INLAND REVENUE LONG-TERM INSIGHTS BRIEFING

# Analytical note 1 – Tax treatment of risk and lock-in

# Section 1: Risk and taxes: Taxes on economic income vs taxes on consumption

Different taxes on capital income can affect the returns taxpayers receive from investing in risky assets. In Section 1 of this Analytical Note, we discuss how different tax bases are likely to affect incentives to invest in risky assets.

To analyse risk and uncertainty, we suppose, as in the examples considered in Chapter 2, that there is a risk-free rate of return of 4%. However, we now assume that people can also invest in risky assets, and these generate a higher expected rate of return to compensate for risk.[1]

Initially we assume that there are no economic rents and consider the effects of either a general income tax (GIT) or a consumption tax (CT) in this case. Then we consider the possibility of both risk and economic rents and once more consider the effects of either a GIT or a CT in this context.

**Risk but no economic rents**

Suppose $10,000 is invested in a risk-free asset at the end of year 0 and this earns risk-free revenue of $400 in year 1. In the absence of tax, the investor would have $10,400 at the end of year 1. Now suppose that if the $10,000 is invested in a risky investment instead, it has a 50% chance of earning $3,000 ($2,600 more) and a 50% chance of earning -$1,000 ($1,400 less) a year later. This means the investor has an expected return to risk of $600 (.5*$2,600 + .5*-$1,400) at the end of year 1. The expected total return is $1,000 or 10%. We assume that the 6% premium on this asset relative to the riskless asset is just sufficient to compensate for the riskiness of the investment.

Weisbach (2004) suggests thinking of investment in a risky asset as a two-step process. The first step is for the investor to undertake a riskless investment, which we can think of as investing $10,000 in year 0 to obtain a certain $10,400 in year 1. The second step is to then use the $10,400 of wealth in year 1 to undertake a gamble, which involves a gain of $2,600 (so $3,000 of total income) in the good state of the world and a loss of $1,400 (so a net loss of $1,000) in the bad state of the world. The 4% riskless return compensates the investor for the time value of deferring consumption and the 6% risk premium compensates for accepting a risky rather than a riskless return. The gamble involves a gain in expected income of $600 but this just compensates investors for the risk they are taking on.

If there were these two types of assets available in the economy and people could choose as much of the two assets as they wanted to acquire, we might expect that peoples' portfolios of the two assets would differ according to the amount of risk they are willing to accept but that everyone's portfolio would be chosen to make them as well off as possible given their risk preferences. Investors holding both types of assets would, at the margin, be indifferent between the two types of investment.

[1] This discussion draws heavily on material from Weisbach (2004) and McLeod (2001a).

### *GIT at flat rate with full loss offsets*

Suppose a 20% GIT is introduced. This taxes capital income comprehensively. Also suppose that there are full loss offsets as would be required under a benchmark comprehensive tax on economic income. This would require any losses that could not be immediately offset against other income to be cashed out.

We assume that $10,000 is invested in year 0 in either a risk-free or a risky investment. This requires the taxpayer to forgo consumption of $10,000 in year 0. The outcome in the good state, the bad state, and on average is recorded in Table 1 below.

If the $10,000 is invested in the riskless asset, income of $400 is earned in year 1 and tax of $80 is paid. This leaves $320 of after-tax income that, together with the initial investment, finances $10,320 of consumption in year 1. This asset is riskless, so this happens in both the good state and the bad state of the world.

If instead the $10,000 is invested in a risky asset, outcomes vary. With a general tax on economic income, in the good state of the world $3,000 is earned, $600 is paid in tax and $2,400 is earned after tax. The taxpayer is better off by $2,600 before tax and by $2,080 after tax compared to what would have happened if they had invested in the riskless asset. In the bad state of the world a pre-tax loss of $1,000 and an after-tax loss of $800 are incurred. The taxpayer is worse off by $1,400 before tax and $1,120 after tax than they would have been if they had invested in the riskless asset.

