CONFIDENTIAL

Effective tax rates imposed on the incomes of New Zealand residents

Report prepared for Olivershaw

Kieran Murray, John Wallace and Mehrnaz Rohani

April 2023

Contents

Figures

Tables

Appendices

About the authors

Kieran Murray

Kieran is a professional economist, working primarily in the fields of public policy reform, economic regulation, and competition analysis. He has served as an economic consultant on these matters in more than 15 countries over two decades. Kieran co-founded and jointly leads Sapere, one of the largest expert services firms in Australasia and a leader in providing independent economic, forensic accounting and public policy services.

Kieran has testified before Select Committees of New Zealand's House of Representatives, the High Court, the Environment Court, the Environment Protection Agency, the Human Rights Tribunal, and the Waitangi Tribunal. His expertise as an economist is recognised in his appointment as an expert lay member of the New Zealand High Court, and his appointment by the Governor General of Papua New Guinea as an International Arbitrator for appeals from the PNG Independent Consumer and Competition Commission.

Earlier in his career he served as an adviser to the New Zealand Minister of Finance. He began his career as a Treasury official advising on tax policy reform.

John Wallace

John is the Canberra-based Director of Sapere Research Group. He is an economist with trade and industry policy reform experience working for the Australian Industries Assistance Commission (now the Productivity Commission), as well as domestic and international tax reform experience working for the New Zealand Treasury, the Policy Advice Division of the New Zealand Inland Revenue Department, Arthur Andersen and EY.

Mehrnaz Rohani

Mehrnaz is an economist with expertise in applied economics including economic evaluation and data analysis. Her expertise crosses a range of industries including land use, land transport, transport and land use integration, natural resources and waste. Mehrnaz's particular interest is in the monetisation of intangible outcomes using non-market valuation techniques.

She has local and central governments background with extensive experience in cost benefit analysis. Prior to joining Sapere, Mehrnaz held a principal role leading the update of New Zealand Transport Agency's (NZTA) Monetised Benefits and Costs Manual. She holds a Master's of Economics (majors in econometrics and economic engineering) from Tehran, Iran.

Foreword

OLIVERSHAW LTD

TAX SPECIALISTS

Olivershaw Limited
Level 3
120 Featherston Street
WELLINGTON
PO Box 30 504
Lower Hutt 5040

11 April 2023

New Zealand effective tax rates

Background

There seems to be a broad social consensus that government activities should be paid for out of taxes that reflect an ability to pay principle. The more people earn, the higher the taxes they should pay. There seems to be less of a consensus as to the extent the tax system should be used to redistribute income. The issue is open for debate. Presumably in order better to inform this debate, the government has included in the Inland Revenue Tax Policy Work Programme research into the effective tax rates paid by high wealth individuals. It is understood that Treasury has also initiated a study into effective tax rates paid by the population in general. At the time of writing neither of these studies have been released.

From what has been said about the methodology of the Inland Revenue study, it seems that the Inland Revenue and Treasury studies may use different methodologies. A comparison of two different studies using different methodologies could easily produce a misleading and confusing picture of our tax system. Moreover, the Inland Revenue methodology seems inconsistent with OECD and academic effective tax rate studies. While the Inland Revenue study uses information from taxpayers on the types of assets they own, it seems to require unreliable estimates of the economic income such assets generate. In particular, when deriving effective tax rates it seems to divide a legal concept of what tax is paid by a less than comprehensive definition of the concept of economic income, making the results very questionable. We therefore considered it important to have a study that uses a more consistent approach to estimate the effective tax rates that are imposed on the incomes of low, medium and high wealth households, rather than just high wealth individuals. In addition, we also recognised the need for that study to explain the different methods that can be used to estimate those effective tax rates, and how those effective tax rate estimates should be interpreted and applied.. As a result. we commissioned Sapere Research Group (Sapere) to prepare this report (the Report) on the extent effective tax rates vary according to economic income.

We summarise here our interpretation of that report. It is emphasised that this is our interpretation of the Report's findings – not that of Sapere. People are encouraged to read the Report and reach their own conclusions.

Our interpretation of the Report is, in summary:

- Effective tax rate estimates need to be interpreted and applied with caution given the inevitable lack of complete information involved with any such study.
- It should not be expected that effective tax rates will mirror the tax rates set out in income tax legislation. That is because tax rules reflect government policies that take into account a person's

circumstances and behaviours (assist low income families, support home ownership and ensure business investment) that are not solely dependent on levels of individual income.

- In general, as should be expected, average effective tax rates are lower than statutory tax rates at all income levels because of policy decisions not to tax all types of economic income.
- There is, however, high variability of effective tax rates for those at the same income level. This variability is highest for the lowest and highest income groups who have the most variability in their circumstances and how tax impacts differently according to their decisions in accordance with government policy that aims to influence those decisions.
- Overall, high income earners pay the most tax and fund most government expenditure.
- Even taking into account the above, average effective tax rates increase as the real economic incomes of all households increase.

Focus on income tax and benefits

The Report's focus is on income tax (not GST or excises) because income tax is the main tax type in New Zealand and redistribution of income is one of the policy objectives of our income tax at an individual level.

One cannot sensibly consider income tax without taking into account Working for Families Tax Credits (family tax credit, the in-work tax credit, etc.) because these operate to reduce the tax a person has to pay (and can result in a net tax refund or negative tax). It then makes sense also to take into account other cash payments the government provides – New Zealand Superannuation, Jobseeker benefit, Accommodation Supplement etc. As the Report notes, the same logic leads to other government expenditures (health and education) also being taken into account to paint a more accurate picture of the extent people on different income levels receive net benefits from the government while others pay for this through net tax payments.

When considering the fairness of the tax system – the extent to which it redistributes income from higher to lower income earners – the focus is on average effective tax rates. This is the total tax paid relative to the total income derived. However, marginal effective tax rates are also important. This is the tax rate applying to the last dollar of income derived. Marginal tax rates are important because they influence how people react to taxation – whether they work, save and invest more and how they work, save and invest is generally influenced by marginal not average tax rates.

As the Report sets out, there is no particular pattern to when marginal effective tax rates are high or low for a person. Some of the highest marginal rates apply to some of the lowest income earners (beneficiaries with work income subject to abatement). Those people generally have negative average effective tax rates – tax paid is exceeded by benefits provided. High benefit abatement rates discourage beneficiaries from entering the workforce. If they stay out of the workforce, they earn less market income and pay less tax.

Statutory individual income tax rates increase with income

New Zealand has a progressive individual income tax scale with the statutory marginal tax rate rising from 10.5% for income under $14,000 to 39% for income of $180,000 or more. The result is material redistribution based on taxable income. As the Report shows, those on incomes over $70,000 (21% of taxpayers) paid 68% of income tax. On this measure higher income earners are meeting most of the cost of government. If Working for Families and other cash benefits are also taken into account, the proportion of government expenditure paid by higher income earners is even higher. This is even more so if other benefits (education and health expenditure) are taken into account.

Average effective tax rates

The above statutory individual rates are based on taxable income derived. However, people also:

- get cash benefits from the government that should be netted off against tax payable on taxable income
- earn income that is not included in taxable income – the benefits of homeownership and capital gains

- derive taxable income that benefits from tax concessions – forestry and research and development expenditure
- sometimes derive income that the income tax measures in excess of its true economic value – the nominal interest paid on bank accounts whereas in economic terms income should be measured so only interest in excess of the inflation rate should be counted as income
- benefit from income that is derived from other entities taxed at different (normally lower) rates than applies to individuals.

The Report considers how these types of factors might alter the picture of a progressive statutory individual income tax rate scale resulting in those better off paying the lion's share of the cost of government expenditure.

An initial comment is that in general the average effective tax rates paid by individuals are lower than the average rates based on the statutory scale This can be by a substantial amount and can be the case at all income levels. This is because not all income in an economic sense is taxable and the statutory tax scale is before (not after) netting off tax against cash payments from the government.

Taxable income that is less than economic income is not generally a mistake. Normally it reflects deliberate policy decisions or recognises the practical difficulties of measuring income in a manner other than how it is measured currently by the income tax rules.

One should expect (and not be surprised) that any study of effective average tax rates produces rates lower than statutory rates. There are exceptions. A high income person with mostly interest income in a bank, even at moderate levels of inflation (2-3% per annum), is facing effective tax rates on that income well in excess of statutory rates because the inflation component of interest is included by tax rules in income. However, effective average tax rates less than statutory rates are the norm.

The interesting question is whether these lower effective tax rates still redistribute income from higher income earners to lower income earners, albeit with lower rates. The broad answer from the Report is "yes". Those on lower incomes generally face negative average effective tax rates (not low positive rates that the statutory rates would produce for those on lower incomes). In other words, lower income earners receive more from the government than they pay in taxes. On higher incomes average effective tax rates become increasingly more positive. Higher income earners pay more in taxes than they receive from the government. As incomes rise the trend is for average effective tax rates to rise.

However, average effective tax rates vary considerably within income bands. An individual within a certain income band can have average effective tax rates more or less than those on the same income. This is because government policy deliberately alters the effective tax rates depending on the circumstances of people. As examples:

- The government provides support to lower income families (Working for Families tax credits and other benefits), generally making their effective tax rates negative. This results in people on the same income facing different average effective tax rates depending on whether or not they support children. While having people on the same income facing different tax rates is generally viewed by economic texts as undesirable on fairness grounds, the policy decision made by governments is that it is fairer to target assistance to those supporting families who are in most need.
- Home ownership income and capital gains are not included in taxable income. This means those owning their own home and those making capital gains have lower average effective tax rates than those who rent or do not earn capital gains. This simply reflects policy decisions by governments as to what forms of economic income should be subject to tax.
- Higher income earners deriving taxable income through Portfolio Investment Entities (PIEs such as KiwiSaver) and companies have that income taxed at 28% (until distributed in the case of companies) have lower tax rates relative to the higher personal rates (up to 39%) that would apply if they earned the same income directly. This reflects policy tradeoffs made by governments. In particular, governments have taken the view that higher company tax rates would discourage investment, reduce wages and thus overall make the population worse off. If companies were taxed at 28% but PIEs at lower rates, that would encourage people to invest in companies and not in KiwiSaver and other PIEs.

The government decision to have a company tax rate lower than that of many shareholders illustrates that many of the government decisions leading to the variability of average effective tax rates for those on the same income are driven by concerns about how people will respond to taxes. In the company case, the concern is that a higher company tax rate will reduce investment and lower the incomes of workers.

Behavioural responses to tax drive much government decision making. All practical taxes result in people changing their behaviour in response, and the response is generally to the marginal not average effective tax rate. Sometimes the government wants people to respond to taxes – high taxes on tobacco, alcohol and gambling aim to reduce consumption of these items. Taxes on activities that degrade the environment are argued for on the same basis. More often the way people respond to taxes is an unwanted but inevitable product of taxes – less work and savings and sup-optimal investment. These generate the economic costs of tax – taxes reduce the overall welfare of society although this can be viewed, at least to some extent, as offset by the benefits of how the government then spends the tax revenue.

The relevance in this context of how people respond to taxes is that such responses can alter average effective tax rates. The Working for Families recipient subject to very high effective marginal tax rates because of the abatement of Working for Families has an incentive to work fewer hours and reduce the income subject to abatement. This reduces their measured income. It also increases their negative average effective tax rate because they receive more tax credits on that lower income.

The highest income earners tend to have the greatest ability to change their behaviour in response to high effective marginal tax rates. That is because they largely earn income from their savings and investment, which gives them great flexibility in structuring their income to minimise tax. They also face high marginal tax rates even if their average tax rate is low. The natural response is that high wealth individuals tend to invest where marginal tax rates are low. The low marginal tax rate is worth more to them than to those on lower incomes with lower marginal tax rates. High wealth individuals can therefore be expected to be over-represented as investors where marginal tax rates are set by government at a low level. In New Zealand this tends to be in land, which tends to benefit from high levels of tax-free capital gains. Indeed, the Cullen Tax Working Group presented evidence that high wealth individuals have high levels of land investment. This is exactly what economics predicts.

The result is that high wealth individuals can have low average effective tax rates. It should not necessarily be concluded that because they may have low average effective tax rates high wealth individuals in this position do not bear a cost because of the tax system.

The impact of tax on them can be similar to the Working for Families recipient who works less because of abatement of tax credits – they pay lower tax but earn less income.

The point is illustrated by two examples often cited in economic texts:

- In the USA interest on local government bonds can be tax-free. Those on the highest marginal tax rates buy such bonds because of the tax-free income they produce. It is observed that such bonds are held mainly by high income earners on high marginal tax rates. However, the tax advantage is largely offset the by lower interest such bonds offer. If a person on a 40% marginal tax rate would normally accept a fully taxed 5% interest rate, they would accept anything above a 3% interest rate on a tax-free bond. Assume, for simplicity, that interest on tax-free bonds is the only income such a person has. They are observed to have a zero average effective tax rate but substantial income. However, they are receiving only a 3% interest rate whereas in the absence of tax they would get 5%. The value of the tax exemption benefits the local government body that is able to raise loans at a low interest rate. The incidence or burden of the tax is still borne by the high wealth investor even though they pay no tax in a direct sense.
- England used to have a tax on the number of windows a person had. This window tax made some sense given that at that time the number of windows a person's house had was a good estimate of their wealth and income – so the higher their wealth, the more windows they had, and the more tax they paid. However, in response to the tax people boarded up their windows, removing the tax liability they otherwise would have had. The window tax became known and criticised as a tax on sunshine

and considerable health costs were attributed to the reduction in windows of residential properties. At the extreme the tax generated no tax revenue for the government but considerable loss of welfare. Those with boarded up windows might have a zero average effective tax rate, but they bore the cost of the tax in non-cash terms. As it has been expressed, they paid tax in terms of no sunshine rather than cash, but no sunshine did not fund the government.

These examples illustrate the danger of assuming that average effective tax rates reflect the cost of tax on people. It is reasonable to assume that this occurs in New Zealand. For example, at least some of the tax benefits of land and forestry that high wealth individuals invest in is likely to be capitalized into the price of those investments so that the actual incidence of tax is higher than any legal liability that average effective tax rate calculations suggest.

As a result of the above, the Report shows that average effective tax rates at the high wealth individual level can vary widely depending on the circumstances and response to tax of the individual. However, economic theory holds that high wealth individuals are most attracted to invest in low taxed activities, but this does not necessarily mean they do not bear the real cost of taxes levied.

The results for effective average tax rate calculations are somewhat unclear, especially at the high wealth end. However, the Report does suggest a broader picture in terms of the effect of government on income distribution. Taking into account not just taxes and benefits but also the value of other government expenditure funded from taxes (health and education) and taking into account the expected impact over the lifetime of a person, data from other studies suggest:

- For lower income earners and especially women, the government supplements their incomes – negative average effective tax.
- For the bulk of the population, the government simply smooths out income over the person's lifetime – net recipients when young and old, then net providers of funds to the government in middle age.
- High income earners are net contributors to the government over their lifetimes, in effect paying for the redistribution of funds to lower income earners.

In this wider sense it can be concluded that in New Zealand taxes do redistribute income to a considerable extent.

The Report's calculation of effective tax rates

The Report provides a number of estimates of effective average and marginal tax rates for illustrative types of households with low, medium and high levels of wealth and economic income. As noted, there is considerable variability of effective tax rates at each income level as a result of government policy decisions that mean that effective rates vary from statutory marginal rates. Policy decisions cause variable effective rates within the same income band because those policies impact on people differently depending on their circumstances and how they respond to tax. That is a deliberate feature of the policy design.

Broadly:

Low income households (less than $48K)

At this level of economic income people generally face negative effective average tax rates because cash benefits exceed tax payable.

Medium income households ($48K to $180K)

Effective average tax rates at this economic income level are generally highly dependent on whether a household has dependent children and is receiving Working for Families tax credits or not:

- If receiving WFF, average effective tax rates are negative for low levels of income but then become positive similar to those who do not receive WFF.

If not receiving WFF, average effective tax rates are highly dependent on the level of untaxed income a person earns. At this income level, effective average tax rates can approach or even exceed statutory rates. For example, a single employed person with no dependent children living in rental accommodation has an average effective tax rate of 24% at $48,000 of income.

Medium income households ($180K to $500K)

Similar to the non WFF case the effective tax rates vary. At $500,000 a working couple with two children living in their own home has an average effective tax rate of 29%. An older retired couple living in their own home with the same level of economic income has an effective tax rate of 6%.

High income households (over $500K)

At this economic income level it is assumed that higher proportions of that economic income are derived in the form of income from savings and investment. As a group the average effective tax rates for those not on New Zealand Superannuation is 29% to 31%. Average effective tax rates, however, vary considerably depending on a person's circumstances and how they respond to marginal effective tax rates. At one extreme average effective tax rates can be very high. That is the case for the person with largely interest income. Interest income is fully taxable, and no allowance is made for inflation. At a low 3% inflation rate and a high 5% nominal interest rate, a person on a marginal 39% tax rate faces an effective tax rate of around 98%. At the other extreme a person with predominantly capital gain income (from land ownership) is likely to have an average effective tax rate approaching 0%.

As noted above, economics predicts that because of incentives of the tax system high wealth individuals are likely to be over-represented in those earning lowly taxed forms of income. However, as discussed above that does not necessarily reflect the impact of tax on such persons.

What does this say?

The relatively simple picture given by statutory income tax rates of a moderately progressive rate structure becomes much more complex when trying to estimate average effective tax rates. Overall, from a number of perspectives the tax system still seems moderately redistributive but less so than the statutory rates may suggest.

The government could more closely align effective rates with statutory individual rates and more clearly achieve the sort of redistribution suggested by the progressive statutory rates. However, that would involve changes to fundamental policies arrived at for various sensible reasons. To align statutory and effective rates the government would, for example, need to:

- remove Working for Families tax credits
- tax people on the rental value of their homes
- increase the company tax rate to 39%
- tax capital gains on an accrual basis.

These do not seem realistic or even desirable policies. This illustrates tax policy involves trading off a number of policy objectives and thus effective tax rates do not simply reflect differences in income level.

Even if alignment between statutory and effective tax rates were achieved this would not necessarily mean a fairer overall outcome or less income inequality. This depends on the who bears the incidence of the higher taxes alignment suggests. For example, orthodox economics, accepted by officials in a number of documents, is that if a country increases taxes on foreign investment, that can lead to higher returns on capital being required by those investing in New Zealand. That then leads to higher investment income for any given investment but less investment overall. That in turn leads to lower wages. So a policy to tax foreign investors more ends up with higher incomes for well off New Zealanders and lower incomes for lower income workers.

Robin Oliver Mike Shaw

Detailed outline of the report

Purpose, structure and content of this report

Over the last decade, increasing attention has been focussed on the "equity" of the income tax system, both overseas and in New Zealand.

In particular, as discussed further in the introduction to this report, the concern that high wealth individuals may not be paying their "fair share" of tax has led the New Zealand government to include, in the 2021-22 Tax Policy Work Programme, "Research work by Inland Revenue involving the collection of information on the level of tax paid by high wealth individuals".[1]

The stated goal of that project is to "improve the evidence base on which to assess the fairness of the tax system. The project will do this by improving our information on effective tax rates. The project is not making any policy recommendations, but the analysis will inform future tax policy advice." Specifically, it is envisaged that project will "compare the amount of tax an individual, and their household, pays to a number of different measures of income. This will allow us to estimate a range of effective tax rates for each household – enabling us to take different perspectives on how we assess the fairness of New Zealand's tax system. Economic income is the broadest measure of income we will use." The primary output of that project will be a public report on the project, which "is expected to be completed by June 2023" ahead of the next general election.[2]

In the light of those developments, Olivershaw has commissioned Sapere Research Group (Sapere) to prepare a report on the effective rates of tax that New Zealand's tax and benefit systems impose on the incomes of its residents.

The main body of this report commences with a brief overview of New Zealand's income tax and benefit systems (section 2), including the:

- size and complexity of the tax and benefit systems (section 2.1);
- need to estimate "effective tax rates" in order to obtain a potentially more accurate estimate of the combined effects that the income tax and benefit systems have on the actual rates of tax that individuals, as well as the households in which they reside, are legally required to pay on the economic income they derive (section 2.2); and
- need to understand how government decisions regarding the design of the income tax and benefit systems alter those effective tax rates (section 2.3).

[1] See the Government's tax policy work programme: 2021-22 https://taxpolicy.ird.govt.nz/-/media/project/ir/tp/work-programme/2021-22/2021-07-20-tax-policy-work-programme-pdf.pdf?modified=20210720041930

[2] Information Sheet: Inland Revenue's high-wealth individuals research project on effective tax rates https://www.ird.govt.nz/-/media/project/ir/home/documents/about-us/high-wealth-research-project/hwi-research-project/info-sheet-on-effective-tax-rates.pdf?modified=20220602230929&modified=20220602230929

The report then presents estimates of the effective tax rates imposed on the economic incomes of illustrative households (section 3). Specifically, section 3 outlines:

- the approach used to identify illustrative households and estimate effective tax rates (section 3.1);
- estimates of the effective tax rates imposed on the economic incomes of those households (section 3.2);
- estimates of the effective rates of tax that are imposed on the incomes that New Zealand residents derive from their savings and investment (section 3.3) that have been developed by the OECD, the New Zealand Treasury and Inland Revenue Department, as well as the academic community.

Section 4 of the report then discusses how those estimates of effective tax rates should be interpreted and applied in the process of tax review and reform. This includes a discussion of the:

- economic incidence of taxes and subsidies (section 4.1) – that is, who really bears the burden of income taxes and enjoys the benefits of the tax concessions and other transfer payments provided by the government; and
- practical constraints that limit the reform of the income tax and benefit systems (section 4.2).

Section 5 concludes the report by drawing from the information outlined above to identify the key findings.

Overview of New Zealand's income tax and benefit systems

How much revenue is raised and redistributed by the income tax and benefit systems?

Income tax is still the main source of taxation revenue

Despite the introduction of GST in 1986 and the subsequent increases in the rate of GST from its original rate of 10 per cent to 12.5 per cent in July 1989 and to its current rate of 15 per cent in October 2010, the income tax system continues to be the main source of revenue used by the New Zealand government to finance its expenditure.

In 2022, of the $113,002 million of the total net revenue raised by Inland Revenue and GST raised by Customs:

- $75,539 million (67%) was raised from direct taxes on the incomes of individuals and companies:
  - $54,053 million from taxes on the incomes of individuals (e.g. source deductions, Fringe Benefits Tax, and taxes on the interest incomes of residents); and
  - $21,486 million from taxes on the incomes of companies (e.g. company tax, taxes on the dividend income of residents and non-residents, and tax on the income of non-residents);
- $37,094 million (33%) was raised by GST:
  - $24,691 million of net GST revenue collected by Inland Revenue; and

- $12,403 million of net GST revenue collected by Customs.[3]

Significant benefits are also redistributed to welfare recipients

In addition to raising significant tax revenue for the government, the income tax and benefit systems also redistribute significant amounts of revenue to welfare recipients through the provision of:

- tax credits,[4] which in 2021/22 included:
  - "Working for Families Tax Credits" that provided:
    - $2,108 million of "Family Tax Credits";
    - $542 million of "In-Work Tax Credits";
    - $15 million of "Minimum Family Tax Credits";
  - $978 million of "KiwiSaver Tax Credits";
  - $339 million of "Best Start" payments;
- $30,320 of direct benefits and related expenditure provided by the Ministry of Social Development,[5] which include the following main benefits:
  - $19,529 million of "New Zealand Superannuation";
  - $3,428 million of "Jobseeker Support" and "Emergency Benefit";
  - $2,331 million of "Accommodation Assistance";
  - $2,219 million of "Supported Living Payments";
  - $1,819 million of "Sole Parent Support".

These benefits are supplemented by significant levels of government:

- education expenditure, including expenditure of both:
  - $15,974 million on Vote Education in 2021/22, which included:
    - $4,035 million of primary education services;
    - $2,962 million of secondary education services;
    - $4,944 million for services from the Ministry of Education;
    - $1,846 million of capital expenditure[6]
  - $4,028 million on Vote Tertiary Education in 2021/22, which included:
    - $3,203 million for tuition and industry training subsidies;
    - $235 million for first year fees-free study for eligible students, apprentices and trainees;[7]

[3] Inland Revenue Department, Revenue collected 2001 to 2022, https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/revenue-collected-2001-to-2022

[4] 2022 Tax Expenditure Statement, Table 2, p6, Value of expenditure 2021/22 (forecast), , https://www.treasury.govt.nz/sites/default/files/2022-05/b22-taxexpstmt.pdf

[5] Vote Social Development, The Estimates of Appropriations 2022/23 - Social Services and Community Sector B.5 Vol.9, Estimated Actual Expenditure 2021/22, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v9-socdev.pdf

[6] Vote Education, The Estimates of Appropriations 2022/23 - Education and Workforce Sector B.5 Vol.2, Estimated Actual Expenditure 2021/22, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v2-educ.pdf

[7] Vote Tertiary Education, The Estimates of Appropriations 2022/23 - Education and Workforce Sector B.5 Vol.2, Estimated Actual Expenditure 2021/22, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v2-tered.pdf

- health expenditure. In 2021/22, the government spent $26,884 million on Vote Health, which included:
  - $16,644 million of health and disability support services that were provided by the 20 district health boards (DHBs) for services to meet the needs of each district's population;
  - $4,148 million to fund health and disability services, funded at a national level, and managed by the Ministry of Health, which comprised:
    - $1,859 million of National Disability Support Services;
    - $525 million of National Planned Care Services;
    - $504 million of Public Health Service Purchasing;
    - $396 million of Primary Health Care Strategy;
    - $246 million of National Mental Health Services;
    - $235 million of National Maternity Services;
    - $185 million of National Emergency Services;
    - $116 million of National Child Health Services;
    - $71 million of National Personal Health Services;
    - $10 million of National Health Services.[8]

Who pays the most tax and receives the most benefits?

Most of the income tax revenue raised was paid by high income individuals

IRD estimates indicate that in the 2021 income year (the latest year for which this detailed information is publicly available):

- most (68.5%) of the income tax revenue raised by government from individuals in the 2021 income year was paid by the 21.2% of taxpayers who are in the two top income tax brackets (i.e. those with taxable incomes between $70,001 and $180,000, as well as those with taxable incomes greater than $180,000 per annum), who collectively paid $31,931 million of tax on their assessed taxable incomes of $122,244 million. Specifically:
  - individuals earning taxable income from $70,001 to $180,000 each year (18.8% of taxpayers) collectively earned $81,889 million (37.7%) of taxable income and paid $19,562 million (42%) of tax;
  - individuals earning taxable income in excess of $180,000 each year (2.4% of taxpayers) collectively earned $40,355 million (18.6%) of taxable income and paid $12,369 million (26.6%) of tax. Specifically:
    - individuals earning taxable income from $180,001 to $300,000 each year (1.6% of taxpayers) collectively earned $15,042 million (6.9%) of taxable income and paid $4,350 million (9.3%) of tax;

[8] Vote Health, The Estimates of Appropriations 2022/23 - Health Sector B.5 Vol.5, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v5-health.pdf

- individuals earning taxable income in excess of $300,000 each year (0.8% of taxpayers) collectively earned $25,313 million (11.7%) of taxable income and paid $8,019 million (17.2%) of tax;[9]

- the average tax rate that individuals have paid on their taxable income (measured by dividing their tax assessed by their taxable income) increases for individuals in higher tax brackets, with the highest average tax rate being paid by those individuals with taxable incomes in excess of $300,000. Specifically:
  - individuals earning taxable income from $70,001 to $180,000 each year paid an average rate of tax of 23.9% on their taxable income;
  - individuals earning taxable income from $180,001 to $300,000 each year paid an average rate of tax of 28.9% on their taxable income;
  - individuals earning taxable income in excess of $300,000 each year paid an average rate of tax of 31.7% on their taxable income.

Some of the benefits are targeted at low income households

Some of the benefits provided by the New Zealand government are targeted at low income households and are reduced (i.e. abated) as their incomes increase.

Those targeted benefits include:

- tax credits such Working for Families Tax Credits; and
- direct benefits such as Jobseeker Support, Emergency Benefit, Accommodation Assistance, Supported Living Payments, and Sole Parent Support.

Other benefits are provided to all New Zealanders regardless of their wealth or income

Not all of the benefits provided by the New Zealand government are targeted at low income households. Rather, the government also provides significant benefits to all New Zealand residents regardless of their levels of wealth and income, including:

- direct benefits, such as New Zealand superannuation; and
- indirect benefits in the form of subsidised education and health services.

The net fiscal impact of the tax and benefit systems is to redistribute income away from high income households to low income households

As discussed further in section 2.1.4, Aziz, et al (2012) have examined the net fiscal impact of New Zealand's tax and benefit systems with a view to determining the extent to which it redistributes income from higher income households to low income households.

Specifically, the authors estimate the net fiscal impact of the tax and benefit systems by deducting the amount of tax paid by households (which includes income tax, as well as indirect forms of taxation such as GST and excise duties on fuel, alcohol and tobacco) from the amount of benefits they receive from government (which includes: income support expenditure such as NZ Superannuation, income

[9] Inland Revenue Department, Taxable income distribution of individuals for the 2021 income year (based on random sample of individual taxpayers), https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/income-distribution. IRD intends to publish similar information for the 2022 income year in December 2023.

replacement benefits for working age people, family assistance, housing assistance and other benefits; as well as health and education expenditure). This allows them to estimate the net tax paid, or net benefit received, by households with disposable incomes that are within each of the 10 income bands (i.e. deciles) considered.

As illustrated in **Figure 4** in section 2.1.4, the results of their analysis indicate that:

- in all four time-periods (i.e. 1987/88, 1997/98, 2006/07 and 2009/10), households in the lowest five deciles of disposable income received more government spending on the social services included in the study than they paid in taxes;
- since 1998, households with net disposable incomes in decile six have also become a net fiscal recipient; and
- households in deciles seven to ten were consistently net contributors as they paid more tax, on average, than they received in social services.[10]

How does the amount of tax paid and benefits received vary by age and gender?

It is important to note that the amount of tax paid and benefits received by individuals does not remain constant over their lives. Rather, it tends to vary over their lifetimes, reflecting changes in their levels and forms of income, consumption, savings and investment. This means that focusing attention on the amount of tax paid and benefits received by an individual or household at a particular stage of their lives (e.g. when they have accumulated high levels of wealth and income) can produce a misleading indication of the amounts of tax they have paid and benefits they have received in the earlier years of their lives.

As outlined in section 2.1.5 of this report, research by Aziz et al (2013) indicates that the amounts of tax paid and benefits received vary with age and gender in New Zealand (i.e. the "legal" or "fiscal" incidence of those taxed and benefits). The authors use Household Economic Survey (HES) data for 2010, in conjunction with the New Zealand Treasury's non-behavioural tax-benefit micro-simulation model, Taxwell, to model the distribution of taxes, transfers and social spending.

In their paper, the authors distinguish between three main types of income received by individuals and households, namely:

- market income (i.e. wages and salaries, income from investments, self-employment, and from other forms of taxable income earned by private means);
- disposable income, which is equal to:
  - market income;
  - plus income support (i.e. working age benefits, Working for Families, New Zealand Super and housing subsidies);
  - less direct tax (i.e. income tax);

[10] Aziz, O.A., Gibbons, M., Ball, C, and E. Gorman (2012), *Fiscal Incidence in New Zealand: The Distributional Effect of Government Expenditure and Taxation on Household Income, 1988 to 2010,* Paper for New Zealand Association of Economists Conference 2012, New Zealand Treasury. https://www.nzae.org.nz/wp-content/uploads/2012/07/Aziz_Fiscal-Incidence-NZAE-2012-Conference-Paper.pdf

- final income, which is equal to:
  - disposable income;
  - plus the value of subsidised services received (i.e. subsidised education and health services);
  - less indirect taxes (i.e. GST and excise duties).

The results of their analysis are outlined briefly below and set out in greater detail in section 2.1.5 of this report.

Market income per capita increases with age and then declines in retirement

Average market incomes increase from early working age, peak in late 50s and decrease thereafter (i.e. in retirement). From the age of 20 onwards women earn, on average, significantly less market income than men of the same age due, in part, to lower labour force participation.

The large drop in market income for men at the age of 65 is attributable to the large work disincentive provided by New Zealand's universal pension (i.e. "NZ Super").

Direct tax paid per capita also increases with age and then declines in retirement

Disposable income in New Zealand differs from market income due to government's redistributive policies in the form of income support targeted predominantly at low-income households, families with children and pensioners, and direct taxes (mainly personal income taxes) deducted from market income.

The distribution of direct taxation per capita closely resembles the profile of individuals' market incomes. Contributions to direct tax revenues, by both genders, rise sharply during ages 20-40, become relatively flat till around ages 50-60, and then decline. The authors note that the sharp increase in direct taxation paid by women in particular in the 65-69 year old age group is likely due to their entitlement to the taxable Superannuation (NZS) at 65 (i.e. for many women attaining the age of 65, and receipt of NZS, involves an increase in their income).

More income support is provided to women than men

More income support is granted to women than men between the ages of 15 to 64 – a difference that:

- peaks during the child-rearing ages of 35-39 when women receive income support that is, on average, 4.8 times that of the income support payments to men of the same age;
- narrows after typical child-rearing age, around 50, onwards, but still remains above that of men.

After the superannuation entitlement age of 65, women on average still receive more income support than men, with the discrepancy reaching 20% in the over-80 demographic group.

Disposable income per capita increases over working lives and declines in retirement

Disposable income per capita indicates the combined effects of market income, direct taxation, income support and intra-family sharing on the distribution of disposable income.

Under 15 year olds have significant levels of disposable income despite their general lack of market income or income support, resulting from intra-family sharing of resources, whereby children are assumed to receive a share of family disposable income. Intra-family income redistribution has narrowed the gap in incomes between working-age males and females.

However, the authors note that those estimates of disposable income per capita do not take into account the significant effects that the provision of in-kind government subsidised goods and services and indirect taxation (e.g. GST and excise duties) have on the final income of individuals.

As a result, the authors also provide estimates of the:

- indirect tax per capita, which indicate:
  - increasing indirect tax payments by both genders from early adulthood to the late-50s age group, with declines from around age 60 or 65, which is likely to reflect the tendency for disposable incomes to rise over the working life and decline in retirement;
  - slightly more indirect tax is attributed to women than men in the under 25 age range, peaking at a difference of 23% per capita for the 10-14 age group;
  - from ages 25-69, men on average pay 28% more per capita than women (although the authors note that this difference is sensitive to the method of intra-family allocation of disposable income and indirect taxes included in the analysis);
- real consumption per capita, which the authors estimate by netting off indirect taxes before taking into account of consumption of publicly provided health and education. Those estimates indicate that real private consumption:
  - initially increases with age, especially during the 20s to 30s age range;
  - then flattens off over middle age; and
  - then declines (more rapidly for men) in older ages.

Most education expenditure is on the young

Not surprisingly, the bulk of education spending is on younger age groups and, for males and females younger than 15 years of age, is allocated roughly equally.

There is noticeably higher education expenditure per capita on women in the 20-24 year old age group (women, on average, receive 62% more funding than men, which may stem from more women attending tertiary education or from women proportionately attending more expensive forms of tertiary education, such as university).

Health expenditure per capita increases with age, particularly for older people

Apart from the 0-4 age group, health expenditure per capita increases with age and at an increasing rate for older people:

- in the 70-79 year old age brackets, men appear to cost more per capita than women, but in the 80+ age range, this trend reverses;
- across child-bearing age ranges, women receive more healthcare on average than men given costs of birth, pre-natal and post-natal care.

Net effect of government interventions over time

The authors use the information outlined above to estimate the overall impact that all of these government interventions (i.e. direct and indirect taxes, education, health and transfers spending) have on the average final incomes of males and females over time. This indicates that:

- government taxing and spending interventions tend to smooth income over lifetimes by redistributing income away from those aged approximately 25 to 64 towards either end of the age spectrum; and

- indirect taxation and government provision of education and health services have very little effect on the final incomes of middle aged individuals, but substantially increase the consumption of children and the elderly. For adult females in particular, the age distribution of final income becomes surprisingly "flat" and especially when compared with female market incomes.

The authors note that since the data used for the purposes of their paper is cross-sectional (for 2010), it cannot be interpreted directly as life-cycle profiles for an individual. Despite those limitations, however, they note that the age, and gender, distribution of net fiscal incidence might provide useful information on the patterns of change associated with the ageing process.

As a result, the authors also provide estimates of the:

- net fiscal impact per capita (i.e. the incidence of tax revenue minus expenditure on income support, education and health), which indicates that:
  - males, on average, start making a positive net fiscal contribution (i.e. their per capita tax revenue exceeds the government expenditure they receive) in their early 20s;
  - women, on average, do not start making a positive net fiscal contribution until their mid-40s due to a combination of lower workforce participation, higher health and education spending, higher income support and lower direct and indirect taxation;
  - beyond the age of eligibility for superannuation both genders are again, on average, net recipients of government tax and spending, but with the onset of this net negative balance slightly later for men;
- cumulative net fiscal impact per capita, which indicates that the:
  - positive net fiscal impact women make from 45-59 never outweighs the prior negative net fiscal impacts. As a result, when the large negative net impacts of the retirement years arrive, they simply add to an already negative profile;
  - men, on the other hand, appear to have a positive cumulative net fiscal impact from approximately 40 until 80 years of age. For these particular taxes and public expenditures, the net fiscal incidence on men is approximately zero when cumulated over all ages.

Why is there a need to estimate effective tax rates?

As discussed in section 2.2 of this report, in view of the complexity of the income tax and benefit systems, the statutory marginal rates of income tax set out in the *Income Tax Act 2007* and the benefit rates set out in the *Social Security Act 2018* do not provide an accurate indication of the net amount of tax that individuals and households legally required to pay on the economic income they earn.

Rather, there is a need to estimate more accurate measures of the actual "effective" rates of tax that individuals are legally required to pay on the actual "economic income" they derive, net of the tax concessions and other benefits that there are legally entitled to receive.

What is economic income?

In order to understand the need to estimate effective tax rates, as well as the methods used to estimate those tax rates, it is essential to understand what "economic income" is and how it differs from "taxable income".

Economic income is a much broader concept than the taxable income that the income tax system seeks to measure (i.e. define) and tax. In its broadest sense, economic income is a concept that refers to changes in a person's wellbeing. In practice, however, some forms of economic income are difficult to measure and, as a result, are not included in the definition of taxable income and subject to tax.

As noted in section 2.3, for the purposes of this report, we use a "comprehensive" definition to define the concept of economic income. That is, we define economic income to include all forms of income generated by a person's financial and non-financial assets, regardless of their source, and regardless of whether they are taxed, which includes both the:

- income that individuals earn and spend each year on goods and services (i.e. non-durable consumer goods and services that are completely "used up" that year); and
- income that individuals derive from any increase in the value of the net assets they own that occurs over the course of that year (i.e. the gross value of those assets, less the gross value of their liabilities, which include the loans they may have raised to finance the purchase of those assets). This includes, but is not limited to, any accrued (but not necessarily realised) increase in the value of the following types of assets:
  - financial assets (e.g. savings held in the form of debt instruments, including bank deposits and debentures, as well as equity instruments such as shares held in companies); and
  - non-financial assets, such as physical capital (e.g. consumer durables, owner-occupied housing, rental properties, plant and equipment and inventories owned by individuals who own and operate their own businesses) and intangible assets (e.g. human capital and intellectual property).

Not all economic income is taxable

Although it is possible, in theory, to define economic income in such a comprehensive manner, it is essential to recognise that this does not mean that it is either feasible, or desirable, to attempt to measure and tax all forms of that economic income.

Like other countries, New Zealand's income tax system does not use such a comprehensive definition of economic income to define taxable income. Rather, it tends to limit the definition of taxable income (i.e. "assessable income" less "allowable deductions") to those forms of net economic income that tend to be easier to measure and tax and are considered by government to be appropriate to tax – namely:

- net cash receipts (e.g. gross cash receipts less deductible cash expenses incurred in the derivation of that gross assessable income). Economic income derived in a non-cash form (e.g. the imputed rental income that individuals derive from living in their own homes) is not included in the definition of taxable income and subject to tax;
- income derived from net increases in the value of a limited range of assets, such as the:
  - net income that is realised on the sale of certain assets (i.e. "realised capital gains" on the sale of assets such as inventories and other assets held on "trading account"); and
  - net income that accrues (but is not necessarily realised) as a result of increases in the value of certain assets that can be measured with reasonable accuracy (e.g. accrued income and expenditure in relation to the debt instruments that are owned by taxpayers subject to New Zealand's financial accruals rules, as well as accrued reductions in the value of depreciable assets). By contrast, the accrued increases and decreases in the value of other

assets and liabilities are not taxable (e.g. accrued gains and losses in the value of other financial assets, such as equity instruments, and non-depreciable physical assets).

In other words, the difficulties associated with the measurement of certain forms of economic income have had, and are likely to continue to have, a significant impact on the decisions that past and future governments make regarding the forms of economic income that should be included in the definition of taxable income.

In addition, as discussed further in section 3, the difficulties associated with the measurement of economic income also influences the selection of the approach used to estimate effective tax rates.

Statutory rates of tax indicate the amount of tax payable on taxable income

Since not all economic income is taxable, the statutory rates of tax set out in the Income Tax Act and regulations do not provide an accurate indication of the actual rates of tax that are imposed on the actual economic income derived by individuals and the households in which they reside.

Rather, those statutory tax rates indicate the rates of tax that are payable on taxable income.

For example, most people would be aware that each dollar of "personal" income they earn (e.g. the income they earn from wages and salaries) is taxable at the following rates of tax:

- the first few dollars of income up to $14,000 is taxable at a rate of 10.5%;
- each additional dollar of income over $14,000 up to $48,000 is taxable at a rate of 17.5%;
- each additional dollar of income over $48,000 up to $70,000 is taxable at a rate of 30%;
- each additional dollar of income over $70,000 up to $180,000 is taxable at a rate of 33%; and
- each additional dollar of income over $180,000 is taxable at a rate of 39%.

This schedule of personal income tax rates is an example of what we refer to in this report as "statutory marginal tax rates" that apply to taxable income. That is, they outline the rate of tax that is payable on each additional (i.e. marginal) dollar of taxable income that is earned by the individual.

In order to determine the total amount of tax that an individual has to pay on their total taxable income, it is necessary to sum the amounts of tax they have to pay on each dollar of taxable income they earn. For example, an individual earning $200,000 has to pay 10.5% tax on their first $14,000, $17.5% on the income they earn between $14,001 and $48,000, 30% of the income they earn between $48,001 and $70,000, 33% of the income they earn between $70,001 and $180,000, and 39% of the income they earn between $180,000 and $200,000.

In addition, in order to estimate the average (statutory) tax rate that individuals have to pay on their total amount of income, we need to divide the total amount of tax they pay by the total amount of taxable income they earn.

