

### Estimating the responsiveness of top incomes to tax: a summary of three new papers

### **IFS Briefing Note BN214**

James Browne David Phillips







## Estimating the responsiveness of top incomes to tax: a summary of three new papers<sup>\*</sup>

#### James Browne and David Phillips

Copy-edited by Judith Payne

Published by

The Institute for Fiscal Studies

ISBN 978-1-911102-58-8

August 2017

\* The authors gratefully acknowledge funding from the Nuffield Foundation. The Nuffield Foundation is an endowed charitable trust that aims to improve social well-being in the widest sense. It funds research and innovation in education and social policy and also works to build capacity in education, science and social science research. The Nuffield Foundation has funded this project, but the views expressed are those of the authors and not necessarily those of the Foundation. More information is available at http://www.nuffieldfoundation.org. Support from the Economic and Social Research Council (ESRC) through the Centre for the Microeconomic Analysis of Public Policy at IFS (grant reference ES/M010147/1) is also gratefully acknowledged. This work contains statistical data from HMRC which is Crown Copyright. The research datasets used may not exactly reproduce HMRC aggregates. The use of HMRC statistical data in this work does not imply the endorsement of HMRC in relation to the interpretation or analysis of the information. Data from the Survey of Personal Incomes is Crown Copyright material and has been used with the permission of the Controllers of HMSO and the Queens Printer for Scotland.

Browne's work on this paper was conducted while he was at the IFS. This paper does not represent the official views of the OECD or of its member countries. The opinions expressed and arguments employed are those of the authors.

## 1. Introduction

In 2010, an 'additional' 50% rate of income tax applying to incomes above £150,000 was introduced. Following HMRC analysis of the responses of high-income individuals to this new tax rate in the first year of its operation, the Chancellor announced in Budget 2012 that the tax rate would be reduced to 45% from April 2013. The IFS has now published three working papers that look at the behavioural responses to the 50% tax rate in more detail, including examining responses in the second year of the 50% tax rate (2011–12). As well as this historical episode being of interest in its own right, such analysis can help inform ongoing debates about taxation of high income individuals.

The introduction of the 50% income tax rate in April 2010 was well publicised in advance, having been announced in March 2009.<sup>1</sup> This gave those affected the opportunity to avoid having to pay the 50% tax rate in the first year by bringing their income forward to the 2009–10 tax year. It seems clear from the data that many of these individuals took advantage of this opportunity, artificially increasing their incomes in the year prior to the tax rate being increased, leading to a big reduction below their normal levels the following year. We call this phenomenon 'forestalling'. If the 50% tax rate had remained in place for the long term, this forestalling would have unwound, leading to the reported incomes of this group returning to more normal levels. Separating the impact of this forestalling from the underlying impact of the 50% tax rate – which weakens the incentives individuals face to earn more and increases the pay-off to income shifting to other tax bases (such as capital gains) and other forms of tax avoidance or even evasion – is one of the key challenges faced in this analysis.

<sup>&</sup>lt;sup>1</sup> Previous plans, announced in Autumn 2008, were for a 45% rate on incomes above £150,000 from April 2011.

## 2. Updating HMRC's analysis<sup>2</sup>

In our first working paper, we update and critique the analysis produced by HMRC in 2012,<sup>3</sup> which was based on incomplete data from the first year of the 50% tax rate, 2010– 11. HMRC's analysis attempted to estimate what would have happened to the incomes of the group affected by the 50% rate in 2009–10 and 2010–11 if the new tax rate had not been introduced, using data on the income trends of a group with slightly lower income (those with incomes between £115,000 and £150,000) and stock market growth, which is known to particularly affect the very highest incomes. The difference between the aggregate income of taxpayers with incomes above £150,000 and this prediction of the income they would have reported in the absence of the tax change is, in effect, HMRC's estimate of the impact of the 50% tax rate. The analysis then needed to distinguish between the short-term 'forestalling' effects and longer-term 'underlying' effects on incomes. It attempted to do this by examining the behaviour of those whose incomes were stable in the years prior to the announcement of the 50% tax rate – and hence for whom it would be easier to identify any spike in income in 2009–10 caused by forestalling.

