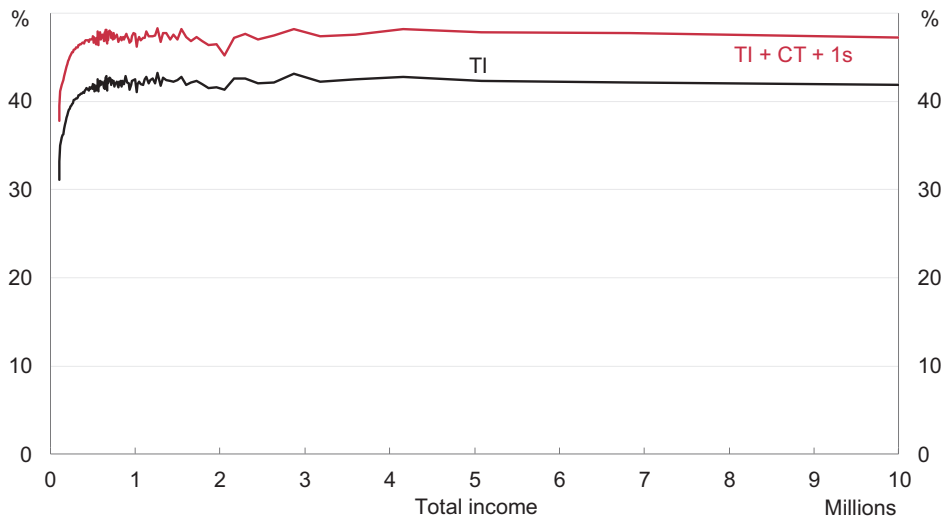
Figure B1: Effective average tax rates on income among those receiving more than £100,000 in income under different assumptions about incidence, 2018

Notes: Constructed using data on all reported taxable income going to individuals in 2018. 'TI' shows the EATR assuming statutory incidence on income only. 'TI+CT+1s' shows the EATR on income adding in corporation tax and employer (i.e. Class 1 secondary) NICs. Individuals are grouped and mapped to the X axis according to their total income following statutory incidence.

Source: Authors' calculations based on HMRC administrative datasets.
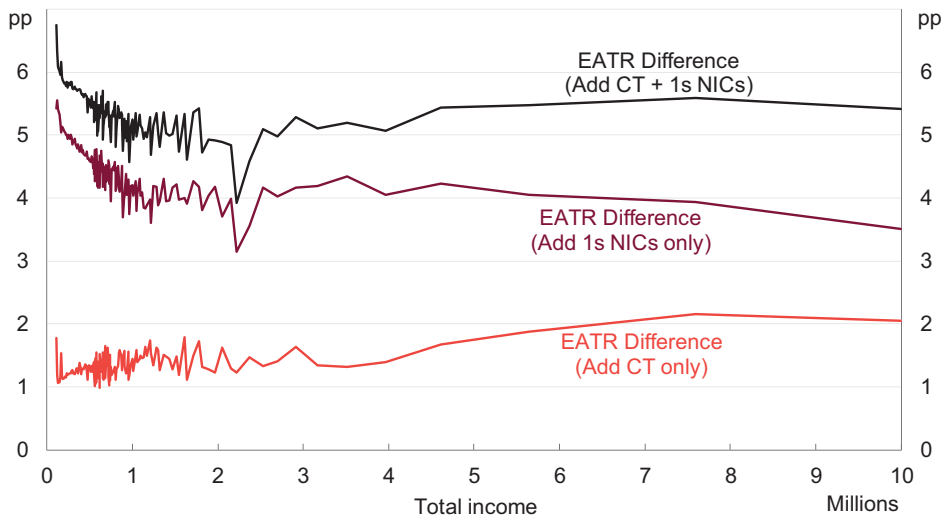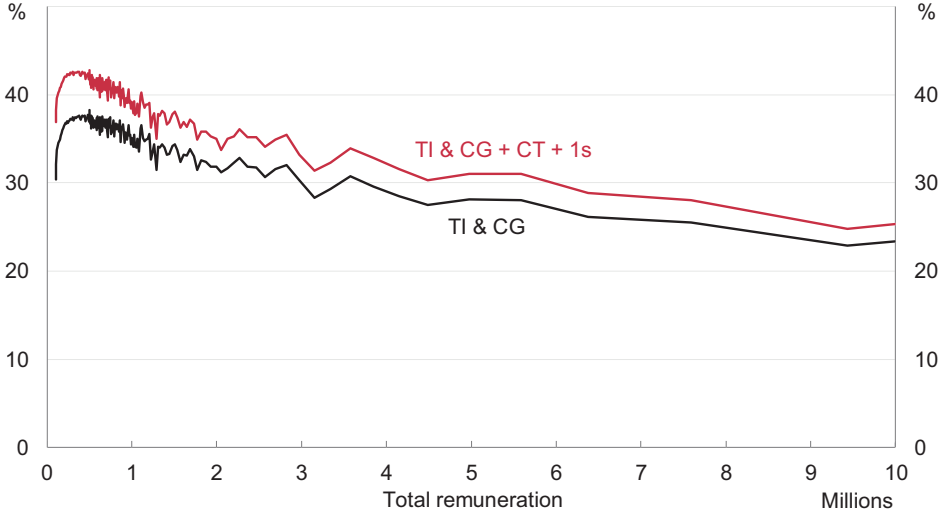

Figure B2: Impact on EATR of including corporation tax and/or employer NICs among those receiving more than £100,000 in income, 2018

Notes: Constructed using data on all reported taxable income going to individuals in 2018. Individuals are grouped and mapped to the X axis according to their total income following statutory incidence. Lines show effects of adding only employer (i.e. Class 1 secondary) NICs, only corporation tax, or both on EATRs. The combined effect is not obtained by summing the separate effects because the denominator changes.

Source: Authors' calculations based on HMRC administrative datasets.

The effect of assigning both corporation tax and employer NICs to individuals is even smaller when shown in context of capital gains. Figure B3 shows that EATRs shift up by around 2–4pp, if anything by more for lower levels of total remuneration than for higher.