**Table 1: GIT at flat rate with full loss offsets – riskless and risky investments**

| | **Good state** | **Bad state** | **Expected** |
|---|---|---|---|
| Investment year 0 | 10,000 | 10,000 | 10,000 |
| Forgone consumption year 0 | **10,000** | **10,000** | **10,000** |
| | | | |
| Risk-free investment | | | |
| Capital income year 1 | 400 | 400 | 400 |
| Less GIT year 1 | 80 | 80 | 80 |
| After-tax income year 1 | 320 | 320 | 320 |
| Consumption year 1 | **10,320** | **10,320** | **10,320** |
| | | | |
| Risky investment | | | |
| Capital income year 1 | 3,000 | -1,000 | 1,000 |
| Less GIT year 1 | 600 | -200 | 200 |
| After-tax income year 1 | 2,400 | -800 | 800 |
| Consumption year 1 | **12,400** | **9,200** | **10,800** |
| | | | |
| Gains from gamble | | | |
| Pre-tax | 2,600 | -1,400 | 600 |
| Tax | 520 | -280 | 120 |
| After tax | 2,080 | -1,120 | 480 |

The risk-free investment and the risk-free component of the risky investment are both being taxed. At first glance, it might appear that a burdensome tax is being imposed on the risk component of the risky investment. The expected return is $1,000 and an expected $200 is being generated in tax revenue. Of this tax $80 is tax on the $400 risk-free component of the return and an expected $120 is being levied on the risk component of the return of $600.

However, as writers in the taxation and risk literature have pointed out, if the tax on capital income operates symmetrically so there are full loss offsets, the government is effectively becoming a partner in sharing risk with the investor. In good states of the world, the government benefits from $520 or 20% of the $2,600 gain from the gamble. In bad states of the world the government picks up $280 or 20% of the cost of the gamble.[2] While investors lose 20% of the expected return from an investment, they are also only bearing 80% of the pre-tax risk. The government is not only taking 20% of the premium required to compensate taxpayers for risk but also absorbing 20% of the risk. Thus, this sort of tax should not discourage risk taking.

***GIT with progressive marginal rates or less than full loss offsets***

In practice, taxpayers are taxed at progressive marginal rates and there are imperfect loss offsets. Progressive marginal rates can mean that a taxpayer is taxed more heavily on risky investments than on less risky investments. For example, suppose that taxpayer A earns $180,000 each year while taxpayer B earns $280,000 half the time and $80,000 the other half. Half the time B will be earning $100,000 more than A and paying $39,000 more tax. The other half of the time B will be earning $100,000 less and paying $33,000 less tax. B will be paying $3,000 more tax on average, which discourages risk taking. There will, however, often be ways of mitigating this asymmetry, for example, by earning business income through an entity such as a company.

A bigger issue is that for taxpayers making a loss, the government will not cash out the loss. Instead, losses can be carried forward but without interest and set off against profits in the future. This is a way of the government guarding against specious loss claims, but it will have the downside of discouraging firms from undertaking risky investments. This could possibly be mitigated if losses were carried forward with interest.

***CT with flat tax rate and full loss offsets***

Now consider a 20% tax on gross consumption expenditure and consider investment of $10,000 in year 0. This requires forgoing $8,000 of consumption in the initial year. This could either be through a direct expenditure tax (DET) at a flat rate of 20% with full loss offsets or through an indirect tax on consumption like New Zealand's GST.[3] Under a DET a taxpayer who invests $10,000 could immediately deduct this sum, so tax would fall by $2,000. This tax saving together with forgone consumption of $8,000 would finance the investment. Under a GST, the investment would

2 References include Gordon (1985), Kaplow (1994), Zodrow (1995), Weisbach (2004) and Bankman and Weisbach (2006). In the New Zealand context, these issues are discussed in McLeod (2001a, Annex A) in the context of the risk-free return method (RFRM) tax suggested by the McLeod Review for certain assets.

3 Note that with an indirect tax on consumption, the level of tax paid does not depend on the consumer's individual circumstances. A loss in a bad state of the world will automatically feed into a reduction in the amount that the consumer will have available to spend, which will tend to lower tax collections without any need for loss offset provisions.

also be financed in part by $8,000 of forgone consumption as well as tax relief of $2,000 (when the tax relief is that which arises because the $10,000 is invested rather than consumed).

Like a tax on economic income, a consumption tax involves the government risk sharing with taxpayers. This is outlined in Table 2 below.