This highlights the fundamental mathematical relationship that exists between marginal tax rates, the total amount of tax paid, and average tax rates. In order to estimate both the total amount of tax paid, as well as the average tax rate imposed on that income, we need to know the marginal rates of tax that are imposed on each additional dollar of income earned.

It is also the reason why the average statutory rates of tax that individuals have to pay on their income are typically less than the statutory marginal rates of tax that apply to their last few dollars of taxable

income they earn. Unless an individual earns a level of personal income less than or equal to $14,000, the average statutory rate of tax they pay on their taxable income will always be less than the statutory marginal rate of tax that is applied to the last few dollars of their taxable income they earn, since some proportion of that taxable income will have been subject to lower statutory marginal rates of tax. For example:

- individuals with a taxable income of $14,000 face an average statutory rate of tax of 10.5% on that total taxable income;
- individuals with a taxable income of $48,000 face an average statutory rate of tax of around 15.5% on that total taxable income;
- individuals with a taxable income of $70,000 face an average statutory rate of tax of around 20% on that total taxable income;
- individuals with a taxable income of $180,000 face an average statutory rate of tax of around 28% on that total taxable income.

Effective tax rates indicate the amount of tax payable on economic income

By contrast, effective tax rates seek to identify the rate of tax that is imposed on economic income. Specifically, as discussed further below:

- effective marginal tax rates (i.e. EMTRs) seek to measure the amount of tax levied on each additional dollar of economic income derived; and
- average effective tax rates (i.e. AETRs) seek to measure the amount of tax levied on the total amount of economic income derived (i.e. the amount of tax paid, divided by total economic income).

Why is there a need to estimate different types of effective tax rates?

Effective tax rate measures have been developed in order to provide key stakeholders with a much better indication of the effects that the tax concessions and benefits provided by government have on the actual rates of tax that are levied on the economic incomes of taxpayers and welfare beneficiaries.[11]

Effective marginal tax rates seek to provide a more accurate indication of the additional amount of tax levied on each additional dollar of economic income

Effective marginal tax rates (EMTRs) seek to provide a more accurate indication of the combined effect that the income tax and benefit systems have on the net amount of tax that individuals are legally required to pay on each additional dollar of economic income they earn.

Those EMTR estimates are typically used to determine the extent to which the income tax and benefit systems alter economic efficiency with which the economy operates (e.g. by unintentionally distorting savings and investment decisions by imposing different EMTRs on the incomes that individuals derive

[11] As noted in section 2.2.1, a wide range of different methods of estimating effective tax rates have been developed for different purposes, not all of which seek to express the amount of tax paid as a proportion of economic income.

from the different financial assets in which they hold their savings and the different assets in which they invest their savings).

Average effective tax rates seek to provide a more accurate indication of the overall rate of tax levied on total economic income

Average effective tax rates (AETRs) seek to provide a better indication of the combined effect that the income tax and benefit systems have on the net amount of tax that individuals are legally required to pay on the total economic income they earn.

Those AETR estimates are typically used to determine the extent to which the income tax and benefits systems alter the distribution of income and improve the equity with which income is distributed across individuals in the community.

Effective tax rates do not measure who actually bears the burden of income taxes or enjoys the benefits of tax concessions and other benefits provided by the government

If the tax and benefit systems had no effect on the decisions of individuals, then the net amount of tax that each individual is legally required to pay on their income (e.g. as measured by the AETR on their income) would provide an accurate estimate of the actual net burden they bear, or net benefit they derive, from the combined effects of the income tax and benefit systems.

Indeed, for convenience and "simplicity", it is often assumed either explicitly, or implicitly, that the people who are legally required to pay tax, and legally entitled to receive benefits, are the same people who actually bear the burden of those taxes and enjoy the benefits provided by government. That is, it is often assumed that:

- those individuals who are legally required to pay high AETRs on their income actually bear all of the burden of those high tax rates;
- those individuals who are legally required to pay low AETRs on their income (e.g. those who receive significant tax concessions and other benefits from the government) are the same people who enjoy the benefits of those low tax rates.

Unfortunately, in practice, the tax and benefit systems do not just have the intended effect of raising and redistributing income. Rather, it is well recognised that in the course of raising and redistributing revenue, the tax and benefit systems also have the unintended effects of:

- reducing the efficiency with which the income tax and benefit systems raise and redistribute revenue and the economy operates. The income tax and benefits systems unintentionally encourage individuals to alter their decisions to work, consume, save, invest, produce and use resources. As a result, the economic cost of raising and redistributing that revenue exceeds the amount of revenue raised and redistributed by an amount referred to as the "excess burden" or "deadweight costs" of taxation; and
- reducing the equity with which income is raised and redistributed by the income tax and benefit systems. By unintentionally encouraging individuals to alter their decisions, some of the economic burden of the income taxes that individuals are legally required to pay, and economic benefits of the tax concessions and subsidies they are legally entitled to receive from the government, is also unintentionally passed onto other individuals in the community.

Effective tax rates provide some, but not all, of the information required to determine the extent to which the income tax and benefits systems:

- reduce the economic efficiency with which the nation uses its resources. Differences in the EMTRs that are imposed on the economic incomes generated by different types of assets provide an indication of the unintended adverse effects that the income tax and benefit systems can have by discouraging people from working, saving and investing and distorting their patterns of savings and investment in favour of assets that produce concessionally taxed income. However, additional information is required on the extent to which those unintended distortions in relative rates of return actually encourage individuals to change their levels and patterns of work, saving, investment, production and resource use (i.e. information on price elasticities of the demand for savings and the supply of investment); and
- improve the equity with which income is distributed across individuals in the community. Although AETR estimates help provide a better indication of how much tax individuals are legally required to pay on their economic income, additional information is required on the extent to which they alter their decisions in response to those taxes and pass on some, or all, of the actual economic burden to others through the operation of the markets for their capital assets.

Why is there a need to estimate effective tax rates for illustrative households?

As noted in section 2.2.3, since the actual effective rates of tax imposed on the incomes of individuals can differ significantly across different types of households, it is desirable to focus attention on the estimation of effective tax rates for those households that are illustrative of most New Zealand households (i.e. for the "typical" types of households). This focus on households is also required in order to consider the combined effects of the income tax system, which levies tax on the incomes of individuals, and the social welfare system, which provides benefits to specific types of households.

As a result, as outlined in greater detail in section 3 of this report, we have sought to use the limited information that is currently publicly available from the IRD and Stats NZ (e.g. Household Economic Survey data) to identify a number of representative households within three broad groups of households:

- low wealth households who derive up to $14,000 of net real economic income each year (i.e. low wealth/low income households);
- medium wealth households who derive annual net real economic incomes greater than $48,000 but less than or equal to $500,000 (i.e. medium wealth/medium income households); and
- high wealth/high income households who derive net real economic incomes in excess of $500,000 (i.e. high wealth/high income households).

Why is there a need for consistent estimates of effective tax rates?

As discussed in section 2.2.4, another important implication of the complexity of the income tax and benefit systems is the need for consistent measures of effective tax rates that compare "like with like".

The effective tax rates imposed on the incomes of individuals by the income tax and benefit systems depend on a wide range of factors other than the level of their income. This means that when examining how the effective rates of tax imposed on the incomes of individuals change as their

incomes increase (e.g. when estimating the effective marginal tax rates applying to that income to see how "progressive" the income tax system is), it is important to hold all of those other factors constant.

In addition, it is also important to ensure that the various elements of the formulas used to estimate effective tax rates (i.e. the "numerator" and "denominator" used in those estimates) are consistent with each other, since inconsistencies in these elements can result in the mismeasurement of those effective tax rates.

How do government decisions regarding the design of the income tax and benefit systems alter effective tax rates?

In order to aid the interpretation of the effective tax rate estimates outlined in section 3 of this report, section 2.3.2 illustrates the effects that key government decisions regarding the design of the income tax and benefit systems have on effective tax rates that are imposed on the net real economic incomes of taxpayers.

Taxing nominal rather than real income means that inflation increases the effective tax rates imposed on the incomes of all households

Successive New Zealand governments have decided not to seek to index the income tax system to exclude income and expenditure that is due purely to the effects of inflation. Rather, assessable income and most allowable deductions continue to be measured in nominal "dollar of the day" terms.

This means that in the presence of inflation, taxpayers have to pay tax not only on the net real economic income they derive, but also on the additional nominal income that they derive purely due to the effects of inflation. That is, the decision of governments not to index the income tax system to exclude the effects of inflation:

- increases the effective marginal tax rate that is imposed on each dollar of real economic income earned by the taxpayer; and
- increases the average effective tax rate that is imposed on their total real economic income.

The magnitude of those increases in effective tax rates depends on the rate of inflation and the real risk adjusted rate of return they derive on their income. If it is assumed that the real risk adjusted rate of return is 5% (as is assumed for the purposes of this report), then even a low rate of inflation of 2% will significantly increase the effective tax rates paid by taxpayers above the statutory tax rates they are legally required to pay. For example, although low wealth individuals earning low levels of real economic income are subject to the lowest statutory marginal tax rate of 10.5% on each dollar of taxable nominal income they earn, in the presence of a 2% rate of inflation, they are subject to an effective marginal rate of tax of 14.9% on each taxable dollar of real economic income they earn. Similarly, although high wealth individuals are subject to statutory marginal rates of tax of 39% on each additional dollar of taxable nominal income they earn, in the presence of a 2% inflation, they are subject to an effective marginal rate of tax of 55% on each additional taxable dollar of real economic income they earn.

Taxing the incomes of individuals rather than households reduces the tax rates imposed on households with more than one income earner

The decision of governments to tax each individual on the income they earn, rather than on the income earned by the household in which that individual resides, reduces the rates of tax that are applied to the total net real economic incomes of households with more than one income earner.

In effect, households with more than one income earner are able to earn much higher levels of taxable income before they are subject to higher statutory marginal rates of income tax.

Tax concessions reduce the effective tax rates imposed on the economic incomes households derive from their human, physical and financial capital

Tax concessions also reduce effective tax rates. That is, the decision made by governments not to tax certain forms of economic income (e.g. capital gains in the value of human capital, the family home and shares held on "capital account", as well as the imputed rental income derived by home owners) and to tax certain forms of income (e.g. income from Portfolio Investment Entities) at lower, "concessional", marginal rates of tax, tends to reduce effective tax rates.

In particular, the decision of government to exempt certain forms of income from tax, or tax those forms of income at lower concessional marginal rates of tax:

- reduces the effective marginal tax rate imposed on each dollar of the total economic income of the taxpayer; and
- reduces the average effective tax rate imposed on that total economic income.

In general, the magnitude of those reductions in effective tax rates is greater the:

- greater the proportion of the total economic income that is earned in a concessionally taxed form; and
- greater the size of the tax concession provided (i.e. lower the concessional statutory marginal tax rate applying to that income).

Government benefits further reduce the effective tax rates imposed on the incomes of households but the abatement of those benefits increases effective tax rates

The decision of governments to provide benefits in the form of tax credits, lump sum benefits and subsidised services such as education and health services further reduces the effective tax rates imposed on the economic incomes of taxpayers.

The provision of lump sum benefits that are not means tested (e.g. subsidised education and health services):

- does not alter the effective marginal tax rates imposed on the incomes of the recipients of those benefits;
- reduces the average effective tax rates they are legally required to pay on their income.

The magnitude of that reduction in average effective tax rates is greater the:

- lower the economic income of the taxpayer. That is, lump sum subsidies generate greater reductions in average effective tax rates for taxpayers earning lower levels of income. As the

wealth and economic income of taxpayers increase, lump sum subsidies generate progressively lower reductions in the average effective tax rates imposed on their income; and
- greater the size of the lump sum subsidy received by the taxpayer, which is reduced to some extent if that benefit is taxable.

When the lump sum subsidies provided to individuals and the households in which they reside are reduced (i.e. abated) as their incomes increase, however, this can significantly increase the effective rates of tax imposed on their economic incomes.

Net effect of inflation, tax concessions and other government subsidies

The net effect that inflation, tax concessions and other government subsidies have on the effective rates of tax imposed on the economic incomes of taxpayers therefore depends on the extent to which:

- inflation increases those effective tax rates; and
- the existence of more than one income earner in the household, tax concessions and other government subsidies reduce those higher effective tax rates.

As outlined further below, and illustrated in greater detail in section 3 of this report, this means that the effective tax rates that are imposed on the incomes of individuals and the households in which they reside can differ significantly due to the effects of both the:

- decisions that those households make regarding how much to work, consume, save, invest, produce and use resources; and
- decisions of governments regarding the design of the income tax and benefit systems, particularly their decisions:
  - not to index the income tax system for the effects of inflation;
  - to tax individuals, rather than households, on their income;
  - to tax certain forms of income from savings and investment at lower, "concessional" rates of tax (e.g. income from savings held in Portfolio Investment Entities);
  - not to tax certain forms of income (e.g. capital gains in the value of human capital, financial capital such as shares held on "capital account", as well as capital gains in the value of physical assets such as investments in the family home, as well as other residential and commercial properties);
  - to provide targeted subsidies to low income households that are reduced in magnitude (i.e. "abated" as their incomes increase); and
  - to provide certain benefits to all individuals, regardless of their wealth and economic incomes (e.g. NZ Super and subsidised education and health services that provide significant education subsidies to encourage individuals to invest their savings in their human capital, as well as significant health subsidies to help them "repair and maintain" their human capital).

Effective tax rate estimates

Why is it difficult to estimate the effective tax rates imposed on the real economic income of "representative" households?

Households differ significantly in terms of their composition and the forms in which they hold their wealth and earn their income

It is difficult to estimate the effective tax rates imposed on the incomes of households that are representative of New Zealand households due to the existence of significant differences in both the:

- composition of the households in which individuals choose to live at different stages of their lives and the eligibility of those households for government benefits; and
- wealth of those households, the types of assets in which they choose to hold their wealth, and the forms in which they earn the economic income from those assets.

In particular, it is difficult to generalise about the effective tax rates that are imposed on households at the two ends of the wealth and income spectrum:

- low wealth/low income households; and
- high wealth/high income households.

Differences in household income and eligibility for government assistance can have significant effects on the effective tax rates imposed on the incomes of low wealth/low income households

For example, although low income households tend to derive their low levels of economic income primarily in the form of taxable wage and salary income, differences in their household composition (e.g. their age, marital status, as well as their number of dependents and the regional areas in which they live) result in significant differences in their eligibility for different levels and types of benefits.

Differences in the form in which households earn their income and the tax treatment of that income can result in significant differences in the effective tax rates imposed on high wealth/high income households

As the wealth of individuals and the households in which they reside increases, their eligibility for means tested benefits reduces, but the range of different types of assets in which they can choose to hold their savings (e.g. different types of financial assets) and invest those savings (e.g. in human and physical capital) increases.

This makes it progressively more difficult to identify "representative" households and estimate "the" effective rates of tax imposed on their real economic incomes. Rather, at best, it is only possible to estimate the effective tax rates applying to "illustrative" types of households using a range of assumptions regarding the types of assets in which they hold their wealth and the forms in which the economic income from those assets is earned. This approach is consistent with the approach that is

used by the OECD in its "Taxing Wages" reports to estimate the taxes paid on wages in OECD countries.[12]

Effective tax rate estimates for a range of such "illustrative" low, medium and high wealth households are outlined briefly below and illustrated in greater detail in section 3 of this report.

What approach has been used to estimate effective tax rates?

As outlined in section 3, this report has adopted a "prospective" approach to estimating effective tax rates. This involves estimating the combined effects that the income tax and benefit systems have on the effective rates of tax that are imposed on the net real economic incomes that each of the illustrative households identified expect to derive from the range of different assets in which they hold their wealth. Specifically,. it has been assumed that:

- each of the illustrative households identified:
  - has a different household composition that makes them eligible for different types of government benefits (e.g. different income tax credits as well as different social welfare benefits);
  - hold their net wealth in the form of different types of financial and non-financial assets that are expected to generate different forms of economic income that are subject to different statutory marginal rates of tax. This includes assets that are expected to generate economic income in a non-taxable form (e.g. owner occupied housing, which generates non-taxable forms of income such as imputed rental income and accrued capital gains in the value of that housing);
- all of those assets, including financial and non-financial assets (including human capital), are expected to generate the same risk-adjusted net real economic rate of return of 5% before taxes and benefits. That is, we do not seek to measure the net real economic income derived by households. Rather, we examine how the income tax and benefit systems alter effective rates as the wealth and economic incomes of households increase;
- the rate of inflation is assumed to be 2%.

As discussed further in section 3, such a "prospective" approach helps to reduce, to some extent, many of the problems encountered by "retrospective" approaches to the estimation of effective tax rates that involve using survey data obtained from taxpayers on the assets they own, the income they derived from those assets and the tax they paid on that income. Those problems include the difficulties associated with:

- measuring the net real income of individuals and households using information they provide on their assets and liabilities. As previously noted, the difficulties associated with the measurement of economic income do not just limit the extent to which it is possible to include certain forms of that income in the definition of taxable income. It also creates problems for the estimation of effective tax rates (which require the amount of tax paid to be expressed as a proportion of some measure of that economic income). In particular, it makes it difficult to use information provided by taxpayers on the types of assets they own to measure the net real economic

[12] OECD (2022), Taxing Wages, https://www.oecd.org/tax/taxing-wages-20725124.htm

income generated by those assets. In the face of such problems, it is often necessary to "narrow" the definition of economic income to make it easier to measure, which inevitably results in inaccurate effective tax rate measures (i.e. since the "denominator" used in the effective tax rate formula will be lower to the extent that it excludes certain forms of economic income that are too difficult to measure);

- adjusting for the effects that differences in risk can have on the economic income generated by different types of assets. Some assets tend to offer quite low rates of return that reflect the relatively low risk that the actual rate of return they generate differs from the rate of return they were expected to generate (e.g. savings held in the form of securities issued by the NZ government). By contrast, other assets tend to offer quite high rates of return that reflect the possibility that the actual rate of return they generate might differ significantly from that expected rate of return (e.g. shares held in public and private companies). This means that when estimating the effective tax rates using information on the actual amount of economic income they generated, it is important to adjust that economic income to take into account the effects of those differences in risk. If such risk adjustments are not made, this can result in inaccurate effective tax rate estimates that reflect differences in risk, rather than differences in the amount of tax levied on the risk-adjusted economic income derived from those assets.

It is important to note, however, that even the use of a prospective approach to the estimation of effective tax rates does not eliminate all of the problems arising from the difficulties associated with the measurement of economic income (e.g. it is still necessary to determine the proportions of the total net economic income that are derived in each form, particularly the proportion of their net economic income that is not taxable). This is, of course, one of the reasons why effective tax rate estimates need to be interpreted and applied with caution. Inevitably, they have to be based on incomplete and potentially inaccurate information.

What effective tax rates are imposed on the economic incomes of illustrative low, medium and high wealth households?

Average effective tax rates increase as the net real economic incomes of households increase

As indicated in **Table 1** and outlined further below and in section 3.2 of this report, as the net real economic incomes of households increase, the amount of tax levied on that income increases (i.e. the average effective rate of tax levied on that income increases). This is the case for all of the illustrative households considered, including high wealth/high income households.

The rates at which average effective tax rates increase differ due to differences in the effective marginal rates of tax applying to different forms of economic income

Although average effective tax rates increase as the net real economic incomes of households increase, the rates at which those average effective tax rates increase vary significantly across households due to differences in the effective marginal rates of tax that are imposed on the different forms in which they derive their economic income.

As outlined below, in general, the average effective rates of tax that are imposed on low wealth/low income households tend to increase at a much greater rate than for medium and high wealth households. This is due to the very high effective marginal tax rates that are imposed on each

additional dollar they earn due to the high rates at which the benefits they receive from the government are abated.

Low wealth households receive a net subsidy from the government that rapidly reduces as their economic incomes increase

Consider first the effective tax rates that are imposed on the net real economic incomes of low wealth households (i.e. households earning net real economic income of less than $48,000 per annum) who earn their low levels of income, if any, in the form of wages and salaries.

As outlined in **Table 1**, those illustrative low wealth/low income households include:

- single person households who are unemployed or underemployed, live in rental accommodation and receive Jobseeker Support and the Accommodation Supplement;
- single parent households who have one dependent child, live in rental accommodation and receive Sole Parent Support and the Accommodation Supplement;
- single parent households who have one dependent child, work at least 20 hours a week, live in rental accommodation and receive Sole Parent Support, the Accommodation Supplement and Family Tax Credits.

In the absence of government subsidies and tax concessions (i.e. under a comprehensive real income tax system), such low wealth households would face:

- average effective tax rates on their net real economic incomes that increase from 10.5% for those earning only very low levels of income, through to around 15.5% for those earning income of $48,000 per annum; and
- effective marginal tax rates that increase from 10.5% on the first few dollars of net real economic income they earn, through to 17.5% on each dollar of income they earn in excess of $14,000 and up to $48,000.

As a result of the government's decision to provide subsidies including Sole Parent Support, the Accommodation Supplement and Working for Families tax credits (e.g. the Family Tax Credit), however, these low wealth households face:

- large negative average effective tax rates (i.e. subsidies well in excess of 100% of their real economic income) on their low levels of income that increase rapidly to average effective tax rates of around 26% (for single parent households) and 28% (for single person households with no dependents) for households with a net real economic income of $48,000 per annum;
- high effective marginal tax rates that increase rapidly from around 25% on low levels of net real economic income, to very high effective marginal tax rates (e.g. in excess of 100%) for those on real incomes of around $10,000 per annum due to the combined effects of inflation and high rates of abatement of their benefits as their incomes and assets held in the form of cash increase (e.g. Sole Parent Support abates at a rate of 30% for each dollar of nominal income earned in excess of $8,320 per annum and 70% for each dollar of nominal income earned in excess of $13,000 per annum). These very high effective marginal tax rates are of significant concern to the extent that they discourage individuals re-entering the workforce and earning higher levels of income. Those effective marginal tax rates reduce to around 43% (for single person households), or 58% (for single working parent households), on the last few dollars they earn of a net real economic income of $48,000 per annum.

Medium wealth households also face average effective tax rates that increase as their net real economic incomes increase

Now consider the effective tax rates that are imposed on the net real economic incomes of medium wealth households (i.e. households earning net real economic income between $48,000 and $500,000 per annum).

As outlined in **Table 1**, those illustrative medium wealth/medium income households include:

- single person households who are employed, have no depends, live in rental accommodation, do not receive benefits and derive most of their income (90%) in the form of wages and salaries that are taxable at their statutory marginal tax rates and the remainder (10%) of their income in a non-taxable form (e.g. the imputed rental income generated by the consumer durables they own);
- working couple households who have two dependent children, live in their own homes, receive Working for Families Tax Credits, and derive their income in the form of wages and salaries (48%), income from their investments in a Portfolio Investment Entity (32%) and the remainder (20%) of their income in a non-taxable form (e.g. the imputed rental income they derive from living in their own home, as well as capital gains in the value of that home);
- older retired couple households who live in their own home, derive most (80%) of their income from the savings they hold in a Portfolio Investment Entity that is taxable at their Prescribed Investor Rates of tax and the remainder (20%) of their income in a non-taxable form (e.g. the imputed rental income they derive from living in their own home, as well as capital gains in the value of that home).

Once again, in the absence of government subsidies (i.e. under a comprehensive income tax system), those medium wealth households would face:

- average effective tax rates ranging from around 15.5% for real economic incomes of $48,000 to 35% for incomes of $500,000; and
- effective marginal tax rates ranging from 10.5% for the first few dollars they earn, up to 39% for each dollar they earn in excess of $180,000 per annum.

In practice, however, the actual effective tax rates that are imposed on the net real economic incomes of medium wealth/medium income households differ significantly due to the decision of governments:

- not to index the income tax base to exclude the effects of inflation, which significantly increases the effective rates of tax they are legally required to pay on each additional dollar of real economic income they earn (e.g. assuming a risk adjusted real rate of return of 5%, even a low rate of inflation of 2% will result in their net taxable income being around 40% higher than their actual net real economic income);
- to tax individuals, rather than households, on the income they earn, which reduces the amount of tax they pay in relation to a single person deriving the same level of household income;
- not to tax, or to concessionally tax, certain forms of income (e.g. the imputed rental income from the family home, as well as capital gains in the value of human capital and the value of the family home). This reduces the effective rates of tax imposed on the economic incomes of

those households who choose to hold and invest a higher proportion of their savings in those assets that generate those non-taxable and concessionally taxed forms of income;
- to provide certain forms of means tested subsidies to medium wealth households that are abated as their incomes increase, which increases the effective tax rates imposed on their economic income; and
- to provide other subsidies to all households (e.g. subsidised education and health services), regardless of their levels of wealth and income. Those non-means tested benefits do not alter the effective marginal tax rates imposed on the economic incomes of households (i.e. since they are not abated as their incomes increase). However, they do reduce the average effective tax rates imposed on their economic incomes. Note, however, that the effective tax rate estimates presented in **Table 1** do not include the effects of those subsidised education and health services.

The net effect of this range of factors has on effective tax rates depends on the decisions not only on the government decisions outlined above, but also on the decisions that households make regarding the:

- types of households in which they choose to reside (e.g. whether or not to marry and have children);
- how much to work, consume, save and invest;
- types of assets in which to hold their savings and invest those savings;
- forms in which they earn that income; and
- entities through which they choose to save and invest (e.g. investment funds, Portfolio Investment Entities, as well as public and private companies).

For example, as outlined in **Table 1**, the illustrative:

- single person households identified face much higher average effective tax rates that range from around 24% on $48,000 and 46% on $500,000 of income. Those higher average effective tax rates are due to the higher effective marginal tax rates that are imposed on their net real economic income, which increase from around 13% for the first few dollars of income to around 50% for the last few dollars of a $500,000 income per annum. Those higher effective marginal tax rates are due to government decisions not to index the income tax system to exclude the effects of inflation;
- working couple households identified face low average effective tax rates ranging from around negative 16% (i.e. a net subsidy from government) for net real economic incomes of $48,000 per annum to around 29% for incomes of $500,000 per annum. These low average effective tax rates are the result of the government decisions to provide such households with Working for Families Tax Credits, which abate as their incomes increase. It is the abatement of those benefits, in combination with the decision of governments not to index the income tax base for the effects of inflation, that result in these households facing high effective marginal tax rates on their net real economic income of around 45% for those with incomes of $48,000 to 37% for those with incomes of $500,000;
- older retired couple households identified face low average effective tax rates of around negative 71% (i.e. a net subsidy from government) on incomes of $48,000 that increase to around 6% on incomes of around $500,000. These low average effective tax rates are the combined result of:

  - government decisions not to tax, or to concessionally tax certain forms of income (e.g. the income earned through Portfolio Investment Entities) and to provide NZ Super to all retired individuals, regardless of their wealth or income. This reduces the effective marginal tax rates imposed on the first few dollars of their income to around 6% and on their last few dollars of an income of $500,000 to around 16%; and
  - the greater the levels of disposable income that households at the higher end of the medium wealth spectrum have to save, as well as their greater flexibility to hold their wealth in those forms that generate non-taxable and concessionally taxed forms of income.

High wealth households also face average effective tax rates that increase as their net real economic incomes increase, but at a lower rate

Finally, consider the effective tax rates that are imposed on the net real economic incomes earned by high wealth households (i.e. households earning net real economic incomes in excess of $500,000 per annum).

As outlined in **Table 1**, those illustrative high wealth/high income households include:

- professional working couple households who have no dependents, do not receive benefits, and derive most of their income in the form of wages and salaries (48%), income from the savings they hold in a Portfolio Investment Entity (32%) and the remainder (20%) of their income in a non-taxable form (e.g. the imputed rental income they derive from living in their own home, as well as capital gains in the value of that home);
- self-employed couple households who have no dependents, live in their own home, do not receive benefits, and derive most of their income in the form of income from the businesses they own, such as wage and salary income (48%) and the retained earnings of their companies (19.2%), income from their savings that are held in a Portfolio Investment Entity (12.8%) and the remainder (20%) of their income in a non-taxable form (e.g. imputed rental income from owner-occupied housing and capital gains in the value of that housing);
- older retired couple households who live in their own home, both receive NZ Super, derive most (80%) of their income from the savings that they hold in a Portfolio Investment Entity and the remainder (20%) of their income in a non-taxable form (e.g. imputed rental income from owner-occupied housing and capital gains in the value of that housing).

In the absence of government subsidies and tax concessions (i.e. under a comprehensive income tax system), those high wealth households would face:

- average effective tax rates ranging from 35% for net real economic incomes of $500,000 to 37.6% for incomes of around $1.4 million;
- effective marginal tax rates ranging from 10.5% on their first few dollars of income to 39% on each dollar they earn in excess of $180,000.

Once again, however, the actual effective tax rates that are imposed on the net real economic incomes of high wealth households differ from those tax rates due to the combined effects of both the:

- decisions of government:
  - not to index the income tax system for the effects of inflation, which significantly increases the effective tax rates imposed on their income;

- to tax individuals, rather than households, on their income, which reduces the effective tax rates imposed on their household income in relation to those imposed on the incomes of single person households earning the same amount of household income; and
- not to tax, or to concessionally tax, certain forms of income from capital (e.g. imputed rental income from owner occupied housing and capital gains in the value of human capital and the value of owner-occupied housing) which reduces effective tax rates;

- different savings and investment decisions made by high wealth households, who not only have much higher levels of disposable income to save and invest, but also much greater flexibility to determine the:
  - assets in which to hold and invest their savings;
  - entities through which they choose to save and invest (e.g. investment funds such as Portfolio Investment Entities, as well as private and public companies); and
  - form in which they choose to derive the income from their assets (e.g. interest and dividend income, as opposed to income in the form of capital gains in the values of those assets).

For example, as outlined in **Table 1**, the illustrative:

- professional working couple households identified face lower average effective tax rates that range from around 23% on a net real economic income of $500,000 to around 29% on income of around $1.4m per annum. Those lower average effective tax rates are due to the lower effective marginal tax rates that are imposed on their net real economic income, which increase from around 9.5% for the first few dollars of income to around 33% for the last few dollars of a $1.4 million income per annum. These lower effective marginal tax rates are due to government decisions to tax certain forms of economic income at lower concessional rates of tax;
- self-employed couple households identified face lower average effective tax rates that range from around 25% on income of $500,000 to around 31% on incomes of around $1.4 million per annum. Once again, those lower average effective tax rates are due to the decisions of government not to tax certain forms of economic income and to tax other forms of economic income at lower, concessional, tax rates, which lower the effective marginal tax rates imposed on their income to around 29% on the last few dollars of an income around $500,000 and to 34% on the last few dollars of an income around $1.4 million;
- older retired couple households identified face low average effective tax rates ranging from around 6% on net real economic incomes of $500,000 to around 12% on incomes of around $1.4 million. Once again, those average effective tax rates are the combined result of government decisions to concessionally tax certain forms of economic income and to provide NZ Super to all retired individuals, regardless of their wealth or income. Those tax concessions reduce the effective marginal rates of tax imposed on the first few dollars of net real economic income they earn to around 6% on their first few dollars of income to around 16% for the last few dollars of an income of around $1.4 million.

Table 1: Effective tax rates imposed on the net real economic incomes of illustrative households

Income band	Household composition	Type of benefits received	Proportion of net real economic income earned in each form				Effective tax rates imposed on net real economic income							
							First few dollars		$48,000		$500,000		$1.4m	
			Wages and salaries	Retained earnings of company	Income from PIE	Non-taxable income	EMTR	AETR	EMTR	AETR	EMTR	AETR	EMTR	AETR
Low wealth/ low income	Single unemployed or underemployed person, living in rental accommodation	Jobseeker Support and Accommodation supplement	100%	0%	0%	0%	25%	<-100%	43%	28%	N/A	N/A	N/A	N/A
	Single parent, one child, living in rental accommodation	Sole Parent Support, Accommodation Supplement	100%	0%	0%	0%	25%	<-100%	43%	26%	N/A	N/A	N/A	N/A
	Single working parent, one child, living in rental accommodation	Sole Parent Support, Accommodation Supplement, Family Tax Credits	100%	0%	0%	0%	25%	<-100%	58%	26%	N/A	N/A	N/A	N/A
Medium wealth/ medium income	Single employed person, no dependents, living in rental accommodation	N/A	90%	0%	0%	10%	13%	13%	38%	24%	50%	46%	N/A	N/A
	Working couple with two children, living in own home	Working for Families Tax Credits	48%	0%	32%	20%	>100%	<-100%	45%	-16%	37%	29%	N/A	N/A
	Older retired couple, living in own home	NZ Super	0%	0%	80%	20%	6%	<-100%	6%	-71%	16%	6%	N/A	N/A
High wealth/ high income	Professional working couple, no dependants, living on own home	N/A	48%	0%	32%	20%	9.5%	9.5%	14%	10%	29%	23%	33%	29%
	Self-employed couple, living in own home	N/A	48%	19.2%	12.8%	20%	13%	13%	18%	14%	29%	25%	34%	31%
	Older retired couple, living in own home	NZ Super	0%	0%	80%	20%	6%	<-100%	6%	-71%	16%	6%	16%	12%

Note: The effective tax rate estimates outlined in this table exclude the effects of subsidised education and health services

What effective tax rates are imposed on income from savings and investment?

In order to understand who ultimately bears the economic burden of income taxes and enjoys the benefits of tax concessions and subsidies provided by government, it is important to understand how those effective tax rates alter economic decisions – particularly saving and investment decisions.

This requires the use of more detailed measures of effective tax rates that take into account a wider range of complexities of the company and personal income tax systems, as well as the operation of domestic and international capital markets, to provide more accurate estimates of the effective marginal tax rates that are imposed on income from savings and investment.

As a result, in addition to providing estimates of the effective tax rates imposed on illustrative types of low, medium and high wealth households, section 3 of this report also outlines more detailed OECD, New Zealand Treasury and Inland Department estimates of the effective tax rates that are imposed on the incomes that individuals derive from both the:

- financial assets in which they hold their savings (i.e. the effective tax rates that are imposed on their "income from savings"); and
- physical assets in which they invest those savings (i.e. the effective marginal tax rates that are imposed on their "income from investment").

Different effective tax rates are imposed on the incomes individuals derive from the different types of financial assets in which they hold their savings

As set out in section 3.3.3 of this report, OECD estimates indicate that the effective marginal rates of tax that are imposed on the incomes that individuals earn from their different types of savings vehicles in New Zealand differ significantly (e.g. from negative16.3% for shares held by a low income individual in companies that distribute 100% of their profits through to 59% for debt financed investments in owner-occupied housing) due to differences in the:

- incomes of the individual, which influences the statutory marginal rate of tax that is imposed on their income. EMTRs are presented for:
  - low-income individuals (i.e. individuals earning 67% of the average wage);
  - average income individuals (i.e. individuals earning 100% of the average wage); and
  - high income individuals (i.e. individuals earning 500% of the average wage);
- real rate of return generated by the asset (i.e. 2%, 3% and 4%);
- inflation rate (i.e. the actual current rate of inflation as well as OECD average rate of inflation, which is used to facilitate comparisons in EMTRs across countries. In both cases, the assumed rate of inflation used is an average of inflation rates over the period 2011 to 2016); and
- length of time over which the asset is held.

Different effective tax rates are imposed on the incomes individuals derive from the different types of physical assets in which they invest their savings

As outlined in section 3.3.4, OECD, NZ Treasury and Inland Revenue estimates also indicate that there are significant differences in the effective marginal tax rates that are imposed in New Zealand on the income generated by different types of investments in different assets that are due to differences in the:

- statutory marginal rates of tax that are imposed on different types of income (e.g. interest and dividend income that is taxable and capital gains realised on the sale of assets held on "capital account" that are exempt from tax);
- tax treatment of debt and equity finance, since interest expense is tax deductible whereas dividends are paid out of after-tax profits;
- timing of recognition of certain forms of taxable income and expenditure (e.g. the recognition of some forms of taxable income and deductible expenditures as they accrue and others only when they are received or realised);
- effects of inflation on different forms of income, due to the lack of indexation of the tax base to exclude changes in taxable income and expenditure that are purely due to inflation.

Interpretation and application of effective tax rates

Who really bears the burden of taxes and enjoys the benefits of tax concessions and government subsidies?

Effective tax rate estimates indicate the "legal" incidence of income taxes and benefits, not the "economic incidence" of those taxes and benefits

As outlined in section 4.1 of this report, effective tax rates potentially provide a more accurate indication of the actual amount of income tax that individuals are legally required to pay on their economic income, as well as the actual benefits they are entitled to receive. However, they do not provide an accurate indication of either the:

- distributional equity of the tax system – that is, who actually bears the burden of those income taxes and enjoys the benefits of the concessional rates of income tax and subsidies provided by the government; or
- economic efficiency of the tax system – that is, its ability to raise and redistribute sufficient revenue in a manner that minimises any unintended adverse effects on economic decisions and the efficient allocation of the nation's scarce resources.

As previously noted, effective tax rates only provide some of the information required to analyse these complex issues. Additional information is required on how the income tax and benefit systems alter the decisions of individuals and through the operation of capital markets pass on some or all of the incidence of those taxes and subsidies onto other individuals.

Existing asset owners bear the burden of new taxes and enjoy the benefits provided by new tax concessions and government transfers

The individuals who bear the burden of new taxes, or enjoy the benefits of new tax concessions or other government subsidies, tend to be those who own the assets that generate the income that is subject to those new taxes or eligible for those new tax concessions or subsidies at the time they are introduced (i.e. existing asset owners):

- individuals who own assets that generate income at the time of the introduction of a new or increased rate of tax on that income will experience a capital loss in the value of that asset (i.e. since the stream of future after-tax income that it is expected to generate is lower);

- individuals who own assets that generate income at the time of the introduction of a new tax concession, or government subsidy, on that income will experience a capital gain in the value of that asset (i.e. since the stream of future after-tax income that it is expected to generate in the future is higher).

Subsequent owners of assets are unlikely to bear all of the burden of taxes they are legally required to pay, or enjoy all of the benefits provided by tax concessions and government transfers

By contrast, individuals who purchase the assets that generate the income that is already subject to those new taxes, or eligible for those new subsidies, are unlikely to bear all of the burden or benefit of those new taxes and subsidies. This is because the introduction of new taxes or subsidies has the effect of altering the relative after-tax risk adjusted rates of return that individuals earn on their human, financial and physical capital, which will unintentionally:

- alter their decisions to work, consume, save, invest, produce and use resources; and
- thereby shift some, or even all, of the burden of those new taxes, or the benefits of those new tax concessions and other government subsidies, onto other individuals in the community.

Capital markets will continue to adjust to those changes in the decisions of individuals and businesses until any differences in those after-tax risk adjusted rates of return are competed away. The only way that those differences in risk adjusted after-tax rates of return can be equilibrated by the operation of those capital markets is by distorting pre-tax rates of return, which creates long term inefficiencies in levels and patterns of saving, investment and resource use. That is, the operation of capital markets tends to capitalise any short term differences in after-tax rates of return into long term distortions in the relative prices of assets.

What factors constrain the government's ability to improve the equity and efficiency of the income tax and benefit systems?

The government's ability to significantly reduce further unintended differences in the effective marginal tax rates imposed on the incomes that individuals derive from their savings and investment is significantly constrained by a range of key factors:

- information constraints, particularly the lack of the extensive information required in order to estimate the nature and extent of the unintended effects that the income tax and benefit systems have on both economic efficiency and distributional equity;
- conflicting objectives, particularly the inherent conflict that exists between the equity and efficiency objectives of the tax and benefit systems. Attempts to improve the equity of the tax and benefit systems can have the unintended effect of reducing economic efficiency;
- unavoidable economic costs (e.g. the unavoidable adverse effects that taxes and benefits inevitably have on economic efficiency, which include the adverse effects of an income tax on work, saving and investment decisions, as well as the administrative and compliance costs arising from the operation of the tax and benefit systems);
- legislative constraints (e.g. the long standing different tax treatment of debt and equity).

What implications do those practical constraints have for the government's approach to income tax and benefit reform?

The constraints outlined above have significant implications for the approach that governments should adopt to the review and reform of the income tax and benefit systems.

Effective tax rates need to be interpreted and applied with caution

As noted in section 5.1, effective tax rates need to be interpreted and applied with caution.

The effective tax rates imposed on the net real economic incomes depend on a wide range of factors that can differ significantly across households, even those with the same levels of wealth and net real economic income, due to differences in the:

- decisions of those households regarding their household composition, how much of their incomes to consume, save and invest, as well as the types of assets in which to hold and invest their savings; and
- decisions of governments regarding what types of income to tax, the rates of tax that should be applied to that income, the benefits that should be provided to particular types of households and the rates at which those benefits should abate as their wealth and incomes increase.

This makes it difficult to generalise about "the" effective rates of tax imposed on any particular type of household, or form of savings and investment, particularly for high wealth households who have the greatest flexibility to choose the form in which they hold their wealth and earn their income.

Information constraints (e.g. the limited information currently available on the wealth of households, the forms in which they hold that wealth and derive their economic income, as well as the amount of economic income they derive) not only constrain the extent to which it is possible to measure and tax economic income, but they also limit the extent to which it is possible to estimate accurate effective tax rates. Regardless of the approach used to estimate effective tax rates, inevitably they have to be based on incomplete and potentially inaccurate information.

In addition, although effective tax rates provide a potentially more accurate indication of the "legal" incidence of income taxes and benefits, they do not provide an accurate indication of who ultimately bears the burden of those taxes or enjoys the benefits provided by tax concessions and other government subsidies.

Rather, additional information is required in order to determine the extent to which differences in the effective marginal rates of tax imposed on different forms of income will encourage individuals to change their savings and investment decisions and thereby, through the operation of capital markets, pass on some, or even all, of the economic incidence of those taxes and benefits onto other individuals.

Practical constraints limit the scope for further reform of the income tax and benefit systems

Although effective tax rate estimates help to identify those features of the income tax and benefit systems that may be in need of further review and reform, this does not mean that any reform that reduces those differences will improve economic efficiency or distributional equity.

Rather, as noted in section 5.2, the practical constraints outlined in section 4.2 of this report limit the scope for further reform of the income tax and benefit systems.

Many of the remaining sources of differences in effective tax rates reflect difficult trade-offs between the competing objectives of the equity and efficiency of the tax system that, to date, governments have found difficult to resolve. As a result, attempts to reduce differences in effective tax rates can result in the reversal of many complex, long standing tax policy decisions regarding the design of the income tax and benefit systems.