Figure B4 shows again that employer NICs has the most important impact, with the larger impact at relatively lower levels of remuneration. This reflects the fact that capital gains, which are not liable for national insurance contributions, play a larger part in the mix of remuneration further up the distribution.

Figure B3: Effective average tax rates on remuneration among those receiving more than £100k in remuneration under different assumptions about incidence, 2018

Notes: Constructed using data on all reported taxable income and capital gains going to individuals in 2018. 'TI & CG' shows the EATR assuming statutory incidence on income and capital gains. 'TI & CG+CT+1s' shows the EATR on income adding in corporation tax and employer (i.e. Class 1 secondary) NICs. Individuals are grouped and mapped to the X axis according to their total income and capital gains following statutory incidence.

Source: Authors' calculations based on HMRC administrative datasets.
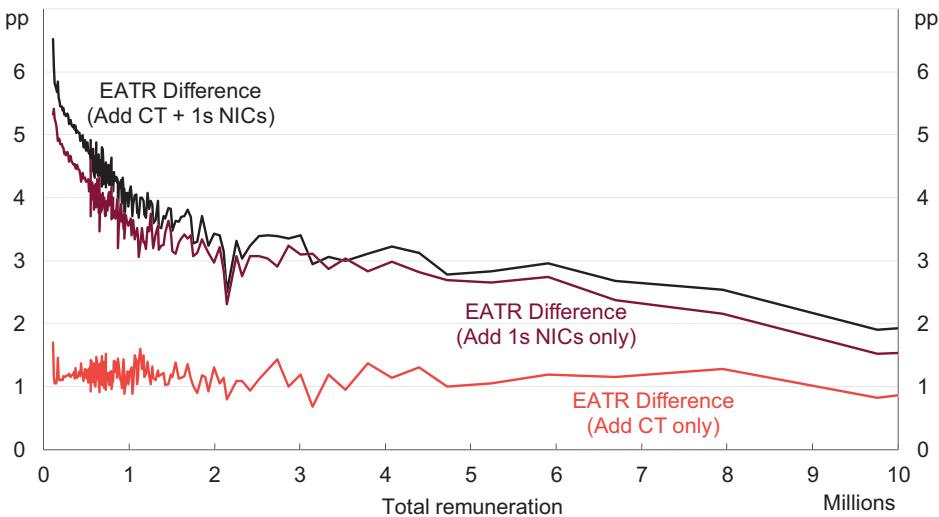
Figure B4: Impact on EATR of including corporation tax and/or employer NICs among those receiving more than £100,000 in remuneration, 2018
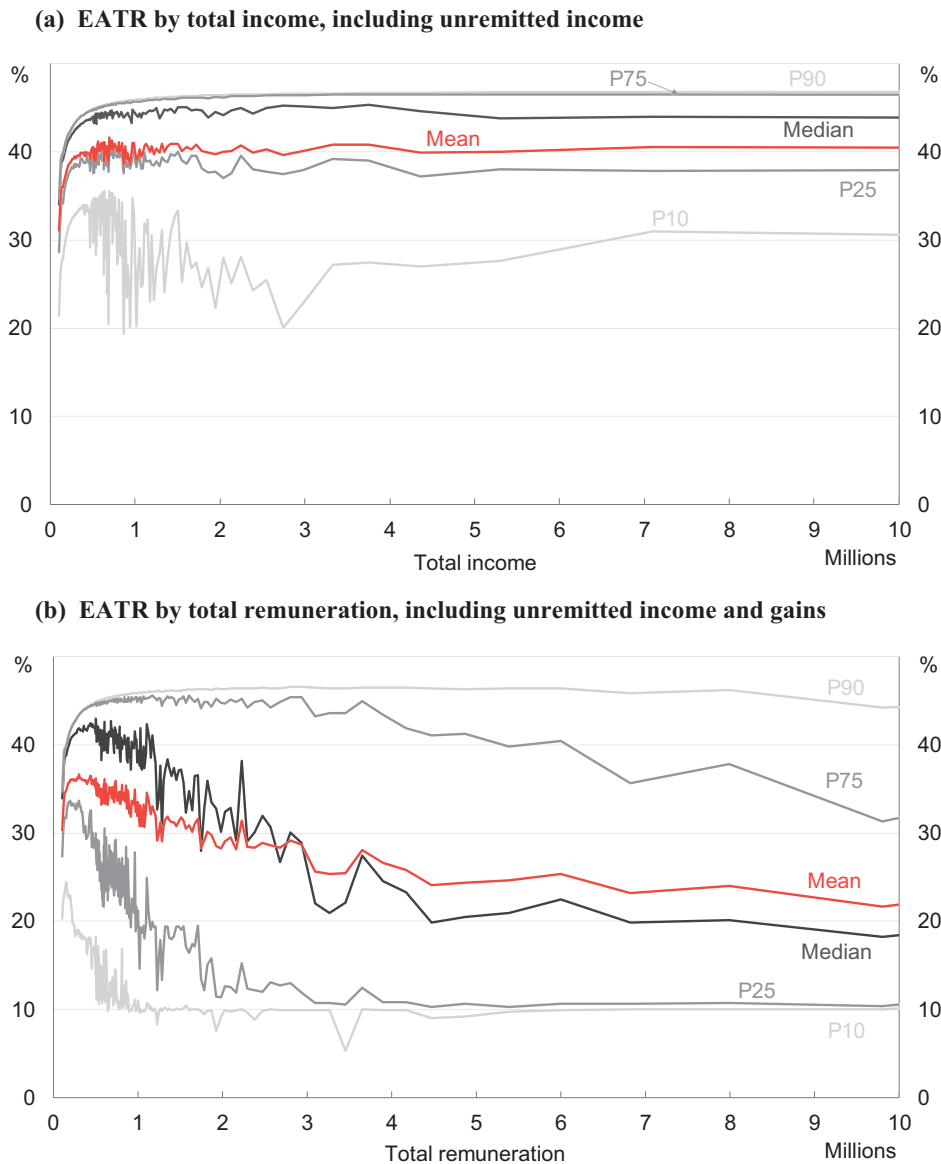
Notes: Constructed using data on all reported taxable income and capital gains going to individuals in 2018. Individuals are grouped and mapped to the X axis according to their total remuneration following statutory incidence. Lines show effects of adding only employer (i.e. Class 1 secondary) NICs, only corporation tax, or both on EATRs. The combined effect is not obtained by summing the separate effects because the denominator changes.

