

Reference: 20210239



25 June 2021

Dear [REDACTED]

Thank you for your Official Information Act request, received on 1 June 2021. You requested the following:

... any formula or methodology that calculates how much tax will be gathered for a rise in income tax rates that takes account of efforts of higher rate taxpayers to reduce their taxable income to mitigate the impact of the tax rise.

Information being released

Please find enclosed the following documents which I have decided to release in full:

Item	Date	Document Description	Decision
1.	October 2020	Note outlining proposed behavioural assumptions for top personal rate changes	Release in full
2.	October 2020	Review by Professor John Creedy of our behavioural assumptions	Release in full
3.	October 2020	Email: Response from Professor Creedy on request for further advice	Release in full
4.	October 2020	Note outlining our proposed adjustment of behavioural assumptions following review by Professor Creedy	Release in full

Please note that this letter (with your personal details removed) and enclosed documents may be published on the Treasury website.

This reply addresses the information you requested. You have the right to ask the Ombudsman to investigate and review my decision.

Yours sincerely

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OIA 20210239

Information for Release

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Note – behavioural assumptions for top rate costings

This note:

1. Outlines the behavioural assumption currently in the top personal rate costing models (the 2019 estimate)
2. Considers whether we would need to change this assumption if the top personal rate was increased, but the trustee rate was not
3. Considers whether we should change the assumption as a result of the more recent evidence on elasticities of taxable income (ETI)

Summary proposed assumptions

The proposed elasticities are outlined in the table below. The estimates are provided in a range to show sensitivity to behavioural assumptions with a mid-point central estimate. When providing estimates we should show the range of assumptions and highlight the uncertainty and risk that revenue could be different to forecast. The appendix to this note outlines draft text to accompany any revenue estimates.

Type of income	Elasticity low-end	Elasticity midpoint	Elasticity high-end	What causes the reduction?
<i>Salary and wage income</i>	0	0.2	0.4	<ul style="list-style-type: none"> • All of this is reduction in total income earned and none of it is due to shifting to entities (real effect)
<i>Non-salary and wage income</i>	1.5	2.5	3.5	<ul style="list-style-type: none"> • 75% of this is income shifted to companies and PIEs (and not distributed) (shifting effect) • 25% is reduction in income earned (real effect)

1. Previous models and behavioural assumptions

Both Tsy and IRD have models that can estimate the revenue impact of changes to the top personal rate.

Both models include an assumption that people respond to a higher top personal rate by reducing the amount of their income subject to the rate.

The models assume that *individuals* do this through two channels:

- **Real effect.** Choosing to earn less personal income in NZ (or potentially evading their tax obligations)
- **Shifting effect.** Diverting their personal income into companies or PIEs and subjecting them to a 28% rate

The models also incorporated a behavioural impact for *trustees* if the trustee rate were increased:

- **Real effects.** Choosing to earn less trustee income in NZ (or potentially evading their tax obligations)
- **Shifting effect.** Diverting their trustee income into companies or PIEs and subjecting them to a 28% rate
- **Beneficiary effect.** Choosing to pay higher amounts of beneficiary income to those on a 33% tax rate

ETI formula

When deciding how much shifting there will be the models utilise elasticities of taxable income as per the formula:

$$\frac{\text{New tax rate} - \text{current tax rate}}{1 - \text{current tax rate}} * \text{elasticity} = \text{behavioural response}$$

The amount of income subject to a new rate is decreased by the amount of behavioural response. Then depending on the assumed type of response the income is modelled as being either not be taxed (real effect) or taxed at 28%/33% (shifting or beneficiary effect).

Our previous elasticities used

For our previous modelling (in 2019) we designed our behavioural assumptions based on a package of reform where:

- The top personal rate and the trustee rate are both increased;
- The company and PIE rates are not increased
- There are no further integrity measures

Our behavioural assumptions were then:

Table 1. Elasticities used in 2019 Tonka estimates

Type of income	Elasticity	What causes the reduction?
Salary and wage income	0.22	<ul style="list-style-type: none"> • All of this is reduction in total income earned and none of it is due to shifting to entities (real effect)
Non-salary and wage income (including trust income)	2.48	<ul style="list-style-type: none"> • 75% of this is income shifted to companies and PIEs (and not distributed) (shifting effect) • 25% is reduction in income earned (real effect)
Trustee income	2.48	<ul style="list-style-type: none"> • 75% of this is shifted to companies or PIEs (shifting effect) • 10% is converted to personal/beneficiary income that is subject to the 33% tax rate (beneficiary effect) • 15% is reduction in income earned (real effect)

The elasticities were based on estimates in (Carey, Creedy, Gemmell, & Teng, 2015). This study estimated the ETI based on the experience in 2000-2008 where there was misalignment between the trustee and personal rates.

The assumptions on “what causes the reduction” were a judgement by IRD and Treasury. We were influenced in making these judgements by our assumption that:

- most, but not all of the ETI for self-employed people is due to avoidance activity;
- for employees there is little scope for avoidance and so the ETI is likely due to labour supply or other ‘real’ responses; and
- trustees likely have similar avoidance responses as the self-employed.