Doing this, HMRC estimated that around £18 billion of income was brought forward to 2009–10, and of this around 70% came from the first year of the 50% tax rate, 2010–11. Even with such a high level of income shifting from 2010–11 to 2009–10, HMRC estimated an underlying level of responsiveness to the 50% tax rate that was so large that reducing the tax rate to 45% (as occurred in April 2013) would have little impact on revenues.

Our analysis updates this analysis in a number of respects. First, we use more up-to-date data than were available to HMRC in 2012: we have revised data from 2009–10, more complete data from 2010–11 and also data from 2011–12.<sup>4</sup> Figure 1 shows how this has affected our estimates.

There are several points to note from the figure. First, income shifting to 2009–10 from later years is obvious from the spike in the incomes of the group with incomes above £150,000 in 2009–10. But we also see that, after the big drop in incomes in 2010–11, the incomes of the group affected by the 50% tax rate did not subsequently increase more quickly than those of the group with slightly lower incomes. Since we would expect the incomes of the group affected to increase significantly in 2011–12 if there had been substantial income shifting from 2010–11 to 2009–10 (and relatively little from 2011–12 and subsequent years), this suggests that somewhat less of the income brought forward to 2009–10 came from 2010–11 than HMRC was assuming in its analysis.

The other key point to note from Figure 1 is that our updated data show lower incomes in 2010–11 for those individuals with incomes above  $\pm 150,000$ , and for those with an income between  $\pm 115,000$  and  $\pm 150,000$ , than in the data used by HMRC. However, the income

<sup>&</sup>lt;sup>2</sup> J. Browne and D. Phillips, 'Updating and critiquing HMRC's analysis of the UK's 50% top marginal rate of tax', IFS Working Paper WP17/12, https://www.ifs.org.uk/publications/9677, 2017a.

<sup>&</sup>lt;sup>3</sup> HM Revenue and Customs, 'The Exchequer effect of the 50 per cent additional rate of income tax', 2012, http://webarchive.nationalarchives.gov.uk/20130127161217/http://www.hmrc.gov.uk/budget2012/excheqincome-tax-2042.pdf.

<sup>&</sup>lt;sup>4</sup> Data are also available for later years, but the pre-announcement of a reduction in the top rate of tax from 50% to 45% created a strong incentive for 'reverse' forestalling – delaying of income to take advantage of the lower tax rate – which limits the usefulness of data from 2012–13 and beyond for analysis.



Figure 1. Growth in taxable income for groups with incomes greater than £150,000 and of £115,000–£150,000, 2007–08 to 2011–12 (2007–08=100)

Note: Thresholds and aggregate income amounts adjusted for RPI inflation except in 2011–12.

Source: Authors' calculations using the Survey of Personal Incomes from 2007–08, 2009–10 and 2010–11 and scaled data from self-assessment tax returns for 2008–09 and 2011–12.

difference is much larger for the group with lower incomes (between £115,000 and £150,000). As the income growth of the lower and higher income groups is highly correlated, this suggests that at least some of the drop in incomes among the group with incomes above £150,000 would have happened even if the 50% rate had not been introduced (whereas HMRC's initial analysis was, in effect, based on the assumption that incomes for this group would have risen in the absence of the 50% rate).

Thus, when we apply HMRC's method to the new data, we find that underlying responsiveness is somewhat smaller than HMRC estimated for 2010–11, but significantly larger in 2011–12. A summary measure of the responsiveness of taxable incomes to changes in tax rates is the *taxable income elasticity*, which tells us how much individuals will increase their income in response to a 1% increase in the net-of-tax share of income. The meaning of this parameter is discussed in Box 1.

HMRC's estimate of the taxable income elasticity based on the initial 2010–11 data was 0.48. This would imply that the overall revenue-maximising effective tax rate – incorporating National Insurance contributions (NICs) and potentially indirect taxes, as well as income tax – would be around 55%. Accounting for the impacts of behavioural response on NICs revenues as well as income tax revenues – the approach adopted by HMRC – this elasticity estimate would suggest that a 50% rate of income would *cost* the government around £0.1 billion relative to a 45% rate.<sup>5</sup> We discuss how different

<sup>&</sup>lt;sup>5</sup> Note that in the official policy costing for the reduction in the additional rate of tax to 45%, HMRC and the Office for Budget Responsibility (OBR) used an elasticity of 0.45, a little lower than the 0.48 found by HMRC (2012, op. cit.). An elasticity of 0.45 would imply a 50% additional rate would lead to a revenue *gain* of £0.1 billion relative to a 45% rate.

approaches to estimating the revenue effect of such a tax rate change affect this figure (and figures for other elasticity estimates) in Section 5.