Source: Authors' calculations based on HMRC administrative datasets.

Appendix C: Results including estimated unremitted income and gains

In this Appendix we consider the effect on estimated EATRs of including the unremitted foreign income and gains of individuals who are tax resident in the UK, but who claim that their domicile (permanent home) is elsewhere, known as 'non-doms'. Non-doms who claim the remittance basis for taxation are not required to report or pay tax on returns—either income or gains—from non-UK wealth. Non-domicile status is not available to all taxpayers but varies with individual background and situations; thus while (unremitted) foreign income and gains are taxable for some individuals who are tax resident in the UK they are not for others. For more information on the non-dom regime, see Advani *et al*. (2022*a*).

(a) EATR by total income, including unremitted income

(b) EATR by total remuneration, including unremitted income and gains

Figure C1: Distribution (mean and percentiles) of EATRs, 2018.

Notes: Constructed using data on income (and, for panel (b), capital gains) going to individuals with over £100,000 in total remuneration (income plus gains) in 2018, including imputed unremitted income and gains for individuals claiming the remittance basis. 'Mean' shows the average (mean) EATR at different levels of income/remuneration. 'Median' shows the median EATR at different levels of income/remuneration, and 'P*XX*' shows the *XX* percentile of EATR at any given level of income/remuneration.

Source: Authors' calculations based on HMRC administrative datasets and imputed unremitted income and gains from Advani *et al*. (2022*a*).

Non-doms are not required to report their foreign returns to HMRC. However, Advani *et al*. (2022*a*) show that it is possible to estimate these returns using a combination of willingness to pay an alternative flat tax and comparison to individuals who would also be willing to pay the flat tax if they were non-doms. Including this foreign income (and gains) increases the denominator of EATRs (total income/remuneration) while not affecting the numerator (as these returns are not taxable in the UK or elsewhere). This has two effects: it reduces the effective average tax rate paid by individuals with access to non-dom status and shifts these individuals further up the distribution of income and of remuneration.

Compared with respective panels of Figure 2, Figure C1 shows that EATRs are much lower for both income and total remuneration. Looking first at income, we see that the mean EATR averages around 40 per cent for those with incomes over £1 million, compared with 42 per cent when unremitted incomes are not included. The benefits of the non-dom regime are not evenly spread across earners with comparable levels of income, though: the largest shifts can be seen at the 10th and 25th percentiles.

The impact on EATRs when considering overall remuneration is even more striking. The EATR averages only around 20 per cent even for the median person above £3 million.

Appendix D: Additional results

Like Figure 2(a) (which shows the equivalent rates for just 2018), Figure D1 shows substantial variation in EATRs across individuals with similar levels of total income even when smoothing income and tax over time. Taking a 5-year view shows mean and median EATRs which are lower than single-year EATRs, indicating that over a longer period of time, more individuals can diversify their income towards including some lower taxed sources.

When considering total remuneration, however, the 5-year view indicates relatively less dispersion in actual EATRs. Figure D2 shows average and median EATRs remaining closer to 33 per cent throughout the distribution, where for the single-year equivalent in Figure 2(b) these approached 20 per cent. While fewer individuals are able to have all their remuneration taxed at a 10 per cent rate over a longer time horizon (with the P10 line higher in the 5-year view), it is also true that fewer individuals pay the headline rate of 47 per cent.

EATRs on remuneration of around £100,000 remained fairly unchanged over the decade to 2018 (naturally we do not see the impact of the changes to the additional rate of income tax as this applied only to incomes above £150,000). For those with total remuneration of around £1 million, a similar pattern is observable as that shown
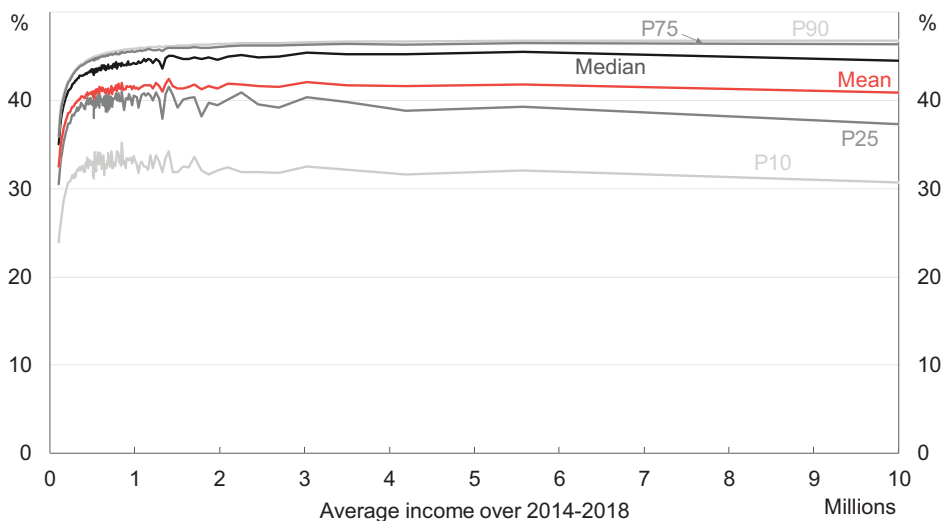
Figure D1: Distribution (mean and percentiles) of EATRs on income, averaged over 5 years (2014–18)

Notes: Constructed using data on average income going to individuals with over £100,000 in total income over 2014–18. 'Mean' shows the average (mean) EATR at different levels of income. 'Median' shows the median EATR at different levels of income, and 'P*XX*' shows the *XX* percentile of EATR at any given level of income.

Source: Authors' calculations based on HMRC administrative datasets.

in Figures 3(b) and 3(c), for incomes of £500,000 and £2 million, with most taxpayers seeing an increase in their EATR, but with limited impact for those paying the lowest effective rates.