Illustration of how this works

The elasticity formula is

$$\frac{\text{Current tax rate} - \text{new tax rate}}{1 - \text{current tax rate}} * \text{elasticity} = \text{behavioural response}$$

To illustrate if the top rate and trustee rate were increased to 34%

- Salary and wage income (subject to the new rate)
 - Decrease by 0.33% ($[(0.34-0.33)/0.67] * 0.22$)
- Non-salary and wage income (subject to the new rate):
 - Decrease in personal income by 3.7% ($[(0.34-0.33)/0.67] * 2.48$)
 - 2.8% of which is now subject to 28% rate ($0.037*0.75$)
 - 0.9% of which is not earned (effectively subject to 0% rate)
- Trustee income
 - Decrease in trustee income by 3.7%
 - 2.8% of which is subject to 28% rate
 - 0.37% of which is subject to 33% rate (personal)
 - 0.56% of which is no longer earned (subject to 0% rate)

We later decided to change the elasticities to incorporate the expected effects of a company tax and PIE integrity package. We assumed that a substantial amount of the avoidance of the top rate by the self-employed would be reduced due to this package and so planned to reduce the ETIs.

2. Would we need to change this assumption if the top personal rate was increased, but the trustee rate was not?

ETI assumption

Our 2019 estimates for the behavioural response for *self-employed individuals* was on the assumption that the top personal rate and trustee rate are aligned. If we have misalignment between the trust and personal rate this causes reason to reconsider our assumptions.

If we have misalignment between the trust and personal rate, this will put us in the same situation as we were in 2000-2008. As a result, the ETI estimates for 2000-2008 will be our best evidence on avoidance assumptions.

Our previous 2019 ETI estimates were based on (Carey, Creedy, Gemmell, & Teng, 2015) which also looked at the ETI for 2000-2008. As a result using the experience of 2000-2008 will mean we use similar assumptions.

This may seem odd as our 2019 estimates assumed alignment between personal and trust rates. Using the same estimates when there is misalignment means that moving to misaligned trust rates doesn't increase our assumed level of avoidance – so long as there are opportunities to avoid through companies and PIEs.

The ETI literature outlined in the next page support this approach however. ETI estimates for 2000-2008 are broadly similar to the estimates for 2012-17 (and in fact estimates for 2012-17 are slightly higher). This indicates that either addressing trust misalignment did not significantly reduce the ETI or that if we had not made the change the ETI would have increased.

However, we have no good way of determining how the underlying ETI may have been changing over time and for these reason we propose to use similar ETIs as we used in our 2019 estimates.

Shifting assumption

If there is misalignment between the top personal rate and both the company and trustee rate it is possibly that individuals will choose to avoid the top personal rate through the use of trusts (33% rate) rather than companies or PIEs (28% tax rate).

There are two ways this changed shifting effect could be implemented:

- *Alongside no change to ETIs.* If we assume some shifting to trusts but make no change to the ETI assumptions proposed above then this means there is *more* revenue leakage when the trust rate is aligned compared with the situation where the trust rate is misaligned. We do not think this outcome is logical
- *Alongside a change in the ETIs.* Another approach is to have some shifting to trusts but to change the ETIs so that the ETI is higher in a trust misaligned scenario. However, this would involve using a higher ETI than arose in the 2000-08 period and we have no firm evidence on how the ETI may have changed since then.

For this reason we continue to use similar ETIs to 2019. However, there is considerable uncertainty in any behavioural estimate. When we communicate revenue estimates we should be explicit about these uncertainties and how the revenue could be different from that forecast.

4. Does the more recent literature change our conclusions on the right ETI to use?

We used (Carey, Creedy, Gemmell, & Teng, 2015) as the basis for our 2019 ETI assumptions. This is one of a series of NZ papers exploring the elasticity of taxable income in New Zealand. Since we produced the estimates in 2019 there has been additional papers including (Alinaghi, Creedy, & Gemmell, 2019) and (Alinaghi, Creedy, & Gemmell, 2020).

This section briefly summarises these ETI results.

Table 2. Studies showing ETI results split by wage earners and self-employed

Study	ETI for...		
	All individuals	Those with solely wage income	Those with some non-wage income
(Carey, Creedy, Gemmell, & Teng, 2015)	0.676 (2001 reform)	0.190 (2001 reform)	0.909 (2001 reform)
(Alinaghi, Creedy, & Gemmell, 2019)	2001-08: 0.238 2012-17: 0.209	2001-08: 0.060 2012-17: 0.060	2001-08: 0.831 2012-17: 1.040
(Alinaghi, Creedy, & Gemmell, 2020)	Single individuals: 2001-08: 0.136 2012-17: 0.135 Couples: 2001-08: 0.267 2012-17: 0.249	Single individuals: 2001-08: 0.048 2012-17: 0.050 Couples: 2001-08: 0.069 2012-17: 0.063	Single individuals: 2001-08: 0.594 2012-17: 0.801 Couples: 2001-08: 0.807 2012-17: 1.083

Table 3. Studies showing results with other ways of splitting results

Study	ETI estimate
(Carey, Creedy, Gemmell, & Teng, 2015)	Those with solely non-wage income: 2.484 Those with just wage income: 0.2201
(Claus, Creedy, & Teng, 2012)	Top tax bracket: 0.2 – 1.7 Top decile: 0.6-1.0 Top 1%: 1.3-2.2

(Alinaghi, Creedy, & Gemmell, 2019) also produced the following table summarising the results.