Consequent need to pursue less informationally demanding approaches to reform

While it is desirable to improve our understanding of both the equity and efficiency of the tax and benefit systems, it is also important to recognise the difficulties and considerable costs of obtaining the information required to develop a more detailed understanding of those effects. As noted in section 5.3, those costs include the:

- administrative costs associated with obtaining, analysing and regularly updating that information since it becomes rapidly obsolete as individuals change their savings and investment portfolios over time;
- compliance costs, which can be significant when taxpayers (e.g. high wealth individuals) are asked to provide confidential information that is not required for accounting or taxation purposes; and
- potential unintended effects that such requests for information could have on savings and investments decisions (e.g. by creating a more uncertain environment for investment due to concerns that the government might be considering the introduction of comprehensive taxes on capital gains or wealth).

Those information constraints are the key reasons why, until recently, successive New Zealand governments have:

- adopted a less informationally demanding approach to improving the economic efficiency and distributional equity of the income tax system that has involved:
  - reducing statutory marginal rates of income tax in order to reduce the disincentives to save and invest; and
  - broadening the tax base, where practicable, to:
    - raise a greater proportion of tax revenue using more efficient taxes, such as New Zealand's broad based indirect consumption tax (i.e. GST); and
    - include a wider range of economic income in the tax base in order to reduce the extent to which the income tax system unintentionally distorts patterns of saving and investment;
- rejected more informationally demanding approaches to tax reform that deviate from that broad base, low rate approach to tax reform unless there is sufficient empirical evidence to suggest that such reforms are both feasible in practice and can be expected to significantly improve the efficiency and equity of the tax system.

1. Introduction

1.1 Background to this report

Over the last decade, increasing attention has been given to the distribution of wealth and income in most developed countries. In particular, attention has focussed on the extent to which the estimated increasing gap in the distribution of wealth and income between the rich and the poor is the result of "high net wealth individuals" not paying their "fair share" of tax on their actual economic income (i.e. on the annual increments in their wealth).

For example, in the US, Leiserson and Yagan (2021) have estimated that the average Federal individual income tax rate paid by America's wealthiest 400 families was only 8.2% for the period 2010–2018, partly due to the concessional tax treatment of capital gains.[13]

In the United Kingdom, Advani and Summers (2020) have also estimated that although the headline (i.e. statutory) average tax rate on earnings rises to a peak of 47% for those with earnings of more than £2 million, the average person with more than £2 million in taxable income had an average effective tax rate of only 40%. The average person with total remuneration of £10 million (i.e. income plus capital gains) had an estimated effective tax rate of just 21%, which is less than the rate that would be paid by someone on median earnings of £30,000.[14]

Similarly, in New Zealand there has been an increasing focus on the issue as to whether high wealth individuals are paying their fair share of tax following the release of the results of research into the distribution of wealth in New Zealand by Rashbrooke, et al (2021). In the conclusion to their paper, the authors note that although New Zealand has traditionally portrayed itself as an egalitarian country, the results of their analysis suggest that this is not the case when it comes to economic wealth, even leaving aside all the other inequalities – for instance those between ethnicities – that characterise New Zealand. Specifically, they note that:

- there are striking inequalities of wealth, more so even than in comparable developed countries. These inequalities appear to be even greater once the under-reporting of the largest fortunes is corrected;
- there is significant inequality in housing, one of the most important assets for well-being, and even greater inequality in the assets that create, and are created by, control over the productive economy; and

[13] Leiserson, G. and D. Yagan (2021), *What Is the Average Federal Individual Income Tax Rate on the Wealthiest Americans?*, the White House, 23 September 2021. https://www.whitehouse.gov/cea/written-materials/2021/09/23/what-is-the-average-federal-individual-income-tax-rate-on-the-wealthiest-americans/

[14] Advani, A. and A. Summers (2020), *How much tax do the rich really pay? New evidence from tax microdata in the UK*, CAGE Policy Briefing no. 27 June 2020, https://warwick.ac.uk/fac/soc/economics/research/centres/cage/manage/publications/bn27.2020.pdf

- while New Zealand may be egalitarian in some other respects – its relative ease of connection between different social classes, for instance, or its moderately high social mobility – it is not egalitarian in its actual distribution of economic wealth.[15]

The issue of wealth taxation also arose at the 2015 CAANZ conference, when a comment was made by one of the speakers that, in relation to wealth taxation in New Zealand, "income tax does the heavy lifting". That comment led to subsequent research being undertaken by Inland Revenue to explore the extent to which this is actually the case, which involved an analysis of the tax paid by a sample of high wealth individuals, the results of which were released in redacted form on the 5th of May 2018 under the Official Information Act.[16]

In response to the results of that research, the Government decided to include in the 2021-22 Tax Policy Work Programme "Research work by Inland Revenue involving the collection of information on the level of tax paid by high wealth individuals":[17]

- The stated goal of that project is to "improve the evidence base on which to assess the fairness of the tax system. The project will do this by improving our information on effective tax rates. The project is not making any policy recommendations, but the analysis will inform future tax policy advice".
- The project will "compare the amount of tax an individual, and their household, pays to a number of different measures of income. This will allow us to estimate a range of effective tax rates for each household – enabling us to take different perspectives on how we assess the fairness of New Zealand's tax system. Economic income is the broadest measure of income we will use. It is not based on legal concepts but seeks to estimate the increase in resources a person has available to them in a given period. Economic income includes increases in wealth, such as through capital gains, and looks beyond legal or tax concepts of income."
- The primary output of that project will be a public report on the project, which "is expected to be completed by June 2023" ahead of the next general election.[18]

On 16 February 2021, a Treasury Report (T2020/2965) on "Experimental estimates of New Zealand's Wealth Distribution" was released under the Official Information Act that:

- outlines the first phase of the work scoped out the available data sources and options for further work (T2019/3234 Effective tax rates – distributional analysis, December 2019);

---

[15] Rashbrooke, M, Rashbrooke, G. and A. Chin (2021), *Wealth inequality in New Zealand An analysis of the 2014-15 and 2017-18 net worth modules in the Household Economic Survey*, Institute for Governance and Policy Studies, Victoria University of Wellington, May 2021, https://www.wgtn.ac.nz/__data/assets/pdf_file/0007/1935430/WP-21-10-wealth-inequality-in-New-Zealand.pdf

[16] This sequence of events is documented in a note by Andrea Black dated 13 March 2018, who was involved in the CAANZ conference discussions and led the Inland Revenue team who looked at the actual tax being paid by a sample of the high wealth population (see https://taxworkinggroup.govt.nz/sites/default/files/2019-08/twg-bg-4162258-taxation-of-high-wealth-individuals.pdf). The redacted report released under the OIA is available at https://taxworkinggroup.govt.nz/sites/default/files/2018-05/High-wealth-individuals.pdf.

[17] See the Government's tax policy work programme: 2021-22 https://taxpolicy.ird.govt.nz/-/media/project/ir/tp/work-programme/2021-22/2021-07-20-tax-policy-work-programme-pdf.pdf?modified=20210720041930

[18] Information Sheet: Inland Revenue's high-wealth individuals research project on effective tax rates https://www.ird.govt.nz/-/media/project/ir/home/documents/about-us/high-wealth-research-project/hwi-research-project/info-sheet-on-effective-tax-rates.pdf?modified=20220602230929&modified=20220602230929

- notes that additional work had been commissioned from:
  - Treasury on data sources that might be used to estimate the income for the top 1% of earners (which was delivered in Treasury report T2020/297, in February 2020); and
  - Inland Revenue to provide its annual report on high wealth individuals and estimates of effective tax rates (using a proxy for economic income) for a sample of high wealth individuals (HWIs) using administrative data (delivered in BN2020/087, February 2020);
- sets out results of Treasury and Inland Revenue's:
  - improved estimates of the top of the wealth distribution, trialling new statistical methods and augmenting survey data with rich list data; and
  - exploration of the applicability of the income capitalisation method to New Zealand, and results from this method;
- notes that "Given the novelty of these methods they are subject to further refinement, and hence the estimates in this paper should be viewed as preliminary."[19]

1.2 Purpose, structure and content of this report

In the light of those developments, Olivershaw has commissioned Sapere Research Group (Sapere) to prepare a report on the effective rates of tax that New Zealand's tax and benefit systems impose on the incomes of its residents.

This report commences with a brief overview of New Zealand's income tax and benefit systems (section 2), including the:

- size and complexity of the tax and benefit systems. Section 2.1 provides available information on:
  - the amount of revenue that is raised and redistributed by the income tax and benefit systems (section 2.1.1);
  - who was legally required to pay that tax revenue (section 2.1.2);
  - who was legally entitled to receive those benefits (section 2.1.3);
  - the net effect of the income tax and benefit systems (section 2.1.4); and
  - how the amounts of tax paid and benefits received vary with age and gender (section 2.1.5);
- need to estimate "effective tax rates" in order to obtain a potentially more accurate estimate of the combined effects that the income tax and benefit systems have on the actual rates of tax that individuals, as well as the households in which they reside, are legally required to pay on the economic income they derive. Section 2.2 outlines the:
  - concept of economic income and outlines how it differs from the definition of taxable income (section 2.2.1);
  - need for different effective tax rate measures (section 2.2.2) in order to understand how the income tax and benefit systems affect both the economic efficiency and distributional equity with which the income tax and benefit systems raise and redistribute revenue;
  - need to identify illustrative types of households in order to be able to estimate the combined effects that the income tax and benefit systems have on the effective tax rates

[19] See https://www.treasury.govt.nz/sites/default/files/2021-04/oia-20210012.pdf.

that the members of that household are legally required to pay on the income they earn (section 2.2.3);
  - need for consistent measures of effective tax rates (section 2.2.4);
- need to understand how government decisions regarding the design of the income tax and benefit systems alter those effective tax rates. In order to help with the interpretation and application of the effective tax rate estimates set out in section 3, section 2.3 illustrates:
  - what effective tax rates look like under proportional and progressive income tax systems (section 2.3.1);
  - how effective rates change as a result of key government decisions regarding the design of the income tax and benefit systems (section 2.3.2), such as the decisions of governments:
    - not to index the income tax base for the effects of inflation;
    - to tax individuals on the income they earn, rather than households;
    - not to include certain forms of income and expenditure in the definition of taxable income and allowable deductions;
    - to tax certain forms of income at lower (i.e. concessional) statutory marginal tax rates;
    - to provide benefits to some households that are either taxable or not taxable;
  - how effective tax rates change as a result of the combined effects inflation and tax concessions (section 2.3.3).

The report then presents estimates of the effective tax rates imposed on the incomes of illustrative households (section 3). Specifically, section 3 outlines:

- the approach used to identify illustrative households (section 3.1). This includes a discussion of the:
  - difficulties associated with the identification of "representative" households (section 3.1.1);
  - limited information available on the distribution of wealth in New Zealand that has been used to identify those illustrative households (3.1.2);
  - three main categories of illustrative households identified for analysis, which include:
    - illustrative low wealth / low income households (section 3.1.3);
    - illustrative medium wealth / medium income households (section 3.1.4); and
    - illustrative high wealth / high income households (section 3.1.5);
  - method used to estimate the effective tax rates imposed on the incomes of illustrative households (section 3.1.6);
- estimates of the effective tax rates imposed on the net real economic incomes of those illustrative households (section 3.2). Specifically, section 3.2 outlines the:
  - effective tax rates imposed on low wealth / low income households (section 3.2.1);
  - effective tax rates imposed on medium wealth / medium income households (section 3.2.2);
  - effective tax rates imposed on high wealth / high income households (section 3.2.3);
- estimates of the effective rates of tax that are imposed on the incomes that New Zealand residents derive from their savings and investment (section 3.3). This provides information on the:
  - definition of savings and investment (section 3.3.1);
  - effects of income tax on savings and investment (section 3.3.2);

- OECD estimates of the effective tax rates imposed on the income that New Zealand residents derive from the different forms of financial assets in which they choose to hold their savings (section 3.3.3); and
- estimates of the effective tax rates imposed on income from the different assets in which taxpayers can choose to invest their savings (section 3.3.4) that have been developed by the OECD, the New Zealand Treasury and Inland Revenue Department, as well as the academic community.

Section 4 of the report then discusses how those estimates of effective tax rates should be interpreted and applied in the process of tax review and reform. This includes a discussion of the:

- economic incidence of taxes and subsidies (section 4.1) – that is, who really bears the burden of income taxes and enjoys the benefits of the tax concessions and other transfer payments provided by the government. This includes the:
  - economic incidence of a consumption tax or subsidy (section 4.1.1); and
  - economic incidence of an income tax or subsidy (section 4.1.2);
- practical constraints that limit the reform of the tax and benefit systems (section 4.2), which include:
  - information constraints (section 4.2.1);
  - conflicting objectives (section 4.2.2);
  - unavoidable economic costs (section 4.2.3); and
  - legislative constraints (section 4.2.4).

Section 5 concludes the report by drawing from the information outlined above to identify the key findings, including the:

- need for caution when interpreting and applying effective tax rates (section 5.1);
- practical constraints that limit the scope for further reform of the income tax and benefit systems (section 5.2); and
- consequent need to pursue less informationally demanding approaches to reform (section 5.3).

2. Overview of New Zealand's tax and benefit systems

2.1 Size and complexity of New Zealand's tax and benefit systems

2.1.1 How much revenue is raised and redistributed by the tax and benefit systems?

Since the introduction of the income tax system in 1891 (through the Land and Income Assessment Act 1891) and the social welfare system in 1938 (through the Social Security Act 1938), successive governments have been monitoring, reviewing and reforming New Zealand's tax and benefit systems with a view to improving the overall welfare of New Zealand and its residents by:

- improving the efficiency (i.e. "economic efficiency") with which the tax and benefit systems raise and redistribute revenue (i.e. by reducing the extent to which the tax and benefit systems reduce the efficiency with which New Zealand uses its scarce resources by unintentionally distorting the decisions of individuals to work, save, invest, produce and use resources); and
- improving the fairness (i.e. "distributional equity") with which the tax and benefit systems raise and redistribute revenue.

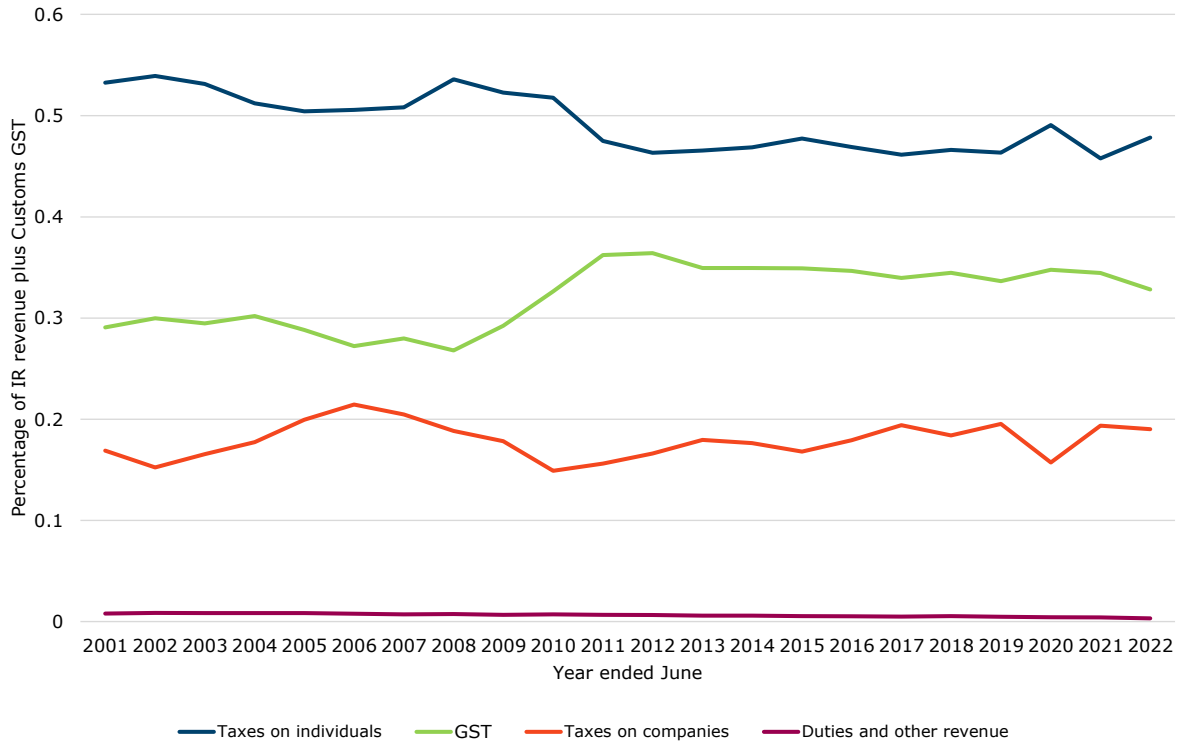
Despite the introduction of GST in 1986 and the subsequent increases in the rate of GST from its original rate of 10% to 12.5 per cent in July 1989 and to its current rate of 15% in October 2010, the income tax system continues to be the main source of revenue used by the New Zealand government to finance its expenditure.

As illustrated in **Figure 1** (which shows the relative shares of components of net Inland Revenue taxes and Customs GST from June 2001 to June 2022), although the increase in the rate of GST to 15% in 2010 increased the proportion of net revenue raised by GST, taxes on the incomes of individuals and companies continue to raise most revenue.

Specifically, in 2022, of the $113,002 million of the total net revenue raised by Inland Revenue and GST raised by Customs:

- $75,539 million (67%) was raised from direct taxes on the incomes of individuals and companies:
  - $54,053 million from taxes on the incomes of individuals (e.g. source deductions, Fringe Benefits Tax, and taxes on the interest incomes of residents); and
  - $21,486 million from taxes on the incomes of companies (e.g. company tax, taxes on the dividend income of residents and non-residents, and tax on the income of non-residents);
- $37,094 million (33%) was raised by GST:
  - $24,691 million of net GST revenue collected by Inland Revenue; and
  - $12,403 million of net GST revenue collected by Customs.

Figure 1: Composition of combined Inland Revenue and Customs GST



Source: Inland Revenue Department, Revenue collected 2001 to 2022, https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/revenue-collected-2001-to-2022

The amount of tax revenue raised by the income tax and GST regimes is, however, significantly offset by the benefits provided to welfare recipients, which include:

- tax credits,[20] which in 2021/22 included:
  - "Working for Families Tax Credits" that provided:
    - $2,108 million of "Family Tax Credits";
    - $542 million of "In-Work Tax Credits";
    - $15 million of "Minimum Family Tax Credits";
  - $978 million of "KiwiSaver Tax Credits";
  - $339 million of "Best Start" payments;
- $30,320 of direct benefits and related expenditure provided by the Ministry of Social Development,[21] which include the following main benefits:
  - $19,529 million of "New Zealand Superannuation";
  - $3,428 million of "Jobseeker Support" and "Emergency Benefit";
  - $2,331 million of "Accommodation Assistance";

[20] 2022 Tax Expenditure Statement, Table 2, p6, Value of expenditure 2021/22 (forecast), , https://www.treasury.govt.nz/sites/default/files/2022-05/b22-taxexpstmt.pdf

[21] Vote Social Development, The Estimates of Appropriations 2022/23 - Social Services and Community Sector B.5 Vol.9, Estimated Actual Expenditure 2021/22, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v9-socdev.pdf

- $2,219 million of "Supported Living Payments";
- $1,819 million of "Sole Parent Support".

These benefits are supplemented by significant government:

- education expenditure, including expenditure of both:
  - $15,974 million on Vote Education in 2021/22, which included:
    - $4,035 million of primary education services;
    - $2,962 million of secondary education services;
    - $4,944 million for services from the Ministry of Education;
    - $1,846 million of capital expenditure[22]
  - $4,028 million on Vote Tertiary Education in 2021/22, which included:
    - $3,203 million for tuition and industry training subsidies;
    - $235 million for first year fees-free study for eligible students, apprentices and trainees;[23]
- health expenditure. In 2021/22, the government spent $26,884 million on Vote Health, which included:
  - $16,644 million of health and disability support services that were provided by the 20 district health boards (DHBs) for services to meet the needs of each district's population;
  - $4,148 million to fund health and disability services, funded at a national level, and managed by the Ministry of Health, which comprised:
    - $1,859 million of National Disability Support Services;
    - $525 million of National Planned Care Services;
    - $504 million of Public Health Service Purchasing;
    - $396 million of Primary Health Care Strategy;
    - $246 million of National Mental Health Services;
    - $235 million of National Maternity Services;
    - $185 million of National Emergency Services;
    - $116 million of National Child Health Services;
    - $71 million of National Personal Health Services;
    - $10 million of National Health Services.[24]

Those heavily subsidised education and health services provide a significant subsidy to those individuals and households who have invested most of their savings in the creation and maintenance of their human capital. In particular, it benefits low to medium wealth households who hold most of their wealth in the form of their human capital and earn most of their economic income in the reform of returns to that human capital – namely, wage and salary income.

[22] Vote Education, The Estimates of Appropriations 2022/23 - Education and Workforce Sector B.5 Vol.2, Estimated Actual Expenditure 2021/22, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v2-educ.pdf

[23] Vote Tertiary Education, The Estimates of Appropriations 2022/23 - Education and Workforce Sector B.5 Vol.2, Estimated Actual Expenditure 2021/22, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v2-tered.pdf

[24] Vote Health, The Estimates of Appropriations 2022/23 - Health Sector B.5 Vol.5, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v5-health.pdf

2.1.2 Who pays the income tax raised by the government?

As outlined in **Table 2**, IRD estimates indicate that:

- most (68.5%) of the income tax revenue raised by government from individuals in the 2021 income year (the latest year for which this detailed information is publicly available) was paid by the 21.2% of taxpayers who are in the two top income tax brackets (i.e. those with taxable incomes between $70,001 and $180,000, as well as those with taxable incomes greater than $180,000 per annum), who collectively paid $31,931 million of tax their assessed taxable incomes of $122,244 million. Specifically:
  - individuals earning taxable income from $70,001 to $180,000 each year (18.8% of taxpayers) collectively earned $81,889 million (37.7%) of taxable income and paid $19,562 million (42%) of tax;
  - individuals earning taxable income in excess of $180,000 each year (2.4% of taxpayers) collectively earned $40,355 million (18.6%) of taxable income and paid $12,369 million (26.6%) of tax. Specifically:
    - individuals earning taxable income from $180,001 to $300,000 each year (1.6% of taxpayers) collectively earned $15,042 million (6.9%) of taxable income and paid $4,350 million (9.3%) of tax;
    - individuals earning taxable income in excess of $300,000 each year (0.8%) of taxpayers collectively earned $25,313 million (11.7%) of taxable income and paid $8,019 million (17.2%) of tax;
- the average tax rate that individuals have paid on their taxable income (measured by dividing their tax assessed by their taxable income) increases for individuals in higher tax brackets, with the highest average tax rate being paid by those individuals with taxable incomes in excess of $300,000. Specifically:
  - individuals earning taxable income from $70,001 to $180,000 each year paid an average rate of tax of 23.9% on their taxable income;
  - individuals earning taxable income from $180,001 to $300,000 each year paid an average rate of tax of 28.9% on their taxable income;
  - individuals earning taxable income in excess of $300,000 each year paid an average rate of tax of 31.7% on their taxable income.

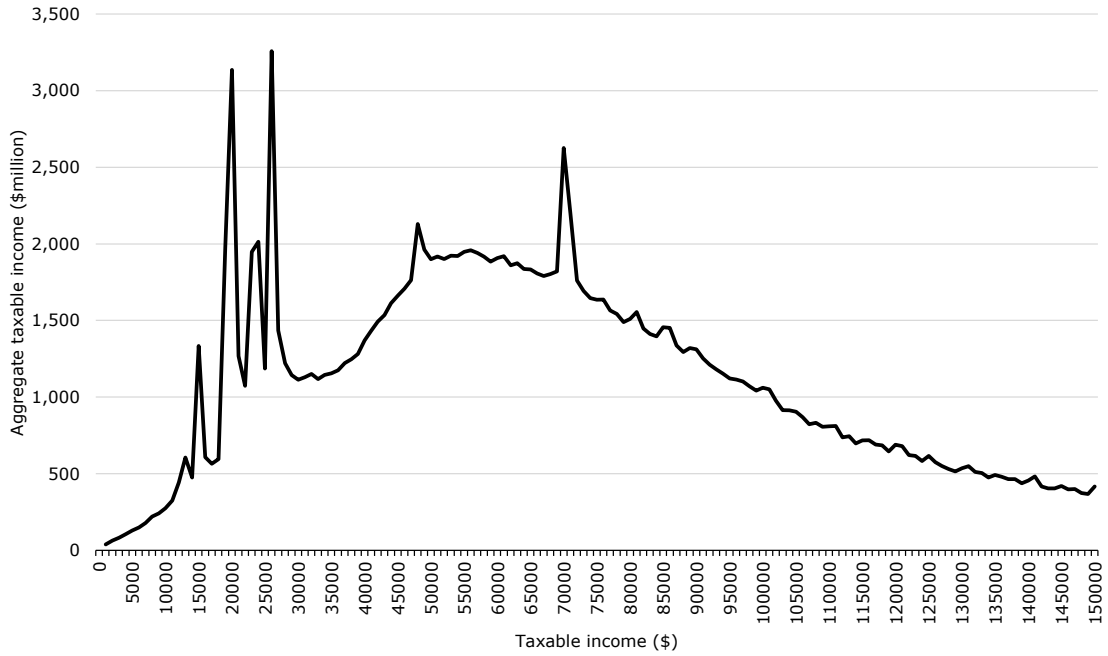
Table 2: Estimated amount of tax and average effective tax rate paid by taxpayers in each tax bracket (2021)

Taxable income	Statutory marginal tax rate	Number of people		Taxable income		Tax assessed		Average tax rate
		No.	%	$m	%	$m	%	
$0	0.0%	253,380	5.8%	0	0.0%	0	0.0%	0.0%
$0.01 to $14,000	10.5%	709,490	16.3%	3,343	1.5%	351	0.8%	10.5%
$14,001 to $48,000	17.5%	1,749,570	40.1%	49,200	22.7%	6,684	14.3%	13.6%
$48,001 to $70,000	30.0%	723,990	16.6%	42,243	19.5%	7,619	16.4%	18.0%
$70,001 to $180,000	33.0%	821,770	18.8%	81,889	37.3%	19,562	42.0%	23.9%
Over $180,000:								
$180,000 to $300,000	39.0%	67,670	1.6%	15,042	6.9%	4,350	9.3%	28.9%
Over $300,000	39.0%	36,780	0.8%	25,313	11.7%	8,019	17.2%	31.7%
Total over $180,000	*39.0%*	*104,450*	*2.4%*	*40,355*	*18.6%*	*12,369*	*26.6%*	*30.7%*
Total		**4,362,650**	**100.0%**	**217,030**	**100.0%**	**46,585**	**100.0%**	

Source: Inland Revenue Department, Taxable income distribution of individuals for the 2021 income year (based on random sample of individual taxpayers), https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/income-distribution. IRD intends to publish similar information for the 2022 income year in December 2023.

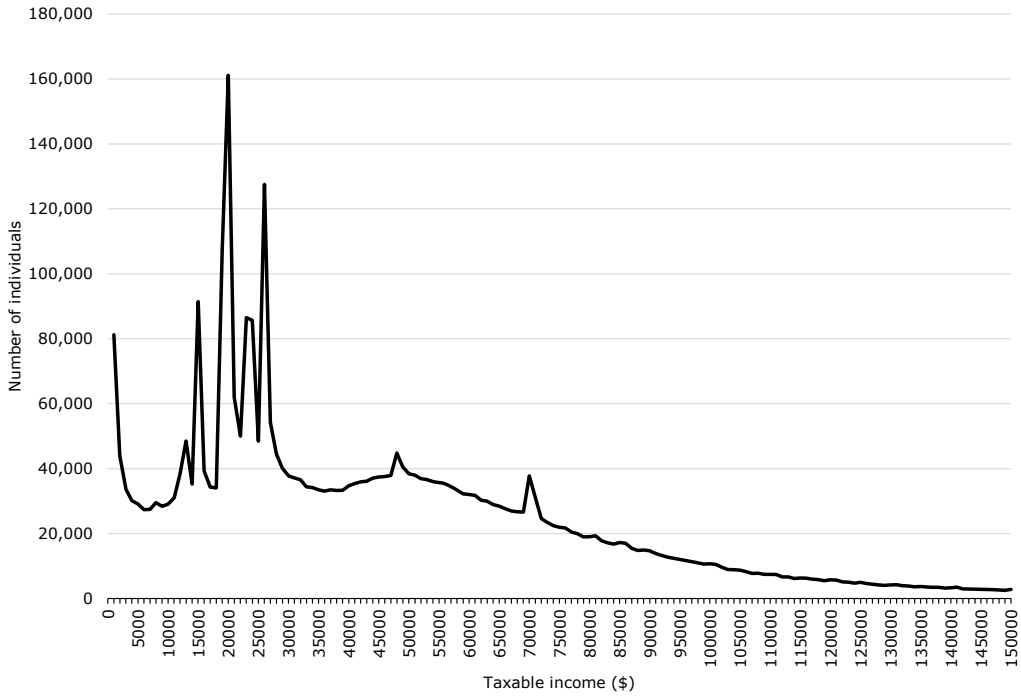
A more detailed view of the amount of taxable income derived by individuals with net taxable incomes that fall within each $1,000 bracket is set out in **Figure 2**, which largely reflects the results of the numbers of people deriving that taxable income, which are set out in **Figure 3** below.

Figure 2: Aggregate taxable income declared by individuals 2021



Source: Inland Revenue Department, Aggregate taxable income declared by individuals, 2021 income year, https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/income-distribution

Figure 3: Taxable income distribution of individuals 2021



Source: Inland Revenue Department, Taxable income distribution of individuals, 2021 income year, https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/income-distribution

It is important to note, however, that in view of the complexity of the income tax system, the "statutory" tax rates set out in the Income Tax Act 2007 (e.g. the statutory marginal tax rates set out for each tax bracket in **Table 2**) do not provide an accurate indication of the actual rates of tax that individuals are legally required to pay on their economic income.

Rather, the rates of tax that individuals are required to pay on their economic income depend on a wide range of factors that are the result of both:

- decisions made by the current and past governments regarding the design of the income tax system, which include the decisions to:
  - measure taxable income using nominal "dollars of the day", rather than constant "real" dollars (i.e. the decision by government not to index the income tax base for the effects of inflation);
  - exempt, or impose concessional (i.e. lower) rates of tax on, certain forms of income (e.g. imputed rental income arising from owner-occupied housing, as well as the capital gains realised on the sale of owner-occupied housing or commercial property);
  - tax the retained earnings of certain entities (e.g. companies and trusts) at potentially different statutory marginal tax rates than those that would apply if that income was distributed to its recipients (i.e. shareholders of companies and beneficiaries of trusts); and
  - provide either non-taxable or taxable benefits to supplement the net economic income of certain taxpayers;
- decisions that those individuals make each year, and have made over previous years of their lives, regarding:
  - how much to work;
  - how much of their incomes to consume, save and invest;
  - the types of assets in which they decide to invest and the consequent forms of income in which they derive the returns from those investments;
  - how much of their income to invest in New Zealand, as opposed to offshore, investments (which determines the "source" of their investment income);
  - entities through which they choose to invest (e.g. companies, trusts, Portfolio Investment Entities, Superannuation funds, Foreign Investment Funds, etc).

2.1.3 Who receives the benefits provided by the government?

The actual types of benefits received by individuals and the amount of those benefits they receive also vary significantly across individuals depending on a wide range of factors including the:

- decisions made by the current and past governments regarding the design of the benefit system, which provides different types and levels of benefits to individuals that depend on:
  - the age of the recipient;
  - the size and composition of the household (e.g. the marital status of the recipient and the number of their dependents);
  - where the recipient lives in New Zealand;
  - how much they spend on accommodation each week;
  - health and disability status of the recipient;
- decisions made by individuals regarding:
  - their hours of work;

- their levels of saving and investment and consequent level of income they earn from their investments;
- the proportion of the value of their assets they choose to hold in the form of "cash assets";
- marital status;
- number of children to have;
- number of other dependents to look after (e.g. other members of the family, including parents and grandparents);
- which area of New Zealand they decide to live;
- whether they decide to live in rental accommodation or purchase their own home (i.e. live in "owner-occupied" housing);
- how much to spend on their accommodation.

As noted by the IRD, in 2021 the government provided a total of $2,851 million of Working for Families Tax Credits to around 345,300 families who received at least one form of Working For Families tax credit. On average, each family received around $8,258 each year.[25]

In addition to those tax credits, households also received a range of benefits that are outlined in **Table 3** below, which provides an overview of the numbers of recipients of each of the main benefits and the key characteristics of those recipients (i.e. gender, ethnicity and age of those recipients, as well as the length of time they have been receiving those benefits).

Table 3: Characteristics of working age recipients of main benefits 2022

Recipient characteristic		Jobseeker Support		Sole Parent Support		Supported Living Payment		Youth Payment and Young Parent Payment		Other Main Benefits		Total	
		Number	%	Number	%	Number	%	Number	%	Number	%	Number	%
Continuous duration	One year or less	67,068	39.4	14,382	19.6	6,294	6.3	531	39.4	7,767	87.7	96,036	27.1
	More than one year	103,035	60.6	59,178	80.4	93,747	93.7	819	60.8	1,089	12.3	257,865	72.9
Gender	Male	94,440	55.5	6,375	8.7	49,365	49.3	114	8.5	3,168	35.8	153,462	43.4
	Female	74,523	43.8	67,152	91.3	50,496	50.5	1,230	91.3	5,559	62.8	198,963	56.2
	Gender Diverse	1,137	0.7	36	0.0	177	0.2	3	0.2	126	1.4	1,479	0.4
Age group	18-24 years	33,138	19.5	9,714	13.2	7,626	7.6	1,350	100.2	3,828	43.2	55,653	15.7
	25-39 years	53,586	31.5	46,725	63.5	20,229	20.2	N/A	N/A	3,243	36.6	123,789	35.0
	40-54 years	47,094	27.7	16,149	22.0	32,256	32.2	N/A	N/A	1,194	13.5	96,693	27.3
	55-64 years	36,285	21.3	972	1.3	39,927	39.9	N/A	N/A	585	6.6	77,769	22.0
Ethnic group	European	82,368	50.6	31,125	44.1	59,919	63.6	321	26.8	4,320	53.3	178,053	52.8
	Māori	65,799	40.4	35,610	50.4	26,541	28.2	765	63.8	2,259	27.9	130,974	38.9
	Pacific Peoples	18,771	11.5	10,896	15.4	7,383	7.8	189	15.8	1,041	12.9	38,283	11.4
	Asian	9,699	6.0	2,592	3.7	3,729	4.0	15	1.3	1,320	16.3	17,361	5.2
	Middle Eastern/Latin	3,285	2.0	969	1.4	990	1.1	9	0.8	453	5.6	5,706	1.7
	Other ethnicity	6,126	3.8	1,173	1.7	4,281	4.5	12	1.0	465	5.7	12,060	3.6
Total recipients with recorded ethnicity		**162,891**	**95.8**	**70,653**	**96.0**	**94,230**	**94.2**	**1,200**	**89.1**	**8,100**	**91.5**	**337,074**	**95.2**
Ethnicity not specified		7,209	4.2	2,907	4.0	5,808	5.8	147	10.9	753	8.5	16,830	4.8
Total		**170,103**	**100.0**	**73,560**	**100.0**	**100,038**	**100.0**	**1,347**	**100.0**	**8,853**	**100.0**	**353,904**	**100.0**

Source: Ministry of Social Development, National level tables 2022, Characteristics of working age recipients – latest quarter December 2022, https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/statistics/benefit/index.html#MachinereadableCSVfiles3

[25] Inland Revenue Department, Working for Families statistics, https://www.ird.govt.nz/about-us/tax-statistics/social-policy/wfftc#:~:text=The%20average%20Family%20tax%20credit,in%20the%202021%20tax%20year.

Once again, this complexity of the benefit system, and the way it interacts with the income tax system (e.g. most benefits are income tested and are reduced, or "abated" as it is called as the taxable income of the taxable income of the recipient's household increases) means that the "statutory" rates of benefit set out in the Social Security Act legislation and regulations do not provide an accurate indication of the actual benefits that individuals are legally entitled to receive.

2.1.4 What is the net effect of the tax and benefit systems?

In a paper prepared for the New Zealand Association of Economists Conference in 2012, Aziz et al (2012) have examined the net fiscal impact of New Zealand's tax and benefit systems with a view to determining the extent to which it redistributes income from higher income households to low income households over the period 1988 to 2010.[26]

Specifically, the authors estimate the net fiscal impact of the tax and benefit systems by:

- estimating the amount of benefits households receive from government expenditure on:
  - income support, which includes expenditure on NZ Superannuation, income replacement benefits for working age people, family assistance, housing assistance and other benefits;
  - health and education;
- deducting the amount of tax paid by households, which includes;
  - income tax; and
  - indirect forms of taxation such as GST and excise duties on fuel, alcohol and tobacco.

This allows them to estimate the net tax paid, or net benefit received, by households with disposable incomes that are within each of the 10 income bands (i.e. deciles) considered.

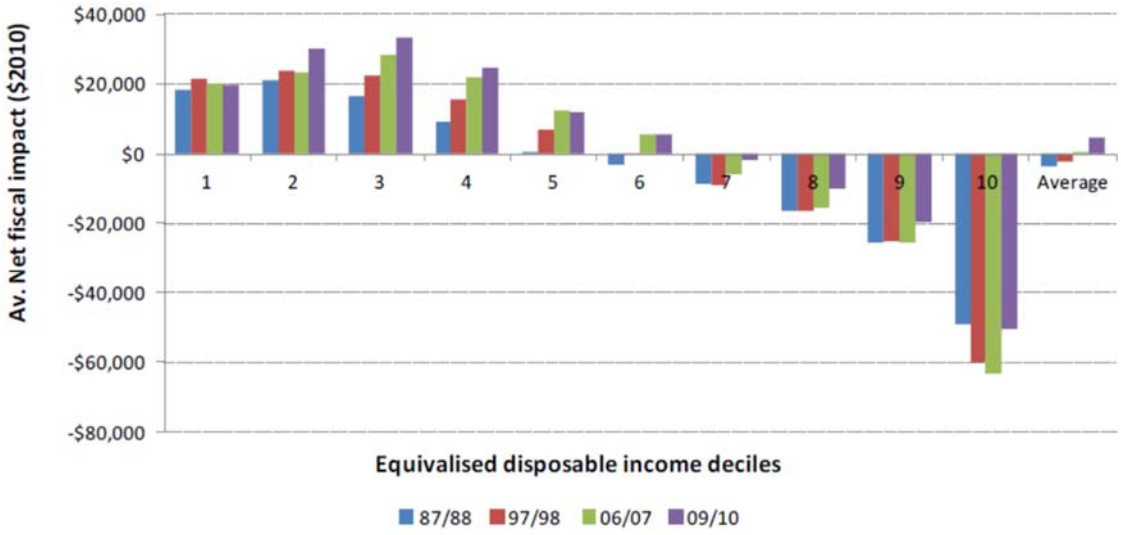
As illustrated in **Figure 4**, the results of their analysis of the net fiscal incidence of the tax and benefit systems indicate that:

- in all four time-periods, households in the lowest five deciles of disposable income received more government spending on the social services included in this study than they paid in taxes;
- since 1998, households with net disposable incomes in decile six have also become a net fiscal recipient; and
- households in deciles seven to ten were consistently net contributors as they paid more tax, on average, than they received in social services.

The authors also note that those net fiscal impact results occur in other countries such as the United States.

[26] Aziz, O.A., Gibbons, M., Ball, C, and E. Gorman (2012), *Fiscal Incidence in New Zealand: The Distributional Effect of Government Expenditure and Taxation on Household Income, 1988 to 2010,* Paper for New Zealand Association of Economists Conference 2012, New Zealand Treasury. https://www.nzae.org.nz/wp-content/uploads/2012/07/Aziz_Fiscal-Incidence-NZAE-2012-Conference-Paper.pdf

Figure 4: Net fiscal impact of the tax and benefit systems - Average receipt of income support and social services less tax payments per household ($2010)



Source: Figure 11, Aziz, et al (2012).

2.1.5 How does the amount of tax paid and benefits received vary with age and gender?

Aziz et al (2013) have estimated how the amounts of tax paid and benefits received vary with age and gender in New Zealand using:

- Household Economic Survey (HES) data for 2010; and
- the New Zealand Treasury's non-behavioural tax-benefit micro-simulation model, Taxwell, to model the distribution of taxes, transfers and social spending.[27]

The estimates they provide are of the legal incidence of taxes and transfers, including subsidised education and health services, not estimates of the actual economic incidence of those taxes and transfers (i.e. who actually bears the burden of taxes and enjoys the benefits of transfers), which they note is difficult to determine without the use of a general equilibrium model:

> The traditional methodologies for undertaking fiscal incidence analysis are well established. As with most previous studies, this paper does not aim to capture the overall 'impact of government' on individuals' incomes or consumption. Governments, including in New Zealand, often intervene in economic activity in ways that are not captured by their taxation and expenditure policies alone. Even within this limited form of fiscal intervention, fiscal incidence analysis generally ignores general equilibrium interactions and responses. These can often be shown at the micro level to be important but their importance at the aggregate level is much harder to ascertain. In addition, since a 'no government' counterfactual is never available, we follow standard practice and treat the pre-tax-and-transfer, or 'market' income

[27] Aziz, O, Gremmell G. and A. Laws (2013), *The Distribution of Income and Fiscal Incidence by Age and Gender: Some Evidence from New Zealand*, Working Paper 10/2013, June 2013 https://researcharchive.vuw.ac.nz/xmlui/bitstream/handle/10063/2852/Working%20paper.pdf?sequence=1

distribution as the benchmark against which changes due to fiscal interventions are compared.

Interpretation of fiscal incidence results always requires caution. The allocation of both taxes and expenditures to individuals is a difficult task, known in principle to depend on a variety of conditions and response elasticities. For public expenditures especially, such as on health and education, allocating the costs to individuals on a pro-rata basis to the users of the services provided out of that public expenditure can be a crude approximation to presumed incidence, even before allowing for general equilibrium responses. We therefore regard the results reported below as preliminary evidence on the approximate direct impact of taxes, transfer payments and some government expenditures on individuals in New Zealand in 2010. More sophisticated analysis would be required before drawing conclusions regarding the distribution of the economic or welfare gains and losses associated with these fiscal variables.[28]

The authors identify the three main "concepts" of household income:

- market income (i.e. wages and salaries, income from investments, self-employment, and from other forms of taxable income earned by private means);
- disposable income, which is equal to:
  - market income;
  - plus income support (i.e. working age benefits, Working for Families, New Zealand Super and housing subsidies);
  - less direct tax (i.e. income tax);
- final income, which is equal to:
  - disposable income;
  - plus the value of subsidised services received (i.e. subsidised education and health services);
  - less indirect taxes (i.e. GST and excise duties).