Figure D4 shows how much of the difference between headline EATRs and actual EATRs paid on income can be attributed to the use of reliefs, as opposed to the composition of income and to losses and expenses. In line with Figure 6, the majority of the reduction in EATR is due to the composition of income rather than the effect of reliefs, although reliefs do play a comparatively larger part in the reduction. The effect of composition on the income-only EATR is not as large as in Figure 6, because the tax rate on dividend income is much higher than capital gains tax rates.

The use of reliefs accounts for a relatively small share of the overall reduction in EATRs on income across the income distribution (Figure D5). However, as with Figure 7, some reliefs figure more prominently in different parts of the distribution than others. In particular, reliefs generated by pension contributions make up a significant proportion of overall use of reliefs only for those towards the lower end of the distribution of high earners. Further up the distribution, charitable donations become more important.

Across the taxpayer population, including among those with incomes above £1 million, earnings from employment or self-employment comprise more than three-quarters of all taxable income (Figure D6).

Distributional figures in the main body of this paper show EATRs paid by taxpayers at different points of the income distribution. This is only one way to consider the equity of the distribution of EATRs. Around one million taxpayers earn over £100,000 in income or remuneration: Figure D7 represents these individuals when grouped in the same way as in the main body of the paper, but with the horizontal axis representing the number of individuals. While the tax system is shown to be progressive over most of the distribution of individuals, it is nonetheless the case that some of the highest-earning individuals pay lower effective average tax rates on their income than individuals earning less. Figure D8 shows that this is even more stark when considering individuals' total remuneration: the mean for the very highest remunerated individuals is lower than the mean anywhere else among the next 900,000 individuals.

Individuals earning over £100,000 collectively earn over £200 billion. Figure D9 represents the tax rates paid on that income, with the horizontal axis representing each pound of taxable income, arranged according to whether the individual earning that income is at the top or the bottom of the high-earners distribution. The mean EATR is rising across most of the distribution of total income, but once the top £50 billion is reached the tax rate remains roughly constant around 42 per cent, rather than continuing to rise. When considering both income and capital gains (Figure D10), the average tax rate paid on taxable remuneration declines—for both median and mean—over the top £100 billion in remuneration.


Figure D2: Distribution (mean and percentiles) of EATRs on total remuneration, averaged over 5 years (2014–18)

Notes: Constructed using data on average income and capital gains going to individuals with over £100,000 in total remuneration (income plus gains) over 2014–18. 'Mean' shows the average (mean) EATR at different levels of remuneration. 'Median' shows the median EATR at different levels of remuneration, and 'P*XX*' shows the *XX* percentile of EATR at any given level of remuneration.

Source: Authors' calculations based on HMRC administrative datasets.

(a) Individuals with £100,000 in total remuneration
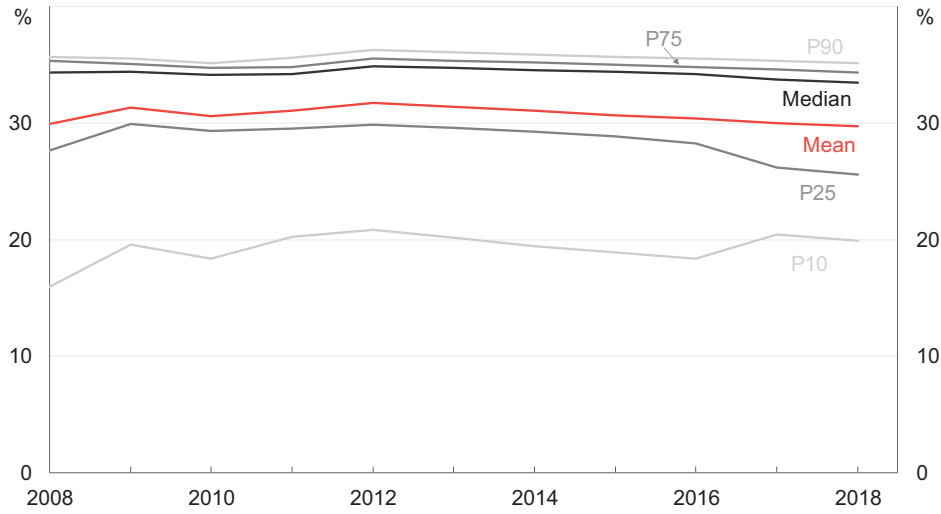
(b) Individuals with £1 million in total remuneration
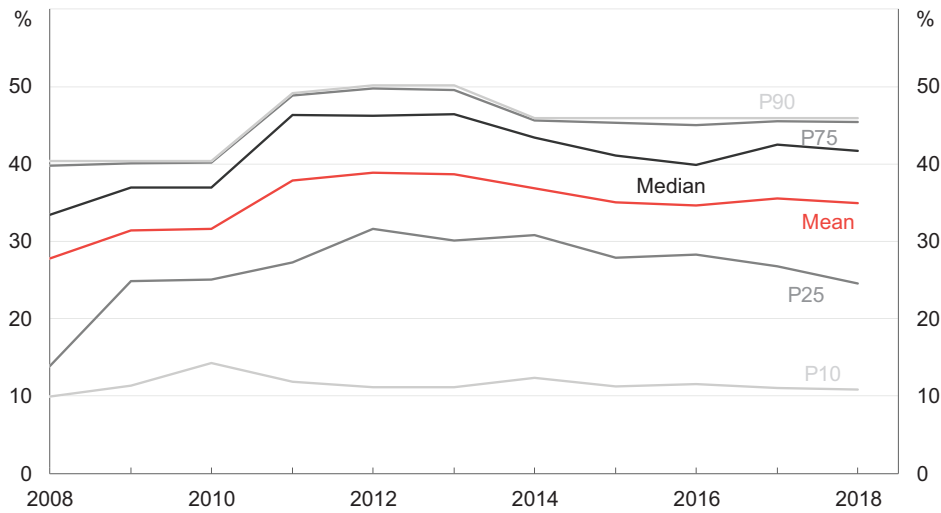

Figure D3: Change in EATRs over time, at varying levels of total remuneration.