If the $10,000 were invested in a riskless asset in year 0, this would generate capital income of $400, which would allow $10,400 of gross consumption spending. This would lead to $2,080 of CT and $8,320 of net consumption spending in year 1.

Instead, if the taxpayer invested in a risky asset with the same returns as above, they would earn $3,000 and have a pre-tax accumulation of $13,000 in year 1 in the good state of the world. If this were spent on consumption, this would result in $2,600 of consumption tax and $10,400 of net consumption. In the bad state of the world, there would be a loss of $1,000 leading to $9,000 of gross spending and $7,200 of net consumption.

**Table 2: CT at flat rate with full loss offsets – riskless and risky investment**

| | **Good state** | **Bad state** | **Expected** |
|---|---|---|---|
| Investment year 0 | 10,000 | 10,000 | 10,000 |
| Forgone consumption year 0 | **8,000** | **8,000** | **8,000** |
| | | | |
| Risk-free investment | | | |
| Capital income year 1 | 400 | 400 | 400 |
| Less CT year 1 | 2,080 | 2,080 | 2,080 |
| Net consumption year 1 | **8,320** | **8,320** | **8,320** |
| | | | |
| Risky investment | | | |
| Capital income year 1 | 3,000 | -1,000 | 1,000 |
| Less CT year 1 | 2,600 | 1,800 | 2,200 |
| Net consumption year 1 | **10,400** | **7,200** | **8,800** |
| | | | |
| Gains from gamble | | | |
| Pre-tax | 2,600 | -1,400 | 600 |
| Tax | 520 | -280 | 120 |
| After tax | 2,080 | -1,120 | 480 |

The gains and losses from the gamble end up being exactly the same as under the flat rate general income tax with full loss offsets (the bottom three rows of Table 1 and 2 are identical). So, just like with the flat rate general income tax with full loss offset, the government is sharing in risk rather than imposing a burdensome tax on risk.

The key difference between the flat rate full loss offset general income tax and the consumption tax is that the former imposes a tax on the risk-free return whereas the latter does not. Sharing of risk with the government occurs with both of these taxes.

***CT with progressive marginal rates or less than full loss offsets***

We have talked about two different types of CT, a direct expenditure tax, DET, and an indirect consumption tax such as GST. Under a DET, there can be progressive marginal tax rates and less than full loss offsets. This would lead to a DET discouraging risk taking for the same reasons that a GIT with progressive marginal rates or less than full loss offsets discourages risk taking.

However, a CT such as New Zealand's GST is unlikely to create the same issues. First, the GST is not levied at progressive marginal rates. Second, a reduction in income automatically flows through to a loss in spending power of consumers. The GST does not give rise to concerns about a lack of full loss offsets.

***Other tax bases***

In Chapter 2 we discussed a tax on labour income (LIT) and a GIT with a rate of return allowance (RRA). To avoid needless repetition, we do not work through numerical examples for these two other cases.

It should be clear that with a labour income tax, there is no tax on capital income at all so there can be no tax on excess returns from risk taking. The only difference between a GIT and a general income tax with a rate of return allowance (GITR) is that the latter allows a fixed extra deduction of the amount invested multiplied by the risk-free rate of return (4%). Just like a 20% GIT, a 20% GITR, would tax excess returns from risk taking and in so doing be getting the government to become a 20% partner with the taxpayer in sharing risk. Just like the GIT, a GITR with progressive rates and less than full loss offsets would discourage risk taking.

**Economic rents as well as risk**

It is straightforward to extend this analysis to consider the possibility of economic rents as well as risk. As was discussed in Chapter 2, economic rents would be taxed under a GIT, CT or GITR but not under an LIT. This carries forward to the case where there is risk as well as economic rents.

For completeness, we consider the possibility that some taxpayers can earn $600 of economic rents and in both states of the world earn $600 more than in the cases just discussed when there were no economic rents. With both a GIT and a CT, the government ends up taxing 20% of the economic rents. It ends up that the government would collect $120 more tax in both the good state of the world and the bad state of the world if $600 of economic rents is earned and taxpayers end up with the remaining $480.