Specifically, the authors provide estimates by age and gender of the:

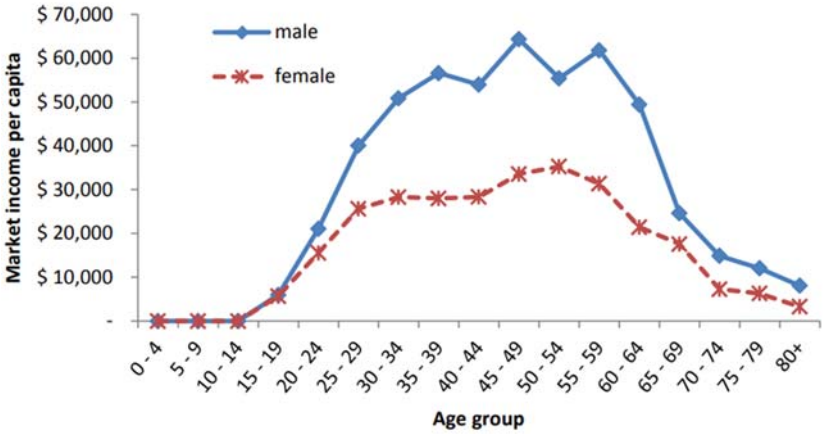
- market income per capita (**Figure 5**), which indicate that:
  - average market incomes increase from early working age, peak in late 50s and decrease thereafter (i.e. in retirement);
  - the large drop in market income for men at the age of 65 is attributable to the large work disincentive provided by New Zealand's universal pension ("NZ Superannuation" or "NZS"). The authors note that as Gorman et al (2012) found, for those reaching the entitlement age of 65, NZS "substantially reduces the likelihood of remaining in the labour force";[29]
  - from the age of 20 onwards women earn, on average, significantly less market income than men of the same age due, in part, to lower labour force participation;

[28] pp 2-3, Aziz et al (2013).

[29] p.34, Gorman, E., Scobie, G. and Towers, A. (2012), *Health and Retirement of Older New Zealanders*, New Zealand Treasury Working Paper 12/02, https://www.treasury.govt.nz/sites/default/files/2012-06/twp12-02.pdf

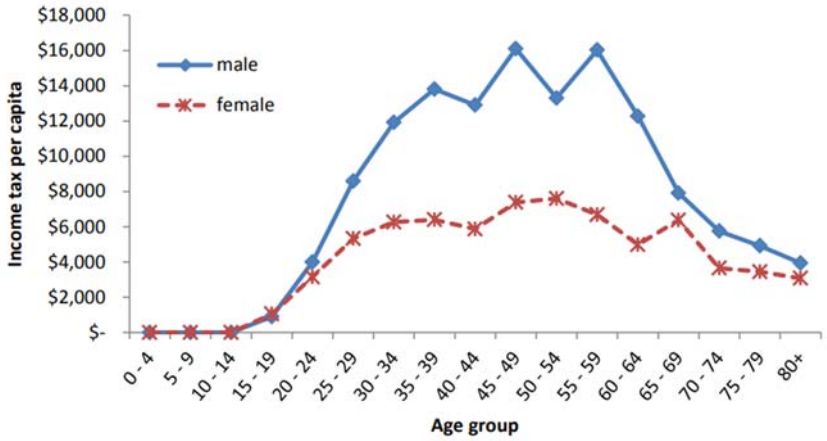
- direct tax per capita (**Figure 6**), which indicate that:
  - disposable income in New Zealand differs from market income due to government's redistributive policies in the form of income support targeted predominantly at low-income households, families with children and pensioners, and direct taxes (mainly personal income taxes) deducted from market income;
  - the distribution of direct taxation per capita closely resembles the profile of individuals' market incomes in **Figure 5**;
  - contributions to direct tax revenues, by both genders, rise sharply during ages 20-40, become relatively flat till around ages 50-60, and then decline. The authors note that the sharp increase in direct taxation paid by women in particular in the 65-69 year old age group is likely due to their entitlement to the taxable Superannuation (NZS) at 65 (i.e. for many women attaining the age of 65, and receipt of NZS, involves an increase in their income);
- income support per capita ((**Figure 7**), which indicate that:
  - more income support is granted to women than men between the ages of 15 to 64. This partly reflects their lower workforce participation rate, higher rate of providing for dependents and increased likelihood of being a sole parent. That male-female difference:
    - peaks during the child-rearing ages of 35-39 when women receive income support that is, on average, 4.8 times that of the income support payments to men of the same age;
    - narrows after typical child-rearing age, around 50, onwards, but still remains above that of men;
  - after the superannuation entitlement age of 65, women on average still receive more income support than men with the discrepancy reaching 20% in the over-80 demographic group. This is due to:
    - the longer life expectancy of women (78.8 years for men and 82.7 years for women), which results in women, on average, outliving their partners. As a result, a higher proportion of retirement age men live in couples and receive the lower NZS allowance;
    - singles, more commonly women, potentially being entitled to other forms of income support such as Accommodation Supplement which further contributes to differences in the average amount of income support received by males and females in this age group;
- disposable income per capita (**Figure 8**), which indicate the combined effects of market income, direct taxation, income support and intra-family sharing on the distribution of disposable income. This indicates that:
  - under 15 year olds have significant levels of disposable income despite their general lack of market income or income support, resulting from intra-family sharing of resources, whereby children are assumed to receive a share of family disposable income;
  - intra-family income redistribution has narrowed the gap in incomes between working-age males and females (e.g. by comparing **Figure 8** and **Figure 5** it is apparent that this income redistribution has reduced the per capita percentage difference between incomes of 30 to 64 year old men and women from 89% for market income to 43% for disposable income).

Figure 5: Market income per capita by age and gender (2010)



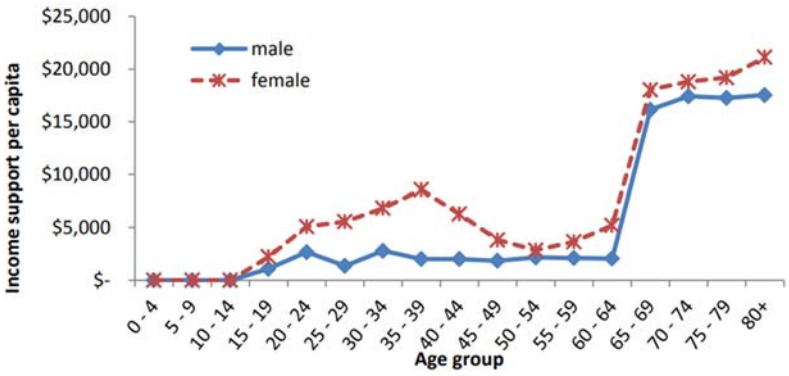
Source: Figure 3, Aziz, et al (2013).

Figure 6: Direct tax per capita by age and gender (2010)



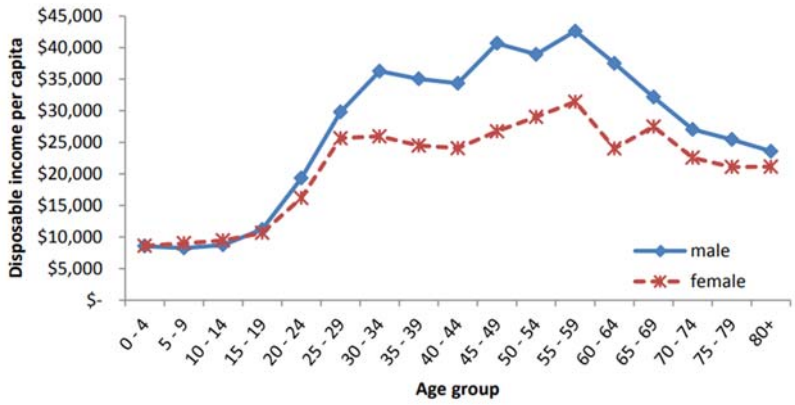
Source: Figure 5, Aziz, et al (2013).

Figure 7: Income support per capita by age and gender (2010)



Source: Figure 6, Aziz, et al (2013).

Figure 8: Disposable income per capita by age and gender (2010)



Source: Figure 7, Aziz, et al (2013).

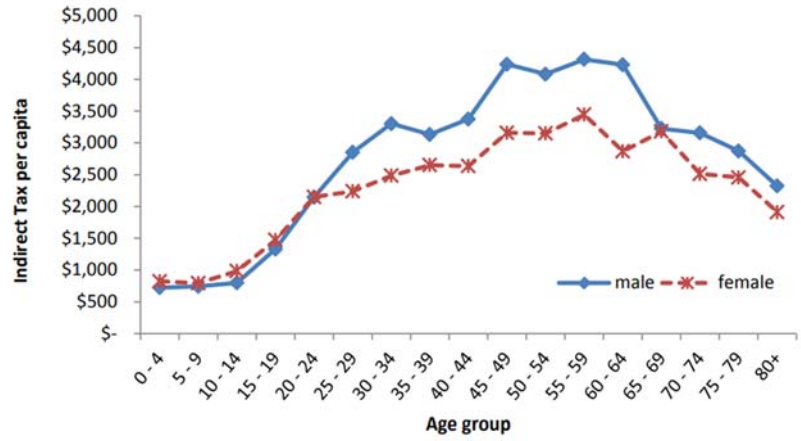
However, the authors note that those estimates of disposable income per capita do not take into account the significant effects that the provision of in-kind government subsidised goods and services and indirect taxation (e.g. GST and excise duties) have on the final income of individuals.

As a result, the authors also provide estimates of the:

- indirect tax per capita (**Figure 9**), which indicate:
  - increasing indirect tax payments by both genders from early adulthood to the late-50s age group, with declines from around age 60 or 65, which is likely to reflect the tendency for disposable incomes to rise over the working life and decline in retirement;
  - slightly more indirect tax is attributed to women than men in the under 25 age range, peaking at a difference of 23% per capita for the 10-14 age group;
  - from ages 25-69, men on average pay 28% more per capita than women (although the authors note that this difference is sensitive to the method of intra-family allocation of disposable income and indirect taxes included in the analysis);
- real consumption per capita (**Figure 10**), which the authors estimate by netting off indirect taxes before taking into account of consumption of publicly provided health and education. Those estimates indicate that real private consumption:
  - initially increases with age, especially during the 20s to 30s age range;
  - then flattens off over middle age; and
  - then declines (more rapidly for men) in older ages;
- education expenditure per capita (**Figure 11**), which indicates that:
  - not surprisingly, the bulk of education spending on younger age groups and, for males and females younger than 15 years of age, is allocated roughly equally;
  - there is noticeably higher spending on women in the 20-24 year old age group (women, on average, receive 62% more funding than men, which may stem from more women attending tertiary education or from women proportionately attending more expensive forms of tertiary education, such as university);
- health expenditure per capita (**Figure 12**), which indicates that:
  - apart from the 0-4 age group, the incidence of health spending rises smoothly with ageing but at an increasing rate as the oldest age ranges approach;

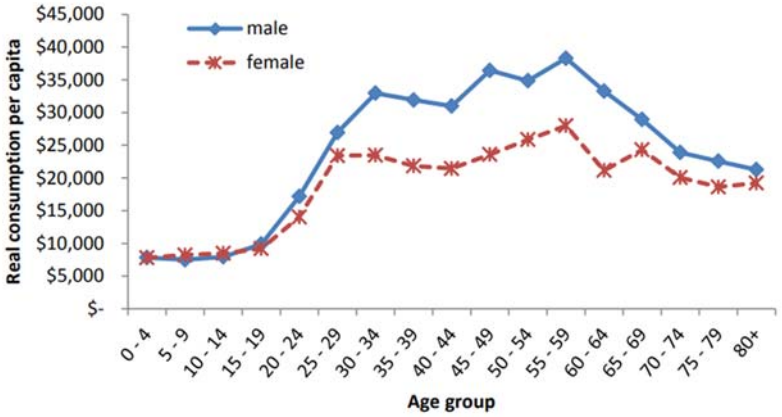
– in the 70-79 year old age brackets, men appear to cost more per capita than women but in the 80+ age range, this trend reverses. The authors note that some literature suggests that proximity to death is an important determinant of health costs (e.g. Mays (2012) reports that typically half of an individual's lifetime health costs are generated in the last 12 months of their lives).[30] Since the average life expectancy of males falls in the 70-79 year old age bracket, this may lie behind the per capita difference;
– across child-bearing age ranges, women receive more healthcare on average than men given costs of birth, pre-natal and post-natal care.

Figure 9: Indirect tax per capita by age and gender (2010)



Source: Figure 8, Aziz, et al (2013).

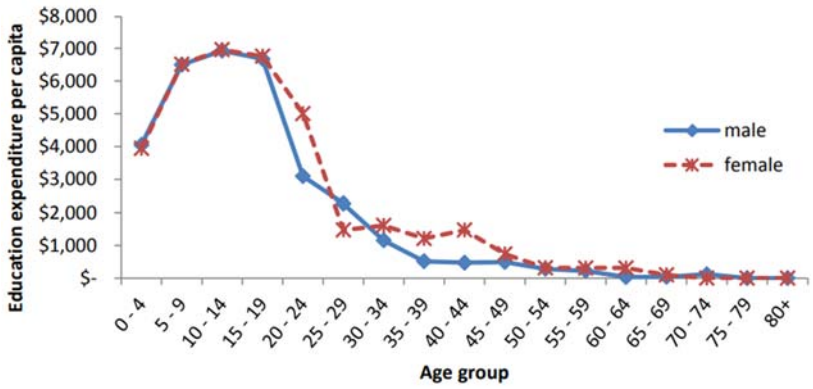
Figure 10: Real consumption per capita by age and gender (2010)



Source: Figure 9, Aziz, et al (2013).

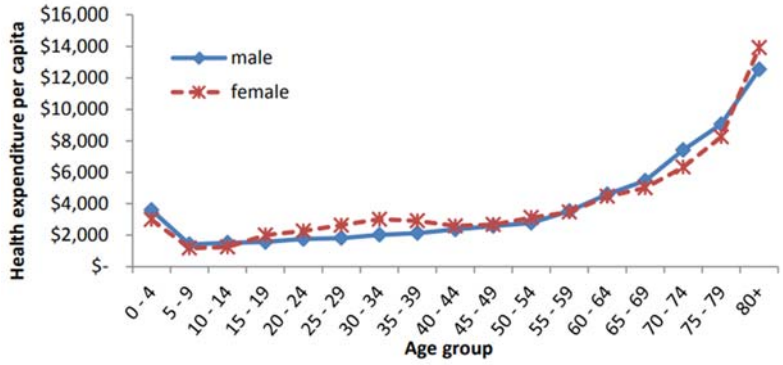
[30] Mays, N., (2012) *Reorienting the New Zealand Health Care System to Meet the Challenge of Long-term Conditions in a Fiscally Constrained Environment*, Paper presented at the Affording Our Future conference, 10-11 Dec 2012 (http://www.victoria.ac.nz/sacl/about/cpf/events/affording-our-future-conference2012/papers).

Figure 11: Education expenditure per capita by age and gender (2010)



Source: Figure 10, Aziz, et al (2013).

Figure 12: Health expenditure per capita by age and gender (2010)



Source: Figure 11, Aziz, et al (2013).

The information outlined above is then used by the authors to derive estimates of the overall impact that all of these government interventions (i.e. direct and indirect taxes, education, health and transfers spending) have on the average final incomes of males and females (**Figure 13** and **Figure 14**), which indicate that:

- final income is similar across genders until the ages of 25-29 when men begin to receive more. The discrepancy is less than for both market and disposable income as a consequence of state assistance and intra-family sharing. The per capita difference for men and women between the ages of 30 and 64 falls from 89% for market income to 43% for disposable income and then further to 35% for final income;
- government taxing and spending interventions tend to smooth income over lifetimes by redistributing income away from those aged approximately 25 to 64 towards either end of the age spectrum;
- for women, far less redistribution from middle age occurs compared to that for men, largely due to their lower market income;
- indirect taxation and government provision of education and health services have very little effect on the final incomes of middle aged individuals, but substantially increase the consumption of children and the elderly. For adult females in particular, the age distribution of

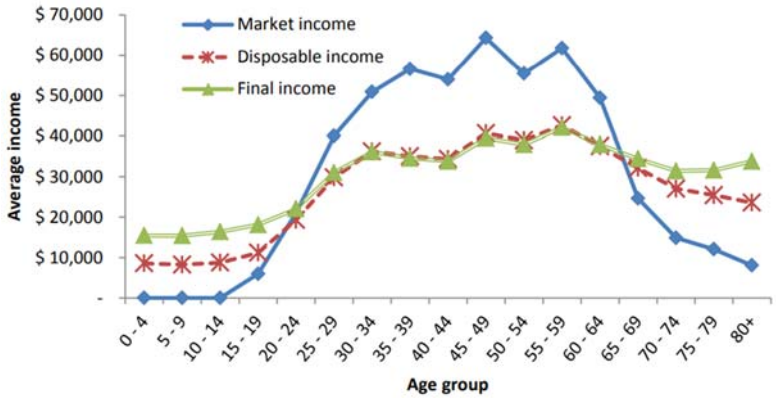
final income becomes surprisingly 'flat' and especially when compared with female market incomes.

The authors note that since the data used for the purposes of their paper is cross-sectional (for 2010), it cannot be interpreted directly as life-cycle profiles for an individual. Despite those limitations, however, they note that the age, and gender, distribution of net fiscal incidence might provide useful information on the patterns of change associated with the ageing process.

As a result, the authors also provide estimates of the:

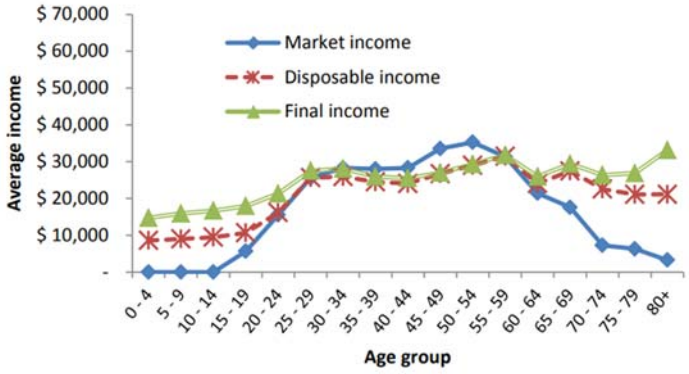
- net fiscal impact per capita (i.e. the incidence of tax revenue minus expenditure on income support, education and health, which is set out in **Figure 15**), which indicates that:
  - males, on average, start making a positive net fiscal contribution (i.e. their per capita tax revenue exceeds the government expenditure they receive) in their early 20s;
  - women, on average, do not start making a positive net fiscal contribution until their mid 40s due to a combination of lower workforce participation, higher health and education spending, higher income support and lower direct and indirect taxation;
  - beyond the age of eligibility for superannuation both genders are again, on average, net recipients of government tax and spending, but with the onset of this net negative balance slightly later for men;
- cumulative net fiscal impact per capita (**Figure 16**), which indicates that the:
  - positive net fiscal impact women make from 45-59 never outweighs the prior negative net fiscal impacts. As a result, when the large negative net impacts of the retirement years arrive, they simply add to an already negative profile;
  - men, on the other hand, appear to have a positive cumulative net fiscal impact from approximately 40 until 80 years of age. For these particular taxes and public expenditures, the net fiscal incidence on men is approximately zero when cumulated over all ages.

Figure 13: Income of males (2010)



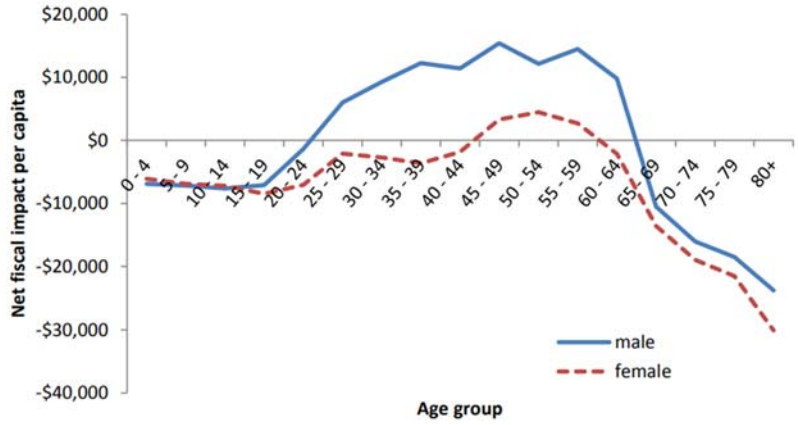
Source: Figure 14, Aziz, et al (2013).

Figure 14: Income of females (2010)



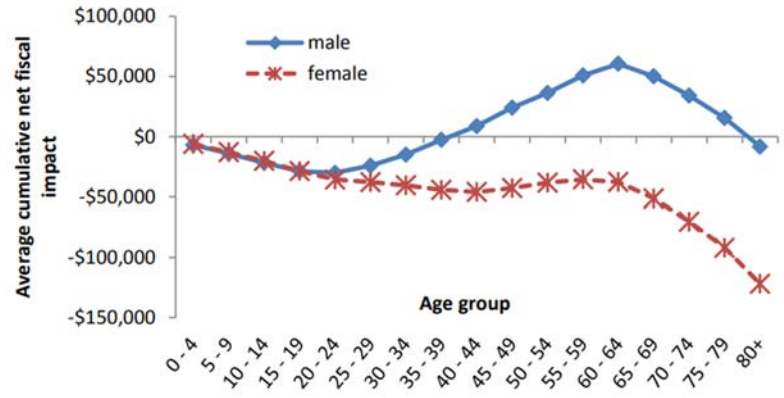
Source: Figure 15, Aziz, et al (2013).

Figure 15: Net fiscal impact per capita by age and gender (2010)



Source: Figure 16, Aziz, et al (2013).

Figure 16: Cumulative net fiscal impact per capita by age and gender (2010)



Source: Figure 17, Aziz, et al (2013).

In the conclusion to their paper, the authors note that:

- the incidence of tax and government spending differs significantly across age groups for males and females:
  - children and the elderly are on average net recipients in the fiscal system;
  - working age men contribute significantly more taxation and receive less income support than their female counterparts, largely due to higher workforce participation rates and higher wage rates in employment;
  - gender composition in the over 80 age bracket is significantly skewed towards women resulting in an aggregate tendency towards higher net fiscal costs despite higher per capita direct and indirect taxation attributable to men over 80;
- government taxing and spending interventions tend to narrow gender income discrepancies. However, the authors note those results must be interpreted with several caveats in mind:
  - assumptions surrounding intra-family disposable income sharing influence the patterns of disposable income and indirect taxation. To account for this, the authors included a sensitivity test involving assumed equal sharing among all family members. Interestingly, this alters the distribution of indirect taxation particularly, but the overall effect on net fiscal incidence is small;
  - the analysis provides a static snapshot of the fiscal system in 2010 and therefore does not take into account changes across time in behaviour or policy. For this reason, the authors note that caution is required when using the results to infer an individual's or population aggregate lifetime profiles. Numerous possible policy and demographic changes such as international migration will affect lifetime outcomes that are not captured in their analysis;
- some key changes over the next 50 years that will potentially have significant implications for fiscal incidence can, however, be anticipated:
  - Stats NZ projects increased labour force participation particularly for women and those over 65 years old. This is likely to increase the market income of both groups, increasing direct and indirect tax liabilities, thus improving gender discrepancies and net fiscal stances;
  - the demographic structure is also hanging. Fertility is projected to reduce which may result in lower family social welfare benefits, particularly affecting the fiscal incidences of women aged 25-45. The growth in the older demographic may also trigger alterations in New Zealand Superannuation, with resulting changes in the fiscal incidences of those aged over 65;
- the evidence of significant variation by gender and age group implies that future policy changes may have quite different consequences for males and females which could be obscured where policy impacts focus only on intended aggregate distributional aspects (e.g. women will be disproportionately affected by working age welfare system reforms and men by direct taxation policies). As a result, the authors consider that more systematic gender-based analysis is required to ensure that the distributional consequences of policy options are more fully understood.

2.2 Need to estimate "effective tax rates"

In view of the complexity of the income tax and benefit systems, the statutory marginal rates of income tax set out in the *Income Tax Act 2007* and the benefit rates set out in the *Social Security Act 2018* do not provide an accurate indication of the net amount of tax that they are legally required to pay on the economic income they earn since:

- taxable income does not include all forms of economic income (i.e. some forms of economic income are excluded from the income tax base) and other forms of economic income are taxed at concessional rates of tax that are below the rates of tax that apply to the personal incomes of individuals;
- different types of households are provided with quite different types and amounts of government benefits that abate at different rates when their incomes and assets increase.

As a result, there is a need to:

- estimate the effective tax rates that are imposed on economic income, rather than taxable income;
- derive different types of effective tax rate estimates that measure the "effective marginal tax rates" and "effective average tax rates" that are imposed on economic income;
- estimate those effective tax rates for those types of households that are considered to be illustrative of the different types of households in New Zealand; and
- use consistent measures of effective tax rates that compare "like with like".

2.2.1 Need to estimate the effective tax rates imposed on economic income

What is economic income?

Before seeking to estimate the effective tax rates that are imposed on the economic incomes of households, it is important to clarify exactly what we mean by "economic income" and how that definition differs from the definitions of income that are used for the purposes of determining how much tax households have to pay on that income and the amount of benefits they are entitled to receive from the government.

Economic income is a much broader concept than the taxable income that the income tax system seeks to measure (i.e. define) and tax. In its broadest sense, economic income is a concept that refers to changes in a person's wellbeing. In practice, however, some forms of economic income are difficult to measure and, as a result, are not included in the definition of taxable income and subject to tax.

As noted in section 2.3, for the purposes of this report, we use a "comprehensive" definition to define the concept of economic income. That is, we define economic income to include all forms of income generated by a person's financial and non-financial assets, regardless of their source, and regardless of whether they are taxed, which includes both the:

- income that individuals earn and spend each year on goods and services (i.e. non-durable consumer goods and services that are completely "used up" that year); and

- income that individuals derive from any increase in the value of the net assets they own that occurs over the course of that year (i.e. the gross value of those assets, less the gross value of their liabilities, which include the loans they may have raised to finance the purchase of those assets). This includes, but is not limited to, any accrued (but not necessarily realised) increase in the value of the following types of assets:
  - financial assets (e.g. savings held in the form of debt instruments, including bank deposits and debentures, as well as equity instruments such as shares held in companies);
  - non-financial assets, such as physical capital (e.g. consumer durables, owner-occupied housing, rental properties, plant and equipment and inventories owned by individuals who own and operate their own businesses) and intangible assets (e.g. human capital and intellectual property).[31]

It is important to note that this is a much broader definition of income than is used for either the purposes of determining the amount of tax that individuals are legally required to pay on their "taxable incomes" or the amount of benefits that they are eligible for under the social welfare system.

Not all economic income is taxable

Although it is possible, in theory, to define economic income in such a comprehensive manner, it is essential to recognise that this does not mean that it is either feasible, or desirable, to attempt to measure and tax all forms of that economic income.

Like other countries, New Zealand's income tax system does not use such a comprehensive definition of economic income to define taxable income. Rather, it tends to limit the definition of taxable income (i.e. "assessable income" less "allowable deductions") to those forms of net economic income that tend to be easier to measure and tax – namely:

- net cash receipts (e.g. gross cash receipts less deductible cash expenses incurred in the derivation of that gross assessable income). Economic income derived in the form of .... (e.g. the imputed rental income that individuals derive from living in their own homes) is not included in the definition of taxable income and subject to tax;
- income derived from net increases in the value of a limited range of assets, such as the:
  - net income that is realised on the sale of certain assets (i.e. "realised capital gains" on the sale of assets such as inventories and other assets held on "trading account"); and
  - net income that accrues (but is not necessarily realised) as a result of increases in the value of certain assets that can be measured with reasonable accuracy (e.g. accrued income and expenditure in relation to the debt instruments that are owned by taxpayers subject to New Zealand's financial accruals rules, as well as accrued reductions in the value of depreciable assets). By contrast, the accrued increases and decreases in the value of other assets and liabilities are not taxable (e.g. accrued gains and losses in the value of other financial assets, such as equity instruments, and non-depreciable physical assets).

In other words, the difficulties associated with the measurement of certain forms of economic income have had, and are likely to continue to have, a significant impact on the decisions that past and future

[31] This definition is often referred to as the "Schanz-HaigSimons" definition of income.

governments make regarding the forms of economic income that should be included in the definition of taxable income.

In addition, as discussed further in section 3, the difficulties associated with the measurement of economic income also influences the selection of the approach used to estimate effective tax rates.

Statutory rates of tax indicate the amount of tax payable on taxable income

Since not all economic income is taxable, the statutory rates of tax set out in the Income tax act and regulations do not provide an accurate indication of the actual rates of tax that are imposed on the actual economic income derived by individuals and the households in which they reside.

Rather, those statutory tax rates indicate the rates of tax that are payable on taxable income.

For example, most people would be aware that each dollar of "personal" income they earn (e.g. the income they earn from wages and salaries) is taxable at the following rates of tax:

- the first few dollars of income up to $14,000 is taxable at a rate of 10.5%;
- each additional dollar of income over $14,000 up to $48,000 is taxable at a rate of 17.5%;
- each additional dollar of income over $48,000 up to $70,000 is taxable at a rate of 30%;
- each additional dollar of income over $70,000 up to $180,000 is taxable at a rate of 33%; and
- each additional dollar of income over $180,000 is taxable at a rate of 39%.

This schedule of personal income tax rates is an example of what we refer to in this report as "statutory marginal tax rates" that apply to taxable income. That is, they outline the rate of tax that is payable on each additional (i.e. marginal) dollar of taxable income that is earned by the individual.

In order to determine the total amount of tax that an individual has to pay on their total taxable income, it is necessary to sum the amounts of tax they have to pay on each dollar of taxable income they earn. For example, an individual earning $200,000 has to pay 10.5% tax on their first $14,000, $17.5% on the income they earn between $14,0001 and $48,000, 30% of the income they earn between $48,001 and $70,000, 33% of the income they earn between $70,001 and $180,000, and 39% of the income they earn between $180,000 and $200,000.

In addition, in order to estimate the average (statutory) tax rate that individuals have to pay on their total amount of income, we need to divide the total amount of tax they pay by the total amount of taxable income they earn.

This highlights the fundamental mathematical relationship that exists between marginal tax rates, the total amount of tax paid, and average tax rates. In order to estimate both the total amount of tax paid, as well as the average tax rate imposed on that income, we need to know the marginal rates of tax that are imposed on each additional dollar of income earned.

It is also the reason why the average statutory rates of tax that individuals have to pay on their income are typically less than the statutory marginal rates of tax that apply to their last few dollars of taxable income they earn. Unless an individual earns a level of personal income less than or equal to $14,000, the average statutory rate of tax they pay on their taxable income will always be less than the statutory marginal rate of tax that is applied to the last few dollars of their taxable income they earn, since some proportion of that taxable income will have been subject to lower statutory marginal rates of tax. For example:

- individuals with a taxable income of $14,000 face an average statutory rate of tax of 10.5% on that total taxable income;
- individuals with a taxable income of $48,000 face an average statutory rate of tax of around 15.5% on that total taxable income;
- individuals with a taxable income of $70,000 face an average statutory rate of tax of around 20% on that total taxable income;
- individuals with a taxable income of $180,000 face an average statutory rate of tax of around 28% on that total taxable income.

Effective tax rates indicate the amount of tax payable on economic income

By contrast, effective tax rates seek to identify the rate of tax that is imposed on economic income. Specifically:

- effective marginal tax rates (i.e. EMTRs) seek to measure the amount of tax levied on each additional dollar of economic income derived; and
- average effective tax rates (i.e. AETRs) seek to measure the amount of tax levied on the total amount of economic income derived (i.e. the amount of tax paid, divided by total economic income).

It is important to note, however, that there are many different methods for estimating effective tax rates that have been developed for different purposes, not all of which seek to estimate the average effective tax rates, or effective marginal tax rates, that are imposed on economic income. This includes the range of different effective tax rate measures identified by Fullerton (1983).[32] For the purposes of this report, however, we have sought to:

- estimate the effective tax rates that are imposed on the net real economic incomes of illustrative low, medium and high wealth households in New Zealand, which are set out in section 3.2 of this report; and
- set out OECD, NZ Treasury and Inland Revenue Department estimates of the effective marginal tax rates that are imposed on the incomes that individuals derive from their savings and investment, which are set out in section 3.3 of this report.

2.2.2 Need to estimate different types of effective tax rates

In order to monitor, review and reform the extent to which the income tax and benefit systems are achieving their objective of improving the overall welfare of New Zealand and its residents, information is required on both the:

- "effective marginal tax rates" that are imposed on the economic incomes of individuals; and
- "average effective tax rates" that are imposed on the economic incomes of individuals.

[32] Fullerton, D. (1983). *Which effective tax rate?*, National Bureau of Economic Research Working Paper No. 1123, May 1983, https://www.nber.org/system/files/working_papers/w1123/w1123.pdf

Effective marginal tax rates provide a more accurate indication of the additional amount of tax levied on each additional dollar of economic income

Effective marginal tax rates (EMTRs) seek to provide a more accurate indication of the combined effect that the income tax and benefit systems have on the net amount of tax that individuals are legally required to pay on each additional dollar of economic income they earn.

Those EMTR estimates are typically used to determine the extent to which the income tax and benefit systems alter economic efficiency with which the economy operates (e.g. by unintentionally distorting savings and investment decisions by imposing different EMTRs on the incomes that individuals derive from the different financial assets in which they hold their savings and the different assets in which they invest their savings).

Average effective tax rates provide a more accurate indication of the overall rate of tax levied on total economic income

Average effective tax rates (AETRs) seek to provide a better indication of the combined effect that the income tax and benefit systems have on the net amount of tax that individuals are legally required to pay on the total economic income they earn.

Those AETR estimates are typically used to determine the extent to which the income tax and benefits systems alter the distribution of income and improve the equity with which income is distributed across individuals in the community.

Effective tax rates do not measure who actually bears the burden of income taxes or enjoys the benefits of tax concessions and other benefits provided by the government

If the tax and benefit systems had no effect on the decisions of individuals, then the net amount of tax that each individual is legally required to pay on their income (e.g. as measured by the AETR on their income) would provide an accurate estimate of the actual net burden they bear, or net benefit they derive, from the combined effects of the income tax and benefit systems.

Indeed, for convenience and "simplicity", it is often assumed either explicitly, or implicitly, that the people who are legally required to pay tax, and legally entitled to receive benefits, are the same people who actually bear the burden of those taxes and enjoy the benefits provided by government. That is, it is often assumed that:

- those individuals who are legally required to pay high AETRs on their income actually bear all of the burden of those high tax rates;
- those individuals who are legally required to pay low AETRs on their income (e.g. those who receive significant tax concessions and other benefits from the government) are the same people who enjoy the benefits of those low tax rates.

Unfortunately, in practice, the tax and benefit systems do not just have the intended effect of raising and redistributing income. Rather, it is well recognised that in the course of raising and redistributing revenue, the tax and benefit systems also have the unintended effects of:

- reducing the efficiency with which the income tax and benefit systems raise and redistribute revenue and the economy operates. The income tax and benefits systems unintentionally encourage individuals to alter their decisions to work, consume, save, invest, produce and use resources. As a result, the economic cost of raising and redistributing that revenue exceeds the amount of revenue raised and redistributed by an amount referred to as the "excess burden" or "deadweight costs" of taxation; and
- reducing the equity with which income is raised and redistributed by the income tax and benefit systems. By unintentionally encouraging individuals to alter their decisions, some of the economic burden of the income taxes that individuals are legally required to pay, and economic benefits of the tax concessions and subsidies they are legally entitled to receive from the government, is also unintentionally passed onto other individuals in the community.

Effective tax rates provide some, but not all, of the information required to determine the extent to which the income tax and benefits systems:

- reduce the economic efficiency with which the nation uses its resources. Differences in the EMTRs that are imposed on the incomes generated by different types of assets provide an indication of the unintended adverse effects that the income tax and benefit systems can have by discouraging people from working, saving and investing and distorting their patterns of savings and investment in favour of assets that produce concessionally taxed income. However, additional information is required on the extent to which those unintended distortions in relative rates of return actually encourage individuals to change their levels and patterns of work, saving, investment, production and resource use (i.e. information on price elasticities of the demand for savings and the supply of investment); and
- improve the equity with which income is distributed across individuals in the community. Although AETR estimates help provide a better indication of how much tax individuals are legally required to pay on their income, additional information is required on the extent to which alter their decisions in response to those taxes and pass on some, or all of the actual economic burden to others through the operation of the markets for their capital assets.

2.2.3 Need to estimate effective tax rates for illustrative households

Since the actual effective rates of tax imposed on the incomes of individuals can differ significantly across different types of households, it is desirable to focus attention on the estimation of effective tax rates for those households that are illustrative of most New Zealand households (i.e. for the "typical" types of households).

As a result, as outlined in greater detail in section 3 of this report, we have sought to use the limited information that is currently publicly available from the IRD and Stats NZ (e.g. Household Economic Survey data) to identify a number of illustrative households within three broad groups of households:

- low wealth/low income households who have annual net economic incomes and taxable incomes of $48,000 or less;

- medium wealth/medium income households who have annual net economic incomes that are greater than $48,000 but less than $500,000;
- high wealth/high income households, that have net economic incomes in excess of $500,000 per annum and taxable incomes ranging from $48,000 to over $500,000 (which allows for the possibility that some high wealth/high net economic income households may have taxable incomes of less than $500,000 due to the tax exempt, or concessionally taxed, treatment of some of their net economic income).

2.2.4 Need for consistent measures of effective tax rates

Another important implication of the complexity of the income tax and benefit systems is the need for consistent measures of effective tax rates that compare "like with like".

As noted in section 2.1, the effective tax rates that are imposed on the incomes of individuals by the income tax and benefit systems depend on a wide range of factors other than the level of their income. This means that when examining how the effective rates of tax imposed on the incomes of individuals change as their incomes increase (e.g. when estimating the effective marginal tax rates applying to that income to see how "progressive" the income tax system is), it is important to hold all of those other factors constant.

In addition, it is also important to ensure that the various elements of the formulas used to estimate effective tax rates (i.e. the "numerator" and "denominator" used in those estimates) are consistent with each other, since inconsistencies in these elements can result in the mismeasurement of those effective tax rates.

For example:

- effective marginal tax rates are typically estimated by considering how the amount of tax paid by an individual changes in response to a small change in their economic income. This is achieved by dividing the change in tax paid by the individual (i.e. the "numerator") by the small change in the economic income of the individual (i.e. the "denominator").
- average effective tax rates are typically estimated by dividing the amount of tax paid by the individual (i.e. the "numerator") by the total economic income of the individual (i.e. the "denominator").

This approach results in a relatively consistent approach to the estimation of effective tax if the numerator includes not only the amount of tax paid on taxable income, but also any accrued liabilities to pay tax on income that is taxable in future years.

Problems arise, however, when effective tax rates are estimated by dividing tax paid by the net economic income of the taxpayer for the purposes of estimating the effective tax rates imposed on the net economic incomes of high wealth individuals.[33] This is because in this case:

- the numerator only includes the tax paid by the individual that year and ignores any tax liabilities the individual has incurred that year that will not have to be paid until a future income

[33] Inland Revenue Briefing Note, Reference: BN2021/269, 17 June 2021, p.1, https://www.ird.govt.nz/-/media/project/ir/home/documents/about-us/high-wealth-research-project/hwi-research-project/tax-policy-report.pdf?modified=20211202200102&modified=20211202200102

year. In addition, it also includes the deferred tax paid on the gains that actually accrued in previous income years;

- but the denominator now includes not only the taxable income of the individual but also the accrued net economic income of the individual that is yet to be recognised for tax purposes (e.g. "accrued" capital gains). If accrued capital gains are included in the denominator, it is difficult to see why the accrued tax liabilities associated with those accrued capital gains should be omitted from the numerator.

As noted by Armour et al (2014), such an approach can result in the mismeasurement of the actual effective tax rates imposed on the net economic income of individuals.[34] As a result, if effective tax rates are to be estimated using the net economic income of the individual in the denominator, it is also important to include any accrued tax liabilities arising from that net economic income in the numerator and exclude any tax paid on net economic income that actually accrued in previous years.

2.3 Need to understand how government decisions regarding the design of the income tax and benefit systems alter effective tax rates

When interpreting and applying effective tax rates, it is also important to understand how the decisions that have been made by governments regarding the design of the income tax and benefit systems influence those effective tax rates.

As a result, in order to assist with the interpretation and application of the effective tax rate estimates presented in section 3 of this report, we have outlined below:

- what effective tax rates look like under a "proportional" and a "progressive" income tax system (section 2.3.1) where taxable income is defined to include all of the net real "economic income" of taxpayers (see below for a definition of this terminology);
- how those effective tax rates are altered by a range of government decisions regarding the design of the income tax and benefit systems (section 2.3.2), including the decisions to:
  - measure taxable income using "nominal" (i.e. "dollars of the day"), rather than constant "real" dollars (i.e. how the decision by government not to index the income tax base for the effects of inflation alters effective tax rates);
  - tax the incomes earned by individuals, rather than the incomes of the households in which those individuals reside;
  - not include certain forms of economic income in the definition of taxable income (e.g. imputed rental income arising from owner-occupied housing, as well as the capital gains in the value of that housing);
  - tax certain forms of economic income at lower statutory marginal rates of tax (e.g. the retained earnings of companies and trusts, which are taxed at lower statutory marginal rates of tax than the personal statutory marginal rates of tax that would apply if that

[34] Armour, P., R. V. Burkhauser, and J. Larrimore (2014). Levels and Trends in U.S. Income and its Distribution: A Crosswalk from Market Income towards a Comprehensive Haig-Simons Income Approach. Southern Economic Journal 2014, 81(2), 271–293, https://www.jstor.org/stable/44114282

income was distributed to its recipients – that is, the shareholders of companies and beneficiaries of trusts);
  - provide either non-taxable or taxable benefits to supplement the net economic income of certain taxpayers; and
- how the combined effects of inflation, tax concessions and benefits alter the effective tax rates imposed on income (section 2.3.3).