¹ Note – these numbers were subject to considerable debate when we came up with the original ETI estimates. There is a discrepancy with the number in the next table due to different estimation techniques for the two numbers.

Table 8: Comparisons with Previous Results

	Top tax bracket			Lower tax bracket			Sample
	2002	2003	2004	2002	2003	2004	
Present paper	0.997	0.972	0.891	0.260	0.280	0.280	Self-employed
	0	0	0.159	0.010	0.011	0.011	Wage earners
	0.271	0.258	0.345	0.057	0.057	0.057	All taxpayers
Claus <i>et al.</i> (2012)	0.5	1.7	0.2	0.2	0.0	0.3	Tax bracket
	1.0	0.8	0.6	-	-	-	Top 10 per cent
	2.2	1.6	1.3	-	-	-	Top 1 per cent
	Carey <i>et al.</i> (2015)			Creedy <i>et al.</i> (2018)			
	All taxpayers	With other income	No other income	Income effects?			
	0.676	0.909	0.190	Yes	No		
				0.520	0.375		

From these estimates we can see a consistent pattern. Self employed and high income individuals have higher ETI. This could be due to the same effect as higher income individuals are likely to derive a greater proportion of their income from self-employment and investment income.

The studies indicate specific ETIs for:

- Non-wage income at around 0.9-1.0.
- The ETI for wage earners is more variable with estimates of 0.159, 0.190, 0.22 and 0.
- The Claus estimates show even higher elasticities for the top 1% - of around 1.3 to 2.2.

Should we change the ETI we use?

The majority of ETI estimates converge on a 0.9-1.0 ETI for individuals with non-wage income and 0-0.2 for individuals with no or very little non-wage income. As a result, all other things equal this looks like the most robust estimate to use.

This would require a different approach to applying behavioural responses compared with our approach for our 2019 estimates. This is because our previous approach applied the ETI estimates to different types of *income* rather than particular *taxpayers*.

Splitting people into wage and non-wage earners raises a difficulty in how to categorise those who earn a mix of wage and non-wage income. This can result in a need to draw boundaries which may be arbitrary. It is comparatively simpler and more intuitive to apply elasticities to income streams rather than categorising the individuals.

In addition, the use of this ETI has some risk of understating the ETI if a top personal rate applies at a very high income threshold. (Claus, Creedy, & Teng, 2012) estimated an ETI of 1.3-2.2 for individuals in the top percentile of incomes.

Whether to change it depends on how difficult it would be to update these models and trading this off against the benefit of having the estimate with the greater amount of studies supporting it.

Sandra Watson has run a test to see how the relative differences in the two approaches. Her work shows that using the two approaches would lead to similar outcomes. Her results showed that a 2.48 elasticity for non-wage income effectively is the same as a 0.92 elasticity applying to all individuals with some non-wage income.

As a result we are comfortable continuing to use the 2019 estimates.

Final note – FBT etc.

These avoidance estimates would assume that there is alignment between the top personal rate and other rates used to tax employment income such as the fringe benefit tax rate and the employer superannuation contribution tax.

If there was misalignment between the top rate and these other rates, then we would need to assume greater avoidance of the top rate by employees.

Assumptions – draft appendix for any report

Figure X below illustrates the revenue generated by a X% tax rate applying to incomes above \$Y.

We have made this revenue estimate assuming:

- a. **Trustee, company and PIE rate.** There is no change to the trustee, company, or PIE tax rate.
- b. **Fringe benefit tax rate and other similar taxes on employment income.** The fringe benefit tax, employer superannuation contribution tax, and other similar tax rates that are designed to tax employment income at personal rates are increased to 39%
- c. **Timing of tax revenue.** The estimates do not show potential fluctuations in the timing of tax revenue because of a tax change.
- d. **Macroeconomic effects.** The revenue estimates do not include wider macroeconomic impacts of a higher top personal rate.

Our revenue estimate also includes a behavioural assumptions that high-income taxpayers reduce their taxable income subject to a new top personal tax rate. This is through them either reducing their total taxable income (i.e. reducing the amount they work or save in New Zealand, or potentially evading their tax obligations), or restructuring (i.e. moving their income so that it is earned through companies).

Figure X shows a range of potential revenue estimates with different assumptions regarding these behavioural assumptions.