Table 3 examines the effects of a GIT. Capital income, tax, after-tax income and consumption are shown first for the risky investment with no economic rents. These figures are the same as those provided in Table 1. Table 4 examines the effect of a CT for the same example. The no rents case is the same as Table 2.

Tables 3 and 4 also show the outcome if there are economic rents of $600, which is assumed to increase capital income in both the good state and bad state by $600. Relative to the case with no economic rents, pre-tax capital income increases by $600, after-tax income increases by $480, and tax increases by $120 in both the good and bad state under both the GIT and CT.

Therefore, the government is taxing economic rents in both the good and bad state under either GIT or CT. But just as in the case where there are no economic rents, the government is acting as a partner with the taxpayer in sharing risk.

**Table 3: GIT or tax on capital income – risky investments with and without economic rents**

| | **Good state** | **Bad state** | **Expected** |
|---|---|---|---|
| Investment year 0 | 10,000 | 10,000 | 10,000 |
| Forgone consumption year 0 | **10,000** | **10,000** | **10,000** |
| | | | |
| Risky investment (no rents) | | | |
| Capital income year 1 | 3,000 | -1,000 | 1,000 |
| Less GIT year 1 | 600 | -200 | 200 |
| After-tax income year 1 | 2,400 | -800 | 800 |
| Consumption year 1 | **12,400** | **9,200** | **10,800** |
| | | | |
| Risky investment ($600 rents) | | | |
| Capital income year 1 | 3,600 | -400 | 1,600 |
| Less GIT year 1 | 720 | -80 | 320 |
| After-tax income year 1 | 2,880 | -320 | 1,280 |
| Consumption year 1 | **12,880** | **9,680** | **11,280** |
| | | | |
| Difference | | | |
| Consumption year 1 | 480 | 480 | 480 |
| GIT year 1 | 120 | 120 | 120 |

**Table 4: CT – risky investments with and without economic rents**

| | **Good state** | **Bad state** | **Expected** |
|---|---|---|---|
| Investment year 0 | 10,000 | 10,000 | 10,000 |
| Forgone consumption year 0 | **8,000** | **8,000** | **8,000** |
| | | | |
| Risky investment (no rents) | | | |
| Capital income year 1 | 3,000 | -1,000 | 1,000 |
| Less CT year 1 | 2,600 | 1,800 | 2,200 |
| Net consumption year 1 | **10,400** | **7,200** | **8,800** |
| | | | |
| Risky investment ($600 rents) | | | |
| Capital income year 1 | 3,600 | -400 | 1,600 |
| Less CT year 1 | 2,720 | 1,920 | 2,320 |
| Net consumption year 1 | **10,880** | **7,680** | **9,280** |
| | | | |
| Difference | | | |
| Consumption year 1 | 480 | 480 | 480 |
| CT year 1 | 120 | 120 | 120 |

**Overall conclusions**

The overall conclusions for the case with risk are:

- If there is a flat marginal tax rate and full loss offsets:
  - An LIT would tax labour income but not normal returns or economic rents and would not involve the government taxing excess returns from risk taking or sharing in risk.
  - A GIT would tax labour income, normal returns and economic rents. By taxing excess returns from risk taking the government would be sharing risk with taxpayers.
  - A CT and GITR would tax labour income and economic rents but not normal returns.[4] By taxing excess returns from risk taking the government would be sharing in risk with taxpayers.
  - The key difference between a GIT and either a CT or a GITR is that a GIT imposes a tax on normal returns whereas a CT or a GITR do not.
- If there are progressive marginal rates and/or if loss offsets are only partial and we have a GIT, GITR or CT, the government will tend to tax a greater share of gains over and above the risk-free rate than it is absorbing in losses. The government will be imposing a burdensome tax on risk. Also, progressive marginal rates or loss limitations will undermine the savings neutrality of a CT.

In this Analytical Note we have focused on one key proposition put forward by writers in the tax and risk literature. This is that if there is a flat marginal tax rate and full loss offsets, the real difference between a GIT and a CT is tax on the normal returns on capital income.