Notes: Constructed using data on income and capital gains going to all individuals with total remuneration (income plus gains) within +/–5 per cent of the stated level, over the period 2008–18. All lines show the EATR on income plus capital gains. 'Mean' shows the average (mean) EATR at different levels of remuneration (income plus gains). 'Median' shows the median EATR at different levels of remuneration, and 'P*XX*' shows the *XX* percentile of EATR at any given level of remuneration.
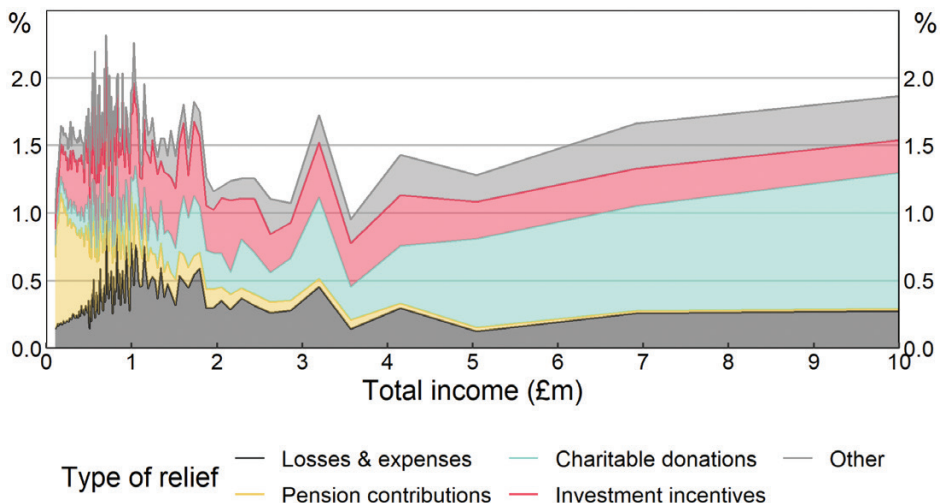
Source: Authors' calculations based on HMRC administrative datasets.
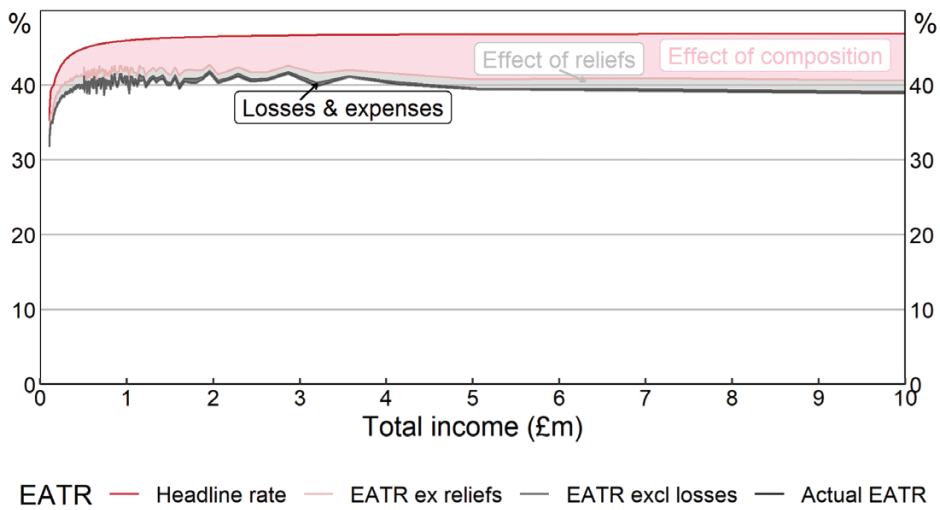
Figure D4: Share of reduction in EATR due to use of tax reliefs vs composition of income, 2016

Notes: Constructed using data on income going to individuals with over £100,000 in total income, and reliefs and deductions claimed by those individuals. 'Actual EATR' shows the effective average tax rate actually paid; 'EATR excl losses' removes loss- and expense-related reliefs and deductions; 'EATR ex reliefs' estimates the effective average tax rate that would be paid in the absence of reliefs and deductions, but with income composition remaining the same. 'Headline rate' shows the headline (statutory) rate on earnings.

Source: Authors' calculations based on HMRC administrative datasets.

Figure D5: Value of tax reliefs as a share of total income, by income level, decomposed by type of relief claimed, 2016

Notes: Constructed using data on income going to individuals with over £100,000 in total income, and reliefs and deductions claimed by those individuals.

Source: Authors' calculations based on HMRC administrative datasets.
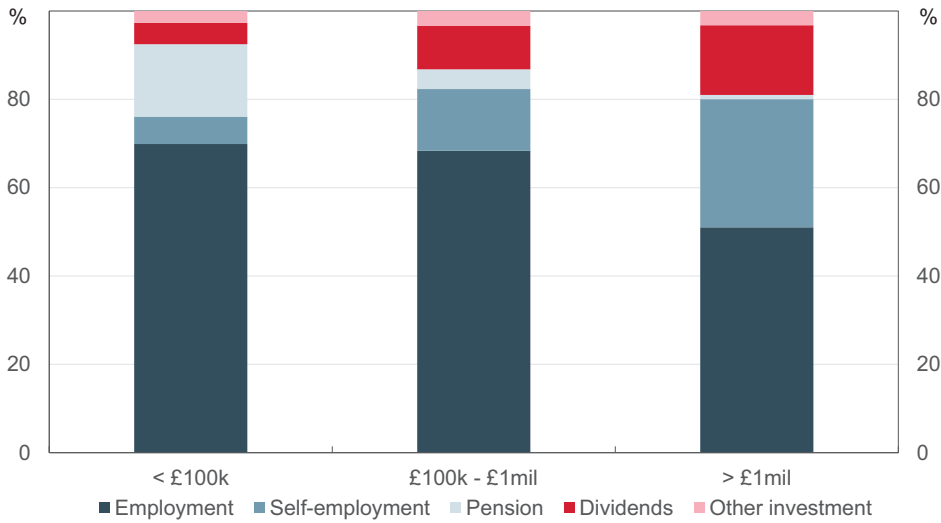
Figure D6: Composition of aggregate taxable income among taxpayers with <£100k, £100k–£1 million and >£1 million each in total income, 2018

Notes: Constructed using HMRC tabulations of aggregate taxable income decomposed by type of income, for all taxpayers by range of total income, for tax year 2017–18. 'Pension' includes income from both state and private pensions. 'Other investment' includes income from property, interest, and miscellaneous investment sources.