These revenue estimates are highly uncertain. This is because:

- The revenue estimates are sensitive to behavioural assumptions. There is significant uncertainty in these assumptions. With easy opportunities for avoidance, revenue could be significantly less than forecast.
- The full impact of Covid-19 on the income distribution is not yet clear.

This creates a risk that revenue could be higher or lower than expected.

References

- Alinaghi, N., Creedy, J., & Gemmell, N. (2019, December). Estimating elasticities of taxable income and adjustment costs from tax kink bunching: Evidence from register data for New Zealand. *Working Papers in Public Finance 08/2019*. Chair in Public Finance, Victoria University of Wellington.
- Alinaghi, N., Creedy, J., & Gemmell, N. (2020, March). Do Couples Bunch More? Evidence from Partnered and Single Taxpayers in New Zealand. *Working Papers in public Finance 02/2020*. Chair in Public Finance, Victoria University of Wellington.
- Carey, S., Creedy, J., Gemmell, N., & Teng, J. (2015). Estimating the Elasticity of Taxable Income in New Zealand. *Economic Record Vol 91 No. 292*, 54-78.
- Claus, I., Creedy, J., & Teng, J. (2012, August). The Elasticity of Taxable Income in New Zealand. *New Zealand Treasury Working Paper 12/03*. New Zealand Treasury.
- Gemmell, N. (2020, May). New Zealand's Tax Reforms and 'Tax Sheltering' behaviour. *Working Papers in Public Finance 03/2020*. Victoria University of Wellington.

Review of: Behavioural Assumptions for Top [Personal Income Tax] Rate Costings

John Creedy

This review comments on the arguments set out in the Treasury paper, ‘Behavioural assumptions for top rate costings’, to justify the assumptions regarding the elasticity of taxable income (ETI) which are made in tax revenue modelling. The main questions raised in the Treasury paper concern a possible need to update ETI values used in previous revenue modelling, and whether ETI assumptions need to be varied according to the extent of misalignment with Trust and corporate tax rates.

The Treasury paper is concerned exclusively with the ETI used in revenue modelling. It excludes discussion of welfare effects, or associated literature on ‘optimal taxation’ which uses the ETI. Hence these are not mentioned in this review.

My view is that the Treasury paper generally makes well-considered judgements, and quite properly considers the implications of a range of assumptions. I commend the authors for their work. However, I take a somewhat different view – while recognising that judgement is largely involved – regarding two points. First, I attach slightly more weight to the more recent ETI estimates. Second, I believe that it is necessary to allow for the ETI to vary, depending on the extent of misalignment with Trust and corporate rates and the direction of past and prospective tax rate changes. These questions are discussed further below.

Comments on ETI Estimates

An important feature of the Treasury paper is that it recognises the crucial point that the ETI is not a ‘fixed parameter’, but depends on characteristics of the tax structure, such as rate alignment regarding different forms of taxable income, and tax administration, such as the ease of incorporation and the costs of setting up trusts. Indeed, it is necessary to make judgements regarding likely behavioural responses in changing conditions regarding these other factors. Given the ‘reduced form’ nature of the ETI, estimation does not deal explicitly with these other features of the tax structure, so there are unfortunately no relevant direct empirical results on which to draw.

Reference is made to a series of papers: Claus et al. (2012), Carey et al. (2005), Creedy et al. (2018) and Alinaghi et al. (2019, 2020). It may be useful to indicate here that the first three papers use a special IRD dataset based on a small sample of taxpayers, with limited information about their characteristics. The last two papers use a very much larger IRD dataset, covering a longer time period, and with more information about taxpayers (in particular, the last paper is able to separate single individuals from those in couples). The first paper uses information about changes in income shares, and also difference-in-difference methods, to look at the 2001 tax reform. The second two papers use regression methods (involving instrumental variable estimation) to estimate ETIs, again for the 2001 tax reform. The latter one of these tests whether income effects (assumed to be zero in the vast majority of literature) are significant, and finds that they are not. The final two papers, using the much larger dataset, use 'bunching estimators' which are based on the clear tendency for taxpayers to bunch around income tax thresholds. This method makes it possible to produce estimates for each year for which data are available, and for several tax thresholds. Each of the methods has important limitations (involving assumptions about 'control groups', appropriate 'instruments', and counterfactual distributions). All the 'point' estimates come with estimates of standard errors, enabling confidence intervals to be constructed.

The results of these studies are briefly summarised in the Treasury paper, and despite the different methods and time periods, it is seen that there is broad consistency between them. Furthermore, variations over the time period are not substantial, but do exist. It is worth stressing that the last study (Alinaghi et al. (2020)) found that the separate treatment of couples turns out to be important, and produced somewhat higher ETIs in a number of cases. And the results are obtained for much larger sample sizes. Finally, the more recent work found (based on variations over time in the degree of bunching following rate changes) that 'adjustment costs' appear to play a part, so that long-run elasticities exceed the short-term responses which are characteristic of the earlier papers.