Another important argument that some writers in this literature have advanced is whether the government taxing excess returns from risk taking is unlikely to affect taxpayers in any way. This is because if the government moves from not taxing excess returns to taxing excess returns, taxpayers are likely to offset the effects of the government's risk sharing by acquiring riskier portfolios themselves. Once all portfolios adjust, there is unlikely to be any real change in the economy. While the government is likely to be gaining a revenue stream with a positive expected value, this revenue stream will be worthless. There does not appear to be much consensus on this second issue, which is discussed further in Section 2.

[4] Assuming a constant CT rate.

## Section 2: Risk and taxes and revenue impacts: A GIT compared with RFRM tax or wealth tax

It is sometimes argued that taxing excess returns from risk taking may make the tax system fairer. This is because (at least if full loss offsets were allowed), the tax system would levy tax on those who are lucky and do well on their investments and support those who are unlucky and do badly on their investments.

However, some writers in the tax and risk literature have argued that taxing these excess returns is self-defeating. If taxpayers are taxed on these excess returns, they will adjust their portfolios and, in the end, both taxpayers and the government are likely to end up in much the same position as if these returns had been untaxed. Therefore, taxes on excess returns to risk-taking are irrelevant. A consequence of this irrelevance would be that even though tax on excess returns would provide an expected stream of revenue for the government, the stream of revenue would be valueless and could not be used to finance cuts in other tax rates. We will refer to this as the "tax irrelevance proposition". It is discussed in McLeod (2001a) Appendix A and in Weisbach (2004).

Other authors have expressed reservations about this irrelevance proposition including Auerbach (2009) and Banks and Diamond (2010). In this Analytical Note we outline the basis for this proposition and discuss some reservations. We also discuss implications of the analysis for the risk-free return method (RFRM) tax that the McLeod Review (2001a) suggested as a possible replacement for a general tax on capital income in some cases.

**RFRM tax**

Switching to an RFRM tax would mean no longer taxing actual capital income and instead taxing only an imputed return. Taxable income would be wealth (or net equity) invested in the assets that are subject to the RFRM tax multiplied by a risk-free interest rate. For example, if $10,000 was invested and the risk-free rate of interest was 4%, the imputed income would be $400 ($10,000 multiplied by 0.04). This imputed income would be taxed at a taxpayer's marginal rate.

It should be clear that the RFRM tax is just levying a tax on the normal return, which is deductible under a GITR. An RFRM tax would levy no tax on labour income or on economic rents. It would not involve the government in sharing risk with a taxpayer.

**Switching from RFRM to comprehensive tax on capital income and the irrelevance proposition**

If there are no economic rents, by switching from an RFRM tax to a comprehensive tax on capital income we would be levying a tax on excess returns from risk taking. Therefore, the effects of taxing excess returns from risk taking may be analysed by considering a switch from an RFRM tax to a comprehensive tax on capital income.

Table 5 below shows income and tax paid for an investment in either riskless or risky investments under an RFRM tax and a GIT (with full loss offsets) when there are no economic rents. In the example we assume that there is no labour income so a GIT and a comprehensive tax on capital income are equivalent. We assume that $10,000 is invested in year 0 in either a riskless bond or a risky asset. The riskless bond earns a 4% interest rate. The risky investment earns income of $3,000

half the time and -$1,000 half the time so it generates expected income of $1,000. The higher return on the risky asset is just sufficient to compensate investors for the risk they are taking on. Once again, we assume a tax rate of 20%.

If $10,000 is invested in a riskless bond in year 0, income is $400 in year 1 and $80 is paid in tax irrespective of whether income is taxed under the RFRM tax or under the GIT. For the risky investment, tax would also be $80 under the RFRM tax. This tax would be levied irrespective of whether the asset earns $3,000 or generates a loss of $1,000. Under the GIT, tax would be $600 in the good state and -$200 in the bad state.

When discussing the effects of a GIT (flat rate, full loss offset) above, we noted that the government ended up sharing 20% of the risk of risky investments with taxpayers. The government gained an additional $520 of tax in the good state and lost $280 of revenue in the bad state relative to what would have happened if the taxpayer had invested in a riskless asset. This is just the difference in tax that is levied if we levy a GIT rather than an RFRM tax as is recorded in Table 5.