Source: Authors' calculations based on the HMRC Personal Incomes Statistics, Tables 3.6 and 3.7.
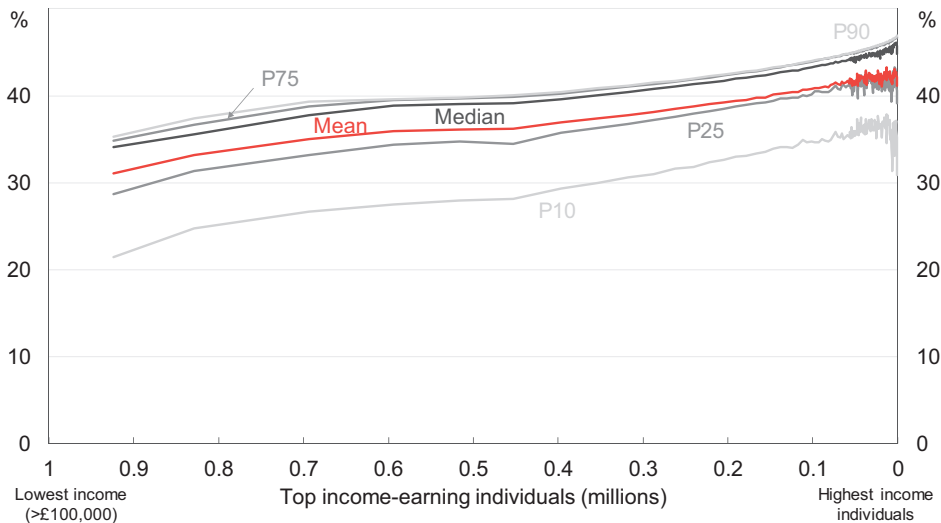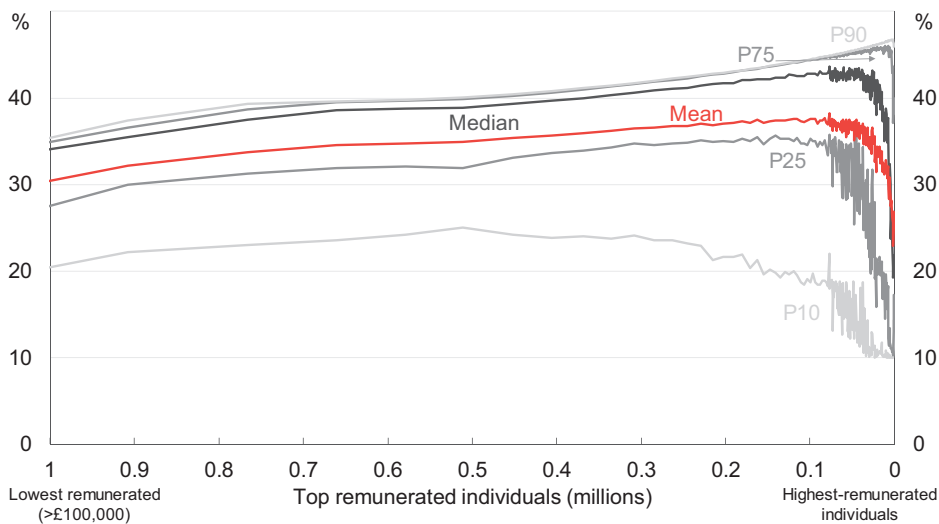
Figure D7: Distribution (mean and percentiles) of EATRs on income, by number of individuals, 2018

Notes: Constructed using data on income going to individuals with over £100,000 in total income in 2018, approximately the 1 million highest-earning taxpayers (ranked by income). 'Mean' shows the average (mean) EATR at different levels of income. 'Median' shows the median EATR at different levels of income, and 'P*XX*' shows the *XX* percentile of EATR at any given level of income.

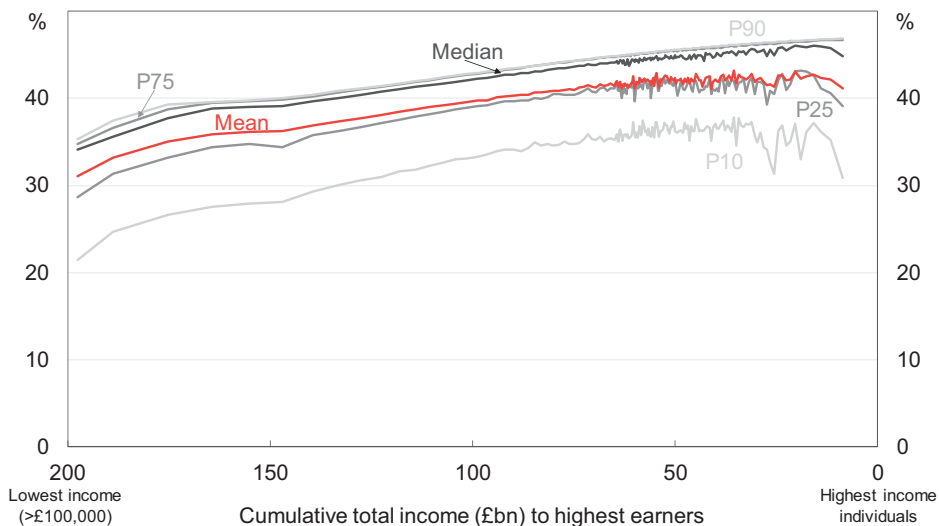*Source*: Authors' calculations based on HMRC administrative datasets.