This helps to illustrate some basic concepts and terminology used in this report that need to be understood in order to interpret and apply the effective tax rate estimates that are set out in section 3. This includes concepts such as:

- "real" and "nominal" values of the "dollars" that are used to measure the incomes of individuals and households (i.e. the "unit" used to measure their incomes):
  - "real" dollars are those that reflect the real value of goods and services that can be purchased with those dollars;
  - "nominal" dollars refer to "dollars of the day" (i.e. the value of goods and services that can be purchased with those dollars at a particular point in time, which is eroded over time by inflation in the general prices of those goods and services);
- "economic" and "taxable" income:
  - net "economic" income. This report adopts a comprehensive definition of economic income that includes all forms of income generated by a person's financial and non-financial assets, regardless of their source, and regardless of whether they are taxed, which includes both the:
    - income that individuals earn and spend each year on goods and services (i.e. non-durable consumer goods and services that are completely "used up" that year); and
    - income that individuals derive from any increase in the value of the net assets they own that occurs over the course of that year (i.e. the gross value of those assets, less the gross value of their liabilities, which include the loans they may have raised to finance the purchase of those assets). This includes, but is not limited to, any accrued (but not necessarily realised) increase in the value of the following types of assets:
      - financial assets (e.g. savings held in the form of debt instruments, including bank deposits and debentures, as well as equity instruments such as shares held in companies); and
      - non-financial assets, such as physical capital (e.g. consumer durables, owner-occupied housing, rental properties, plant and equipment and inventories owned by individuals who own and operate their own businesses) and intangible assets (e.g. human capital and intellectual property);
  - "taxable" income is the net income that is taxable under income tax legislation and regulations (e.g. New Zealand's *Income Tax Act 2007*), which includes:
    - taxable net cash receipts (i.e. gross taxable income such as wages and salaries, as well as interest and dividend income, less allowable deductions); and
    - taxable net gains in the value of certain assets (e.g. capital gains realised on the sale of certain property). Unlike most countries, New Zealand's income tax system does not have a general capital gains tax. Rather, it limits the taxation of capital gains to those realised on the sale of certain assets (e.g. assets held on "revenue account" by

individuals and businesses who earn taxable income from the frequent purchase and resale of those assets, as well as accrued gains in the net value of debt instruments that are taxable under the accrual rules);

- "non-taxable" and "taxable" benefits:
  - "non-taxable" benefits are those social welfare benefits that are not included in the taxable income of beneficiaries, such as the subsidised education and health services provided by the government, as well as the "tax credits" that are provided to reduce the amount of income tax that would otherwise have been payable by the recipients of those benefits (e.g. the "Working for Families Tax Credits", which include the "Family Tax Credit", "In-Work Tax Credit" and "Maximum Family Tax Credit);
  - "taxable" benefits are those social welfare payments that are included in the taxable incomes of the recipients of those benefits (e.g. Jobseeker, Sole Parent Support, etc);
- "average" and "marginal" tax rates:
  - "average" tax rates measure the total amount of tax paid expressed as a proportion of either the taxable income of the taxpayer (i.e. total tax paid divided by taxable income) or the total economic income of the taxpayer (i.e. total tax paid divided by total economic income);
  - "marginal" tax rates measure the rate of tax applying to each additional dollar earned by the taxpayer (i.e. the change in the amount tax paid that arises as a result of a small change in either the taxable income of the taxpayer or the total economic income of the taxpayer);
- "statutory" and "effective" tax rates:
  - the term "statutory" marginal tax rates is used to refer to the marginal tax rates that are set out in income tax legislation and regulations (e.g. New Zealand's *Income Tax Act 2007*). These are the tax rates with which taxpayers tend to be more familiar (e.g. the statutory marginal tax rates of 10.5%, 17.5%, 30%, 33%, and 39% that are applied to the personal incomes of taxpayers in different "tax brackets", as well as the 28% statutory marginal tax rate that is applied to the incomes of New Zealand companies);
  - "effective marginal tax rates" (i.e. EMTRs or METRs) seek to provide a more accurate measure of the actual marginal rates of tax that taxpayers are legally required to pay on their economic income than that provided by "statutory" marginal tax rates (e.g. by taking into account the effects of a range of complexities in the tax and benefit systems that cause actual marginal tax rates on economic income to differ from the statutory marginal tax rates that apply to their taxable income);
  - "effective average tax rates" or "average effective tax rates" (i.e. EATRs, or AETRs) seek to provide a more accurate measure of the actual average rate of tax that taxpayers are legally required to pay on their economic income (e.g. once again by taking into account the effects of a range of complexities in the tax and benefit systems that cause the actual average effective tax rates imposed on their economic income to differ from those the average statutory tax rates that apply to their taxable income);
- "proportional" and "progressive" income tax system. As illustrated in section 4.1.1 below, a:
  - "proportional" income tax system is one in which a single (or "flat") statutory marginal tax rate is applied to taxable income, regardless of its level (e.g. a 24% flat rate of tax);
  - "progressive" income tax system is one where the statutory marginal tax rate increases as the taxable income of the individual increases.

In addition, it also helps to:

- establish a "benchmark" against which to compare the effective tax rates estimated for each of the illustrative households set out in section 3.1. Specifically, as discussed further below, we are using the effective marginal tax rates and average effective tax rates that would exist under a hypothetical progressive income tax system that taxes all net real economic income at the statutory marginal rates of tax that apply to personal income as a guide to comparing the effective tax rates arising from the complexities of New Zealand's income tax and benefit systems; and
- identify some of the key reasons why the effective marginal tax rates and average effective tax rates that are applied to the net real economic incomes of individuals differ from those that would apply if all economic income was taxable at the statutory rates tax.

2.3.1 What do effective tax rates look like under proportional and progressive tax systems?

Effective tax rates under a proportional income tax system

Consider first the effective tax rates that would be imposed on the incomes of individuals under a "proportional" income tax system that:

- measures taxable income in "real", constant dollar, terms (i.e. the tax base is "indexed" for the effects of inflation, so that it measures only increases in the net real wealth of taxpayers);
- imposes a single statutory marginal rate of tax on each dollar of taxable income of 24% (i.e. if there was a "flat tax" on taxable income of 24%);
- defines taxable income to include all of the net economic income of the taxpayer (i.e. there is no tax exempt or concessionally taxed income);
- attributes all net economic incomes to taxpayers (i.e. none of the net economic income of individuals is retained in companies and trusts. Rather, all net economic income is either assumed to be distributed to individuals, or attributed to those individuals and taxed at their relevant statutory marginal tax rates); and
- does not provide any non-taxable, or taxable, benefits to taxpayers.

Under such a "proportional" income tax system the:

- amount of tax that is paid by a taxpayer would increase as their net real economic income increases (as illustrated by the solid brown line in **Figure 17**);
- effective marginal tax rate[35] that is levied on the net real economic income of the taxpayer would be constant at 24% (as is illustrated by the dotted blue line in **Figure 18**, which indicates the rate at which the amount of tax paid increases for a small increase in net real economic income – that is, the slope of the tax paid schedule, which is a constant 24% regardless of the

[35] The effective marginal tax rate measures the rate at which the amount of tax paid increases as the income of the taxpayer increases. That is, the EMTR is equal to the slope of the line illustrated in **Figure 17** (i.e. the first derivative of the function that expresses how the amount of tax paid varies when income changes). In the case of a proportional income tax system, this is constant regardless of the amount of income earned.

level of net real economic income). In this case, this is equal to the statutory marginal tax rate due to the assumptions that:

  - there is no inflation, which means that the real EMTR imposed on net real economic income is the same as the nominal EMTR on economic income; and
  - all net economic income is taxable, which means that the EMTR on taxable economic income is equal to the EMTR on the total net economic income of the taxpayer;

- average effective tax rate that is levied on the net real economic incomes of taxpayers would also be constant at a rate of 24% (which once again is illustrated by the dotted blue line in **Figure 18**).

Figure 17: Amount of tax paid under a proportional income tax system (24% flat rate)

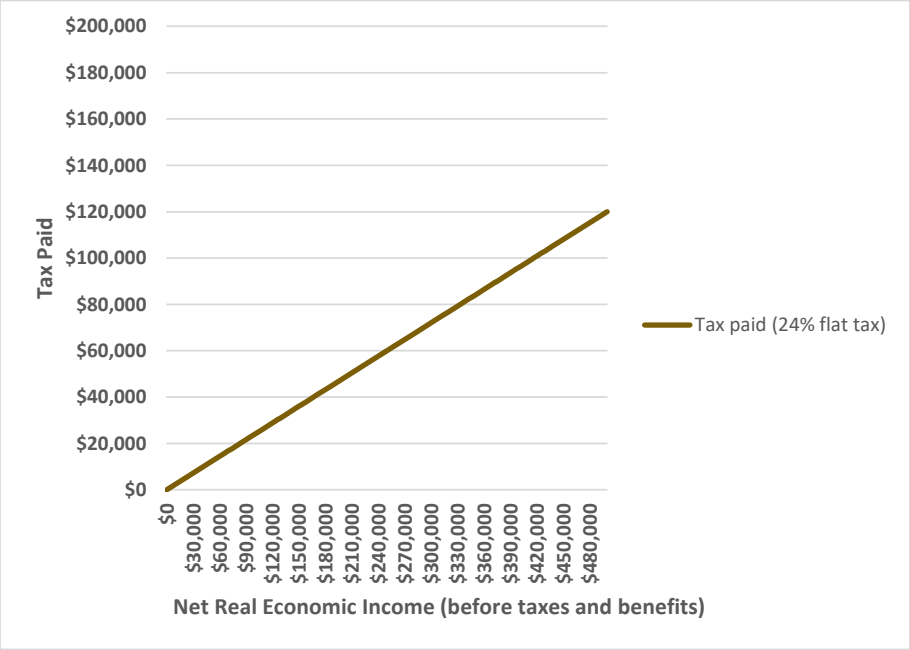
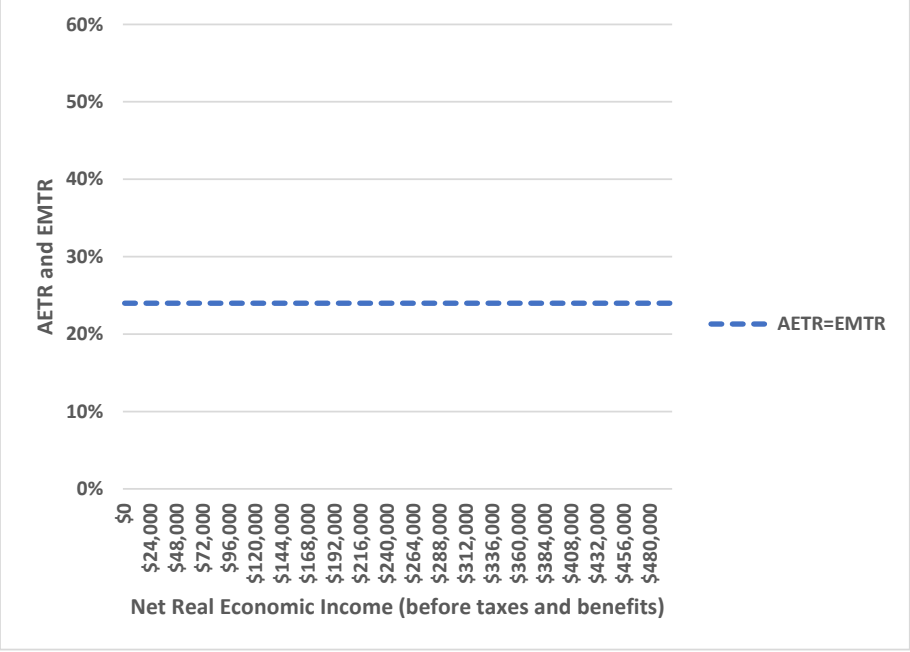


Figure 18: Effective tax rates under a proportional income tax system (24% flat rate)



That is, under such a "proportional" income tax system with no inflation, there would be no need to estimate effective tax rates, since under these assumptions the statutory marginal tax rate set out in legislation would provide an accurate indication of both the:

- effective marginal tax rate that is imposed on each additional dollar of net real economic income that is earned by the taxpayer (which is illustrated by the dotted blue line in **Figure 18**); and
- average effective tax rate imposed on the net real economic incomes of taxpayers (which, once again, is illustrated by the dotted blue line in **Figure 18**).

Effective tax rates under a progressive income tax system

Now consider what happens to effective tax rates when we:

- relax the assumption that a single statutory marginal tax rate is imposed on the net real economic incomes of taxpayers and the net incomes of taxpayers; and
- assume instead that the government has decided to impose "progressively" higher statutory marginal tax rates as the net real economic incomes of taxpayers increase.

For simplicity, it is assumed that under this "progressive" income tax system, the net income of taxpayers would be taxed at the same increasing (i.e. "progressive") statutory marginal rates of tax that the New Zealand income tax system currently applies to taxable income, namely:

- 10.5% for each dollar of taxable income up to and including $14,000;
- 17.5% for each dollar of taxable income in excess of $14,000 but less than or equal to $48,000;
- 30% for each dollar of taxable income in excess of $48,000 but less than or equal to $70,000;
- 33% for each dollar of taxable income in excess of $70,000 but less than or equal to $180,000; and
- 39% for each dollar of taxable income in excess of $180,000.

Unlike the New Zealand income tax system, however, we will continue to assume that this progressive income tax system:

- measures taxable income in "real", constant dollar, terms;
- defines taxable income to include all of the net economic income of the taxpayer (i.e. there is no tax exempt or concessionally taxed income);
- attributes all net economic incomes to taxpayers (i.e. there is no retained earnings that are held within companies and trusts);
- does not provide any non-taxable, or taxable, benefits to taxpayers.

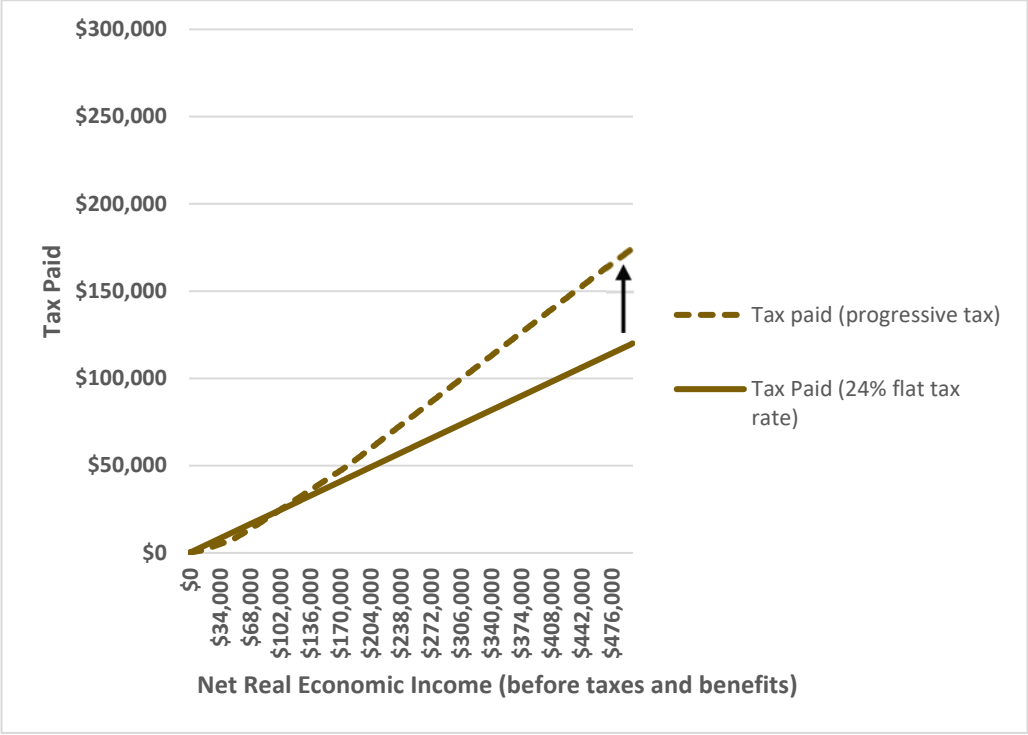
Under such a progressive income tax system the:

- amount of tax that is paid by a taxpayer would increase as their economic income increases (as illustrated by the solid brown line in **Figure 19**, which is lower than the amount of tax that taxpayers with net real economic incomes of $48,000 of less would have had to pay if their income was taxable at a flat statutory marginal rate of tax of 24%, as is illustrated by the dotted brown line, and higher if their income was in excess of $48,000 when statutory marginal rates of tax greater than 24% apply);

- effective marginal tax rates[36] on the net economic incomes of taxpayers increase as the net economic incomes of the taxpayer increases (as illustrated by the dotted blue line in **Figure 20**). Once again, those effective marginal tax rates are equal to the statutory marginal tax rates due to the assumptions that:
  - there is no inflation, which means that the real EMTR imposed on economic income is the same as the nominal EMTR on economic income; and
  - all net economic income is taxable, which means that the EMTR on taxable economic income is equal to the EMTR on the total net economic income of the taxpayer;
- average effective tax rates on the net real economic incomes of taxpayers (as illustrated by the dotted red line in **Figure 20**) are less than the statutory marginal tax rates applying to that income for all taxpayers with net real economic income in excess of the top of the first income tax bracket (i.e. in excess of $14,000 per annum).

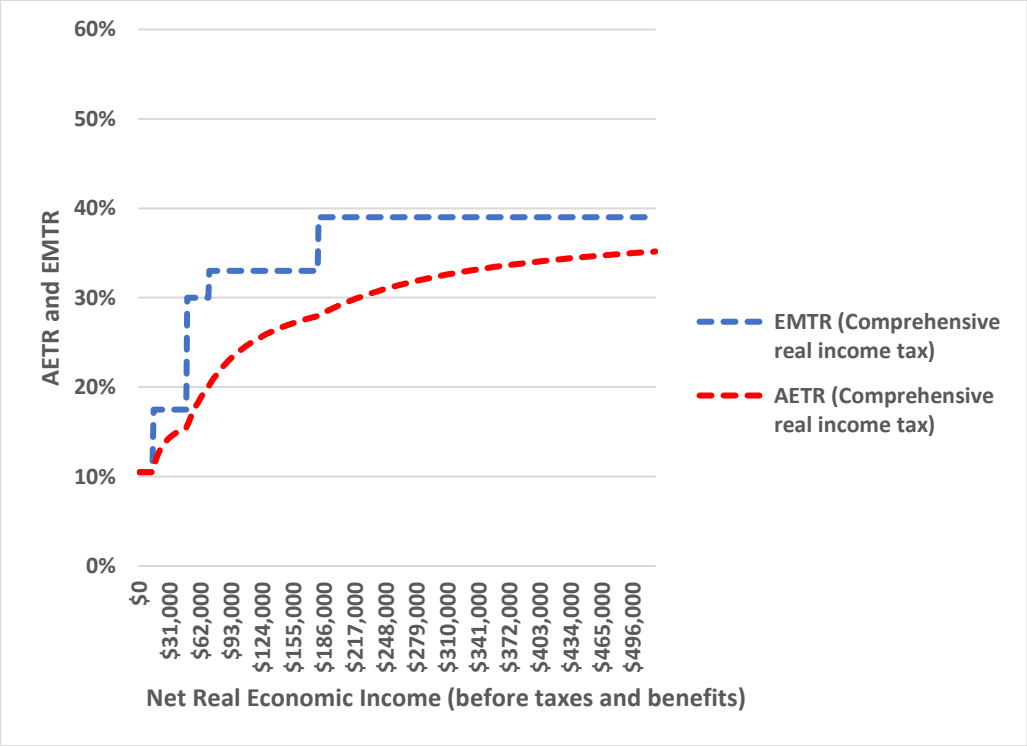
That is, even if New Zealand's tax system was to tax all real economic income, the average effective rates of tax imposed on the net incomes of individuals would be less than the statutory marginal rates of tax applying to that income for all individuals with net incomes in excess of the top of the first tax bracket. This is because some part of the incomes that individuals earn in excess of $14,000 is taxed at a lower statutory marginal rate of tax than the rate that applies to the last few dollars of income they earn.

Figure 19: Amount of tax paid under a progressive income tax system



[36] Once again, the effective marginal tax rate measures the rate at which the amount of tax paid increases as the income of the taxpayer increases. That is, the EMTR is equal to the slope of the "tax paid" line at that level of income (i.e. the first derivative of the function that expresses how the amount of tax paid varies when income changes). In the case of a progressive income tax system, this increases as the amount of income earned increases.

Figure 20: Effective tax rates under a progressive income tax system



2.3.2 How do effective tax rates change as a result of key government decisions regarding the design of the income tax and benefit systems?

Having illustrated in **Figure 20** what marginal and average effective tax rates would look like under a progressive income tax system that taxes all of the net real economic income of taxpayers (i.e. the dotted blue line illustrates the EMTRs and the dotted red line illustrates the AETRs), we can now use these as "benchmarks" against which to consider how those effective tax rates change as a result of the decisions by successive New Zealand governments to:

- measure taxable income in "nominal" dollars of the day, rather than in "real" constant dollar terms (i.e. the decision not to "index" the income tax system to exclude the effects of inflation);
- tax the incomes of individuals, rather than the incomes of the households in which those individuals reside;
- exclude certain forms of net economic income from the definition of taxable income (i.e. consider how the existence of non-taxable net economic income alters effective tax rates);
- impose lower statutory marginal rates of tax on certain forms of income (e.g. a 28% tax on the retained earnings of New Zealand companies rather than attributing that net income to individuals and tax it at their respective statutory marginal rates of tax); and
- provide certain individuals with non-taxable or taxable benefits to supplement their net real economic incomes.

The effects that each of these government decisions regarding the design of the current income tax system are considered individually below.

How does inflation alter effective tax rates?

Consider first the effects that inflation can have on the effective tax rates that a progressive income tax system imposes on the net real economic incomes of taxpayers if we:

- relax the assumption that taxable income is measured in "real", constant dollar, terms; and
- assume instead that taxable income is measured in "nominal" dollars of the day as a result of the government's decision not to index income tax for the effects of inflation.

In the presence of inflation, the income of a taxpayer, as well as amount of tax they pay on that income and the rate of tax levied on that income, can be measured in either:

- nominal dollars (i.e. using "dollars of the day" that include the effects of inflation); or
- real dollars (i.e. using "constant dollars" that exclude the effects of inflation).

Specifically, the:

- net economic income of the taxpayer and the amount of tax they pay on that net economic income can be measured in either nominal or real terms. The:
  - nominal net economic income of the taxpayer is the nominal value of their net wealth (i.e. net assets) multiplied by the pre-tax nominal rate of return on those assets (which is 7.1% assuming a real rate of return or 5% and an expected rate of inflation of 2%);[37]
  - real net economic income of the taxpayer is equal to the real value of their net wealth multiplied by the pre-tax real rate of return on those assets (which is assumed to be 5%);
- amount of tax paid on that net economic income can be measured in nominal or real terms. The:
  - nominal amount of tax paid on nominal net economic income is equal to the sum of each dollar of that net taxable income earned multiplied by the statutory marginal tax rate that applies to that dollar of nominal net taxable income;
  - real amount of tax paid on net real economic income is equal to the sum of each dollar of net real economic income earned multiplied by the real effective marginal tax rate paid on that dollar of that net real economic income;[38]

[37] For the purposes of this report, the "Fisher equation" is used to estimate the nominal rate of interest (i) using the real rate of return (r) and the rate of inflation ($i=(1+r)*(1+\pi)-1$). Other authors sometimes estimate the nominal rate of interest using an approximation of the Fisher equation which involves summing the real rate of return and the rate of inflation (i.e. $i \approx r+\pi$). The error inherent in that approximation is equal in value to the real rate of return multiplied by the inflation rate (i.e. error= $r*\pi$). As a result, such an approximation of the nominal interest rate becomes less accurate for higher real rates of return and inflation rates. With an assumed real rate of return of 5% and an inflation rate of 2%, the inherent error in such an approximation is 0.1%.

[38] The amount of tax paid on an amount of economic income is equal to area under the real EMTR schedule over the range of economic income earned by the taxpayer (i.e. the integral of the real EMTR function over that range).

- effective marginal tax rate (EMTR) imposed on the net economic income of a taxpayer can be measured in either nominal or real dollar terms. The:
  - "nominal EMTR" measures the extent to which the amount of tax paid, measured in nominal dollars of the day, changes in response to small change in the net economic income of the taxpayer, measured in nominal dollars of the day; and
  - "real EMTR" measures the extent to which the amount of tax paid, measured in real constant dollars, changes in response to small change in the economic income of the taxpayer, measured in real constant dollars; and
- average effective tax rate (AETR) imposed on the net economic income of a taxpayer can be measured in either nominal or real dollar terms. The:
  - "nominal AETR" measures the amount of tax paid expressed in nominal dollars as a proportion of taxable income expressed in nominal dollars; and
  - "real AETR" measures the amount of tax paid expressed in real dollars as a proportion of taxable income expressed in real dollars.

Consider first the effects that inflation (e.g. a 2% rate of inflation) has on the nominal amount of tax paid and the effective tax rates that are imposed on the nominal net economic income of taxpayers (i.e. nominal effective tax rates) under such a progressive income tax system. Inflation:

- increases both the:
  - amount of economic income earned by the taxpayers, measured in nominal dollar terms;
  - amount of tax they pay measured in nominal dollar terms on that economic income (as illustrated by the solid brown line in **Figure 21**, which is higher than the dotted brown line which indicates the amount of that that would have been paid under a progressive comprehensive tax on real economic income, which is the same as the dotted brown line in **Figure 19**);
- shifts the original schedule of statutory marginal tax rates (as illustrated by the dotted blue line in **Figure 22** which is the same as that in **Figure 20**) to the left to a new nominal effective marginal tax rate schedule (as illustrated by the green line in **Figure 22**). Since the thresholds at which different statutory marginal tax rates apply are measured in nominal dollar terms, taxpayers will have to pay higher statutory marginal rates of tax at lower levels of net real economic income than they would have in the absence of inflation. That is, inflation results in "bracket creep" by forcing some taxpayers into higher tax brackets even though their net real economic income has not increased; and
- shifts the original schedule of average effective tax rates (as illustrated by the dotted red line in **Figure 22**, which is the same as that in **Figure 20**) to the left to a new nominal average effective tax rate schedule (as illustrated by the orange line in **Figure 22**). That is, in the presence of inflation, taxpayers face higher nominal average effective tax rates on their net real economic incomes at lower levels of net real economic income than they would have in the absence of inflation.

Figure 21: Effect of inflation on the amount of tax paid

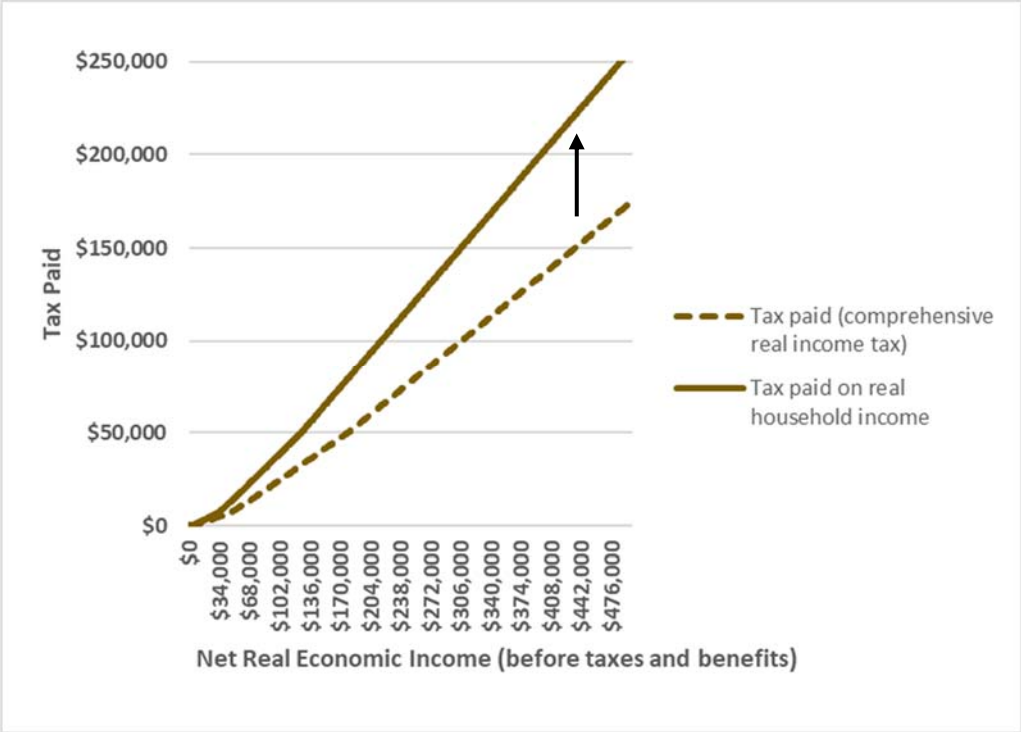
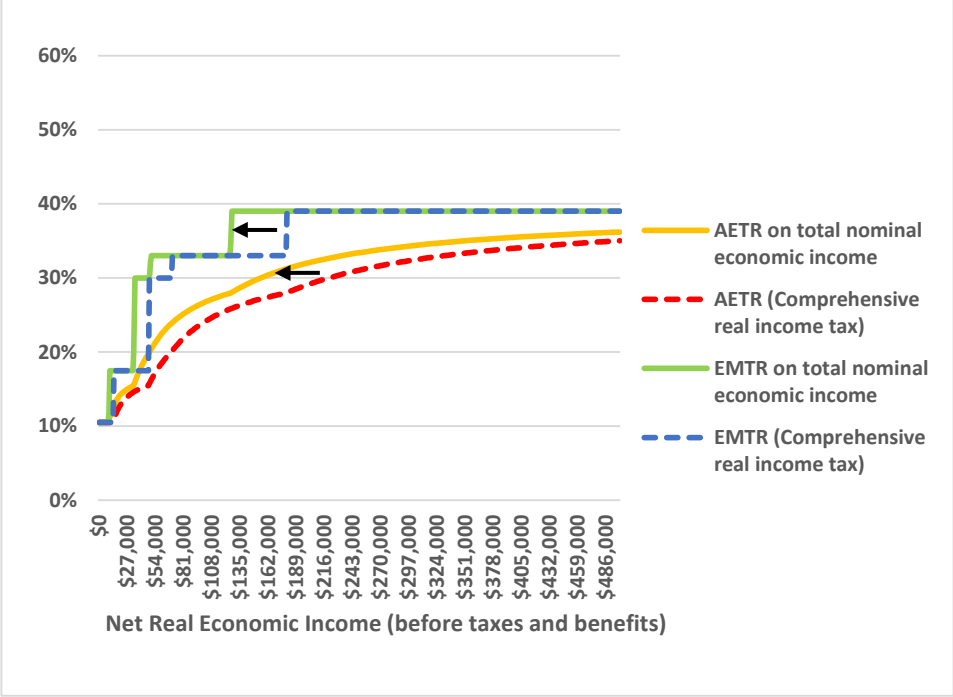


Figure 22: Effect of inflation on the effective tax rates imposed on nominal economic income

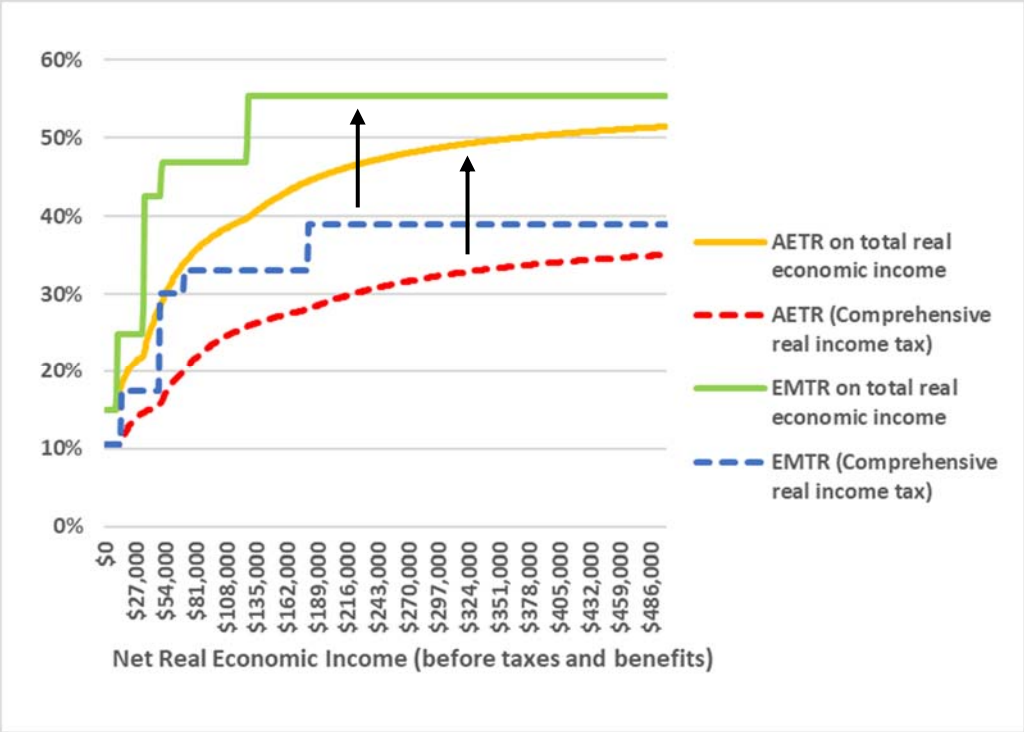


Now consider the effects that inflation has on the real amount of tax paid by taxpayers and the effective tax rates that are imposed on the net real economic income of taxpayers (i.e. the effects of inflation on real effective tax rates). Inflation:

- leaves the net real economic income of the taxpayer unchanged, but:
  - increases the amount of taxable net economic income they earn; and
  - increases the amount of tax they pay on their net real economic income (as is illustrated in **Figure 21** by the upward shift in the amount of tax paid – that is, the upward shift in the dotted brown line which indicates the amount of tax that would have been paid on net real economic income in the absence of inflation, to the solid brown line which indicates the amount of tax paid on taxable income in the presence of 2% inflation). This is because in the presence of inflation, taxpayers have to pay tax not only on the amount of net real economic income they earn (i.e. tax equal to that indicated by the dotted brown line in **Figure 21**), but also have to pay tax on the additional taxable income they earn purely as a result of inflation in the general level of prices in the economy (i.e. additional tax equal to the vertical distance between the dotted brown line and the solid brown line in **Figure 21**);
- increases the real effective marginal tax rates that are imposed on their net real economic income (as illustrated in **Figure 23** by the upward shift in the original statutory marginal tax rate schedule, as represented by the dotted blue line, to the new higher real effective marginal tax rate schedule, as illustrated by the solid green line). That is, inflation has the effect of increasing the real EMTR that is imposed on any particular level of net real economic income, since taxpayers not only have to pay tax on their net real economic income, but also on the additional nominal economic income they derive purely as a result of the effects of inflation, even though this does not increase their net real economic wealth;
- increases the real average effective tax rates that are imposed on their net real economic income (as illustrated by in **Figure 23** by the upward shift in the original average effective tax rate schedule, as illustrated by the dotted red line, to a new higher real average effective tax rate schedule, as illustrated by the solid orange line). That is, inflation imposes a higher real average effective rate of tax on the net real economic incomes of all taxpayers, since individuals not only have to pay tax on their net real economic income, but also on the additional net nominal income they derive as a result of inflation, even though their net real economic income has not increased.[39]

[39] As discussed further in section 3.3.4, inflation has even more complex effects than those illustrated above to the extent that it also alters the relative rates of return derived from different types of assets.

Figure 23: Effects of inflation on the effective tax rates imposed on real economic income



How does the taxation of the incomes of individuals, rather than households, alter effective tax rates?

The decision of successive New Zealand governments to tax each individual on the income they earn, rather than households on the combined incomes that the members of that household earn, also alters the effective tax rates that are imposed on the real economic incomes of those households.

In particular, it imposes:

- the same effective tax rates on the incomes of those households that rely on the income earned by one member of that household; and
- lower effective tax rates on the incomes of those households that comprise more than one income earner, since such households are able to earn higher levels of income before they face higher statutory marginal rates of tax.

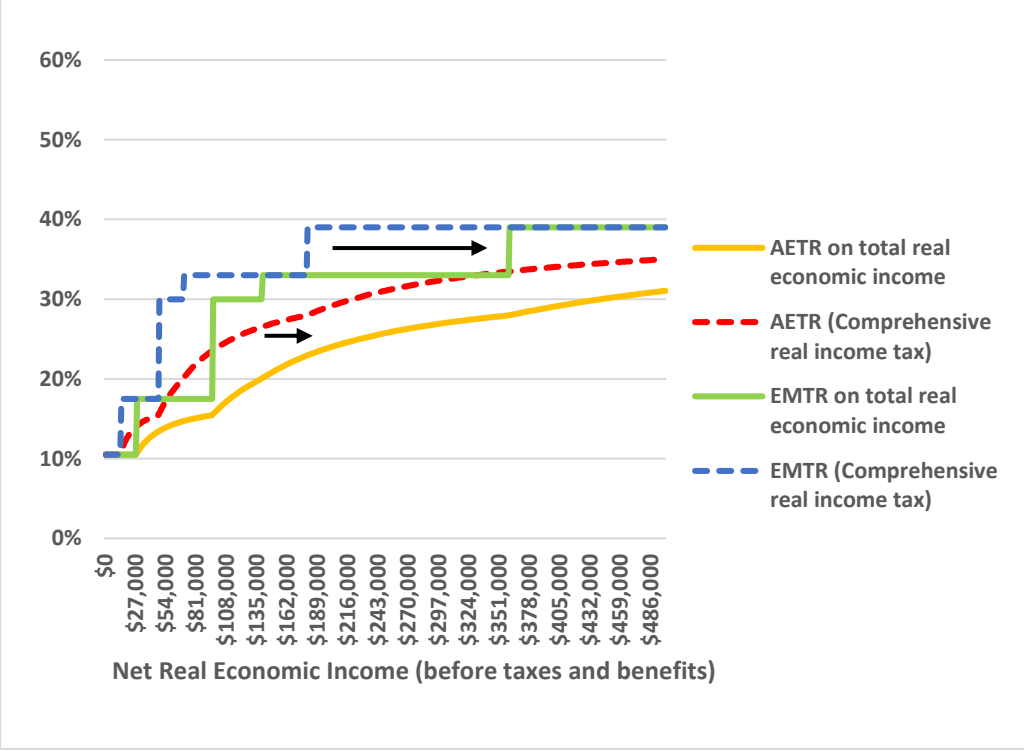
For example, as illustrated in **Figure 24**, if households were subject to tax on the combined real economic incomes of their members, then the:

- effective marginal tax rates that would be imposed on the real economic income of the household would be the same as those that would apply if the real economic income of the household was subject to a comprehensive real income tax levied at the existing statutory marginal rates of tax that apply to personal income (as illustrated by the dotted blue line);
- average effective tax rates imposed on the real economic income of the household would also be the same as they would be under a comprehensive real income tax (as illustrated by the dotted red line).

By contrast, if the incomes of each individual in the household are taxed separately at their respective statutory marginal tax rates, as they are in practice (e.g. if the household comprises a couple who each earn 50% of the total real economic income of that household), then this will:

- shift the original schedule of statutory marginal tax rates (as illustrated by the dotted blue line in **Figure 25** which is the same as that in **Figure 20**) to the right to a new nominal effective marginal tax rate schedule (as illustrated by the green line in **Figure 24**) since it enables the household to earn a higher total level of real economic income before they are subject to higher statutory marginal rates of tax. This reduces the effective marginal tax rates imposed on the real economic incomes of certain households (i.e. those with real economic incomes that are affected by that shift in the effective tax rate schedule);
- reduce the average effective tax rate that is imposed on the real economic income of the household (i.e. as illustrated by the shift in the original average effective tax rate schedule, which is illustrated by the dotted red line in **Figure 24**, to the right to a new average effective tax rate schedule as illustrated by the orange line).

Figure 24: Effects of taxing the incomes of individuals, rather than households, on the effective tax rates imposed on that income



As noted by Dwyer (2004), "...genuine neutrality in personal income taxation is quite impossible unless the tax law recognises private income sharing arrangements within families, just as it recognises such income sharing between partners in partnerships, or among beneficiaries of a trust. From this point of

view, so-called 'income splitting' is not a form of tax avoidance but a logical attempt by taxpayers seeking a fairer tax system which recognises the income sharing already going on".[40]

How does non-taxable income alter effective tax rates?

Now consider what happens to effective tax rates when we:

- relax the assumption that taxable income is defined to include all of the net real economic income of taxpayers; and
- assume instead that governments have decided not to include certain forms of economic income in the definition of taxable income (e.g. the imputed rental income from owner-occupied housing, capital gains realised on the sale of owner-occupied housing and other real property, such as commercial property and shares, that are held on "capital account").

When some of the total economic income of a taxpayer is not subject to tax, effective tax rates can be measured on either the:

- taxable net economic income; or
- total net economic income, which includes both taxable and non-taxable net economic income.

Specifically, when certain forms of net economic income are not taxable:

- effective marginal tax rates (EMTRs) can be measured on either each dollar pf taxable economic income or total economic income. The:
  - "EMTR on taxable economic income" measures the extent to which the amount of tax paid by a taxpayer changes in response to a small change in their taxable net economic income;
  - "EMTR on total economic income" measures the extent to which the amount of tax paid by a taxpayer changes in response to a small change in their total net economic income, which includes both their taxable and non-taxable net economic income;
- average effective tax rates (AETRs) can also be measured on taxable economic income, or total economic income. The
  - "AETR on taxable economic income" measures the amount of tax paid by a taxpayer as a proportion of their taxable net economic income; and
  - "AETR on total economic income" measures the amount of tax paid by a taxpayer as a proportion of their total net economic income, which includes both their taxable and non-taxable net economic income.

Consider first the effects that excluding certain forms of economic income from the definition of taxable income has on the amount of tax paid on taxable net economic income and the effective tax rates imposed on that taxable net economic income. The exclusion of certain forms of economic income from the definition of taxable income (e.g. 40% of net real economic income):

- reduces both the:
  - amount of taxable net economic income earned by the taxpayer;
  - amount of tax they pay on that taxable net economic income (as illustrated in **Figure 25** by the downward shift in the amount of tax paid from the dotted brown line, which indicates

[40] Dwyer, T. (2004), *The Taxation of Shared Family Incomes, Perspectives on Tax Reform (2),* The Centre for Independent Studies, CIS Policy Monograph 61 https://www.cis.org.au/wp-content/uploads/2015/07/pm61.pdf

the amount of tax that would be paid if all net economic income was taxable, to the solid brown line which indicates the amount of tax payable when 40% of the net real income of the taxpayer is not taxable);

- shifts the schedule of statutory marginal tax rates to the right (as illustrated in **Figure 26** by the shift in the original statutory marginal tax rate schedule, as illustrated by the dotted blue line, to the right to the new effective marginal tax rate of taxable economic income schedule, which is illustrated by the solid green line). That is, when taxpayers earn some of their net economic income in a form that is not taxable, they are able to earn higher levels of net economic income before they are subject to higher statutory marginal tax rates on their taxable net economic income;
- shifts the average effective tax rate schedule to the right (as illustrated in **Figure 26** by the shift in the original average effective tax rate schedule, as illustrated by the dotted red line, to the right to the new average effective tax rate schedule on taxable income, which is illustrated by the solid orange line). That is, when taxpayers earn some of their net economic income in form that is not taxable, they are able to earn higher levels of net economic income before they face the same average effective tax rates that would apply if all of their net economic income was taxable.