For these reasons, I am tempted to attach a little more weight to the more recent estimates. This view differs somewhat from the Treasury paper (p. 7), which suggests that 'it isn't clear that the more recent estimates are necessarily more accurate', and for this reason 'it may be better to leave the behavioural estimates as they were in 1919'. A further consideration concerns the level of aggregation used in the revenue projection model used by Treasury (and whether the model can conveniently handle individuals in couples as distinct from single individuals). Here, I see that (p. 7) the model is (understandably) based on types of taxable

income, rather than types of taxpayer. So, I can appreciate that, in the limited time available to Treasury modellers, it may not be possible to allow for further disaggregation.

Comments on Alignment and the ETI

In the middle of page 4, it is suggested that as Trust and top personal tax rates became more closely aligned, there was no simultaneous reduction in estimated ETI values.¹ I suggest that this does not provide indirect evidence that alignment does not influence ETIs. Evidence has shown that the introduction of the higher top marginal rate in 2001 did generate a considerable increase in the use of trusts, and increased incorporation.² Importantly, these effects were probably not reversed when the top personal rate was subsequently reduced and the degree of misalignment of rates consequently fell. For example, Trusts set up in response to the 2001 tax changes continued in existence. It is certainly not easy to predict what would happen in response to an increase in the near future, but the nature of any associated misalignment must be a crucial part of the debate. The 2010 Tax Working Group (chaired by Prof Bob Buckle) also emphasised this problem.

In view of the importance of the likely non-reversible changes mentioned above, I think that the approach discussed (in the bullet point at the top of p. 5 of the Treasury paper) is not necessarily inconsistent with the literature. It is a shame that, as mentioned above, it has not been possible to estimate ETIs in a specification that also includes misalignment (and allows for asymmetry depending on the direction of changes). But I think it is dangerous to assume that the problem is not significant. Because of non-reversible effects, non-falling (or slightly increasing) ETIs during a time when rates were more closely aligned does not necessarily suggest that increasing misalignment again will not have a substantial effect.

Some More Detailed Points

Regarding the formula given on p. 2 of the Treasury paper, I think it would be clearer to start with the basic definition of the ETI, so that it is also clear that the relevant change is the net-of-tax rate. Then the formula given (and repeated unnecessarily on the next page) follows from the definition. Furthermore, a minus sign is missing from the left-hand side, since the

¹ The same page refers to 2012-17 estimates as being both 'slightly higher' and 'broadly similar' compared with earlier ETI estimates: I suppose it could be argued that these are not inconsistent statements, but they may confuse.

² A related point is that European researchers reported substantial increases in corporate tax revenue over a period when corporate tax rates were declining. This was not regarded as a paradox, but was generally attributed to the increase in misalignment as corporate rates were reduced, with unchanged personal tax rates.

change in taxable income is negative. The term, 'behavioural response' is too vague, as it is a proportional change in taxable income that is relevant.

It should be recognised that the formula given in the paper for the change in taxable income is an approximation only, since it strictly applies only to very small tax rate changes. In practice, it is safer to rely on the fact that the ETI is explicitly linked to a double-log relationship between taxable income and the net-of-tax rate.³ The approximation for proportional changes may look quite good in isolation, but when dealing with total taxable incomes of the order of many millions of dollars, there can be a sizeable understatement in the total loss of taxable income, and hence revenue, resulting from a tax rate change.

On a further minor point, the expression, $0.34-0.33/0.67*0.22$, omits crucial brackets and should actually read $((0.34-0.33)/0.67)*0.22$.

Final Comments

Apart from the qualifications I've made above, I think the Treasury report is very useful. However, I have pointed out two aspects where I take a slightly different view. First, I attach more weight to the more recent ETI estimates, which allow for more heterogeneity and, in particular, highlight the higher ETIs for couples (particularly those with some non-wage income). Second, I believe that unchanged, or slightly increasing, estimates obtained during a period of increasing rate alignment, following an earlier reform which introduced substantial misalignment, does *not* provide evidence that alignment has a small role in determining the ETI. This is because of the non-reversible nature of changes made in response to the earlier large top-rate increase.

Finally, the Treasury report makes a brief comment on p. 5 about uncertainties. These are indeed very important. I know it is a challenge to communicate these uncertainties, but they are a crucial part of 'the story' and, in my view, do need to be stressed.

³ If x is the proportional change in the net-of-tax rate, and eta is the ETI, it can be shown that the proportional change in taxable income is given by $(1+x)^{eta} - 1$.

From: Felicity Barker [TSY]
Sent: Tuesday, 27 October 2020 9:08 am
To: Jessica Rowe [TSY]; Shane Domican [TSY]; ^IRD: Phil Whittington; Paul Quirke [TSY]; Daniel White [TSY]
Subject: FW: Creedy ETI e-mail

From: John Creedy <john.creedy@vuw.ac.nz>
Sent: Tuesday, 27 October 2020 7:57 am
To: Felicity Barker [TSY] <Felicity.Barker@treasury.govt.nz>
Subject: RE: Creedy ETI e-mail

Felicity

Perhaps I can give you a fairly succinct response.