**Table 5: Income and taxes under RFRM tax and GIT – no economic rents**

| | **Good state** | **Bad state** | **Expected** |
|---|---|---|---|
| Investment year 0 | 10,000 | 10,000 | 10,000 |
| | | | |
| Risk-free investment (GIT/RFRM) | | | |
| Capital income year 1 | 400 | 400 | 400 |
| Less RFRM/GIT year 1 | 80 | 80 | 80 |
| After-tax income year 1 | 320 | 320 | 320 |
| | | | |
| Risky investment | | | |
| RFRM | | | |
| Capital income year 1 | 3,000 | -1,000 | 1,000 |
| Less RFRM year 1 | 80 | 80 | 80 |
| After-tax income year 1 | 2,920 | -1,080 | 920 |
| GIT | | | |
| Capital income year 1 | 3,000 | -1,000 | 1,000 |
| Less GIT year 1 | 600 | -200 | 200 |
| After-tax income year 1 | 2,400 | -800 | 800 |
| | | | |
| Difference (GIT – RFRM) | | | |
| Tax | 520 | -280 | 120 |
| After tax income year 1 | -520 | 280 | -120 |

Suppose that initially there is an RFRM tax in place with no sharing of risk and taxpayers have decided on the amount of wealth they want to have invested in riskless bonds and the amount they want invested in risky assets. Also suppose that a taxpayer had initially chosen to have $5,000 invested in risky assets and $5,000 in riskless bonds. Now suppose that the government switches to a GIT. It might be expected that the taxpayer would find that with the government sharing the risk on risky assets that they have too little invested in risky assets. With a 20% tax rate this can be

rectified by increasing their holdings of risky assets by 25% to $6,250 and running down their holdings of riskless assets to compensate. More generally, if the tax rate is *t*, taxpayers would want to increase their holdings of risky assets by the fraction *t/*(1-*t*).

The government may not necessarily want to restore its portfolio to exactly the same position as it was in when the RFRM tax was in place. But it can be argued that if it did want to do so, there are possible options. The government could potentially encourage the New Zealand Superannuation Fund (NZSF) to hold fewer shares and more risk-free assets so that the government's overall exposure to risk is unchanged. If the NZSF sold $1,250 of shares and acquired $1,250 of riskless bonds, this would balance the trades that the taxpayer was wanting to make.

If the government did not want to do this, it would have a positive expected revenue stream from switching from an RFRM tax to a GIT. But the key point is that this can only be achieved by the government taking on more risk. The government could do much the same thing if it issued bonds and invested the proceeds in the share market. Therefore, it can be argued that the additional expected revenue stream that the government obtains by taxing excess returns from risk taking would be of zero value. There is no gain for the government that it could not obtain by direct dealings in the share market. This is the basis of the tax irrelevance proposition.

However, there seem to be several important qualifications to the analysis raised by various authors including Auerbach (2009) and Banks and Diamond (2010). As Auerbach points out there are some critical assumptions underlying the taxation and risk analysis including:

- Portfolio positions must be scalable so that taxpayers can move back to their preferred risk-return allocation by buying and selling risky assets. While this may be a reasonable assumption for listed shares, it is less likely to be reasonable for interests in an SME such as a family business.
- The tax system must be symmetric so income over and above a risk-free return is taxed at the same rate as income below. This symmetry can be undermined by either loss limitations or by a progressive marginal tax rate structure.
- There must be complete market participation. When the government takes risk away from someone and gives it to someone else there must be the ability for the second person to be able to adjust their portfolio to offset any risk. This will not be true if risk can be spread to people in an economy who are not investors including those who are not yet born.
- Private markets must pool risk efficiently. If there is no or limited trading of assets (such as shares in an SME) then the government might potentially improve diversification through taxing risky returns by providing insurance against bad outcomes.
- Government spending must not be affected by the riskiness of a government's revenue stream.

Auerbach argues that the assumptions underlying the taxation and risk literature cannot all hold for the United States because, if they did, revenue from capital income would need to be negative sometimes and "at least some components of capital income taxes, notably corporate income taxes, are always more positive than can be explained by taxes on very low safe rates of returns".

We suspect that the absence of full loss offsets and progressive marginal rates are likely to be important reasons why New Zealand's income tax may vary from tax systems discussed in the tax and risk literature. These are likely to make income taxes more distorting than a casual reading of

the tax and risk literature might suggest. The same would be true of consumption taxes like a DET if these were accompanied by a lack of full loss offsets and progressive marginal rates.