Figure D8: Distribution (mean and percentiles) of EATRs on remuneration, by number of individuals, 2018

Notes: Constructed using data on income and capital gains going to individuals with over £100,000 in total remuneration (income plus gains) in 2018, approximately the 1 million highest-earning taxpayers (ranked by remuneration). 'Mean' shows the average (mean) EATR at different levels of remuneration. 'Median' shows the median EATR at different levels of remuneration, and 'P*XX*' shows the *XX* percentile of EATR at any given level of remuneration.
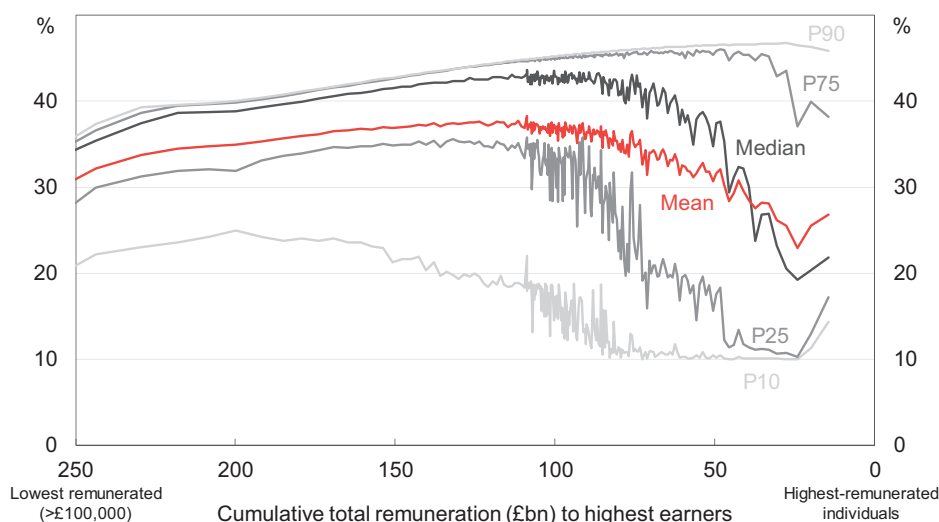
Source: Authors' calculations based on HMRC administrative datasets.

Figure D9: Distribution (mean and percentiles) of EATRs on income, by cumulative total income, 2018

Notes: Constructed using data on income going to individuals with over £100,000 in total income in 2018, approximately £200 billion going to the 1 million highest-earning taxpayers (ranked by income). 'Mean' shows the average (mean) EATR at different levels of income. 'Median' shows the median EATR at different levels of income, and 'P*XX*' shows the *XX* percentile of EATR at any given level of income.

Source: Authors' calculations based on HMRC administrative datasets.

Figure D10: Distribution (mean and percentiles) of EATRs on remuneration, by cumulative total remuneration, 2018

Notes: Constructed using data on income and capital gains going to individuals with over £100,000 in total remuneration (income plus gains) in 2018, approximately £250 billion going to the 1 million highest-earning taxpayers (ranked by remuneration). 'Mean' shows the average (mean) EATR at different levels of remuneration. 'Median' shows the median EATR at different levels of remuneration, and 'P*XX*' shows the *XX* percentile of EATR at any given level of remuneration.

Source: Authors' calculations based on HMRC administrative datasets.

References

Adam, S., Roantree, B., and Phillips, D. (2019), '35 Years of Reforms: A Panel Analysis of the Incidence of, and Employee and Employer Responses to, Social Security Contributions in the UK', *Journal of Public Economics*, **171**, 29–50.

— Delestre, I., Emmerson, C., and Sturrock, D. (2023), 'A Blueprint for a Better Tax Treatment of Pensions', IFS Report, available at https://ifs.org.uk/publications/blueprint-better-tax-treatment-pensions (accessed 16 February 2023).

Advani, A. (2021), 'The Taxation of Capital Gains: Principles, Practice, and Directions for Reform', *Canadian Tax Journal*, **69**(4), 1231–50.

— Summers, A. (2020), 'Capital Gains and UK Inequality', CAGE Working Paper No. 465.

— Burgherr, D., and Summers, A. (2022*a*), 'Reforming the Non-dom Regime: Revenue Estimates', CAGE Policy Briefing No. 38.

— Ooms, T., and Summers, A. (2022*b*), 'Missing Incomes in the UK: Evidence and Policy Implications', *Journal of Social Policy*, 1–21.

Alvaredo, F., Atkinson, A. B., Blanchet, T., Chancel, L. Bauluz, L., Fisher-Post, M., Flores, I., Garbinti, B., Goupille-Lebret, J., Martinez-Toledano, C., Morgan, M., Neef, T., Piketty, T., Robilliard, A., Saez, E., Yang, L., and Zucman, G. (2020), 'Distributional National Accounts Guidelines 2020: Concepts and Methods Used in the World Inequality Database', WID.world Working Paper.

Arulampalam, W., Devereux, M., and Maffini, G. (2012), 'The Direct Incidence of Corporate Income Tax on Wages', *European Economic Review*, **56**(6), 1038–54.

Auerbach, A. J., and Hassett, K. A. (2002), 'A New Measure of Horizontal Equity', *American Economic Review*, **92**(4), 1116–25.

Auten, G., and Splinter, D. (2022), 'Income Inequality in the United States: Using Tax Data to Measure Long-term Trends', mimeo, available at https://www.davidsplinter.com/AutenSplinter-Tax_Data_and_Inequality.pdf (accessed 16 February 2023).

Banks, J., and Diamond, P. (2010), 'The Base for Direct Taxation', in S. Adam *et al.* (eds), *Dimensions of Tax Design*, Oxford, Oxford University Press, 548–648.

Bilicka, K. (2019), 'Comparing UK Tax Returns of Foreign Multinationals to Matched Domestic Firms', *American Economic Review*, **109**(8), 2921–53.

Corlett, A., Advani, A., and Summers, A. (2020), 'Who Gains? The Importance of Accounting for Capital Gains', Resolution Foundation report.

Eisinger, J., Ernsthausen, J. and Kiel, P. (2021), 'The Secret IRS Files: Trove of Never-Before-Seen Records Reveal How the Wealthiest Avoid Income Tax', New York, ProPublica, 8 June, available at https://www.propublica.org/article/the-secret-irs-files-trove-of-never-before-seen-records-reveal-how-the-wealthiest-avoid-income-tax (accessed 20 September 2022).

Feldstein, M. S. (1976), 'On the Theory of Tax Reform', *Journal of Public Economics*, **6**(1–2), 77–104.