Taking your second point first, I would say that if the trust and other rates are increased to maintain alignment, you could use the ETIs from our 'bunching' estimates.

Your first point is much more difficult. As I mentioned in my review, in view of the nature of the ETI (there is no 'structural modelling' involved), there is no direct evidence on the effects of misalignment on which to draw (or evidence looking at personal tax changes under different alignment regimes). With Trust and other rates held constant, I would certainly increase substantially the value of ETI used, but I'm afraid I can't offer evidence to help locate a precise amount.

Several things are clear.

Last time (2001) the top rate was increased with misalignment, two things took place. First, (just like the present case) the rate change was announced/anticipated ahead of implementation, and the evidence showed that a lot of income was brought forward, to avoid the increase (as discussed in the Claus et al paper). I am sure that this will happen again. Second, as mentioned before, there was a great increase in Trusts and incorporation. Again, I'm sure all the tax lawyers around NZ are licking their lips at all the easy consulting fees coming their way. (Just look at all the activity on their web sites when the changes to Trust laws were announced not long ago). And as before, these are unlikely to be reversed.

I think it is also important to recognise that there are strong equity considerations here. Since the burden of the higher tax will be borne by those whose income is nearly all in the form of wages/salaries (we know that not many of the really wealthy even pay tax at the current top rate), such a tax increase has strong horizontal inequity properties.

The discussion has so far been around Trusts and incorporation. But it is important to recognise that those who obtain most of their income in non-wage/salary form are often easily able to convert that income to capital gains. And of course, in NZ very few capital gains are taxed. I know this is a sensitive issue, but we can be sure that there will be perfectly legitimate increases in this type of tax planning.

While I think we are not currently at the 'revenue maximising top tax rate' (still on the 'left hand side' of the Laffer curve, though I'd need to look back at papers Norman Gemmill and I have written on this) I

think the revenue increase is likely to be very much less than expected from a purely 'mechanical' view (assuming no behavioural changes). And importantly, although such an increase in the top rate may be 'sold' on (spurious) vertical equity grounds (since there is in fact very little mileage there), there are serious horizontal inequity considerations.

I'm not sure how much these thoughts help you, but I'm happy for you to pass them on to Tsy colleagues.

John

From: Felicity Barker [TSY] <Felicity.Barker@treasury.govt.nz>
Sent: Friday, 23 October 2020 4:33 PM
To: John Creedy <john.creedy@vuw.ac.nz>
Subject: RE: Creedy ETI e-mail

Hi John

Thank you for your thoughtful paper. We've been reflecting on the paper and its implications for how we do our revenue forecasts.

One of the key challenges you raised for us is that the ETI should vary depending on the extent of misalignment with the trust and corporate rate.

We agree with your key point that the extent of misalignment is likely a material influence on the ETI. We will be emphasising this in our advice and intend to illustrate the uncertainty around fiscal estimates using sensitivity analysis. The key challenge for us is about how we would apply this insight to Budget fiscal forecasts given we are not aware of any empirical evidence on the relationship between the ETI and degree of misalignment. We will need a sound methodology/evidence base for the assumptions used in Budget forecasts.

We were wondering if you could provide your advice on the following:

- Based on the evidence, what would be your recommendation for the ETI for non-salary and wage earners in the situation where the personal rate of 39% applies above \$180,000 and the trust rate remains at 33%, and the PIE and company rate and 28%;
- What methodology or evidence base would you recommend we use to vary our ETI assumptions when faced with different potential changes to trust, company, or PIE settings? (for example if the trust and PIE rate were increased to 39% for income above \$180,000)

If you would be able to provide us your further advice we can activate a contract amendment. We would however ideally like this advice by Friday 30 October.

Could you let me know if you could assist further

Kind regards

fliss

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Reviewing our ETI assumptions as a result of Professor Creedy's review

Summary

This note outlines our proposed adjustment of the behavioural assumption we use for estimating the revenue from a higher top personal rate.

We propose changing the 'elasticity of taxable income' (ETI) assumption as follows:

- *For non-wage income.* Increasing the ETI from 2.5 to 3
- *For wage income.* Decreasing the ETI from 0.2 to 0.1

These revised assumptions follow a review of our ETI assumptions by Professor John Creedy.

Context

In order to estimate the revenue from a 39% top personal rate at \$180,000 we need to make behavioural assumptions. The key behavioural assumption is how much individuals reduce the income they earn that is subject to a higher top personal rate.

The behavioural assumption for non-wage income is particularly important as there is significantly greater opportunities to avoid higher personal rates on non-wage incomes through the use of companies, trusts and PIEs.

For our costing of a 39% top personal rate, we are currently using estimates of the elasticity of taxable income (ETI) in the NZ literature¹. The ETI is an estimate of how much taxable income changes in response to a change in a tax rate. From this evidence we have used an elasticity of:

- 2.5 for non-wage income
- 0.2 for wage income

This effectively assumes that increasing the top personal rate to 39% decreases non-wage income subject to the top rate by approximately 22% and wage income subject to the top rate by approximately 2%

These ETI assumptions materially changes our revenue estimates. For example, doubling the ETI for non-wage income from 2.5 to 5 decreases forecast revenue from approximately \$450m to \$185m per annum.