As both Auerbach and Banks and Diamond point out, the example above only seems to be relevant for what Banks and Diamond refer to as "marketable assets" such as shares in listed companies. In other cases, such as investment in an SME, there could be risk sharing benefits from the government taxing excess returns from risk taking.

**GIT compared with LIT plus RFRM tax**

A potentially unattractive aspect of a GIT is the way in which it can discourage risk taking because of progressive marginal tax rates and limited loss offsets. A question that might be asked is whether it might be better to levy an LIT plus an RFRM tax instead of a GIT. An LIT plus an RFRM tax would be taxing labour income plus normal returns but not economic rents or excess returns.

There are several downsides of the LIT and RFRM tax approach. First, in many cases (eg, profits accruing in an SME) it may be very difficult to distinguish capital income from labour income. As a result, it will be difficult to ensure that all labour income is taxed under a tax targeted at labour income such as a payroll tax. Second, to apply an RFRM tax it is necessary to know about the wealth that is invested. This can often be difficult to determine (for example, the values of shares in a closely-held enterprise or the value of intangible assets). Third, there is the question of whether to tax economic rents. Most economists would think that there is a strong case for taxing economic rents, but these would not be taxed at all under an RFRM tax.

The difficulty of identifying all labour income and the absence of any tax on economic rents seem to be important downsides of the LIT plus RFRM tax approach. These may be important forms of income for some taxpayers including business proprietors. Suppose, for example, a business proprietor builds a business and subsequently sells it for a large profit. It does not matter much whether one says that the gain constitutes labour income of the proprietor or economic rents. Either way, it can be an important source of income. If this is not taxed under an LIT plus RFRM tax, there are important differences between these two taxes in combination and a GIT.

Some authors have suggested that a large fraction of what is normally thought of as capital income may (in reality) be labour income and that much of the income of the highest income earners is (in reality) labour income. Gordon and Hausman (2010) argue that a large fraction of corporate income in the United States may be labour income rather than capital income. The authors note that over the 45-year period from 1959 to 2003 the corporate profit rate exceeded the real interest rate by an average of 8% and was only less than the real interest rate in two of these years by an average of 2.5%. They argue that this is a much too prolonged difference for the difference to reflect a risk premium and that an important contributing factor was labour income. Smith, Yagan, Zidar and Zwick (2019) argue that top income earners in the United State are predominantly human-capital rich rather than financial-capital rich and that 52% of the top 1% income accrues to the human capital of these wage earners rather than their financial capital.

This suggests that taxing excess returns from risk taking should not be dismissed as only raising a valueless stream of revenue. It is likely to be impossible to tax economic rents and an important part of the labour income of business entrepreneurs without taxing these excess returns.

## Section 3: Lock-in effects of realisation-basis CGT with GIT or GITR

The Mirrlees Review argues that levying an income tax on realised capital gains will create a lock-in effect if there is a GIT. By contrast, if there is a GITR, this will stop lock-in from being a problem. This Section discusses the issue.

Here we consider an asset that is acquired for $10,000 at the end of year 0. The normal risk-free return is assumed to be 4%. However, the asset does very well and appreciates to $20,000 by the end of year 1. It is expected to rise by the normal rate of return to $20,800 by the end of year 2.

Suppose taxpayers are taxed at a marginal tax rate of 20% and realised gains are taxed. We show that:

- with an income tax without an RRA, a realisation-basis tax on capital gains will create a lock-in effect, and
- with an income tax with an RRA, a realisation-basis capital gains tax would not create a lock-in effect.

**Lock-in effects of realisation-basis CGT for income tax *without* RRA (GIT)**

Initially, suppose that we have an income tax without any RRA. Here we consider two cases:

- Realise gain at the end of year 1 and repurchase an identical asset that is sold at the end of year 2.
- Realise gain on the initial asset at the end of year 2.

*Realise gain at end of year 1 and repurchase*

The initial asset is purchased at the end of year 0 for $10,000 and sold one year later for $20,000. A gain of $10,000 is realised in year 1 on which tax of $2,000 is paid.