What about our updated estimates of the taxable income elasticity? If, like HMRC, we assume 70% of the income brought forward to 2009–10 came from 2010–11, revised 2010–11 data would imply an elasticity for that year of 0.31. However, when we assume the remaining 30% of income brought forward to 2009–10 came from 2011–12, the data for 2011–12 imply a much larger elasticity of 0.83. This happens even though the data suggest the overall behavioural response to the 50% rate is roughly the same in these two years, because under HMRC's assumptions most of the 'forestalling' is assumed to relate to 2010–11; thus the *underlying* response – what we are attempting to measure with our taxable income elasticity estimates – would have to be much larger in 2011–12.

#### Box 1. The elasticity of taxable income

The elasticity of taxable income with respect to the net-of-tax rate, or *taxable income elasticity*, is a summary parameter that tells us how much individuals will increase their income when tax rates are reduced (or, equivalently, how much they will reduce their income when tax rates rise). Precisely, it tells us by what percentage individuals will increase their income if their net-of-tax rate (i.e. 100% minus their tax rate) increases by 1% – for example, if their tax rate falls from 50% to 49.5% (i.e. their net-of-tax rate increases from 50% to 50.5%).

To give a sense of what these numbers mean for tax policy, the revenue-maximising top tax rate under the case where all of the underlying response to the tax rate is a real change in income (as opposed to shifting income to other tax bases or years, which will increase revenues elsewhere) is given by

$$t^* = \frac{1}{1+a.e},$$

where e is the taxable income elasticity and a is the 'Pareto parameter', which describes the shape of the top of the income distribution. Note that this is the overall tax rate, not just the income tax rate, so National Insurance contributions (NICs) and consumption taxes generally need to be taken into account too (unless one thinks that the behavioural response involved does not impact revenues from these other taxes).

The revenue-maximising tax rate, and the revenue raised by any particular tax rate, will be increased if some of the response involves income shifting to other tax bases. For example, if individuals respond by shifting income into capital gains, not all this revenue will be lost. This changes the formula in the following way: if a share *s* of the response is income shifting to a base that is taxed at rate  $\tau$ , the revenue-maximising rate  $t^*$  becomes

$$t^* = \frac{1 + s.\tau.a.e}{1 + a.e}.$$

Similar formulas can be used to calculate the revenue effects of changes in the top rate of tax (such as an increase from 45% to 50%, or vice versa).

Such a large change in individuals' responsiveness between years seems implausible. We therefore argue that more of the forestalled income was probably brought forward from years after 2010–11 than HMRC assumed in its analysis. This idea is supported when we examine the post-reform behaviour of those with stable incomes during the pre-reform period. HMRC assumed that if an individual brought forward less than one year's normal income to 2009–10, all of this came from 2010–11, and that if more than one year's normal income was brought forward to 2009–10, a whole year's worth of this came from 2010–11 (and the rest from later years).

However, when we examine the data, we find that individuals who engaged in substantial forestalling did still report some income in 2010–11. Taking this post-reform behaviour into account, we estimate that only 45% of the income brought forward to 2009–10 came from 2010–11 and 17% from 2011–12. This goes a little way towards equalising the elasticities across the two years, though they remain far apart, at 0.58 in 2010–11 and 0.95 using the 2011–12 data. These can be brought further into line if we assume that individuals delayed receiving income in 2011–12 in anticipation of the reduction in the tax rate that was announced in Budget 2012: if we assume that individuals were able to delay receiving as much income from 2011–12 to 2013–14 as they were able to bring forward from 2011–12 to 2009–10, the taxable income elasticity estimated using the 2011–12 data falls to 0.80.

We also test the impact of a number of other changes to HMRC's approach: elasticity estimates are shown to be sensitive to even small changes in specification, although in all cases the alternative estimates are larger than the estimates obtained by HMRC in its original analysis. Higher elasticities would imply lower revenue-maximising tax rates. Indeed, unless one makes the assumption that the majority of the behavioural response observed represents a shift of income to other tax bases that are themselves taxed at relatively high rates, given prevailing rates of NICs and indirect taxes, many of the estimated elasticities imply that the revenue-maximising top rate of income tax would be less than 40%, let alone 50%.