Figure 25: Effect of non-taxable income on the amount of tax paid

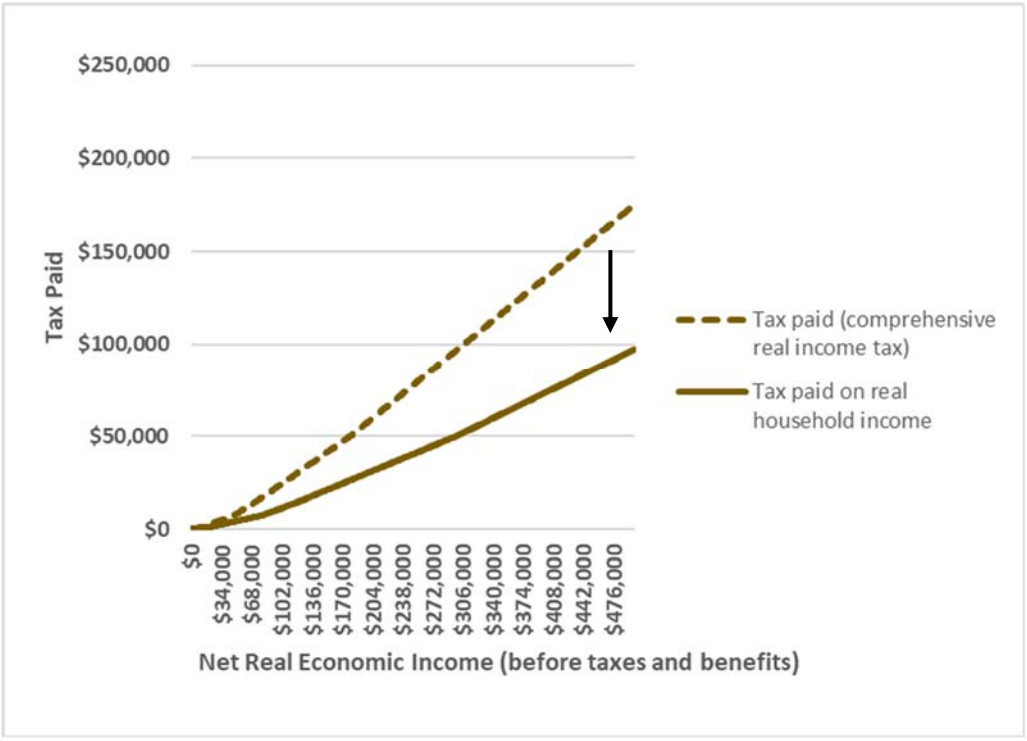
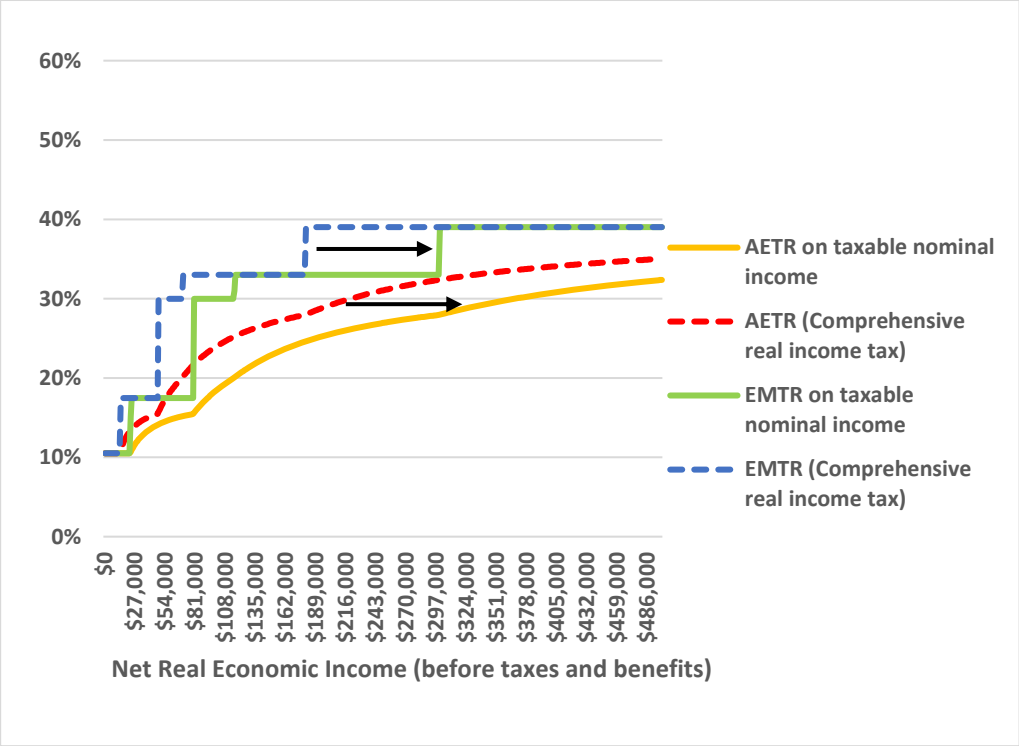


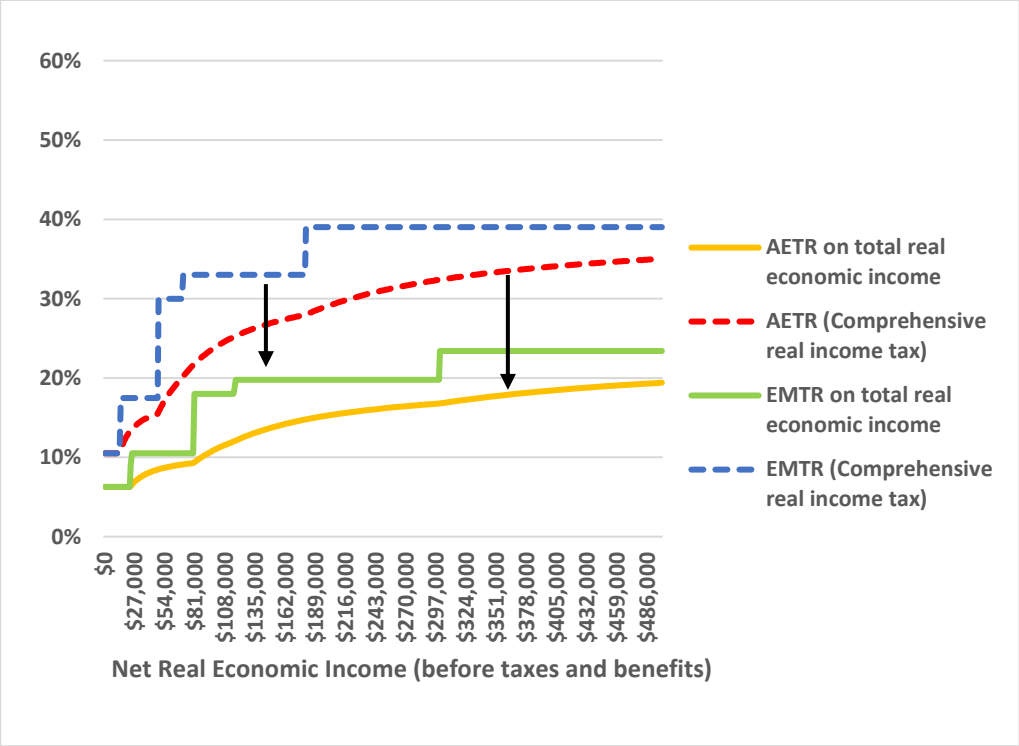
Figure 26: Effects of non-taxable income on the effective tax rates imposed on taxable net economic income



The exclusion of certain forms of economic income from the definition of taxable income (e.g. 40% of total net economic income) also alters the effective tax rates imposed on the total net real economic incomes of taxpayers. Specifically, it:

- leaves the total net real economic income of taxpayers unchanged, but:
  - reduces their taxable net economic income; and
  - reduces the amount of tax paid on their total net real economic income (as illustrated in **Figure 25** by the downward shift in the amount of tax paid on total net real economic income, which is illustrated by the dotted brown line, to the new lower amount of tax paid, which is illustrated by the solid brown line);
- reduces the effective marginal rate of tax imposed on total net real economic income (as illustrated in **Figure 27** by the downward shift in the original statutory marginal tax rate schedule, which is illustrated by the dotted blue line, to the new effective marginal tax rate schedule, which is illustrated by the solid green line);
- reduces the average effective tax rates imposed on total net real economic income (as illustrated in **Figure 27** by the downward shift in the original statutory marginal tax rate schedule, which is illustrated by the dotted red line, to the new average effective tax rate schedule, which is illustrated by the solid orange line.

Figure 27: Effect of non-taxable income on the effective tax rates imposed on total net economic income



How does the taxation of certain forms of income at lower statutory marginal tax rates alter effective tax rates?

In addition to not including certain forms of net economic income in the definition of taxable income, New Zealand governments have also decided to tax certain forms of income at lower statutory marginal rates of tax than those that apply to wages and salaries, interest and dividend income.

For example, the New Zealand income tax system applies a:

- 17.5% statutory marginal tax rate to the retained earnings of Māori Authorities;
- 28% statutory marginal rate of tax to the retained earnings of New Zealand companies;
- 33% statutory marginal tax rate to the incomes of trustees.

In addition, the incomes earned from Portfolio Investment Entities (PIEs) are also subject to statutory marginal tax rates that are concessional for some taxpayers (e.g. those with statutory marginal tax rates on their personal income that are in excess of 28%). Specifically, the income earned from PIEs is taxable at the following progressive Prescribed Investor Rates (PIRs):

- 10.5% where their taxable income excluding PIE income is $14,000 or less and their taxable income including PIE income is $48,000 or less;
- 17.5% where their taxable income excluding PIE income is $48,000 or less and their taxable income including PIE income is $70, 000 or less; and
- 28% for all other cases;

As a result, it is useful to consider the effects of:

- relaxing the assumption that all of the net real economic income earned by taxpayers is attributed to them and taxed at their respective personal statutory marginal rates of tax; and
- assuming instead that some proportion of the net real economic income of taxpayers (e.g. 40%) is taxed at final, potentially concessional, rates of tax. Specifically, it is assumed for the purposes of this example that 40% of net economic income is earned in the form of the income of a company that is retained, rather than distributed to shareholders, which is taxable at the company tax rate, which is concessional for some taxpayers (e.g. the owners of the company, if they face statutory marginal rates of tax on their income that are in excess of 28%).

The taxation of a proportion of the net real economic income of taxpayers (e.g. 40% of net real economic income) at a flat statutory marginal tax rate (e.g. 28%):

- leaves the total net real economic income of the taxpayer unchanged, but:
  - reduces the taxable net economic income earned by the taxpayer;
  - reduces the amount of tax they pay on their total net real economic income (as illustrated in **Figure 28** by the downward shift in the amount of tax paid from the dotted brown line, which indicates the amount of tax that would be paid if all of their net real economic income was taxable at statutory marginal rates of personal income tax, to the solid brown line which indicates the amount of tax payable when 40% of the net real income of the taxpayer is earned in the form of the retained earnings of a company that is taxable at the statutory marginal rate of company tax of 28%);
- shifts the statutory marginal tax rate schedule (as illustrated by the dotted blue line in **Figure 29**) to a new effective marginal tax rate schedule (as illustrated by the green line) that is:
  - to the right of the original statutory marginal tax rate schedule, since it enables individuals to earn higher levels of real economic income before they face higher statutory marginal rates of tax on their real economic income;
  - above the original statutory marginal tax rate schedule for low levels of income that are subject to statutory marginal rates of personal income tax that are less than 28%;
  - below the original statutory marginal tax rate schedule for higher levels of income that are subject to statutory marginal rates of tax on personal income that are in excess of 28%;
- shifts the original average effective tax rate schedule (as illustrated by the dotted red line) to a new average effective rate schedule (as illustrated by the orange line) that is:
  - to the right of the original average effective tax rate schedule (i.e. since, as noted above, it enables individuals to earn higher levels of real economic income before they face higher statutory marginal rates of tax on their real economic income);
  - above the original average effective tax rate schedule for low levels of income that are subject to statutory marginal rates of personal income tax that are less than 28%; and
  - below the original average effective tax rate schedule for higher levels of income that are subject to statutory marginal rates of personal income tax in excess of 28%.

Figure 28: Effect of taxing retained earnings at 28% on the amount of tax paid

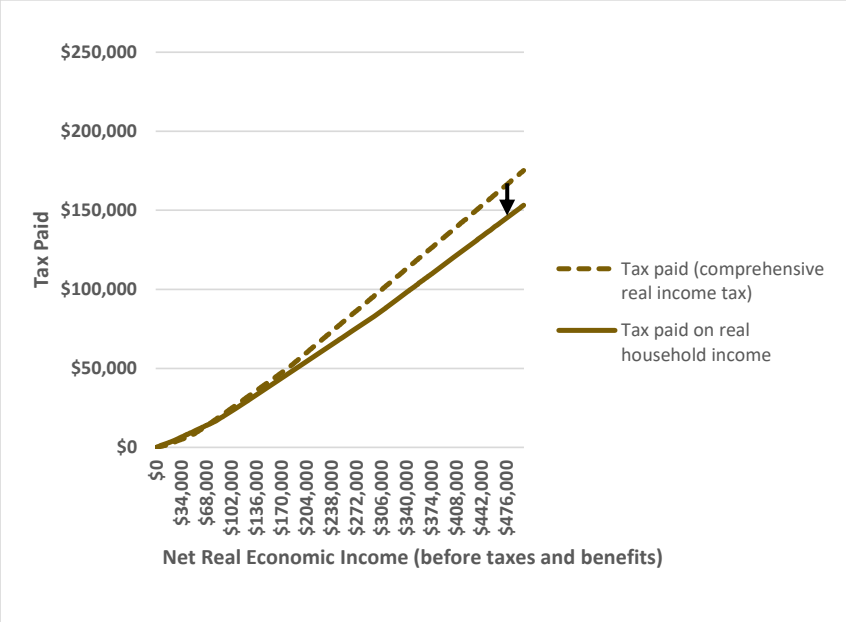
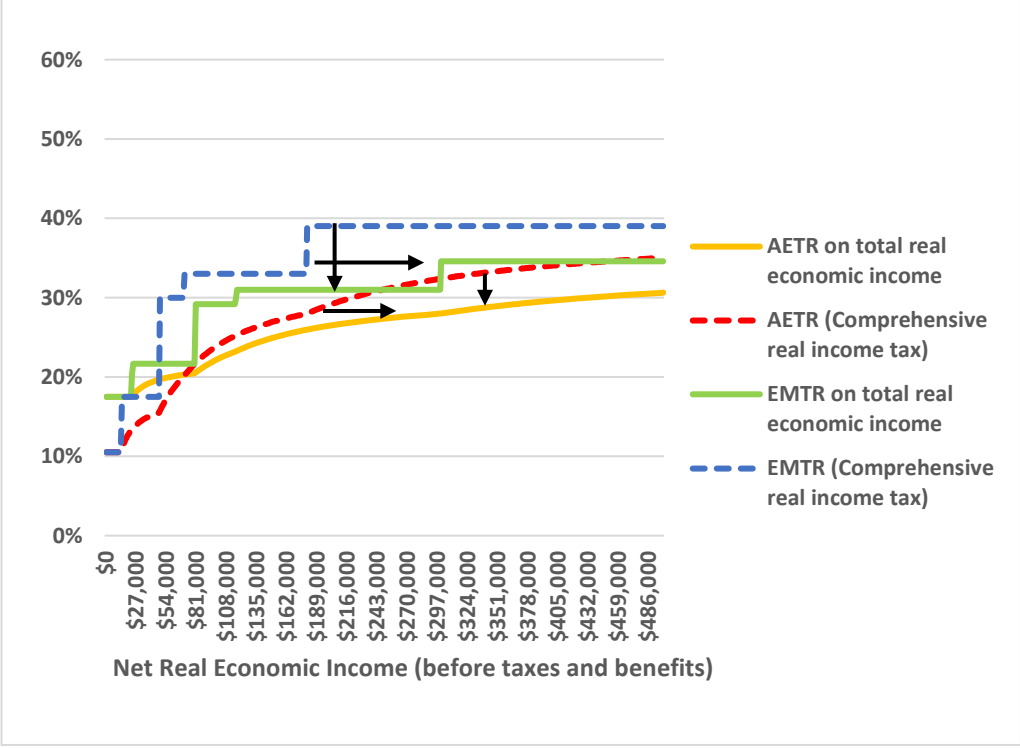


Figure 29: Effect of taxing retained earnings at a lower marginal tax rate (28%) on the effective tax rates imposed on real economic income



How do benefits alter effective tax rates?

In addition to raising tax revenue, the income tax system is also used by governments, in conjunction with the social welfare system, to provide benefits to certain individuals and households.

As a result, it is useful to consider how effective tax rates change when we:

- relax the assumption that the income tax system does not provide benefits to individuals; and
- assume instead that the government decides to provide benefits through either the income tax or social welfare systems.

If the government paid benefits to individuals in the form of a tax credit equal to a specified proportion of their income (e.g. 40%), then this would have the same effect on effective tax rates as would a decision by government not to tax a certain proportion of income (e.g. 40% of income), which was outlined previously.

In practice, however, benefits are typically provided in the form of a lump sum that is paid to recipients at regular intervals over the year.

Some of those lump sum benefits are not taxable, such as:

- subsidised education and health services are not reduced (i.e. "abated") as the incomes of the recipients of those benefits increase;
- Working for Families tax credits, which provide a lump sum subsidy through the income tax system that reduces the amount of income tax that households with dependent children would otherwise have had to pay. However, unlike education and health services, those benefits are means tested and reduced (i.e. abated) as the incomes of recipients increase. Those Working for Families tax credits include the:
  - "Family Tax Credit";
  - "In-Work Tax Credit";
  - "Maximum Family Tax Credit"; and
  - "Best Start Tax Credit".

Other benefits are taxable and are also potentially subject to abatement as the incomes of the households receiving those benefits increase. Those taxable benefits include:

- Jobseeker Support;
- Young Parent Payment;
- Youth Payment;
- Sole Parent Support, including Woman Alone;
- Supported Living Payment; and
- Student Allowance.

It is important to note that the provision of those non-taxable or taxable lump sum benefits has quite different effects from those of a "proportional" subsidy.

For example, consider first the effects of providing a lump sum benefit that does is not reduced (i.e. "abated") as the income of the recipient increases (e.g. a taxable benefit, such as NZ Super, or a non-taxable benefit such as subsidised education and health services).

The provision of a lump sum subsidy that is not abated as the income of the recipient:

- reduces the net amount of tax they pay on their real economic income (as illustrated in **Figure 30** by the downward shift in the amount of tax paid from the dotted brown line, which indicates the amount of tax that they would have paid in the absence of that lump sum subsidy, to the solid brown line which indicates the amount of tax paid net of the lump sum subsidy). That is, it results in a parallel shift downward in the tax paid schedule. In general, the magnitude of that reduction in the amount of tax paid will be greater the greater the lump sum subsidy and the amount of tax payable on that subsidy (i.e. a non-taxable subsidy will generate a greater reduction in tax paid than if that subsidy was taxable);
- shifts the statutory marginal tax rate schedule (as illustrated by the dotted blue line in **Figure 31**) to the left if the lump sum subsidy is taxable (e.g. as is the case for NZ Super), since this will increase the real income of the recipient and subject them to higher statutory marginal rates of tax on their personal income at lower levels of income than they would have experienced in the absence of that lump sum subsidy. By contrast, if the lump sum subsidy is not taxable (e.g. as is the case for subsidised education and health services), there would be no change in effective marginal tax rates;
- shifts the original average effective tax rate schedule (as illustrated by the dotted red line in **Figure 31**) to a new average effective rate schedule (as illustrated by the orange line) that is below the original average effective tax rate schedule, since they are receiving a lump sum subsidy that results in a net reduction in the amount of tax paid on their real economic income. This reduction in average effective tax rates will be greater the greater the magnitude of the lump sum subsidy and the lower the rate of tax applied to that subsidy. For low levels of real income, the lump sum subsidy will more than offset the amount of tax payable on taxable income and result in a negative average effective tax rate. A lump sum subsidy will also generate a greater reduction in average effective tax rates imposed on lower levels of income, since it will comprise a higher proportion of that real economic income.

Figure 30: Effect of a lump sum subsidy on the amount of tax paid

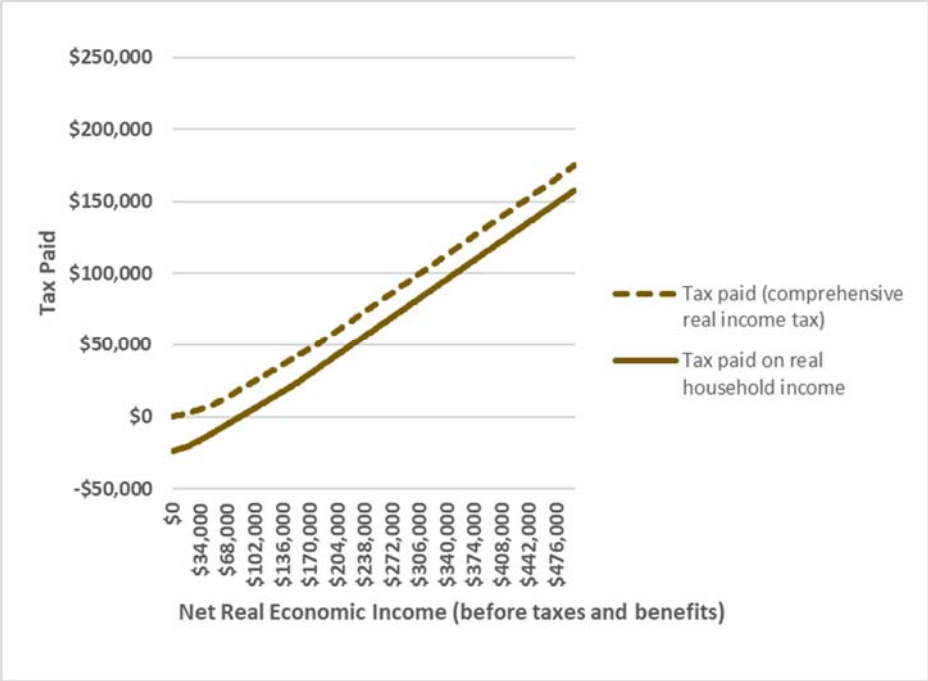
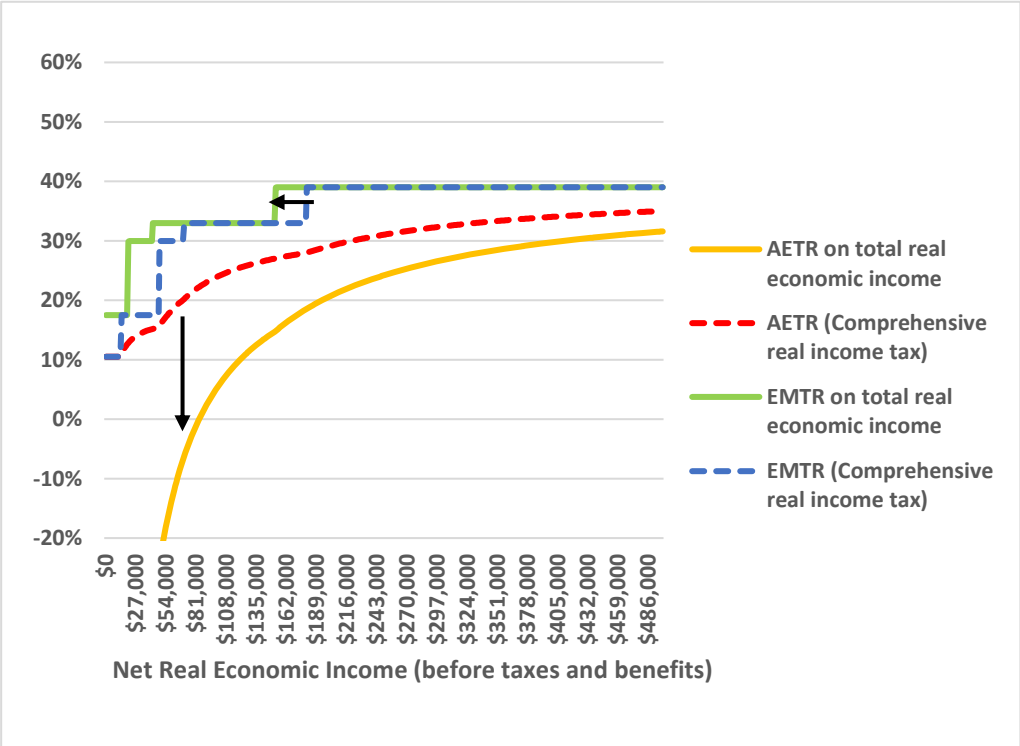
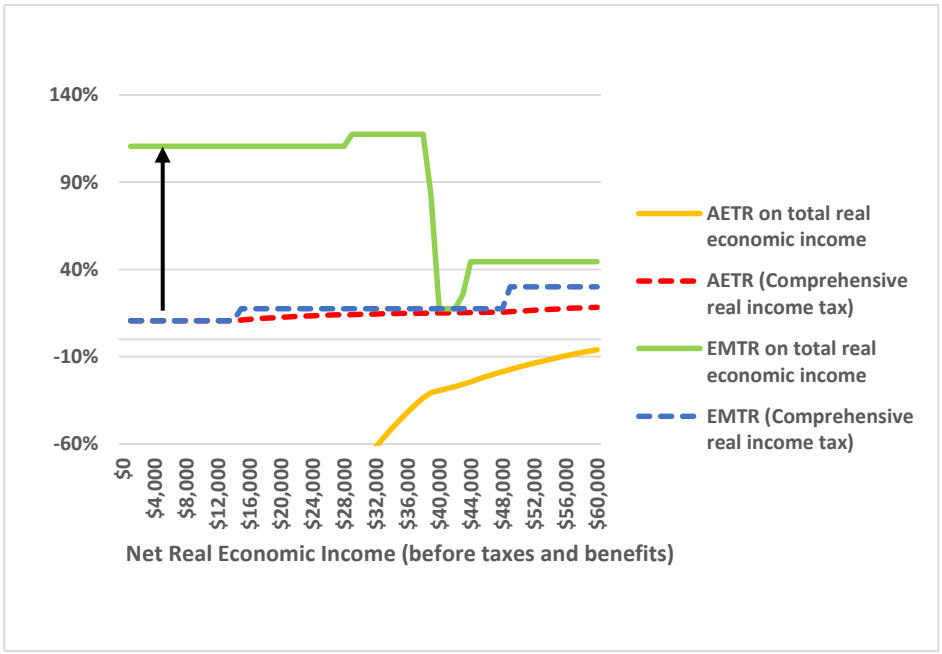


Figure 31: Effect of a lump sum subsidy on the effective tax rates imposed on real economic income



As illustrated in **Figure 32**, if a lump sum subsidy is reduced as the income of the beneficiary increases (e.g. as it is in the case of a working couple with two dependent children receiving Working for Families tax credits), then this can result in very high effective marginal tax rates on relatively low levels of income (as illustrated by the solid green line). This is because the recipients of those means tested benefits not only have to pay tax on each dollar of income they earn, but they also lose a proportion of the lump sum benefit they receive.

Figure 32: Effect of abating a lump sum subsidy on the effective tax rates imposed on real economic income



2.3.3 What are the combined effects of government decisions regarding the design of the income tax and benefit systems?

As outlined in section 2.3.2, inflation increases the real effective rates of tax that are imposed on the economic incomes of households, whereas the taxation of individuals, rather than households, on their income, tax concessions (i.e. the taxation of certain forms of economic income at marginal rates of tax less than the statutory marginal rates of tax that apply to their personal income) tend to reduce those effective tax rates to some extent. This raises the question as to the combined effect that these government decisions regarding the design of the income tax and benefit systems have on effective tax rates.

As outlined in section 3.2 below, ultimately the net effect will vary across households as a result of the combined effects of the:

- decisions that governments have made regarding the design of the income tax and benefit systems (e.g. the decision not to index the income tax system for the effects of inflation and their decisions regarding the rates of tax to apply to different types of incomes earned through different entities and the rates of benefits to apply to different types of households);
- decisions that individuals and the households in which they reside make. This includes the decisions they make regarding:
  - their household composition (e.g. whether to marry and how many children they have);
  - where they live and whether to rent their accommodation or purchase their own home;
  - how much of their incomes to consume, save and invest; and
  - the types of assets in which they choose to hold their wealth (e.g. their human capital, financial assets and physical assets); and
  - the forms in which they choose to derive their economic income (e.g. wages and salaries, interest and dividends, and capital gains in the value of the assets they own).

3. Effective tax rate estimates

3.1 Identification of illustrative households

3.1.1 Difficulties with the identification of "representative" households

In view of the large numbers of individual taxpayers and households receiving benefits from the New Zealand government, it is obviously impractical to try to estimate the effective tax rates faced by each of those individuals and households.

Rather, it is desirable to identify groups of taxpayers and welfare beneficiaries with similar levels of wealth and economic income that are considered to be reasonably "representative" of the general population of taxpayers and welfare recipients.

In particular, although individuals are taxable on the income they earn, it is households who are the recipients of the benefits provided by the income tax and social welfare systems in New Zealand. This means that in order to determine the combined effect of the income tax and benefit systems, it is necessary to do this for "representative" types of households (e.g. high wealth households), rather than "representative" individual income earners (e.g. high wealth individuals).

In practice, however, it is difficult to identify such "representative" types of households in view of the limited amount of information currently available on both:

- the distribution of wealth and economic income in New Zealand, which is discussed further in section 3.1.2 below; and
- how that distribution of wealth and economic income is expected to change over time.

Rather, at best, it is really only possible to identify different types of households that are "illustrative" of the range of existing households who are paying income tax and receiving benefits through the income tax and social welfare systems at a particular point in time.

As outlined further below, we have used the limited amount of information currently publicly available from the household net worth (HNW) statistics provided by Stats NZ to identify three broad groups of households:

- low wealth/low income households who have annual net economic incomes and taxable incomes of $48,000 or less. We have sought to identify and exclude any households from this group that are actually medium wealth households earning medium levels of net economic incomes who are earning taxable income of less than $48,000 due to the concessional tax treatment of that income;
- medium wealth/medium income households who have annual net economic income that is greater than $48,000 but less than $500,000. Once again, we have sought to identify and exclude from this group any high wealth households who actually earn high levels of net economic income but who earn taxable incomes less than $500,000 due to the concessional tax treatment of that income. In addition, we have also sought to include medium wealth

households who have medium net economic incomes, but taxable incomes below $48,000 due to the concessional tax treatment of that income; and

- high wealth/high income households, who have net economic income in excess of $500,00 per annum but may have taxable incomes ranging from $48,000 to over $500,000. One again, we have also sought to include those high wealth households who have high economic incomes, but who have taxable incomes of less than $500,000 due to the concessional tax treatment of that income.

3.1.2 Limited information available on the distribution of wealth and economic income in New Zealand

Ideally, in order to estimate the effective tax rates imposed on the net economic income derived by New Zealand households, detailed information is required on the:

- net wealth of individuals and the households in which they reside, as well as the different forms in which that wealth is held (e.g. financial assets such as currency and deposits and pension funds, as well as non-financial assets such as owner occupied dwellings, other real estate and consumer durables); and
- net economic income they derive from those net assets in which they hold their wealth.

As noted in Appendix A of this report, however, currently only limited information is publicly available on the:

- level and distribution of net wealth in Zealand. This includes the limited information provided by the:
  - Stats NZ Household Net Worth (HNW) survey;
  - Reserve Bank's household balance sheet;
  - OECD's Wealth Distribution Database (WDD);
- net economic income households derive from their wealth. The main source of information on the net economic income of New Zealand individuals is that collected by the IRD, which only includes information on their net taxable income. That net taxable income can be less than the net economic income of individuals due to the concessional taxation of certain forms of income (e.g. the non-taxation of the imputed rental income from owner occupied housing and capital gains in the value of that housing and other assets, as well as the taxation of certain forms of economic income at rates of tax that are lower than the personal statutory marginal rates of tax that would otherwise apply to that income, such as income from Portfolio Investment Entities, which include superannuation funds).

In view of that limited data, it is not possible to identify groups of households that are statistically "representative" of all types of NZ households. Rather, as previously noted, at best it is only possible to identify "illustrative" types of households for which to estimate effective tax rates.

For the purposes of identifying those "illustrative" households, we have used the information provided by the HNW survey, which currently provides the most detailed information on the net wealth of NZ individuals and the households in which they reside, including the:

- total numbers of households with different types of assets and liabilities in each income quintile (**Table 4**);

- total value of assets and liabilities of households in each income quintile (**Table 5**);
- mean value of assets and liabilities of households in each income quintile (**Table 6**).

HNW is a subset of the Household Economic Survey (HES) and is updated every three years (2015, 2018 and most recently 2021). The HES is an annual sample survey that collects a comprehensive range of statistics relating to income and expenditure, and demographic information on households and individuals in New Zealand. The target population for HES is the usually resident population of New Zealand living in private dwellings, aged 15 years and over (15+).

In 2018/19, Stats NZ commenced using administrative data on income from the large Integrated Data Infrastructure (IDI) research database for the purposes of the HES, rather than survey data on income. This required Stats NZ to link individuals in HES to the IDI spine, a dataset to which all datasets in the IDI are linked. A high link rate is needed to ensure the best quality data. The link rate of the overall HES sample to the IDI is 94%; for adults it is 95%.[41]

In order to estimate the net worth of the New Zealand population, Stats NZ:

- replaces missing values in the HES with actual values from similar respondents. Imputation is done at the individual level, which may cause inconsistencies at the household level (e.g. ownership of a property may appear to add up to more than 100%);
- corrects for survey sampling errors using the jack-knife method, which is based on the variation between estimates of different subsamples taken from the whole sample;
- standardises age by re-scaling the underlying weights of the unit record data for each ethnic group to reflect a "standard" age distribution. Stats NZ use the age distribution for the overall population of the net worth sample;
- uses a population weighting process to take into account under-coverage in the survey for specific population groups, such as young males and Māori;
- uses weights to estimate the population from the sample. Each unit in the sample is given a weight that indicates the number of households and people it represents in the final population estimate. Weighting ensures that estimates reflect the sample design, adjust for non-response, and align with the current population estimates.[42]

It is important to note, however, that although the HNW survey provides the most detailed information on the level and distribution of net wealth in New Zealand, it:

- includes education loans as a liability, but excludes information on one of the most important types of assets in which households invest and hold their wealth – namely, human capital. This asymmetric treatment of human capital (i.e. recognition of the liabilities arising from investment in human capital, but exclusion of human capital) potentially:

[41] Stats NZ, Linking HES to the IDI, https://www.stats.govt.nz/methods/child-poverty-statistics-technical-appendix-201718#:~:text=Linking%20HES%20to%20the%20IDI&text=The%20link%20rate%20of%20the,children%20(although%20age%20is).

[42] Stats NZ, Household net worth data collection 2020/21, Methodology, https://datainfoplus.stats.govt.nz/item/nz.govt.stats/ba211f92-b4ad-4b3c-9630-662138009889?_ga=2.239846538.842721483.1678237885-1947806122.1644993077,

  - underestimates the net wealth of individuals and households, particularly for low to medium wealth/income households who derive most of their economic income in the form of wages and salaries;
  - overestimates the proportion of net wealth that is held in the form of financial assets, as opposed to non-financial assets;
- is based on a relatively small sample of households (which was approximately 5,500 households in 2021 due to COVID-19 disruption) that is further constrained by the sample response rate (74.2% for 2021), sampling errors (i.e. variability of sample compared to the whole population) and non-sampling errors (e.g. errors in sampling by interviewers, non-response bias).[43] This limits the information it provides on the net wealth of those households that comprise a relatively small proportion of the sample, particularly high wealth/high income households. As noted by Stats NZ:
  - given their small number, the wealthiest households have a low likelihood of being selected to take part in sample surveys from the approximately 1.9 million households in New Zealand;
  - further issues arise if wealthy households are less likely to respond than households with wealth and if they under-report their assets when they do respond. International evidence on this is mixed, with some evidence of both lower response rates and under reporting of assets;
  - a survey aimed at the "average" New Zealander may not produce the level of detail required to accurately reflect the most complicated asset portfolios;
  - there is no oversampling of the very wealthy in the net worth survey. While the Household Expenditure and Wealth Survey (currently under development to replace the HES net worth survey) will reflect more wealthy respondents from affluent areas, Stats NZ is of the view that targeted oversampling of the very wealthy within HES is not a feasible way to increase data on very high wealth individuals and households. Stats NZ is working with other agencies to explore alternative approaches to improving data on the very wealthy;[44]
- is based on the HES which does not include information on the types of government benefits received by households.

In view of those limitations, we have not relied solely on the HNW survey to inform our selection of the illustrative low, medium and high wealth/income households that we have selected to calculate effective tax rates. Rather we also:

- ordered a customised data set for 2018 (the latest year available at that time) from Stats NZ that provides information on the number of New Zealand Households by household composition, sources of income, type of their assets and liability and mean assets and liability, for each of the six income bands (i.e. tax brackets are used rather than income deciles to group households). When that data set is expanded to the entire population, it covers a total of 1,720,000 households. **Figure 33** shows the breakdown of the population in this data by the

[43] Stats NZ, Household net worth data collection 2020/21, Methodology, https://datainfoplus.stats.govt.nz/item/nz.govt.stats/ba211f92-b4ad-4b3c-9630-662138009889?_ga=2.239846538.842721483.1678237885-1947806122.1644993077

[44] Stats NZ, Net worth statistics: Year ended June 2021 – Information and improvements, The very wealthy, https://www.stats.govt.nz/methods/net-worth-statistics-year-ended-june-2021-information-and-improvements/

income band. The method we used to identify illustrative households using that data is outlined further in sections 3.1.3, 3.1.4 and 3.1.5 below;

- used that data as a guide to the determination of the types of net assets in which the illustrative households hold their net wealth, which is discussed further in sections 3.1.3, 3.1.4 and 3.1.5 below;
- consulted with Olivershaw to test the assumptions we have made when selecting the illustrative households and determining the types of assets in which those households hold their net wealth and derive their net economic income, drawing from their experience with both medium wealth/medium income, as well as high wealth/high income, taxpayers.

Figure 33: Proportion of households included in each of the income bands (2018)

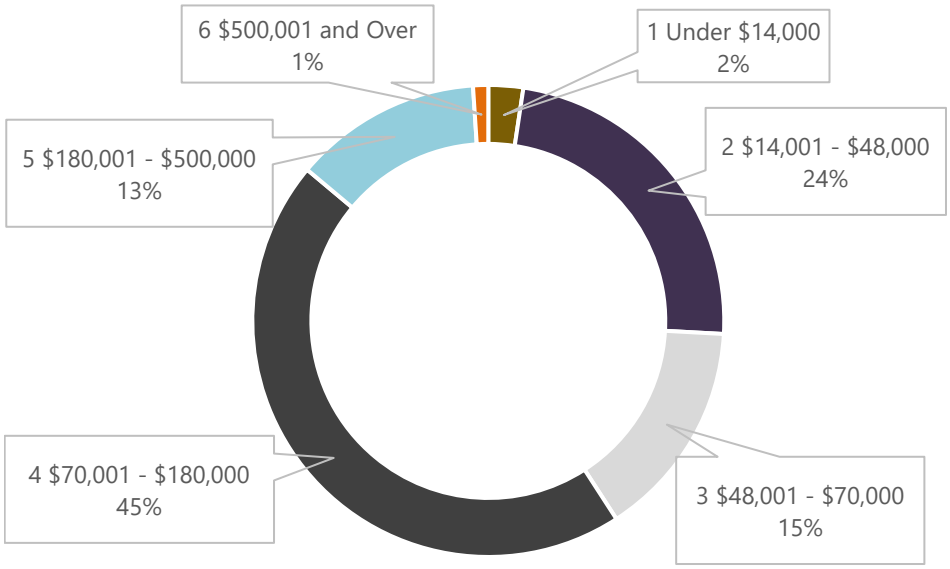


Table 4: Total number of households with assets and liabilities by net income quintile (2018 and 2021)

Asset or liability type	Year ended June 2018										Year ended June 2021									
	Quintile 1 (under $40,654)		Quintile 2 ($40,654 to $71,396)		Quintile 3 ($71,397 to $108,614)		Quintile 4 ($108,615 to $159,676)		Quintile 5 ($159,677 and over)		Quintile 1 (under $40.654)		Quintile 2 ($40,654 to $71,396)		Quintile 3 ($71,397 to $108,614)		Quintile 4 ($108,615 to $159,676)		Quintile 5 ($159,677 and over)	
	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities	(000s)	Proportion of total households in quintile with assets or liabilities
Assets																				
Owner-occupied dwellings	159	45%	168	48%	178	51%	204	58%	200	57%	181	49%	163	44%	194	52%	208	56%	214	57%
Other real estate	18	5%	40	11%	42	12%	54	15%	90	25%	29	8%	32	9%	51	14%	76	20%	107	29%
Other non-financial assets[1]	345	98%	352	100%	351	100%	351	99%	352	100%	367	99%	369	99%	371	99%	372	100%	372	100%
Total number with non-financial assets [2]	***346***	***99%***	***352***	***100%***	***351***	***100%***	***352***	***100%***	***353***	***100%***	***367***	***99%***	***369***	***99%***	***372***	***100%***	***372***	***100%***	***373***	***100%***
Currency and deposits	320	91%	335	95%	343	97%	345	98%	348	99%	329	89%	346	93%	359	96%	365	98%	367	98%
Pension funds	93	26%	211	60%	257	73%	285	81%	289	82%	129	35%	212	57%	298	80%	318	85%	329	88%
Other household financial assets[3]	85	24%	124	35%	138	39%	160	45%	232	66%	95	26%	131	35%	154	41%	177	47%	245	66%
Total number with financial assets [4]	***331***	***94%***	***348***	***99%***	***350***	***99%***	***352***	***100%***	***353***	***100%***	***347***	***94%***	***365***	***98%***	***372***	***100%***	***373***	***100%***	***373***	***100%***
Total number with assets	**351**	**100%**	**353**	**100%**	**352**	**100%**	**353**	**100%**	**353**	**100%**	**371**	**100%**	**373**	**100%**	**373**	**100%**	**373**	**100%**	**373**	**100%**
Liabilities																				
Owner-occupied residence loans	35	19%	70	28%	125	42%	164	53%	166	54%	51	27%	66	26%	130	41%	160	49%	180	53%
Other real estate loans	5	3%	17	7%	25	8%	28	9%	52	17%	8	4%	14	5%	23	7%	44	13%	76	22%
Education loans	49	27%	74	29%	84	28%	92	30%	103	33%	44	23%	69	27%	90	29%	102	31%	103	30%
Other loans and liabilities[5]	150	83%	205	82%	253	84%	259	84%	259	84%	150	78%	213	83%	261	83%	272	83%	289	85%
Total number with liabilities[6]	**180**	**100%**	**251**	**100%**	**300**	**100%**	**307**	**100%**	**308**	**100%**	**192**	**100%**	**256**	**100%**	**315**	**100%**	**328**	**100%**	**339**	**100%**
Total number with net worth	**352**		**353**		**352**		**353**		**353**		**371**		**373**		**373**		**373**		**373**	

Source: Sapere using information provided by Table 3.04, Stats NZ, Household net worth statistics: year ended June 2021, https://www.stats.govt.nz/information-releases/household-net-worth-statistics-year-ended-june-2021/

Notes:

See Appendix B for a definition of the various types of households

1 Includes consumer durables, valuables and other household non-financial assets.

2, 4 and 6 For each asset and liability type, the population for this table is those households which have a non zero value.