The proceeds from selling the asset ($20,000) minus the tax paid ($2,000) plus $2,000 of replacement capital is then used to purchase a replacement asset at the end of year 1. This asset is then sold at the end of year 2 at a price of $20,800. The $800 gain ($20,800 minus $20,000) on the new asset would then be taxed in year 2 resulting in $160 of tax at that time. Therefore, $2,160 of tax would be paid in total, with $2000 paid in year 1 and $160 in year 2. This is the same as paying the tax on accrual (on an annual basis).

*Realise gain at end of year 2*

Now suppose instead that the initial asset is held onto until the end of year 2 at which time it is sold. In this case there is no tax paid in year 1 but a gain of $10,800 ($20,800 minus $10,000) will be recognised in year 2 and tax on this will be $2,160.

It is clear the same total nominal amount of tax is paid in the two cases ($2,160). But relative to paying tax on accrual (or selling in year 1), realisation in year 2 defers $2,000 of tax from year 1 to year 2. Rather than paying tax of $2,000 in year 1 and $160 in year 2, the taxpayer pays $2,160 of tax in year 2. Therefore, delaying realisation to year 2 reduces the present value of tax.

**Lock-in effects of realisation-basis CGT for income tax *with* RRA (GITR)**

Now suppose that we have an income tax with an RRA. Again, we consider two cases:

- Realise gain at the end of year 1 and repurchase an identical asset which is sold at the end of year 2.
- Realise gain on the initial asset at the end of year 2.

*Realise gain at end of year 1 and repurchase*

The initial asset is purchased at the end of year 0 for $10,000 and sold one year later for $20,000. There is a gain of $10,000 in year 1 but this is offset by an RRA of $400 (4% of $10,000). Taxable income will be $9,600 on which $1,920 of income tax will be paid in year 1.

The repurchased asset will cost $20,000. This will be sold at the end of year 2 for $20,800 leading to a gain of $800 but this will be offset by an RRA of $800 leaving no tax to pay in year 2. The only tax payment will be $1,920 of tax in year 1.

*Realise gain at end of year 2*

Now suppose that the initial asset is held onto until the end of year 2. In this case, it is perhaps most natural to assume that the asset is valued at its initial purchase price at the end of year 1.

In this case, there would be no realised gain at the end of year 1 but an RRA of $400. If the taxpayer had no other income, this would lead to a loss of $400 which would be allowed to be carried forward with interest. When the asset is sold for $20,800, there would once more be a gain of $10,800. This could be offset by an RRA for year 2 of $400 (4% of the $10,000 base value of the asset at the end of year 1). In addition, there would be a deduction of $416 for the loss incurred in year 1 carried forward with interest. Net taxable income in year 2 would be $9,984 on which $1,996.80 of tax would be due. The present value of $1996.80 of tax in year 2 is the same as the present value of $1,920 in year 1 so there would be no lock-in effect.

Exactly the same present value of tax would be true of any other base value recorded in year 1 so long as any gains are taxed. Suppose instead, for example, that the asset was treated as rising in value by the risk-free rate from $10,000 to $10,400 over year 1. If this $400 gain were taxable in year 1 but there was a deduction for the RRA of $400 no tax would be paid in year 1. The base value at the end of year 1 would then be $10,400. If the gain of $10,400 ($20,800 minus $10,400) were recognised in year 2 but an RRA of $416 was allowed, the taxpayer would be once more taxed on $9,984 of income in year 2 and pay $1,996.80 in tax.

Exactly the same would be true for any other intermediate valuation of the asset in year 1. Suppose, for example, that the asset was valued at $15,000 at the end of year 1. There would be a gain of $5,000 ($15,000 minus $10,000) in year 1 offset by an RRA of $400. This would mean $4,600 of taxable income and $920 of tax in year 1. The gain in year 2 would be $5,800 ($20,800 minus $15,000) but this would be offset by an RRA of $600 (4% of $15,000) leading to income of $5,200 and tax of $1,040. Tax of $920 in year 1 and $1,040 in year 2 has the same present value as tax of $1,996.80 in year 2. The RRA provides a clever way of ensuring that the present value of tax is independent of these intermediate values so long as realised gains are taxed.