But the biggest problem with the methodology used by HMRC is the high level of statistical uncertainty with which the counterfactual – the estimate of what would have happened to the incomes of the group affected by the 50% rate – is estimated. The 95% confidence interval of the estimated taxable income elasticity is from below 0 (which would imply that individuals *increased* their income in response to the 50% tax rate) to more than 2 (which would imply, even under very optimistic assumptions about how much income was shifted to other tax bases, that the revenue-maximising top rate of income tax was less than 30%).

These estimates therefore tell us that it is highly likely that the introduction of the 50% income tax rate led to significant income shifting to the year before it was introduced. They also imply it is likely that there was some underlying reduction in taxable incomes in 2010–11 and 2011–12 that was not associated with income shifting. However, the scale of both these responses is highly uncertain. As a result, estimates based on this methodology are consistent with a very wide range of revenue-maximising top rates of tax, and a very wide range of revenue estimates for the introduction of the 50% rate.

## 3. Analysis of individual taxpayer behaviour over time<sup>6</sup>

In our second working paper, we go beyond examining trends in aggregate incomes of different groups by using data that have only recently been made available from income tax returns that are linked over time. These tax returns allow us to examine what happened to incomes at an individual level following the introduction of the 50% income tax rate.

Of course, we still face the problem of forestalling. Our most promising strategy for dealing with this is to average incomes over the three-year period from 2009–10 to 2011–12. The rationale behind this is that if all of the income brought forward to 2009–10 was from 2010–11 or 2011–12 (in other words, the forestalling completely unwound by the end of 2011–12), the average income over these three years is unaffected by forestalling, and any change in incomes will reflect the underlying response to the 50% tax rate. Using this estimation strategy, our preferred estimate of the taxable income elasticity is 0.31, which would imply a revenue-maximising total effective tax rate of 65.5%. (We discuss implications for the revenue effects of increasing the top rate of tax from its current 45% in Section 5.) The elasticity estimate is lower than HMRC's estimate of 0.48, but not statistically significantly so.<sup>7</sup> Indeed, the 95% confidence interval for this estimate is 0.09 to 0.53, which would correspond to revenue-maximising total effective tax rates of 87% and 53%, respectively. This is a lower degree of uncertainty than under HMRC's approach but still substantial.

This working paper also examines a broader measure of income before tax-deductible items such as pension contributions are subtracted. It is common to find that this measure is less responsive to changes in tax rates than the standard taxable income measure, as one response to a higher tax rate is to increase the use of tax deductions to shift income into forms that are less heavily taxed (or not taxed at all), such as capital gains (which are subject to lower tax rates), contributions to pensions (which are taxed when pensions are paid out in retirement, when many top-rate taxpayers will be paying a lower tax rate) or charitable contributions (which are completely untaxed). However, we find that our estimate of the broad income elasticity (the change in this broader measure of income that results from a 1% change in the net-of-tax rate) is significantly higher than our estimate of the taxable income elasticity, at 0.71 rather than 0.31. This means that rather than increase, the use of tax deductions we observe on people's tax returns fell at the time the 50% tax rate was introduced, as can be seen in Figure 2.

We argue that the reason for this is that, as well as introducing the 50% income tax rate, the government restricted the amount individuals could contribute to tax-favoured private pensions from £255,000 to £50,000 a year (from 2011–12, with related anti-avoidance activities from 2010–11). This would, other things being equal, have increased the taxable incomes of those who would have otherwise contributed more than this amount. Analysis

<sup>&</sup>lt;sup>6</sup> J. Browne and D. Phillips, 'Estimating the size and nature of responses to changes in income tax rates on top incomes in the UK: a panel analysis', IFS Working Paper WP17/13, https://www.ifs.org.uk/publications/9676, 2017b.

<sup>&</sup>lt;sup>7</sup> Although it is statistically significantly lower than the higher estimates we obtain (e.g. 0.83 for 2011–12) when applying HMRC's methods to updated data.