3 Includes bonds and other debt securities, equity in own unincorporated enterprises, shares and other equity, mutual funds and other investment funds, life insurance funds and annuities, and other household financial assets.

5 Includes consumer durable loans, other investment loans, and other loans and liabilities.

Table 5: Total value of assets and liabilities by income quintile (2018 and 2021)

Asset or liability type	Year ended June 2018										Year ended June 2021									
	Quintile 1 (under $40,654)		Quintile 2 ($40,654 to $71,396)		Quintile 3 ($71,397 to $108,614)		Quintile 4 ($108,615 to $159,676)		Quintile 5 ($159,677 and over)		Quintile 1 (under $40,654)		Quintile 2 ($40,654 to $71,396)		Quintile 3 ($71,397 to $108,614)		Quintile 4 ($108,615 to $159,676)		Quintile 5 ($159,677 and over)	
	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile
Assets																				
Owner-occupied dwellings	65,366,214	43%	74,160,222	35%	93,104,026	40%	110,889,896	31%	144,271,579	24%	101,592,615	48%	96,793,881	38%	115,235,502	35%	127,443,202	33%	180,017,264	26%
Other real estate	6,129,278	4%	14,187,212	7%	16,431,414	7%	27,318,308	8%	56,868,641	9%	14,488,621	7%	19,201,476	8%	32,407,395	10%	43,476,401	11%	79,043,311	11%
Other non-financial assets[1]	18,457,321	12%	25,948,997	12%	29,956,056	13%	37,293,992	10%	55,782,149	9%	19,140,357	9%	28,554,567	11%	30,961,979	10%	36,245,979	9%	51,532,296	7%
Household non-financial assets	***89,952,813***	***59%***	***114,296,432***	***53%***	***139,491,496***	***60%***	***175,502,196***	***49%***	***256,922,368***	***42%***	***135,221,593***	***64%***	***144,549,924***	***57%***	***178,604,877***	***55%***	***207,165,582***	***54%***	***310,592,871***	***44%***
Currency and deposits	11,648,267	8%	15,052,437	7%	13,676,152	6%	21,398,579	6%	42,427,382	7%	14,052,298	7%	20,232,987	8%	16,255,792	5%	18,813,754	5%	34,346,834	5%
Pension funds	2,261,870	1%	7,359,686	3%	11,506,059	5%	19,840,329	6%	34,677,826	6%	6,802,790	3%	9,893,721	4%	17,875,687	5%	25,832,385	7%	46,199,775	7%
Other household financial assets[2]	47,423,248	31%	77,919,657	36%	67,479,388	29%	141,689,104	40%	278,547,350	45%	53,628,327	26%	79,425,861	31%	112,772,949	35%	131,822,113	34%	314,367,600	45%
Household financial assets	***61,333,385***	***41%***	***100,331,780***	***47%***	***92,661,599***	***40%***	***182,928,011***	***51%***	***355,652,558***	***58%***	***74,483,415***	***36%***	***109,552,569***	***43%***	***146,904,429***	***45%***	***176,468,252***	***46%***	***394,914,209***	***56%***
Total household assets	**151,286,198**	**100%**	**214,628,212**	**100%**	**232,153,095**	**100%**	**358,430,207**	**100%**	**612,574,926**	**100%**	**209,705,008**	**100%**	**254,102,493**	**100%**	**325,509,306**	**100%**	**383,633,834**	**100%**	**705,507,080**	**100%**
Liabilities																				
Owner-occupied residence loans	4,204,922	56%	11,093,509	58%	27,782,805	70%	39,674,773	69%	54,896,967	63%	11,264,653	68%	14,613,560	66%	32,541,628	70%	48,204,736	72%	72,151,538	61%
Other real estate loans	996,756	13%	4,421,552	23%	6,110,560	15%	9,419,709	16%	23,440,263	27%	3,378,654	20%	4,164,112	19%	7,629,307	16%	12,884,481	19%	35,747,099	30%
Education loans	1,077,620	14%	1,898,305	10%	2,074,925	5%	2,472,153	4%	3,537,773	4%	984,430	6%	1,786,905	8%	2,579,479	6%	2,293,481	3%	3,805,340	3%
Other loans and liabilities[3]	1,164,803	16%	1,853,833	10%	3,691,346	9%	5,687,127	10%	5,037,975	6%	923,522	6%	1,454,139	7%	3,890,328	8%	3,934,779	6%	7,131,963	6%
Total household liabilities	**7,444,101**	**100%**	**19,267,199**	**100%**	**39,659,636**	**100%**	**57,253,762**	**100%**	**86,912,978**	**100%**	**16,551,259**	**100%**	**22,018,716**	**100%**	**46,640,742**	**100%**	**67,317,477**	**100%**	**118,835,940**	**100%**
Total household net worth	**143,842,097**		**195,361,012**		**192,493,459**		**301,176,445**		**525,661,948**		**193,153,749**		**232,083,777**		**278,868,563**		**316,316,357**		**586,671,140**	

Source: Sapere using information provided by Table 3.03, Stats NZ, Household net worth statistics: year ended June 2021, https://www.stats.govt.nz/information-releases/household-net-worth-statistics-year-ended-june-2021/

Notes:

See Appendix B for a definition of the various types of households

1 Includes consumer durables, valuables and other household non-financial assets.

2 Includes bonds and other debt securities, equity in own unincorporated enterprises, shares and other equity, mutual funds and other investment funds, life insurance funds and annuities, and other household financial assets.

3 Includes consumer durable loans, other investment loans, and other loans and liabilities.

Table 6: Mean value of assets and liabilities by income quintile (2015 and 2018)

Asset or liability type	Year ended June 2018										Year ended June 2021									
	Quintile 1 (under $40,654)		Quintile 2 ($40,654 to $71,396)		Quintile 3 ($71,397 to $108,614)		Quintile 4 ($108,615 to $159,676)		Quintile 5 ($159,677 and over)		Quintile 1 (under $40,654)		Quintile 2 ($40,654 to $71,396)		Quintile 3 ($71,397 to $108,614)		Quintile 4 ($108,615 to $159,676)		Quintile 5 ($159,677 and over)	
	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile	($000s)	Proportion of total value of assets or liabilities of quintile
Assets																				
Owner-occupied dwellings	185	43%	210	35%	264	40%	314	31%	409	24%	273	48%	260	38%	309	35%	342	33%	483	26%
Other real estate	17	4%	40	7%	47	7%	77	8%	161	9%	39	7%	52	8%	87	10%	117	11%	212	11%
Other non-financial assets[1]	52	12%	73	12%	85	13%	106	10%	158	9%	51	9%	77	11%	83	10%	97	9%	138	7%
Household non-financial assets [2]	***255***	***60%***	***324***	***53%***	***396***	***60%***	***498***	***49%***	***728***	***42%***	***363***	***64%***	***388***	***57%***	***479***	***55%***	***556***	***54%***	***833***	***44%***
Currency and deposits	33	8%	43	7%	39	6%	61	6%	120	7%	38	7%	54	8%	44	5%	50	5%	92	5%
Pension funds	6	1%	21	3%	33	5%	56	6%	98	6%	18	3%	27	4%	48	5%	69	7%	124	7%
Other household financial assets[3]	134	31%	221	36%	191	29%	402	40%	789	45%	144	26%	213	31%	302	35%	354	34%	843	45%
Household financial assets [4]	***174***	***41%***	***284***	***47%***	***263***	***40%***	***519***	***51%***	***1,008***	***58%***	***200***	***36%***	***294***	***43%***	***394***	***45%***	***473***	***46%***	***1,059***	***56%***
Total household assets[5]	**428**	**100%**	**608**	**100%**	**658**	**100%**	**1,016**	**100%**	**1,736**	**100%**	**563**	**100%**	**682**	**100%**	**873**	**100%**	**1,029**	**100%**	**1,891**	**100%**
Liabilities																				
Owner-occupied residence loans	12	0%	31	56%	79	71%	112	69%	156	63%	30	0%	39	66%	87	70%	129	71%	193	61%
Other real estate loans	3	0%	13	24%	17	15%	27	17%	66	27%	9	0%	11	19%	20	16%	35	19%	96	30%
Education loans	3	0%	5	9%	6	5%	7	4%	10	4%	3	0%	5	8%	7	6%	6	3%	10	3%
Other loans and liabilities[6]	3	0%	5	9%	10	9%	16	10%	14	6%	2	0%	4	7%	10	8%	11	6%	19	6%
Total household liabilities[7]	**21**	**100%**	**55**	**100%**	**112**	**100%**	**162**	**100%**	**246**	**100%**	**44**	**0%**	**59**	**100%**	**125**	**100%**	**181**	**100%**	**319**	**100%**
Total household net worth	**407**		**553**		**546**		**854**		**1,490**		**518**		**623**		**748**		**848**		**1,573**	

Source: Sapere using information provided by Table 3.02, Stats NZ, Household net worth statistics: year ended June 2021, https://www.stats.govt.nz/information-releases/household-net-worth-statistics-year-ended-june-2021/

Notes:

See Appendix B for a definition of the various types of households

1 Includes consumer durables, valuables and other household non-financial assets.

2, 4, 5 and 7 For each asset and liability type, the population for this table is those households which have a non zero value.

3 Includes bonds and other debt securities, equity in own unincorporated enterprises, shares and other equity, mutual funds and other investment funds, life insurance funds and annuities, and other household financial assets.

6Includes consumer durable loans, other investment loans, and other loans and liabilities.

3.1.3 Illustrative low wealth/low income households

The first main group of illustrative households selected for the purpose of estimating effective tax rates is those with low levels of net wealth and net economic income (i.e. low wealth/low income households). This low wealth/low income group of households includes those with net economic income and net taxable income that falls within the two lowest income tax brackets – namely:

- under $14,000; and
- $14,000-$48,000.

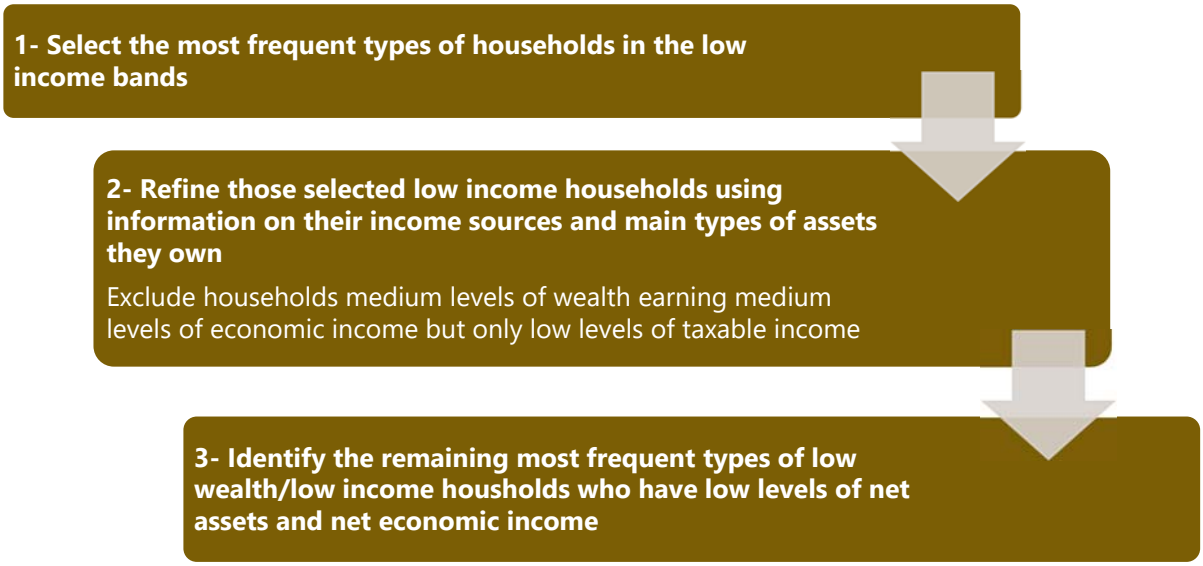
It is important to note, however, that some of the households with net taxable incomes falling within these ranges can actually be medium wealth households who earn medium levels of net economic income, but low levels of net taxable income due to the concessional taxation of some of their net economic income (e.g. the non-taxation of the economic income they earn in the form of non-taxable imputed rental income from living in their own homes).

As a result, when identifying this group of low wealth/low income households, we have sought to:

- exclude those households who earn medium levels of net economic income, but only earn low levels of net taxable income due to the concessional tax treatment of some of their income, such as those households whose main source of income is either "investment" or "NZ superannuation", as well as those with assets such as "owner-occupied dwellings", "other real estate", "currency and deposits". As discussed further below, those households have been included instead in the medium wealth/ medium income category;
- include only those households who have both low levels of net wealth and net economic income.

The process used to identify illustrative low wealth / low economic income households is illustrated in **Figure 34** below.

Figure 34: Process for identifying low wealth/low income households



Households with net economic income of under $14,000

As indicated in **Table 7**, the most common types of households with taxable incomes, and potentially net economic incomes, of $14,000 or less are:

- "one person" households (66% of households in this income band), of whom:
  - 52% receive their income in the form of government benefits (e.g. senior citizens who are reliant on government benefits as their main source of income) and 15% receive income in the form of wages and salary (note that these percentages are not additive since they refer to the proportions of households earning these types of income);
  - 33% own their own home (with an average value of $410,000), 81% have currency and deposits (with an average value of $24,000), 30% earn income from their investments and 22% earn income from NZ Superannuation. This suggests that some one person households in this income band are likely to be receiving economic income each year that is in excess of $14,000 and potentially even in excess of $48,000 (i.e. some of these one person households could be medium wealth/medium income households who are receiving low levels of taxable income due to the concessional tax treatment of some of their net economic income, such as the non-taxation of capital gains in the value of their homes and the imputed rental income they derive from living in their own homes);
- "couple only" households (10% of households in this income band), of whom:
  - 50% receive wage and salary income;
  - 50% own their own home (with an average value of $406,000), all have currency and deposits (with an average value of $40,000) and 75% earn investment income. Once again, this suggests that some of these couple only households in this income band could be receiving economic incomes in excess of $14,000 and potentially in excess of $48,000 due to the concessional tax treatment of some of their net economic income;
- "one parent with dependent child(ren) only" households (7% of households in this income band), of whom:
  - all receive income in the form of other government benefits;
  - 67% hold currency and deposits (with an average value of $4,000);
  - 67% receive income from other sources.

Households with net economic income of $14,001 to $48,000

Table 7 also indicates that the most common types of households with taxable incomes, and potentially net economic incomes, in the $14,001 to $48,000 income band are:

- "one-person" households (46% of households in this income band), of whom:
  - 16% receive income from other government benefits and 26% receive wage and salary income;
  - 52% own their own home (with an average value of $375,000), 92% have currency and deposits (with an average value of $33,000), 41% receive income from investments, 22% receive income from other income sources, and 64% receive income from NZ Superannuation. Once again, this suggests that some one person households in this income band are likely to be receiving economic income each year that is in excess of $48,000 due to the concessional tax treatment of some of their net economic income (e.g.

the non-taxation of capital gains in the value of their homes and the imputed rental income they derive from living in their own homes);

- "couple only" households (25% of households in this income band), of whom:
  - 14% receive income from other government benefits, 23% receive wage and salary income;
  - 67% own their own home (with an average value of $480,000), 10% own other real estate (with an average value of $396,000), 98% have currency and deposits (with an average value of $63,000), 41% receive income from investments, 22% receive income from other income sources, and 75% receive income from NZ Superannuation. Once again, this suggests that some "couple only" households in this income band are likely to be receiving economic income each year that is in excess of $48,000 due to the concessional tax treatment of some of their net economic income (e.g. the non-taxation of capital gains in the value of their homes and the imputed rental income they derive from living in their own homes);
- "one parent with dependent child(ren) only" (10% of households in this income band), of whom:
  - 92% receive income from other government benefits;
  - 44% receive wage and salary income;
  - 13% own their own home (with an average value of $327,000), 82% have currency and deposits (with an average value of $5,000). Once again, this suggests that some one person households in this income band are likely to be earning economic income each year that is in excess of $48,000 due to the concessional tax treatment of some of their net economic income (e.g. the non-taxation of capital gains in the value of their homes and the imputed rental income they derive from living in their own homes);

Illustrative low wealth/income households selected

In summary, when selecting illustrative low wealth/low income households for the purposes of estimating effective tax rates, we have sought to:

- exclude those households receiving low levels of taxable income who are more likely to be medium wealth households who actually receive medium levels of net economic income (e.g. "one person" and "couple only" households who own their own homes, hold significant amounts of their wealth in the form of cash assets, and receive significant levels of investment income. Those particular types of "one person" and "couple only" households are included instead in our group of illustrative medium wealth/medium income households); and
- include only those households who are more likely to be illustrative of most low wealth/low income households, such as those households who:
  - are either "one person" or "one parent with dependent child(ren)" households;
  - hold most of their wealth in the form of their human capital, live in rental accommodation, have little or no cash assets and receive most of their income in the form of "other government benefits" that are supplemented to some extent by "wage and salary" income.

In general, low wealth individuals and households tend to derive most of their economic income in the form of assistance from the government as supplemented by some additional income from part time work, with little or no income from savings, and very limited ability to engage in investment other than in their own human capital (e.g. through publicly funded education when they are young).

As a result, for the purposes of estimating effective tax rates, we have selected the following groups of illustrative low wealth/low income households:

- single, unemployed, or underemployed individuals who are eligible to receive benefits from Jobseeker Support and the Accommodation Supplement; and
- sole parents, who are eligible to receive benefits through either:
  - Sole Parent Support and the Accommodation Supplement; or
  - Working for Families Tax Credits and the Accommodation Supplement.

For simplicity, these low wealth/low income households are assumed to hold all of their net wealth in the form of their human capital, which generates taxable income in the form of limited amounts of wage and salary income that supplement the benefits they receive. In particular, it is assumed that all of the illustrative low wealth/low income households live in rental accommodation and therefore do not hold a proportion of their wealth in the form of owner-occupied housing.

In reality, however, even low wealth/low income households are likely to hold some of their wealth in the non-financial assets they own (e.g. consumer durables). To the extent that this is the case, the effective tax rates imposed on their net economic incomes will be lower than those outlined in section 3.1.3 of this report.

Table 7: Most common types of households earning low levels of taxable income and benefits, their main sources of income and types of assets they own (2018)

Income band	Most frequent type of household		Main sources of income					Main types of assets owned						Total net worth ($000s)
	Household Type	Frequency	Other government benefits	Wages and salary	Other sources of income	Investment	NZ superannuation	Owner-occupied dwelling		Other real estate		Currency and deposits		
								Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	
Under $14,000	One-person household	66%	52%	15%	22%	30%	22%	33%	411	-	-	81%	24	**247**
	Couple only	10%	-	50%	-	75%	-	50%	406	-	-	100%	40	**1,757**
	One parent with dependent child(ren) only	7%	100%		67%	-	-	-	-			67%	4	**247**
	Total Households (41,000)	**100%**	**51%**	**24%**	**27%**	**29%**	**15%**	**34%**	**412**	**5%**	**403**	**83%**	**32**	**414**
$14,000-$48,000	One-person household	46%	16%	26%	14%	41%	64%	52%	375	4%	355	92%	33	**387**
	Couple only	25%	14%	23%	18%	53%	75%	67%	480	10%	396	98%	63	**676**
	One parent with dependent child(ren) only	10%	92%	44%	28%	-	-	13%	327	-	-	82%	5	**99**
	Total households (405,000)	**100%**	**32%**	**34%**	**20%**	**37%**	**52%**	**48%**	**421**	**7%**	**369**	**93%**	**38**	**420**

Source: Sapere using custom Stats NZ data set

3.1.4 Illustrative medium wealth/medium income households

The second main group of illustrative households selected for the purposes of estimating effective tax rates is those with medium levels of net wealth and net economic income (i.e. medium wealth/medium income households). This medium wealth/medium income group of households includes those with net taxable incomes and net economic incomes that fall within the following income bands:

- $48,000-$70,000;
- $70,000-$180,000; and
- $180,000-$500,000.

Once again, however, it is important to note that some of the households with net taxable incomes falling within these income bands can actually be either:

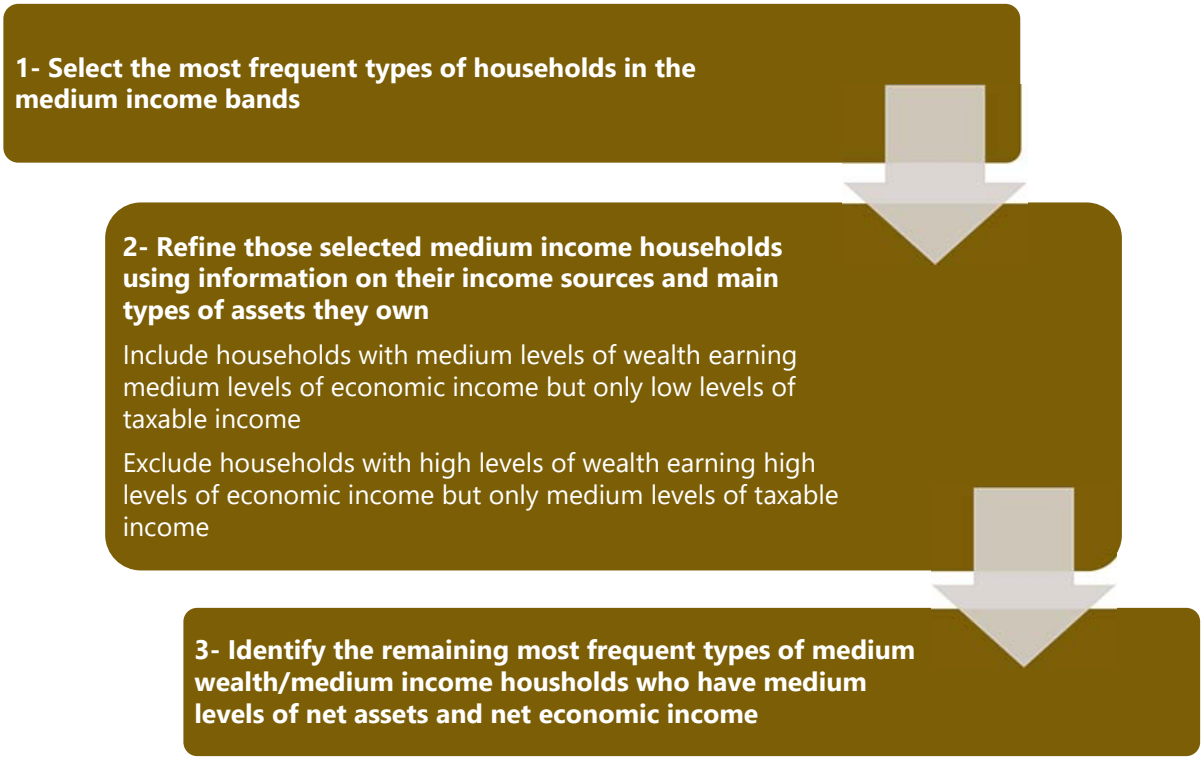
- households with high levels of net wealth who actually receive high levels of net economic income, but only medium levels of taxable income (i.e. high wealth/medium taxable income households) due to the concessional taxation of some of their net economic income;
- households with medium levels of net wealth who actually receive medium levels of net economic income, but only low levels of taxable income (i.e. medium wealth/low taxable income households) due to the concessional taxation of some of their net economic income.

As a result, when identifying these medium wealth/medium income households, we have sought to:

- exclude households with high net wealth who only earn medium levels of taxable income (e.g. due to the concessional tax treatment of that income). Those high wealth/medium taxable income households have been included in the high wealth/high income group of households;
- only include those households who are more likely to be illustrative of most medium wealth households who earn medium levels of net economic income, which include both:
  - households earning low levels of taxable income who actually are likely to have medium levels of net economic income (e.g. due to their ownership of assets that generate concessionally taxed forms of income, such as the non-taxation of capital gains in the value of their owner occupied housing and the imputed rental income generating by that housing); and
  - other households with medium net wealth who earn medium levels of net taxable income and net economic income.

The process used to identify illustrative low wealth / low economic income households is illustrated in **Figure 35** below.

Figure 35: Process for identifying medium/medium income households



Households with net economic income of $48,001 to $70,000

As indicated in **Table 8**, the most common types of households with taxable incomes in the range of $48,001 to $70,000 are:

- "couple only" households (26% of the households in this income band), of whom:
  - 62% receive NZ Super one of their income sources, 59% receive income from investments, 12% receive income from private superannuation and 57% receive wage and salary income, 25% receive income from self-employment and 31% receive income from other sources;
  - 60% own their own home (with an average value of $531,000), 19% own other real estate (with an average value of $420,000) and all of them (100%) own other non-financial assets (with an average value of $108,000);
  - almost all of them (99%) own currency and deposits (with an average value of $78,000) and 51% own other financial assets (with an average value of $1,207,000);
  - 6% receive other government benefits;
- "one-person" households (23% of households in this income band), of whom:
  - 31% receive NZ Super one of their income sources, 39% receive income from investments, 7% receive income from private superannuation. 76% receive wage and salary income, 10% receive income from self-employment and 19% receive income from other sources;

- 46% own their own home (with an average value of $371,000), 12% own other real estate (with an average value of $268,000) and all of them (100%) own other non-financial assets (with and average value of $67,000);
- almost all of them (93%) own currency and deposits (with an average value of $42,000) and 34% own other financial assets (with an average value of $543,000);
- 3% receive other government benefits;

- "other couples with child(ren) only" households (6% of households in this income band), of whom:
  - 27% receive NZ Super as one of their income sources, 20% receive income from investments, 67% receive wage and salary income, 20% receive income from self-employment and 40% receive income from other sources;
  - 53% own their own home (with an average value of $720,000) and all of them (100%) own other non-financial assets (with and average value of $96,000);
  - almost all of them (93%) own currency and deposits (with an average value of $24,000) and 40% own other financial assets (with an average value of $689,000); and
  - 67% receive other government benefits.

Households with net economic income of $70,0001 to $180,000

In addition, **Table 8** also indicates that the most common types of households with taxable incomes in the range of $70,001 to $180,000 are:

- "couple only" households (29% of the households in this income band), of whom:
  - 34% receive NZ Super as one of their income sources, 54% receive income from investments, 8% receive income from private superannuation, 77% receive wage and salary income, 28% receive income from self-employment and 30% receive income from other sources;
  - 57% own their own home (with an average value of $586,000), 17% own other real estate (with an average value of $517,000) and almost all of them (99%) own other non-financial assets (with an average value of $127,000);
  - almost all of them (98%) own currency and deposits (with an average value of $98,000) and 55% own other financial assets (with an average value of $1,056,000);
  - 3% receive other government benefits;
- "couple with two dependent children" households (13% of the households in this income band), of whom:
  - 31% receive income from investments, 91% receive wage and salary income, 30% receive income from self-employment and 24% receive income from other sources;
  - 61% own their own home (with an average value of $591,000), 13% own other real estate (with an average value of $367,000) and all of them (100%) own other non-financial assets (with an average value of $107,000);
  - almost all of them (94%) own currency and deposits (with an average value of $24,000) and 43% own other financial assets (with an average value of $692,000);
  - 25% receive other government benefits;
- "other couples with child(ren) only" households (12% of households in this income band), of whom:
  - 14% receive NZ Super as one of their income sources, 36% receive income from investments, 3% receive income from private superannuation. 95% receive wage and salary

income, 26% receive income from self-employment and 35% receive income from other sources;
  - 70% own their own home (with an average value of $604,000) and all of them (100%) own other non-financial assets (with and average value of $113,000);
  - all of them (100%) own currency and deposits (with an average value of $49,000) and 45% own other financial assets (with an average value of $543,000);
  - 40% receive other government benefits;
- "one-person" households (6% of households in this income band), of whom:
  - 29% receive NZ Super as one of their income sources, 54% receive income from investments, 8% receive income from private superannuation, 75% receive wage and salary income, 17% receive income from self-employment and 27% receive income from other sources;
  - 60% own their own home (with an average value of $575,000), 15% own other real estate (with an average value of $540,000) and all of them (100%) own other non-financial assets (with and average value of $79,000);
  - almost all of them (94%) own currency and deposits (with an average value of $137,000) and 48% own other financial assets (with an average value of $626,000);
  - 2% receive other government benefits.

Households with net economic income of $180,001 to $500,000

Table 8 also indicates that the most common types of households with taxable incomes in the range of $180,001 to $500,000 are:

- "couple only" households (28% of the households in this income band), of whom:
  - 32% receive NZ Super as one of their income sources, 76% receive income from investments, 5% receive income from private superannuation, 76% receive wage and salary income, 47% receive income from self-employment and 29% receive income from other sources;
  - 60% own their own home (with an average value of $797,000), 26% own other real estate (with an average value of $685,000) and all of them (100%) own other non-financial assets (with an average value of $183,000);
  - almost all of them (98%) own currency and deposits (with an average value of $149,000) and 73% own other financial assets (with an average value of $1,519,000);
- "other couples with child(ren) only" households (22% of households in this income band), of whom:
  - 10% receive NZ Super as one of their income sources, 63% receive income from investments, 96% receive wage and salary income, 46% receive income from self-employment and 44% receive income from other sources;
  - 63% own their own home (with an average value of $813,000) and all of them (100%) own other non-financial assets (with and average value of $175,000);
  - all of them (100%) own currency and deposits (with an average value of $69,000) and 67% own other financial assets (with an average value of $894,000);
  - 13% receive other government benefits;

- "couple with two dependent children" households (11% of the households in this income band), of whom:
  - 63% receive income from investments 83% receive wage and salary income, 50% receive income from self-employment and 42% receive income from other sources;
  - 67% own their own home (with an average value of $752,000), 29% own other real estate (with an average value of $430,000) and all of them (100%) own other non-financial assets (with an average value of $152,000);
  - almost all of them (96%) own currency and deposits (with an average value of $65,000) and 71% own other financial assets (with an average value of $2,174,000);
  - 13% receive other government benefits;
- "couple with one dependent child" households (7% of the households in this income band), of whom:
  - 69% receive income from investments, 94% receive wage and salary income, 44% receive income from self-employment and 25% receive income from other sources;
  - 69% own their own home (with an average value of $710,000), 25% own other real estate (with an average value of $620,000) and all of them (100%) own other non-financial assets (with an average value of $154,000);
  - all of them (100%) own currency and deposits (with an average value of $88,000) and 69% own other financial assets (with an average value of $1,094,000);
  - 19% receive other government benefits;
- "couple with three or more dependent children" households (5% of the households in this income band), of whom:
  - 60% receive income from investments, 80% receive wage and salary income, 50% receive income from self-employment and 40% receive income from other sources;
  - 60% own their own home (with an average value of $971,000), 20% own other real estate (with an average value of $418,000) and all of them (100%) own other non-financial assets (with an average value of $193,000);
  - all of them (100%) own currency and deposits (with an average value of $35,000) and 70% own other financial assets (with an average value of $1,544,000);
- "one-person" households (3% of households in this income band), of whom:
  - 67% receive income from investments, 67% receive wage and salary income, 17% receive income from self-employment and 33% receive income from other sources;
  - 33% own their own home (with an average value of $470,000), 17% own other real estate (with an average value of $1,206,000) and all of them (100%) own other non-financial assets (with and average value of $97,000);
  - all of them (100%) own currency and deposits (with an average value of $269,000) and 83% own other financial assets (with an average value of $792,000).

Illustrative medium wealth/medium income households selected

In summary, when selecting illustrative medium wealth/medium income households for the purposes of estimating effective tax rates, we have sought to:

- exclude high wealth households who derive high levels of economic income, but only medium levels of taxable income. This includes those high wealth/medium taxable income households outlined above who hold the highest levels and proportions of their net wealth in the form of:
  - owner occupied housing, which generates non-taxable income (e.g. imputed rental income and capital gains in the value of that housing); and
  - non-financial assets (e.g. consumer durables);
  - financial assets that generate income that is concessionally taxed;
- include only those households with both medium levels of net wealth and medium levels of net taxable and net economic income. This includes the:
  - medium wealth/low taxable income households identified in section 3.2.1 above; and
  - medium wealth/medium income households. As outlined above, this includes "couple with two dependent children", "other couple with child(ren) only", as well as "one-person" households".

In general, as the wealth and incomes of households increase they tend to hold higher proportions of their higher levels of savings and investment in a wider range of assets and consequently derive greater proportions of their total economic income in the form of income from savings vehicles and income from alternative investments that are subject to different statutory rates of tax and different tax treatment.

Specifically, medium income individuals and households tend to derive most of their income through employment and:

- hold their modest levels of savings in a limited range of:
  - financial assets, such as bank accounts, bank accounts, shares in public companies and superannuation funds, from which they derive taxable interest and dividend income;
  - physical assets, such as their equity interest in their own homes, which generates non-taxable imputed rental income and capital gains and investment properties that generate non-taxable capital gains;
- invest mainly in:
  - their own education, as well as the education of their children, from which they derive higher levels of taxable labour income in the future;
  - the construction of new homes, or capital improvements to their existing properties, in order to generate higher imputed rental income in the future;
  - building up their own relatively small private companies.

As a result, for the purposes of estimating effective tax rates, we have selected the following groups of illustrative medium wealth/medium income households:

- single individuals, with no dependents, who rent their accommodation and earn most of their income in the form of wages and salaries. In particular, it is assumed those individuals:
  - hold most (90%) of their net wealth in the form of their human capital, that generates wage and salary income that is taxable at their personal statutory marginal tax rates;

  - hold the remainder (10%) of their net wealth in the form of non-financial assets that generate non-taxable economic income (e.g. imputed rental income from owner occupied housing and capital gains in the value of those assets). At first sight, this might appear to be too low, particularly given that, as outlined in **Table 5**, the results of the HNW survey indicate that households with incomes in the range of around $40,000 to $159,000 in 2021 (i.e. those with incomes in quintiles 2 to 4) held around 57% to 44% of their assets in the form of non-financial assets. As discussed further in section 3.1.6, however, these high estimates of the proportions of net worth held in the form of non-financial assets are the result of the exclusion of human capital from the assets included in household net worth. Once human capital is included in the net wealth of households, the proportions of their net wealth held in the form of non-financial assets are much lower. For example, if 50% of the net wealth of a household is held in the form of human capital and the remainder of their net wealth is held in the non-financial and financial assets included in the HNW survey, then a household that holds 50% of their net wealth in the form of human capital, and the remainder of their net wealth in the financial and non-financial assets included in the HNW survey would hold around 20% of their net wealth in the form of non-financial assets. If more than 50% of the net wealth of a household is held in the form of human capital, then the proportion of their net wealth that they hold in non-financial assets will be even lower than 20%. In addition, it is also important to note that as indicated in **Table 5**, the proportion of assets that households hold in the form of non-financial assets tends to decrease as their income increases;
- couples with two dependent children who live in their own home, earn most of their income in the form of wages and salaries as well as income from their savings and investments, and who receive Working for Families tax credits. In particular, it is assumed that those households:
  - hold 80% of their net wealth in the form of assets generating taxable income, of which:
    - 60% is derived in the form of wage and salary income (50% each), that is taxable at their respective statutory marginal rates of personal income tax; and
    - 40% is derived in the form of income earned through investments in a Portfolio Investment Entity that generates 50% of its return in the form of taxable income and the remaining 50% in the form of non-taxable capital gains;
  - hold the remainder (20%) of their net wealth in the form of non-financial assets that generate non-taxable forms of economic income (e.g. the imputed rental income from owner-occupied housing and non-taxable capital gains in the value of those assets; and
  - receive Working for Families tax credits;
- older retired couples, with no dependents, who live in their own homes and earn a higher proportion of their income in the form of income from their higher levels of savings and investment, and who receive NZ Super. In particular, it is assumed those households:
  - hold 80% of their net wealth in the form of assets that generate taxable income, which is assumed to be derived from their investments in a PIE that generates 50% of its return in the form of taxable income and the remaining 50% in the form of non-taxable capital gains;
  - hold 20% of their net wealth in the form of non-financial assets that generate income that is not taxable (e.g. imputed rental income from owner occupied housing and capital gains in the value of that housing); and
  - receive NZ Super.

Table 8: Most common types of households earning medium levels of taxable income and benefits, their main sources of income and types of assets they own (2018)

Income band	Most frequent type of household		Main sources of income							Main types of assets owned										Total net worth ($000s)
	Household type	Frequency	NZ Super	Investments	Wages or salary	Other sources of income	Self-employment	Private superannuation	Other government benefits	Other non-financial assets		Currency and deposits		Owner-occupied dwellings		Other real estate		Other financial assets		
										Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	
$48,001-$70,000	Couple only	26%	62%	59%	57%	31%	25%	12%	6%	100%	108	99%	78	60%	531	19%	420	51%	1,207	**1,201**
	One-person household	23%	31%	39%	76%	19%	10%	7%	3%	100%	67	93%	42	46%	371	12%	268	34%	543	**480**
	All other households	9%	25%	21%	83%	42%	17%	-	58%	96%	41	96%	37	29%	476	13%	842	38%	89	**300**
	All other couples with child(ren) only households	6%	27%	20%	67%	40%	20%	-	67%	100%	96	93%	24	53%	720	#N/A	#N/A	40%	689	**789**
	Total households (258,000)	**100%**	**30%**	**34%**	**74%**	**31%**	**19%**	**5%**	**38%**	**100%**	**73**	**95%**	**40**	**44%**	**466**	**13%**	**380**	**36%**	**697**	**579**
$70,001-$180,000	Couple only	29%	34%	54%	77%	30%	28%	8%	3%	99%	127	98%	98	57%	586	17%	517	55%	1,056	**1,196**
	Couple with two dependent children	13%	-	31%	91%	24%	30%	-	25%	100%	107	94%	24	61%	591	13%	367	43%	692	**672**
	All other households	12%	18%	43%	95%	51%	16%	-	49%	99%	76	100%	72	34%	533	16%	450	40%	297	**433**
	All other couples with child(ren) only households	12%	14%	36%	95%	35%	26%	3%	40%	100%	113	100%	49	70%	604	13%	494	45%	543	**774**
	One-person household	6%	29%	54%	75%	27%	17%	8%	2%	100%	79	94%	137	60%	575	15%	540	48%	626	**875**
	Total households (771,000)	**100%**	**18%**	**41%**	**88%**	**32%**	**24%**	**4%**	**27%**	**100%**	**104**	**98%**	**63**	**56%**	**559**	**14%**	**467**	**45%**	**721**	**771**

Income band	Most frequent type of household		Main sources of income							Main types of assets owned										Total net worth ($000s)
	Household type	Frequency	NZ Super	Investments	Wages or salary	Other sources of income	Self-employment	Private superannuation	Other government benefits	Other non-financial assets		Currency and deposits		Owner-occupied dwellings		Other real estate		Other financial assets		
										Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	
$180,001- $500,000	Couple only	28%	32%	76%	76%	29%	47%	5%	-	100%	183	98%	149	60%	797	26%	685	73%	1,519	**2,016**
	All other couples with child(ren) only households	22%	10%	63%	96%	44%	46%	-	21%	100%	175	100%	69	63%	813	31%	850	67%	894	**1,365**
	All other households	16%	23%	60%	94%	49%	34%	-	54%	100%	113	100%	51	43%	707	31%	588	63%	539	**868**
	Couple with two dependent children	11%	-	63%	83%	42%	50%	-	13%	100%	152	96%	65	67%	752	29%	430	71%	2,174	**1,981**
	Couple with one dependent child	7%	-	69%	94%	25%	44%	-	19%	100%	154	100%	88	69%	710	25%	620	69%	1,094	**1,342**
	Couple with three or more dependent children	5%	-	60%	80%	40%	50%	-	-	100%	193	100%	35	60%	971	20%	418	70%	1,554	**1,760**
	One-person household	3%	-	67%	67%	33%	17%	-	-	100%	97	100%	269	33%	470	17%	1,206	83%	792	**1,282**
	Total households (222,000)	**100%**	**17%**	**65%**	**87%**	**38%**	**43%**	**3%**	**20%**	**100%**	**158**	**99%**	**92**	**56%**	**761**	**27%**	**653**	**67%**	**1,175**	1,484

Source: Sapere using custom Stats NZ data set

3.1.5 Illustrative high wealth/high income households

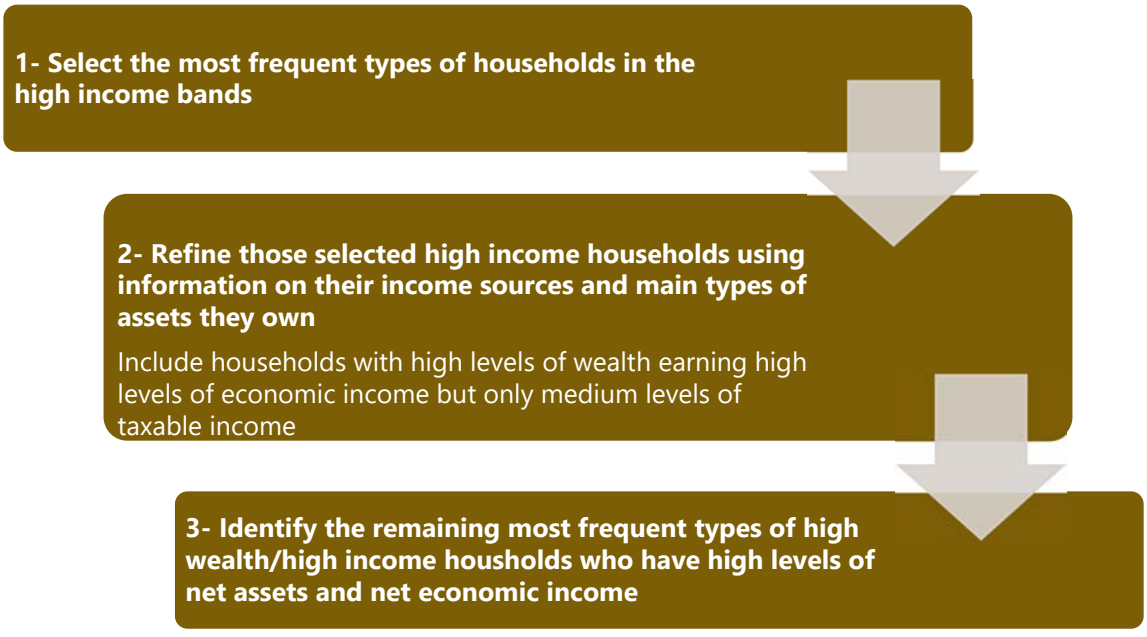
The third main group of illustrative households selected for the purposes of estimating effective tax rates is those with high levels of net wealth and net economic income (i.e. high wealth/high income households). This high wealth/high income group of households includes those with net economic income in the highest net income band of over $500,000 a year.