Fesseau, M., and Mattonetti, M. (2013), 'Distributional Measures across Household Groups in a National Accounts Framework: Results from an Experimental Cross-country Exercise on Household Income, Consumption and Saving', OECD Statistics Working Papers, No. 2013/04, Paris, OECD Publishing.

Fullerton, D., and Metcalf, G. E. (2002), 'Tax Incidence', ch. 26 in A. J. Auerbach and M. Feldstein (eds), *Handbook of Public Economics*, vol. **4**, Elsevier, 1787–872.

HMRC (2021), 'Tax Relief Statistics (December 2021)', available at https://www.gov.uk/government/statistics/main-tax-expenditures-and-structural-reliefs/estimated-cost-of-tax-reliefs-statistics (accessed 22 September 2022).

— (2022a), 'HMRC Tax Receipts and National Insurance Contributions for the UK', available at https://www.gov.uk/government/statistics/hmrc-tax-and-nics-receipts-for-the-uk (accessed 20 September 2022).

— (2022b), 'HS204 Limit on Income Tax reliefs (2022)', available at https://www.gov.uk/government/publications/limit-on-income-tax-reliefs-hs204-self-assessment-helpsheet/hs204-limit-on-income-tax-reliefs-2022

HM Treasury (2020), 'Budget 2020 Policy Decisions', available at https://www.gov.uk/government/publications/budget-2020-documents (accessed 17 February 2023).

Kaplow, L. (1989), 'Horizontal Equity: Measures in Search of a Principle', *National Tax Journal*, **42**(2), 139–54.

— (1992), 'A Note on Horizontal Equity', *Florida Tax Review*, **1**(3), 191–6.

Kiel, P., Ernsthausen, J.. and Eisinger, J. (2021), 'You May Be Paying a Higher Tax Rate Than a Billionaire', ProPublica, 8 June, available at https://www.propublica.org/article/you-may-be-paying-a-higher-tax-rate-than-a-billionaire (accessed 20 September 2022).

Kleven, H., Landais, C., Saez, E., and Schultz, E. (2014), 'Migration and Wage Effects of Taxing Top Earners: Evidence from the Foreigners' Tax Scheme in Denmark', *Quarterly Journal of Economics*, **129**(1), 333–78.

Kopczuk, W. (2019), 'Comment on "Progressive Wealth Taxation" by Saez and Zucman prepared for the Fall 2019 issue of *Brookings Papers on Economic Activity*', available at http://www.columbia.edu/~wk2110/bin/BPEASaezZucman.pdf (accessed 20 September 2022).

Meade, J., Ironside, D., Avery Jones, J., Bell, L., Flemming, J., Kay, J. A., King, M., Macdonald, M., Sandford, C., Whittington, G., and Willis, J. (1978), *The Structure and Reform of Direct Taxation*, London, George Allen & Unwin.

Miller, H., Pope, T., and Smith, K. (2021), 'Intertemporal Income Shifting and the Taxation of Business Owner-Managers', IFS Working Paper WP21/49.

Mirrlees, J., Adam, S., Besley, T., Blundell, R., Bond, S., Chote, R., Gammie, M., Johnson, P., Myles, G., and Poterba, J. (2011), *Tax by Design: The Mirrlees Review*, Oxford, Oxford University Press.

Musgrave, R. A. (1959), *The Theory of Public Finance: A Study in Public Economy*, New York, McGraw-Hill.

— (1990), 'Horizontal Equity, Once More', *National. Tax Journal*, **43**(2), 113–22.

— (1993), 'Horizontal Equity: A Further Note', *Florida Tax Review*, **1**(6), 354–9.

Nanda, S., and Parkes, H. (2019), 'Just Tax: Reforming the Taxation of Income from Wealth and Work', IPPR Report, available at https://www.ippr.org/files/2019-09/just-tax-sept19.pdf (accessed 17 February 2023).

NAO (2020), *The Management of Tax Expenditures*, National Audit Office, available at https://www.nao.org.uk/wp-content/uploads/2020/02/The-management-of-tax-expenditure.pdf (accessed 20 September 2022).

Office for Budget Responsibility (OBR) (2019), *Fiscal Risks Report—July 2019*, available at https://obr.uk/frs/fiscal-risks-report-july-2019/ (accessed 20 September 2022).

Piketty, T., Saez, E., and Zucman, G. (2018), 'Distributional National Accounts: Methods and Estimates for the United States', *Quarterly Journal of Economics*, **133**(2), 553–609, available at https://gabriel-zucman.eu/files/PSZ2018QJE.pdf (accessed 22 September 2022).

Public Accounts Committee (2020), *Management of Tax Reliefs: Inquiry*, available at https://committees.parliament.uk/work/330/management-of-tax-reliefs/publications/ (accessed 8 March 2023).

Repetti, J., and Ring, D. (2012), 'Horizontal Equity Revisited', *Florida Tax Review*, **13**(3), 135–55.

Saez, E., and Zucman, G. (2019), 'Progressive Wealth Taxation', *Brookings Papers on Economic Activity*, **Fall**.

Stiglitz, J. E. (1982), 'Utilitarianism and Horizontal Equity: The Case for Random Taxation', *Journal of Public Economics*, **18**(1), 1–33.

Summers, A. (2019), 'Taxation of Wealth', in J. Bradshaw (ed.), *Let's Talk about Tax*, London, CPAG Press, 115–61.

Tax Justice UK (2020), 'What's Wealth Got to Do With It? Attitudes on Public Spending, Wealth and Tax', available at https://www.taxjustice.uk/uploads/1/0/0/3/100363766/whats_wealth_got_to_do_with_it_.pdf (accessed 20 September 2022).

Yagan, D. (2023), 'What Is the Average Federal Individual Income Tax Rate on the Wealthiest Americans?', *Oxford Review of Economic Policy*, **39**(3), 438–50.

Yossman, K. J. (2021), ' "Avatar" Film Funding Firm Backed by David Beckham, Sacha Baron Cohen Wins $975 Million Tax Avoidance Case Against HMRC', *Variety*, 5 August, available at https://variety.com/2021/biz/news/avatar-film-funding-ingenious-hmrc-david-beckham-1235035446/ (accessed 22 September 2022).