Figure 2. Trends in different income sources and deductions for groups with incomes greater than £150,000, 2001–02 to 2011–12



Source: Authors' calculations using SA302 data from 2001–02 to 2011–12.

of taxable income attributes much of this response to the increase in the top rate of tax to 50%, potentially downwardly biasing estimates of the taxable income elasticity.

To investigate this issue further, we also examine taxable and broad income responses among the group of individuals who contributed less than £20,000 on average to a private pension each year prior to the reform. This group are less likely to find themselves constrained by the new contribution limit and associated anti-avoidance rules in place prior to its introduction. We find no evidence that this group (nor a subsample consisting of self-employed among this group) increased their pension contributions in response to the 50% tax rate.

Given the impact pension restrictions may be having on the taxable income elasticity, if we want to know the pure effect of the 50% tax rate (rather than pension tax changes) on individuals' incomes, the higher broad income elasticity number may actually be a better guide. If the appropriate elasticity were around 0.7, this would imply a revenue-maximising overall rate of tax – including NICs and potentially indirect taxes – of as low as 45%, implying a revenue-maximising top rate of income tax well below 40%, let alone 45% or 50%.

That is, unless significant amounts of the income tax (and NICs) revenues lost as a result of behavioural response to the 50% rate were recouped via other tax bases (such as capital gains) or in subsequent years (as tax levied on pension income, for instance). In such a case, we would usually expect deductions to increase – as it is deducted income that might crop up and be taxed elsewhere – but as Figure 2 shows, recorded deductions actually fell in 2010–11. However, not all deductions are picked up on tax returns.

First, pension contributions made via employers (rather than directly by individuals) are not captured on tax returns. While we do not see increases in individual pension contributions – including among the self-employed, for whom individual contributions are the only type possible – it is possible that employers contributed more on behalf of their employees in response to the 50% tax rate. If this were the case, some revenues would be recouped when pensions are paid out – albeit less than if income had been received up front as earnings, as NICs do not apply to employer pension contributions or any pension income, and high-income individuals are likely to be in a lower tax band when they draw their pension.

Second, those who own and manage their own incorporated businesses can retain income in their business rather than pay it out in earnings and dividends immediately; the income retained at the corporate level is also not recorded on tax returns. Figure 2 shows that dividend payments responded particularly strongly to the introduction of the 50% tax rate, rising by almost 75% between 2008–09 and 2009–10 and then falling by more than twothirds between 2009–10 and 2010–11 and remaining relatively low in 2011–12. Our elasticity estimates – and resulting revenue estimates – effectively assume this pattern reflects only the bringing forward of dividends. If it also reflects individuals delaying the realisation of income by retaining it in their business to pay out later (either after an anticipated cut in income tax rates, or as capital gains, which are taxed at a lower rate), then the taxable and broad income elasticities will be overstating the longer-run revenue costs associated with the behavioural responses to the 50% rate of income tax. To investigate this issue fully, we would need to link individual and corporate tax returns, which has not yet been done. But in Section 5 we show how taking account of such delays to income realisation – and the later recouping of some tax revenues – may impact the revenue effects implied by our elasticity estimates.

In the final piece of analysis in our second paper, we examine the responses of those with incomes just around the £150,000 threshold prior to the reform. We argue that those whose incomes were just above £150,000 in 2009–10 were unlikely to be engaging in forestalling, as that involves increasing income significantly in that year before reducing it in subsequent years. This analysis yields fairly consistent estimates of the taxable income elasticity of between 0.1 and 0.2, implying that those with incomes around the threshold are less responsive than the full group of individuals with incomes above £150,000. Or put another way, those with the very highest incomes are *more* responsive than the group of individuals with incomes just above £150,000.

# 4. Bunching of taxpayers at tax thresholds<sup>8</sup>

A similar result is shown in our third paper, which examines whether individuals bunch at points in the income tax system where marginal tax rates increase – specifically, the £150,000 threshold for the additional rate of income tax, the threshold for the 40% 'higher' rate of income tax, and the £100,000 threshold where the personal allowance starts to be tapered (creating a band of income where the marginal income tax rate is 60%). The motivation for examining this bunching behaviour is that the more responsive individuals are to changes in tax rates, the more they will bunch at these points. It is therefore possible to estimate taxable income elasticities by examining the extent of this bunching. We find that implied taxable income elasticities are very low (below 0.05) at all kink points, with the only significant bunching observed among owner-managers of incorporated businesses, who appear to be timing dividend payments in order to minimise their total tax liability.