¹ (Carey, Creedy, Gemmell, & Teng, 2015), (Alinaghi, Creedy, & Gemmell, 2019) and (Alinaghi, Creedy, & Gemmell, 2020)

Creedys review

We commissioned Professor John Creedy to review our ETI assumptions. Two of his recommendations were that:

1. We should change the ETIs for non-wage income in response to greater misalignment between the top personal rate and trustee rate
2. We should place greater weight on later academic papers in making our ETI assumptions

These are considered in turn below

Recommendation 1. Increasing non-wage income elasticity

Creedy concluded that:

- The ETI will change depending on the mix of company and trust rates accompanying a higher top personal rate. The ETI will be higher if there are opportunities to avoid higher personal rates through the use of companies and trusts
- If we are forecasting the revenue from a higher top personal rate with no change to the trustee or company rate then we should 'substantially' increase the value of the ETI we use for non-wage income (above the 2.5 we are currently assuming).
- However, Creedy noted that he had no evidence to help determine what this higher ETI should be

Creedys rationale

The key challenge from Creedy is on how we interpret the ETI evidence in New Zealand. In particular the NZ evidence indicates that the ETI for self-employed individuals was:

- 2000-2008: 0.831 (when there was misalignment in the trustee and top personal rate)
- 2012-17: 1.040 (when the trustee and top personal rate was aligned)

Note: these are different to the 2.5/0.2 elasticities listed above as the 2.5/0.2 are applied to different types of income rather than particular taxpayers. The two approaches are consistent and lead to similar results.

Creedy suggests that the fact that the ETI did not decrease when there was alignment between the top personal rate and trustee rate does not mean it did not have any impact on the ETI.

I have summarised the rationale for Creedys view in the logic chain below. This is paraphrased for clarity:

1. The tax changes in 2000 caused a substantial increase in the ETI. Taxpayers utilised entities such as trusts and companies to avoid higher personal rates

2. There are adjustment costs for taxpayers in using these structures to avoid higher personal rates. The long-run ETI is likely to be higher than the short-run as taxpayers overcome these costs
3. Post 2010 there was less incentive to use these structures due to alignment between the top personal rate and the trustee rate.
4. However, many taxpayers will have already incurred the adjustment costs in setting up structures to avoid higher personal rates. They are likely to be continuing to use these structures to avoid higher personal rates over 2012-17 which is a likely explanatory factor for the similar ETIs across 2000-08 and 2012-17
5. If we return to a misaligned tax structure, we will likely see increased behaviour to avoid higher personal rates and consequentially we should assume a higher ETI.

Evaluating this

Creedy notes that his views rely on judgement and that there is no direct evidence on the effects of misalignment on ETIs which to draw from.

In particular I would note that the further we move down the 5 point logic chain above the more judgement is required. Points 1-3 have evidence to back them up across empirical papers ((Alinaghi, Creedy, & Gemmell, 2019), (Chetty, Friedman, Olsen, & Pistaferri, 2011)). However points 4-5 rely on a judgement and interpretation of the ETI results in NZ.

As a result an evaluation of this will rely on judgement. There are alternative explanations that could also fit the empirical evidence we have. For example, it could be that the 2010 changes caused a material fall in ETIs, but this was matched by some other factor that increased ETIs. Alternatively the 2010 reform may not have had a material impact on ETIs which would also fit the evidence.

There is little evidence to support or reject any of these hypothesis. One trace of evidence supporting Creedy's judgement is that (Alinaghi, Creedy, & Gemmell, 2019) found that in 2017 there was still some bunching of incomes at \$60,000 (which was the previous top personal threshold). This indicates that adjusting behaviour to avoid higher personal rates can take considerable time. This is particularly striking in this situation as these individuals will have already set up structures to avoid the top personal rate and I would expect adjusting them to the new threshold would likely have relatively small costs.

However, there are other traces of evidence that could go the other direction. For example, the logic chain would suggest that ETIs should be rising over 2000-08² as taxpayers overcome adjustment costs. However, (Alinaghi, Creedy, & Gemmell, 2019) indicate the opposite with slightly falling ETIs over this period. However, both of these

² The expected impact over 12-17 is less clear as there would be competing effects as ETIs increase as taxpayers move bunching from \$60k to \$70k but also ETIs may be falling as taxpayers have ceased or slowed down creating new structures to avoid higher personal rates.

traces of evidence are relatively weak evidence. Neither directly addresses the hypotheses and can be subsumed by expected volatility in year by year ETI estimates and the margins of error involved.