This does not imply that other individuals are necessarily unresponsive to tax rates, however. If there are costs associated with adjusting incomes to respond in the most optimal way, it may not be worthwhile for those who find themselves just above the threshold to readjust to the threshold given that the benefits from doing so are likely to be small. Such adjustment costs therefore mean that estimates of the taxable income elasticity obtained using this method are an underestimate of the true 'underlying' elasticity of taxable income. Indeed, even relatively small adjustment costs would mean these 'attenuated' estimates of the elasticity would be consistent with a much larger true 'underlying' elasticity. This issue means that we are not convinced that much can be learned about likely responsiveness to large changes in taxes from examining individuals' behaviour around tax thresholds.

<sup>&</sup>lt;sup>8</sup> S. Adam, J. Browne, D. Phillips and B. Roantree, 'Frictions and taxpayer responses: evidence from bunching at personal tax thresholds', IFS Working Paper 17/14, https://www.ifs.org.uk/publications/9679, 2017. Please note that this paper combines analysis of income tax thresholds (using Survey of Personal Income data) with analysis of National Insurance thresholds (using New Earnings Survey Panel Dataset data).

## 5. Discussion and conclusions

To conclude then, there is reasonably clear evidence that those affected by the 50% income tax rate adjusted their incomes in response. Most obviously, there seems to have been a substantial amount of income shifting forwards to the year before the tax rate was increased. But it is unlikely – although not impossible – that this income shifting can fully explain all of the reductions in income seen among the affected group. Instead, it appears that the changes in incentives caused by the 50% tax rate led to these individuals reducing their incomes in a way that would have affected tax revenues on an ongoing basis if the rate had been retained.

However, it has not proved possible to obtain precise or robust estimates of the degree of underlying responsiveness of high earners to tax in the UK, reflecting the difficulty of stripping out 'forestalling' effects. Different methods and different assumptions lead to central estimates of the relevant elasticity that range from 0.31 to around 1, and moreover, there is significant statistical uncertainty around these central estimates. Beyond this, different assumptions about the precise nature of the behavioural responses being captured by the taxable income elasticities estimated mean that a given elasticity estimate can translate into quite different revenue effects from a given tax change. Table 1 illustrates this, showing five elasticity estimates from our work (as well as the original HMRC estimate) and, for each of these, three estimates of the revenue effects of increasing the rate of tax on incomes above £150,000 from 45% to 50%:

- A. The revenue effects if reductions in income as a result of behavioural response to the 50% tax rate translated in full into reductions in household expenditure, and no tax were recouped via other tax bases. This might be the case if all the reductions in taxable income reflect changes in real behaviour (such as work effort) as opposed to tax avoidance.
- B. The revenue effects if there were no impacts on household expenditure, and no tax were recouped via other tax bases. This might be the case if all the reductions in taxable income reflect avoidance behaviour that does not generate additional tax revenue via other tax bases.<sup>9</sup>
- C. The revenue effects if there were no impacts on household expenditure, and half of all response reflected shifts of income to capital gains to be taxed at a rate of 20% (albeit at a later date). This might be the case if all the reductions in taxable income reflect avoidance behaviour, half of which generates additional tax revenue via other tax bases.

The table shows that the wide range of elasticity estimates obtained implies a high degree of uncertainty about the revenue effects of returning the top rate of tax to 50%: it could cost or raise several billions of pounds a year. The table also shows that, as the taxable income elasticity increases, assumptions about the nature of the behavioural response

<sup>&</sup>lt;sup>9</sup> Note that this is closest to the assumptions used by the OBR and HMRC in their official policy costings. However, while it may be a justifiable set of assumptions for medium-term policy costings, in a long-run sense it is not very satisfactory: to the extent that changes in tax payments and the costs associated with tax avoidance lead to changes in the net income of taxpayers, in the long run we would expect this to have some impact on expenditure.

Elasticity estimate and source		Revenue effect of increasing top rate of income tax from 45% to 50% (£ billion)		
		А	В	С
0.09	Browne and Phillips (2017b), lower bound of confidence interval for taxable income elasticity (three-year average method)	+2.6	+2.7	+2.8
0.31	Browne and Phillips (2017b), central estimate for taxable income elasticity (three-year average method)	+0.8	+1.1	+1.5
0.48	HMRC (2012), central estimate	-0.6	-0.1	+0.5
0.71	Browne and Phillips (2017b), central estimate for broad income elasticity (three-year average method)	-2.4	-1.8	-0.9
0.80	Browne and Phillips (2017a), estimate for 2011–12 using updated forestalling assumptions and assuming some 'reverse forestalling'	-3.1	-2.4	-1.5
0.95	Browne and Phillips (2017a), estimate for 2011–12 using updated forestalling assumptions	-4.4	-3.5	-2.4

## Table 1. The varying revenue effects of a 50% top income tax rate under different elasticity estimates and assumptions about behavioural responses

Source: Authors' calculations using data referenced in Figures 1 and 2.

underlying the elasticity matter rather a lot for revenue estimates. For instance, with an elasticity of 0.71 - which is equal to the broad income elasticity we obtain in our second paper – the estimated revenue effect of a 50% top rate of income tax varies from a reduction in revenues of £2.4 billion under the assumption that household expenditure falls and no tax is recouped from other tax bases, to a reduction in revenues of £0.9 billion under the assumption that household around half of the behavioural response reflects shifts to capital gains, taxed at a rate of 20%.

Obtaining more precise estimates of the revenue effects of changes in the top rate of tax would therefore require two things. First is a change in the top rate of tax that is not afflicted by forestalling behaviour – which has made estimating the underlying responsiveness of taxpayers to the introduction of the 50% tax rate in 2010–11 so difficult. This would mean it would be easier to evaluate the behavioural responses to and revenue effects of future changes in top tax rates if they were announced with (near) immediate effect: affected individuals would not have the time to engage in forestalling activities. It would also have the benefit from the government's perspective of maximising tax yields (taxpayers engage in forestalling activities to minimise their tax liabilities). However, tax changes made with (near) immediate effect may be subject to less debate and scrutiny, which may impose its own costs.

Second is more research into the nature of responses underlying taxable income elasticities. A key contributor to this would be linking income tax return data (on which the

present analysis is based) to company tax return data and, if possible, data on employer pension contributions. This would allow analysis of the extent to which changes in taxable income in the short term may be offset by changes in taxes paid on capital gains or pension payments in the long term, and the extent to which business holders retain income within their businesses for tax planning purposes.

Finally, it is worth noting that although we cannot rule out a taxable income elasticity below that found by HMRC (0.48), most of the estimates we obtain are larger than that (and some substantially so). If the elasticity were greater than 0.48, at best a 50% top rate of income tax would raise roughly the same as the current 45%. And given that taxes impose costs on taxpayers beyond the revenue raised – both in terms of compliance costs and in terms of the welfare costs associated with the behavioural change reflected in the taxable income elasticity – the revenue-maximising rate of tax, in general, lies above the 'optimal' tax rate from the perspective of societal welfare. A tax rise that raises little or no revenue is therefore costly from the perspective of societal welfare.<sup>10</sup>

However, that is not to say that it is impossible (or necessarily undesirable) to raise more revenue from high-income individuals. We have shown that the restriction in the annual allowance for pension contributions helped offset the reduction in taxable income brought about by the 50% income tax rate. Other measures to broaden the income tax base, such as aligning income and capital gains tax rates, might not only raise more revenue by themselves, but might also increase the revenue-maximising income tax rate by reducing opportunities for individuals to avoid higher income tax rates by shifting income tax bases or more favourably taxed forms. And there are always options beyond income tax – such as property taxes – which may be less subject to behavioural response, and which could be used to raise additional revenues from better-off individuals, if the government wished to do so.

<sup>&</sup>lt;sup>10</sup> This is the case if the 'social welfare weight' applicable to the income of high earners is positive (i.e. conditional upon everyone else's income, social welfare is higher the higher is the income of high-income individuals). If, on the other hand, the 'social welfare weight' applicable to the income of high earners were negative (e.g. if increases in the incomes of high-income individuals were believed to have negative externalities for other individuals), the 'optimal' tax rate could be above the revenue-maximising tax rate. This may be the case if we thought there were negative externalities from some individuals having very high levels of income.