As a result, our position will rely on our judgement and whether we agree with Creedys interpretation of the evidence. In my view the logic chain from Creedy is internally coherent. It implies that ETIs may have risen over 2000-2008 as taxpayers overcome adjustment costs. The 2010 reforms halted or reduced this rising ETI. If we move back to a situation similar to 2000-2008 we may see a similar increase in tax planning behaviour as 2000-08 resulting in a higher ETI still.

The view is also consistent with the view expressed by the private sector and those in Inland Revenue and Treasury working on integrity measures that misalignment in the trust and personal rate will likely increase the use of tax planning behaviour.

Changing the non-wage ETI assumption

This leaves us with two options:

1. Leave the current ETI estimate at 2.5
2. Increase the ETI estimate above 2.5 (which will require us making a judgement on what to increase it to)

Tradeoffs

When making revenue forecasts we should aim to have our assumptions be transparent, defensible and be our best judgement on what is likely to be the actual revenue in practice.

Both options have risks across these. The primary risk is about how defensible our assumption is, given that Creedy is advising us to increase the ETI we use, but we have no evidence for choosing how much to increase the ETI by.

Option	Reasons to use this option	Reasons not to
Keep ETI at 2.5	<ul style="list-style-type: none"> • This option provides a basis for our <i>precise</i> ETI assumption from. As a result it does not require us coming up with a new number. • Is a transparent option with a clear rationale for the specific number we choose • Our ETI estimate is already relatively high compared with what other countries use³. This option would not push this difference out further 	<ul style="list-style-type: none"> • This option means we are relying on estimates from a paper which the author has recommended we depart from • This option will create an inconsistency in our advice. We will be advising that trustee rate alignment is highly important to reduce avoidance, but will not reflect this in our fiscal estimates
Increase the ETI above 2.5	<ul style="list-style-type: none"> • This will bring us in line with the recommendations of Professor Creedy. Given he is the author of the empirical papers we are relying on and is the NZ expert on the issue, his view should be given strong weight. • Increasing the ETI will be more consistent with our overall advice on the trustee rate. Our advice is that misalignment between the trustee and personal rate will provide greater avoidance pressures. 	<ul style="list-style-type: none"> • This will require us to come up with a new number. There is no evidence that we or Professor Creedy are aware of to inform what this number should be (other than it should be larger than 2.5) • This will make our ETI assumption quite high and increase the gap with the approach in most other countries.

³ For example, this appears to be more than double what AU, CA and UK assume, which is reflective of the fact that NZ evidence indicates higher ETIs for the top rate in NZ. T

Conclusion

Given Creedys strong comments and the weight I think we should put on them, it seems more defensible to increase the ETI beyond our 2.5 estimate. The empirical papers seem to provide us with a less defensible rationale for our numbers when the author of the papers is advising us to depart from them.

Increasing the ETI beyond 2.5 will come with risks. It will require us to come up with a new number without a solid empirical basis for the precise number we choose and will make our ETI assumption increasingly larger than what our main comparator countries assume.

Overall I would suggest increasing the ETI from 2.5 to 3. This results in us increasing it in line with Creedys recommendation but does so in a conservative manner.

Regardless of which option we choose, this increases the need for us to highlight the uncertainty in our estimates and make clear that there is significant risk that revenue will be different to forecast.

The table below provides an initial indication of how revenue from a higher top rate could differ with higher elasticities⁴.

Elasticity	2.5	3	3.5	4	4.5	5
Revenue (approx. \$m, p.a)	450	400	350	290	240	190

⁴These will likely overstate the impact as accompanying a higher elasticity we would need to change our assumption about the proportion shifted to other entities. This will reflect that any higher elasticity assumption would be primarily driven by our view that it is due to avoidance rather than real responses.

Recommendation 2. Rely more on more recent papers

Creedys Rationale

In his review, Professor Creedy suggested that he puts a little more weight on the ETI estimates in the later papers (Alinaghi, Creedy, & Gemmell, 2019) (the 2019 paper) and (Alinaghi, Creedy, & Gemmell, 2020). This was because the later papers use larger datasets and cover a longer time period and so can cover long-run elasticities (which will likely be larger due to adjustment costs).

How different are the ETIs in the respective papers?

The table below shows the ETIs in these papers. This indicates broadly similar ETIs for the self-employed across the studies with:

- 2015 paper: ETI of 0.909 (2001-08)
- 2019 paper: ETI of 0.831 (2001-08) and 1.040 (2012-17)

For wage earners the ETI is different:

- 2015 paper: ETI of 0.190 (2001-08)
- 2019 paper: ETI of 0.06 (2001-08 and 2012-17)

As a result, for self-employed individuals the later papers do not have a significant difference. For wage earners the difference is similar in absolute terms, but relatively larger as a percentage of the total.

Conclusion

The results provide a case for decreasing our ETI assumption for wage earners. We are using 1 decimal place for all our estimates so recommend decreasing the wage ETI to 0.1. This is also the midpoint of the results across the ETI studies which Creedy has noted range from 0-0.2.

This change has relatively small impacts on the revenue forecast with revenue decreasing by approximately \$20m per annum.