As previously noted, however, such high wealth/ high income households also include households with high net wealth who earn high levels of net economic income, but only earn medium levels of net taxable income (i.e. high wealth/medium taxable income households) due to the concessional tax treatment of some of their net economic income.

As a result, when identifying households in the high wealth/high income group, we have also sought to include high wealth households who earn high levels of net economic income, but only medium levels of net taxable income due to the concessional tax treatment of some of their net economic income.

The process for selecting illustrative high wealth/high income households is illustrated in **Figure 36** below.

Figure 36: Process for identifying high wealth/high income households



Households with net economic income over $500,000

As indicated in **Table 9**, the main household types in the highest net economic income band are:

- "couple only" households (44% of households in this income band), of whom:
  - 50% receive income from superannuation, all (100%) receive income from investments and 75% receive other sources of income;
  - 63% receive wage and salary income and 38% receive income from self-employment;
  - 50% own their own home (with an average value of $1,309,000), 50% own other real estate (with an average value of $206,000) and all of them (100%) own other non-financial assets (with an average value of $308,000);
  - all of them (100%) own currency and deposits (with an average value of $495,000), 50% have pension funds (with an average value of $311,000) and 75% own other financial assets (with an average value of $5,291,000);
- "couple with two dependent children" households (22% of households in this income band), of whom:
  - 75% receive income from investments;
  - 75% receive wage and salary income;
  - all of them (100%) own other non-financial assets (with an average value of $138,000);
  - all of them (100%) own currency and deposits (with an average value of $9,000), 75% have pension funds (with an average value of $495,000) and 75% own other financial assets (with an average value of $1,198,000).

Illustrative high wealth/high income households selected

In summary, when selecting illustrative high wealth/high income households for the purposes of estimating effective tax rates, we have:

- included the main types of high income/high wealth households outlined above, which include "couple only" and "couple with two dependent children" households who have around twice the value of assets compared to the other household type. These households could be divided to two groups – wage and salary earners and investment income earners; and
- also included those high wealth/high income households who only earn medium levels of taxable income due to the concessional tax treatment of those households (e.g. households who own their own homes and have high levels of investment income).

It is apparent from the Household Net Worth statistics, however, that the survey does not include the very high net wealth/high net economic households who are typically the focus of "rich lists" (e.g. the NBR's list of New Zealand's most wealthy individuals and families).

This highlights one of the key problems associated with the use of survey data where the total sample size is relatively small and the sub-population of particular interest (i.e. high wealth individuals) is even smaller. It inevitably results in relatively large sampling errors, which limits the extent to which such survey data can be used to study income inequality at the sub-national level.

In this regard, it is important to note that as the wealth of households increases, so too does the difficulty associated with identifying those households that are truly "representative" of high net wealth/high net economic income households as a whole.

This is because, as the wealth of individuals and households increases, so too does the range of:

- financial and physical assets in which they can choose to hold their higher levels of savings (i.e. the different "savings vehicles" in which they choose to hold their wealth);
- economic activities in which they choose to invest;
- different entities through which they choose to legally structure their savings and investments (e.g. private companies, trusts, etc);
- different forms in which they derive their economic income (e.g. receipts of interest or dividend income, as well as accrued and realised capital gains in the values of their assets);
- different average and marginal effective rates of tax that are imposed on their incomes; and
- different overall amounts of tax they pay on the total economic income they earn.

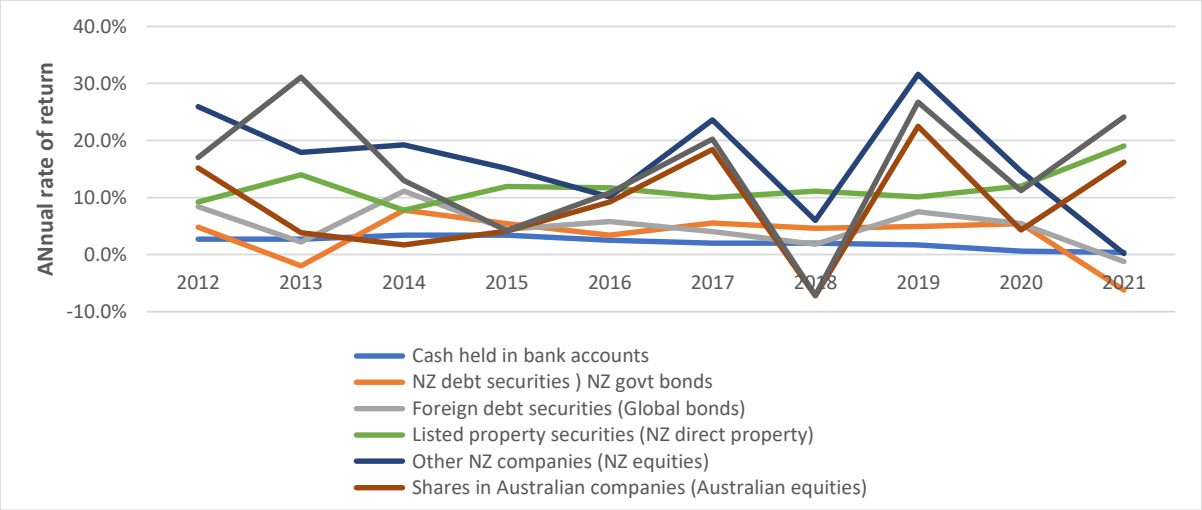
In particular, high wealth individuals and households derive a much higher proportion of their economic income in the form of income from savings and investment than other households and:

- hold much higher levels of savings:
  - in a much wider range of alternative savings vehicles (e.g. a wider range of financial instruments such as debt and equity instruments, as well as hybrid financial arrangements);
  - through a much wider range of legal entities (e.g. private companies, partnerships and trusts);
- undertake much higher levels of investment:
  - in a much a wider range of alternative economic activities (e.g. investment in the creation of a wider range of physical assets and the production of a wider range of goods and services); and
  - through a much wider range of legal entities (e.g. private companies, partnerships and trusts undertaking those investments on their behalf).

Figure 37 and **Table 10** illustrate the challenges that are faced when trying to:

- identify a statistically significant, unbiased sample of high wealth individuals and households;
- collect the data required to estimate the effective rates of tax imposed on the economic incomes derived by those high income individuals and households; and
- interpret the results of those effective tax rate estimates to draw meaningful conclusions about the extent to which those high wealth individuals and households are paying their "fair share" of tax.

Figure 37: Nominal pre-tax rate of return generated by selected assets 2012 to 2021



Source: Sapere drawing from information provided by Mercer
https://www.mercer.co.nz/content/dam/mercer/attachments/private/asia-pacific/new-zealand/periodic-table/Mercer-Periodic-Table-2021-Interactive-Final.pdf

Specifically, as illustrated in **Figure 37** and **Table 10**:

- individuals and households can choose to hold and invest their savings in a wide range of different types of assets;
- over the last decade, those assets have generated nominal pre-tax rates of return that differ significantly both across those assets and over time;
- those differences in rates of return reflect differences in the risks surrounding the returns generated by those assets. In general, the higher the uncertainty and risks surrounding the actual rates of return that those assets will generate in the future (e.g. due to volatility in the actual rates of return generated by those assets in the past), the higher the pre-tax nominal rates of return that individuals and households will expect to derive in the future to compensate them for those higher risks. Specifically:
  - low risk assets (e.g. bonds issued by the New Zealand government) that generate most of their returns in the form of interest income tend to generate relatively low, constant, nominal pre-tax rates of return;
  - by contrast, higher risk assets (e.g. shares and property) that generate most of their returns in the form of accrued gains in the value of those assets (i.e. accrued capital gains) tend to generate higher, but much more volatile, nominal pre-tax rates of return.

This is, of course, the reason why investment advisors:

- explain to their clients that the selection of an appropriate portfolio of assets in which to save and invest depends on a range of factors, including their:
  - need to generate their economic income in the form of cash, as opposed to accrued but yet to be realised, capital gains in the current market value of those assets, which is likely to differ across households (e.g. due to difference in their current and expected future levels and patterns of expenditure);
  - appetite for risk, which once again can vary significantly across individuals and over time; and

- consequently offer their clients a choice between a number of different strategies including:
  - "low risk" strategies that involve holding portfolios of assets that generate most of their relatively low nominal pre-tax rates of return in the form of relatively constant, certain flows of cash;
  - "balanced" strategies that involve holding portfolios of assets that generate their moderate nominal pre-tax rates of return in the form of a combination of a stream of cash returns plus a more volatile stream of accrued capital gains; and
  - "high risk" strategies that involve holding portfolios of assets that generate relatively high, volatile rates of return in the form of accrued capital gains in the value of those assets.

This makes it difficult to:

- identify "representative" groups of high wealth individuals who earn their economic income in similar forms, since those individuals can:
  - hold their wealth in a much wider range of assets;
  - engage in a much wider range of economic activities that are structured through a wide range of different legal forms (e.g. both domestic and foreign companies, trusts and partnerships); and
  - therefore derive their economic income from those assets and economic activities in a much wider range of forms and through a much wider range of legal entities that are subject to different tax treatment and therefore different effective tax rates;
- estimate the effective tax rates imposed on the economic incomes of those high wealth individuals and households using the information they provide on the assets they own, the actual economic income generated by those assets in the past, and the actual amount of tax they paid on that actual income. For lower wealth individuals and households who derive most of their economic income in the form of wages and salaries, there is typically little difference between the "retrospective" effective rates of tax that they have been legally required to pay on their wage and salary income and the "prospective" effective rates that they expect to have to legally pay on the wage and salary income they expect to derive in the future. As a result, it is possible to use information on their actual income and the actual amount of tax they pay to provide "retrospective" estimates of the effective rates of tax they have paid on their economic income to provide a reasonably accurate estimate of the "prospective" effective rates of tax they expect to pay on their future income. However, this is not the case for high wealth individuals and households, who derive significant proportions of their economic income from assets that generate quite uncertain, volatile and risky rates of return over time. In these cases, the actual rate of return that they derive can differ significantly from the rates of return they were expecting to derive. This makes it difficult to:
  - use "retrospective" estimates of the effective tax rates of tax they actually paid on their actual economic income to determine the "prospective" effective tax rates that they expect to pay on the risk adjusted rates of return they expect to derive on the assets in which they hold their savings and invest; and
  - determine who will bear the actual economic burden of the income tax imposed on the incomes of high wealth/high net economic income households, since as discussed further in section 4.1, this requires information on both the:
    - prospective effective marginal rates of tax that those households expect to be legally required to pay on their net economic incomes; and

        - extent to which those effective marginal tax rates unintentionally reduce and distort their savings and investment and, in so doing, pass the actual economic burden of that income tax onto other sections of the community, including low net wealth/low net economic income households.

As a result, for the purposes of this report, we have adopted a somewhat different approach that involves:

- complementing the limited amount of information that is available on high wealth/high income households by working with Olivershaw on the identification of a range of different types of high wealth/high income households that are considered to be "illustrative", but not necessarily "representative", examples of those households;
- estimating the "prospective" effective rates of tax that those high wealth individuals are legally required to pay on the risk adjusted rates of return they expect to derive from the different portfolios of assets in which they hold their savings and invest;
- focusing attention on the key sources of difference in the estimates effective rates of tax imposed on the incomes of high net wealth/high net economic income households – namely the differences in the effective marginal tax rates imposed on different forms of income from saving and investment, which are set out and discussed in section 3.3;
- outlining how those differences in the effective marginal tax rates imposed on income from savings and investment unintentionally shift the actual economic burden of the income tax system onto other sections of the community by discouraging and distorting levels and patterns of savings and investment.

Specifically, for the purposes of estimating effective tax rates, we have selected the following groups of illustrative high wealth/high income households:

- professional working couples with no dependents who are earning most of their income in the form of taxable wages and salaries and who are not receiving any benefits. Specifically, it is assumed those households:
  - derive 80% of their net economic income in a taxable form (50% each), of which:
    - 60% of that taxable income comes from wage and salary income that is taxable at their respective marginal tax rates;
    - 40% of that taxable income is assumed to be earned through their accumulated savings that are held in the form of units in Portfolio Investment Entities (i.e. PIEs) and subject to a final rate of tax equal to their Prescribed Investor Rates (i.e. PIRs). Once again it is assumed that 50% of the net real economic income earned by the PIE is in the form of taxable income and 50% is in a non-taxable form (i.e. capital gains);
  - derive 20% of their net economic income in the form of non-taxable income from non-financial assets (e.g. the imputed rental income from owner-occupied housing and non-taxable capital gains in the value of that housing);
- self-employed couples with no dependents who are deriving most of their net economic income from their direct investment in a private company they own. In particular, it is assumed that those households:
  - derive 80% of their net real economic income in a taxable form, of which:

        - 60% of their taxable income is derived in the form of income that is taxable at their respective statutory marginal rates of tax (e.g. directors fees, wages and salaries, dividends, interest);
        - 40% of their taxable income is earned through other entities and is taxable at statutory and effective marginal rates of tax that potentially differ from the statutory marginal rates of tax applying to their personal income, which are discussed further in section 3.2.3;
    - derive 20% of their net real economic income in a non-taxable form (e.g. the imputed rental income from owner-occupied housing and non-taxable capital gains in the value of that housing);
- older retired couples with no dependents who are deriving most of their net economic income from their portfolio investment in a Portfolio Investment Entity (i.e. a PIE) and who are both receiving benefits in the form of NZ Super. In particular, it is assumed that those households:
    - derive 80% of their net economic income in a taxable form through their interest in a Portfolio Investment Entity that is taxable at their respective Prescribed Investor Rates. Once again it is assumed that 50% of the net real economic income earned by the PIE is in the form of taxable income and 50% is in a non-taxable form (i.e. capital gains);
    - derive 20% of their net economic income in a non-taxable form (e.g. the imputed rental income from owner-occupied housing and capital gains in any other physical assets they own, including direct investments in residential and commercial property).

Table 9: Most common types of households earning high levels of taxable income and benefits, their main sources of income and types of assets they own (2018)

Income band	Most frequent type of household		Main sources of income					Main types of assets owned											Total net worth ($000s)
								Other non-financial assets		Currency and deposits		Other financial assets		Pension funds		Owner-occupied housing		Other real estate	
	Household Type	Frequency	Investments	Other sources of income	Wages or salary	Superannuation	Self-employment	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	Households holding asset	Mean value ($000s)	
$500,000 and over	Couple only	44%	100%	75%	63%	50%	38%	100%	308	100%	495	75%	5,291	50%	311	50%	1,309	50%	206	**6,154**
	Couple with two dependent children	22%	75%	-	75%	-	-	100%	138	100%	9	75%	1,198	75%	492	-	-	-	-	**3,787**
	Total households (18,000)	**100%**	**89%**	**50%**	**67%**	**22%**	**56%**	**100%**	**257**	**100%**	**495**	**89%**	**3,867**	**67%**	**275**	**39%**	**1,048**	**11%**	**520**	

Source: Sapere using custom Stats NZ data set

Table 10: Strategic asset allocation recommendations for portfolio investors

Portfolio composition	Low risk/ low return portfolio	Balanced risk/balanced return portfolio	High risk/ high return portfolio	Annual rate of return									
	Proportion of total assets	Proportion of total assets	Proportion of total assets	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Debt instruments:													
Cash held in bank accounts	15%	8%	5%	2.7%	2.7%	3.4%	3.4%	2.5%	2.0%	2.0%	1.7%	0.6%	0.4%
NZ debt securities (NZ govt bonds)	55%	32%	15%	4.8%	-2.0%	7.8%	5.4%	3.4%	5.5%	4.6%	4.9%	5.4%	-6.2%
Foreign debt securities (Global bonds)	0%	0%	0%	8.4%	2.2%	11.1%	4.4%	5.8%	4.0%	1.8%	7.5%	5.4%	-1.2%
Equity instruments:													
Shares in NZ companies:													
Listed property securities (NZ direct property)	4%	6%	6%	9.2%	14.0%	7.8%	11.9%	11.7%	10.0%	11.1%	10.1%	12.0%	19.0%
Other NZ companies (NZ equities)	8%	16%	23%	25.9%	17.9%	19.2%	15.1%	10.1%	23.6%	6.0%	31.6%	14.6%	0.2%
Shares in Australian companies (Australian equities)	3%	8%	12%	15.2%	3.8%	1.7%	4.1%	9.2%	18.4%	-7.2%	22.5%	4.3%	16.2%
Shares in other foreign companies (Global equities)	12%	25%	34%	17.0%	31.1%	13.0%	4.2%	10.8%	20.2%	-7.1%	26.7%	11.2%	24.1%
Alternatives	3%	5%	5%										
Total	**100%**	**100%**	**100%**										
Expected long run rates of return:													
- Pre-tax	4.6%	5.3%	5.8%										
- Post-tax	3.2%	3.7%	4.1%										

Source: Sapere drawing from information provided by Mercer https://www.mercer.co.nz/content/dam/mercer/attachments/private/asia-pacific/new-zealand/periodic-table/Mercer-Periodic-Table-2021-Interactive-Final.pdf

3.1.6 Method used to estimate effective tax rates

In order to estimate the effective rates of tax imposed on the economic incomes of illustrative households, we have developed a model that enables us to:

- determine, in a consistent manner across households, the net level of real economic income (before taxes and benefits) that each household expects to earn from any given level of their net wealth, using an assumed risk adjusted pre-tax real rate of return on net assets of 5% per annum, which in the presence of the assumed 2% annual rate of inflation, translates into a risk adjusted expected pre-tax nominal rate of return of 7.1% (using the "Fisher equation"). This enables us to avoid the problems that arise with the calculation and interpretation of effective tax rates when actual non-risk adjusted rates of return are used;
- use available information (e.g. from the HNW and HES) to make assumptions regarding each of the key factors that influence the effective tax rates imposed on the net real economic incomes of those households, which include their:
  - demographics (e.g. age of each family member);
  - accommodation status (e.g., whether they rent or live in their own homes);
  - marital status and household composition (e.g. whether they are single, couple, and how many dependent children they have);
  - proportion of their net real economic income that is:
    - earned by each member of the household;
    - taxable or not taxable (e.g. the capital gains in the value of assets);
    - taxable at different statutory marginal rates of tax (e.g. personal tax rates, the company tax rate, as well as other concessional tax rates such as the Prescribed Investor Rates that are applied to income earned through Portfolio Investment Entities);
  - different levels and types of benefits they receive (e.g. Sole Parent Support, Accommodation Supplement, Jobseeker Support, Working for Families tax credits, NZ Super, as well as subsidised education and health expenditure);
- hold those assumptions constant as we increase the assumed level of net wealth, net economic income and hence taxable income of those households, to see what happens to their effective tax rates. This ensures that any observed changes in the effective tax rates are due to the higher net wealth and higher net economic and taxable incomes of taxpayers, and not due to changes in any of the other wide range of factors outlined above.

Retrospective or prospective estimates of effective tax rates

When estimating the effective tax rates imposed on the incomes of households, it is important to decide whether to estimate those effective tax rates using either:

- actual data obtained from those households on the actual net economic income those households derived in past years and the actual amount of income tax they paid on that income (i.e. estimate the "retrospective" effective tax rates that those households have paid on the net economic income they derived in past years): or
- assumptions regarding the net economic income those households expect to derive in future years and the rates of income tax they expect to pay on that net real economic income (i.e.

estimate the "prospective" effective tax rates that those households expect to pay on their net real economic income).

For those lower net wealth households with little or no savings and investment who derive their net economic income solely from a relatively certain, constant stream of income over time (e.g. from secure full time employment that generates a constant, certain stream of wage and salary income), there will be little difference between the actual net economic income they expected to derive from their main asset (i.e. their human capital) and the net economic income they expected to derive. As a result, in these cases, "retrospective" estimates of effective tax rates may provide a reasonably accurate estimate of the "prospective" effective tax rates that taxpayers expect to have to legally pay on their net economic income in the future.

However, this is unlikely to be the case for higher net wealth households who derive a greater proportion of their net economic income in the form of income from the wider range of assets in which they can hold their savings and invest. For these households, "retrospective" estimates of the effective rates of tax they were legally required to pay on the net economic income they derived can differ from the "prospective" effective tax rates they expect to be legally required to pay on the net economic income they expect to derive in the future. This is because as the net wealth of households increases, so too does the:

- range of different forms in which those households can hold their savings or invest;
- range of different forms of net economic income that are measured in different ways for income tax purposes (i.e. due to differences in the timing of recognition of that economic income and expenditure) and are subject to different statutory marginal tax rates depending on the form in which that net economic income is derived and the entities through which that net economic income is derived; and
- uncertainty and risks surrounding the net economic income (i.e. pre-tax rates of return) that households actually derive from the assets in which they hold their savings and invest. For example, as illustrated in **Figure 37** and **Table 10** in section 3.1.5 of this report:
  - some assets generate relatively constant, low risk, low rates of return over time (e.g. savings held in the form of low risk, low return financial assets such as cash held in bank accounts or in government securities). For these assets, there is little difference between the:
    - actual net economic income they derive from those assets and the net economic income they expected to derive from those assets;
    - actual amounts of tax they were legally required to pay on that net economic income and the amount of tax they expect to be legally required to pay on that net economic income in the future;
    - "retrospective" effective tax rate they paid on their actual net economic income and the "prospective" effective tax rate they expect to pay on that net economic income in the future;
  - by contrast, other assets generate highly volatile, high risk, high rates of return over time, which means that there can be significant differences between the:
    - actual returns they derive from those assets and the rates of return they expected to derive from those assets (e.g. as illustrated in **Figure 37** and **Table 10** in section 3.1.5 of this report by the average rates of return generated by those assets);

- actual amount of tax they are required to pay on their taxable income and the amount of tax they expected to be legally required to pay on the net economic income they expected to derive from those assets in the future;
- effective rates of tax they have legally been required to pay on the actual net economic income they derived and the effective tax rates they expect to be legally required to pay on the net economic income they expect to derive from those assets in the future.

For the purposes of this report, we have used a "prospective" approach to estimating effective tax rates which, as discussed further in section 3.3, is the approach that has been adopted to date by the OECD, the New Zealand Treasury and Inland Revenue.

There are several key advantages associated with the estimation of "prospective" effective tax rates. Specifically, it:

- avoids the additional administrative and compliance costs associated with having to regularly survey taxpayers in order to obtain the detailed information required from taxpayers in order to estimate those "retrospective" effective tax rates (e.g. the administrative and compliance costs arising from the survey the IRD is currently conducting of high wealth individuals in order to obtain information on their asset portfolios, the net economic income they derived from those assets and the amount of tax they actually paid on that income);
- results in effective tax rate estimates that are not affected by unexpected changes in the rates of return generated by different types of assets. By contrast, as discussed further below, some of the observed differences in the effective rates of tax imposed on the net economic income generated by different types of assets are due to unexpected changes in the actual rates of return generated by those assets; and
- provides effective tax rate estimates that can be used, in conjunction with additional information on how taxpayers respond to those effective tax rates, to provide some indication of who actually bears the ultimate economic burden of the income tax. As discussed further in section 4.1 of this report, in order to determine who actually bears the economic burden of an income tax, information is required on both the:
  - "prospective" effective rates of tax that are imposed on the net economic incomes that taxpayers expect to derive in the future from their assets. It is unlikely that "retrospective" estimates of effective tax rates will provide an accurate estimate of the "prospective" effective tax rates that are imposed on the net economic incomes that are expected to be derived from the riskier assets in which taxpayers hold their savings and invest; and
  - sensitivity of their decisions to work, save and invest to differences in those "prospective" effective marginal tax rates, which is what determines the extent to which they alter their decisions and pass on the actual economic burden to other sections of the community.

It is important to note, however, that even the use of a prospective approach to the estimation of effective tax rates does not eliminate all of the problems arising from the difficulties associated with the measurement of economic income (e.g. it is still necessary to determine the proportions of the total net economic income that are derived in each form, particularly the proportion of their net economic income that is not taxable). This is, of course, one of the reasons why effective tax rate estimates need to be interpreted and applied with caution. Inevitably, they have to be based on incomplete and potentially inaccurate information.

Effects of the concessional tax treatment of human capital

Another key issue that needs to be resolved when estimating the effective tax rates that are imposed on the incomes of households is whether, to what extent and how to take into account the effects of the:

- concessional income tax treatment of human capital; and
- benefits the government provides to investors in human capital through the provision of heavily subsidised education, health care and accident insurance services.

Investors in financial and physical assets are not the only ones who potentially benefit from the concessional tax treatment of the net economic income they derive from those assets.

The amount of income tax that individuals are legally required to pay on the net economic income they earn from their investments in their own human capital and the human capital of other members of their households (i.e. the legal or fiscal incidence of that income tax) is also potentially reduced (or increased) by the exclusion of certain forms of economic income from human capital (or economic expenditure in relation to human capital) from the income tax base. Specifically, the income tax system does not take into account:

- "non-market" economic income, or economic expenditure, derived or incurred by individuals from their supply or use of labour services that are not traded in formal labour markets (e.g. unpaid child minding services, food preparation and cleaning services). Although those services might be unpaid, they have a real economic value and their provision involves real economic costs that are not taken into account by the income tax system. Like the imputed economic income and expenditure that home owners derive and incur in relation to their owner occupied housing, that non-market economic income and expenditure in relation to human capital is ignored for income tax purposes;
- capital gains or losses in the value of human capital. Like physical capital, the value of human capital can:
  - increase over time as a result of capital improvements (i.e. investment in improvements to human capital) which are funded by the:
    - savings of the individual, or other members of the household;
    - taxpayers who provide the funds necessary for the government to finance its education expenditure each year);
  - decrease over time as a result of reductions in the value of that physical capital that cannot be made good by normal levels of expenditure repairing and maintaining that human capital (e.g. through normal levels of life-long learning and health expenditure).

As a result, when estimating the effective tax rates, we have allowed for the possibility that a proportion of the economic income they derive from their human capital is not taxable, in much the same way as some of the income they derive from their financial or physical assets is not taxable.

Effects of subsidised education and health care services

Income tax concessions are not the only benefits provided by the government to investors in human capital. As outlined in section 2.1 of this report, in addition to providing income support to low income households, the New Zealand government also provides additional assistance to individuals who invest in human capital through the provision of:

- subsidised education. Investors in certain types of financial assets (e.g. superannuation funds) and physical assets (e.g. physical assets that are eligible for accelerated depreciation allowances) are not the only investors who benefit from government subsidies. The government also provides significant investment incentives to individuals who invest in their own human capital or the human capital of other members of their household (e.g. their children) in the form of heavily subsidised education services. Indeed, government subsidised education is compulsory for children aged 6 to 16 and the government continues to supply heavily subsidised tertiary education services to older individuals through a bulk grant (i.e. the "Student Achievement Component") that is determined using information on the number of enrolled students in each course and the amount of study time each course requires; and
- subsidised health care, aged care and accident insurance (i.e. through the ACC regime). Although there are user payments required for some of these services (e.g. co-payments for health and aged care services and the ACC levy), most of the cost of providing those services is met by the government. That is, most of the financial cost of "repairing and maintaining" human capital is met by the government. By contrast, although businesses can claim a deduction for the costs of repairing and maintaining their physical capital, those costs are not subsidised by the government in the absence of accelerated depreciation allowances.

In practice, however, although effective tax rate estimates typically take into account the effects of the benefits the government provides to support low income households (and the abatement of those benefits), they usually do not take into account the effects of subsidised education, health care, aged care and accident services.

This is not due to low levels of investment in human capital in relation to other assets. On the contrary, estimates of the value of the stock of human capital typically indicate that it is much greater than the value of the stock of physical capital. For example, Morrissey (2018) notes that:[45]

- as indicated in **Table 11**, over the period 1986 to 2013:
  - New Zealand's stock of human capital was, on average, 2.43 times the value of the stock of physical capital recorded in the national accounts;
  - that ratio has been relatively stable since 2000, which suggests that the rate of increase for both physical and human capital has been about the same;
- as indicated in **Table 12**, over the period 1981 to 2013:
  - the real stock of human capital has more than doubled (i.e. from $691.3b in 1981 to $1,442.4b in 2013);
  - there has been some variation in the rate of growth over time, with higher growth in the early 1990s and 2000s, and the lower growth in the late 1980s;
- the increase in the value of human capital is due to the:
  - increased education of the population. In 1981, almost two-thirds of people had no post-school qualifications and less than 5% had Bachelors or higher qualifications. By 2013, 40% of the labour force had low skills, and those with Bachelors and above constituted 21% of the labour force.

[45] Morrissey, S. (2018) *The start of a conversation on the value of New Zealand's human capital, New Zealand Treasury Discussion Paper*, No. 18/02, ISBN 978-1-988534-89-3, New Zealand Government, The Treasury, Wellington https://www.treasury.govt.nz/sites/default/files/2018-02/dp18-02.pdf

- increase in lifetime earnings, particularly by women. The increase in the level of labour market participation enhanced women's total lifetime earnings from 30% of male lifetime earnings in 1981 to over 60% in 2013;
- increase in the relative earnings by those with higher qualifications compared to the earnings of unskilled workers, particularly over the period from 1981 to 1996. This is likely to be due partly to a wage effect, and partly because those with higher qualification are more likely to be in the workforce.[46]

Table 11: New Zealand's human capital stocks – 1981 to 2013 ($billion 2019/10 prices)

	1981	1986	1991	1996	2001	2006	2013
Human capital	$691.30	$795.10	$826.60	$965.50	$1,064.20	$1,241.70	$1,442.40
Capital stock		$324.20	$358.00	$385.60	$435.90	$513.10	$592.50
Human/physical		2.45	2.31	2.5	2.44	2.42	2.43
Human capital/GDP		7	7.3	7.3	6.9	6.7	7

Source: Table 2, Morrissey (2018)

Table 12: Aggregate value of New Zealand's human capital stock – 1981 to 2013 ($billion 2013 prices)

	1981	1986	1991	1996	2001	2006	2013
Male							
Unskilled*	267.2	224.5	175.2	199.2	222.8	214.1	206.6
Non-degree**	210.9	277.7	299.6	314.6	303.1	353.4	397.1
Bachelors	33.7	45.9	57	78.9	93.4	133	174.4
Postgraduate	16.5	28.8	31.4	42.8	48.4	62.5	92.5
Sub-total	***528.3***	***576.9***	***563.3***	***635.5***	***667.7***	***763***	***870.7***
Female							
Unskilled*	87.6	94.2	88.2	106.9	121.5	123	119.7
Non-degree**	64.8	102.3	140.6	166.5	184.1	204	220.8
Bachelors	8	13.4	22.7	37.7	61.4	104.9	151.6
Postgraduate	2.6	8.2	11.9	18.9	29.5	46.8	79.6
Sub-total	***163***	***218.1***	***263.3***	***330.1***	***396.5***	***478.7***	***571.8***
Total	**$691.30**	**$795.10**	**$826.60**	**$965.50**	**$1,064.20**	**$1,241.70**	**$1,442.40**
Change from last census		15%	4%	16.80%	10.20%	16.70%	16.20%
Annual growth rate from last census		2.84%	0.78%	3.16%	1.97%	3.13%	2.16%

Source: Table 1, Morrissey (2018)

Notes:

* Unskilled includes those with school qualifications and those with National Certificate of Education Achievement (NCEA) Level 1 or equivalent.

** Non-degree includes those with NCEA Level 2 or Level 3 and non-degree tertiary education.

While it might be convenient, for simplicity, to ignore the effects of government subsidised education, and health care services, it is important to note that this can result in both:

- misleading estimates of the distribution of wealth and income. For example, Chiang and LaBelle (2022) note that accounting for labour wealth in the US:
  - changes how we think of the degree of wealth inequality:

[46] Morrissey, S. (2018) *The start of a conversation on the value of New Zealand's human capital, New Zealand Treasury Discussion Paper*, No. 18/02, ISBN 978-1-988534-89-3, New Zealand Government, The Treasury, Wellington https://www.treasury.govt.nz/sites/default/files/2018-02/dp18-02.pdf

        - if we look at overall wealth excluding expected labour income, 75% of all wealth is held by the top decile. By contrast, when you incorporate labour wealth, this number falls to 59%;
        - similarly, if you calculate the Gini coefficient using the standard measure of net wealth, you get a ratio of 0.86, in line with other sources. By contrast, when accounting for labour wealth, however, the Gini coefficient drops to 0.69, which indicates less inequality;
    - changes the picture of rich and poor households:
        - when accounting for labour income, the demographics of the bottom decile skews notably older. In fact, 73% of people in this bottom decile are over the age of 55, with 45% being older than 65, commonly assumed to be retirement age. They also have the lowest rates of homeownership and college attendance;
        - by contrast, if we calculate these numbers again using net wealth without expected labour income, the shares of older people in the bottom decile fall dramatically to 8% for those over 55 and 4% for those over 65. That's because young people, who have accumulated fewer assets while sometimes taking on large liabilities, hold most of their wealth in the form of their expected labour income;
        - the share of the bottom decile that attended college is dramatically lower when labour wealth is taken into account, with only 36% under the traditional measure compared with 78% when labour income is taken into account. This reflects the inclusion of many students who expect larger labour wealth in their future;[47]
- misleading effective tax rate estimates that overstate the effective marginal tax rates and average effective tax rates applying to the income that individuals and households earn from the investment of their savings in their human capital.

As a result, rather than ignore the effects that the provision of subsidised education and health services have on effective tax rates, we have sought, instead, to:

- use the estimates derived by Aziz et al (2013) regarding the distribution of education and health expenditure by age and gender to calculate the combined subsidy that individuals of each age and gender receive from those subsidised services (as illustrated in **Figure 38** below);
- calculate the cumulative per capital subsidies that individuals receive by age and gender, expressed in real $2018, which is the latest year for which estimates of real interest rates are available (as illustrated in in **Figure 39** below; and
- spread those total subsidies over the remainder of the expected lives of those individuals (i.e. 80 years for males and 83.5 years for females) to determine the per capita annual subsidy provided by those subsidised education and health subsidies; and
- take the value of that annual lump sum subsidy into account when estimating the effective tax rates imposed on the incomes of households, in much the same manner as we take into account the effects of other lump sum, annual, non-taxable subsidies. As discussed further in section 3.2, this is achieved by:

[47] Chiang, Y and J. LaBelle (2022), *How Does Human Capital Affect Wealth Inequality?*, Federal Reserve Bank of St.Louis, June 6 2022 https://www.stlouisfed.org/on-the-economy/2022/jun/how-does-human-capital-affect-wealth-inequality

- first estimating the effective tax rates imposed on the incomes of households in the absence of those lump sum subsidies; and
- then illustrating how those lump sum subsidies alter those effective tax rate estimates.

Figure 38: Assumed total benefits from subsidised education and health expenditure by educational status and gender ($2010 prices)

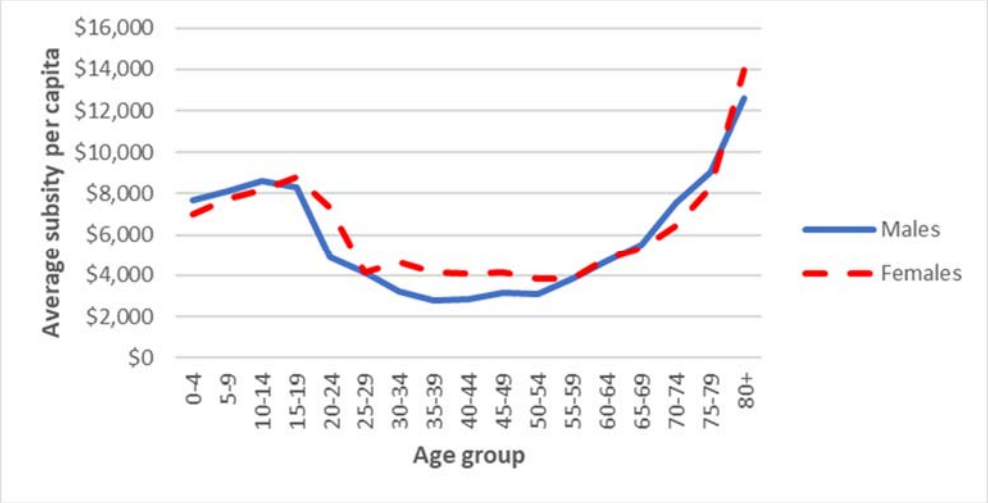
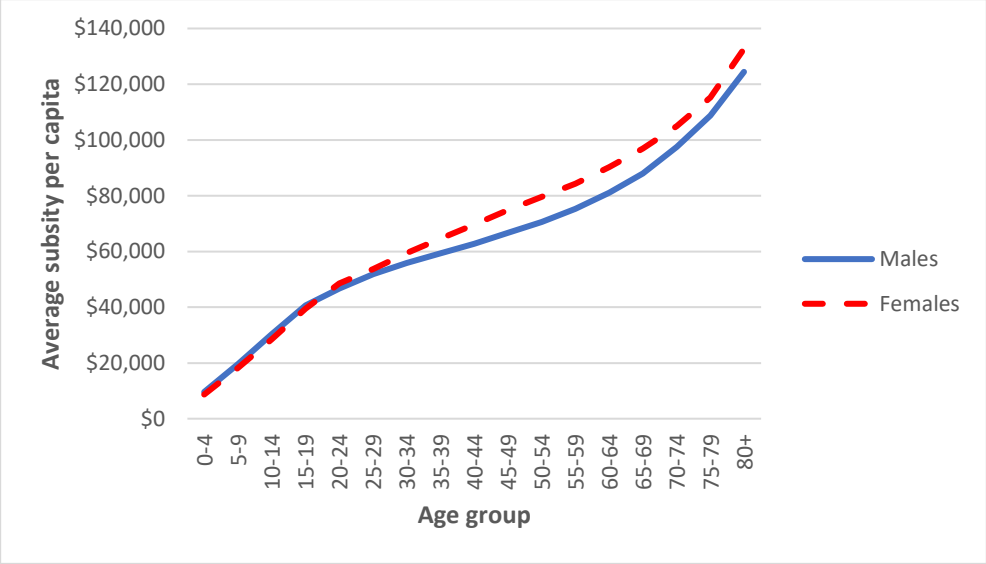


Figure 39: Assumed cumulative per capita benefit received from subsidised education and health expenditure by age and gender ($2018 prices)



Effects of loss restrictions on estimates of effective tax rates

Another related issue that needs to be resolved when estimating the effective tax rates imposed on the net economic incomes of households with higher levels of net wealth is whether and how to take into account the tax treatment of losses in the value of assets.

Since the rates of return that taxpayers actually derive, or expect to derive, on some of their assets can differ significantly over time, it is likely that they will:

- derive losses (i.e. negative net economic income) in those years where the gross return on the asset less than the expenditure they incurred in order to derive that income; and

- expect to derive losses in those future years where the expected gross return on the asset is less than the expenditure they expect to incur in order to derive that income.

However, under the New Zealand income tax system, taxpayers do not receive a refund for those losses in the year in which they occur. Rather, they are only allowed to carry forward those losses to offset against future taxable income. Such "loss restrictions" are intended to offset, to some extent, the effects of exempting certain capital gains from tax (e.g. capital gains in the value of assets held on "capital account"). As outlined below, it is important to note that the decision of successive New Zealand governments to continue to impose such loss restrictions increases both the:

- "retrospective" effective tax rates that taxpayers were legally required to pay on the actual net economic income they derived; and
- "prospective" effective tax rates that taxpayers expect to be legally required to pay on the net economic income they expect to derive.

For example, consider first the effects that loss restrictions have on the on the effective marginal tax rates that taxpayers have legally been required to pay on the net economic income their derive from their investments (i.e. the effects of loss restrictions on "retrospective" estimates of effective tax rates).

Table 13 outlines the effects that such loss restrictions have on the effective marginal rates of tax imposed on the incomes of a range of different types of companies that are assumed to have experienced changes in the actual net economic income they have derived from their investments over the period of analysis (i.e. 2012 to 2021), which include a:

- start-up company with significant upfront expenditure that results in net losses in the first few years of its operation, followed by increasing net economic income in later years;
- company temporarily in loss because of a temporary reduction in the gross income, and increase in gross expenditure, they derive and incur in relation to their investment;
- company experiencing fluctuations in the gross economic income it derived from its investment (i.e. due to fluctuations in the rates of return generated by those assets) that result in tax losses in some years;
- company facing a sustained change in its operating environment that results in it deriving losses and lower levels of net economic income;
- company investing to upgrade its product line in order to attract more customers, which results in losses due to reduced assessable income and increased deductions as a result of refurbishments and staff training; and
- terminal company that has never had positive taxable income. This is what may happen to the start-up company if its investment does not pay off.

For simplicity, it is assumed that all of the gross economic income and gross economic expenditure derived and incurred by each company is respectively assessable and deductible for tax purposes. This ensures that the only sources of difference in effective tax rates from the company tax rate of 28% is due to the existence of the loss restrictions. In practice, of course, the actual effective tax rates applying to the net economic incomes of such companies will be affected by a wide range of other factors (e.g. the non-taxation of capital gains, the different tax treatment of debt and equity finance, differences in the extent to which the investment is financed through debt, and any differences between tax depreciation rates and actual economic rates of depreciation in the value of the company's assets).

Table 13: Effects of loss restrictions on "retrospective" effective tax rates imposed on the net economic incomes derived by different types of companies

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Start up company:										
Assessable income	$0	$1,000,000	$5,000,000	$7,000,000	$8,000,000	$10,000,000	$12,000,000	$14,000,000	$16,000,000	$18,000,000
Allowable deductions:										
Expenses - excluding depreciation	-$2,000,000	-$2,000,000	-$2,000,000	-$2,000,000	-$2,000,000	-$2,000,000	-$2,000,000	-$2,000,000	-$2,000,000	-$2,000,000
Deductions - depreciation	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000
Taxable income - before deductions for carry forward losses	-$3,000,000	-$2,000,000	$2,000,000	$4,000,000	$5,000,000	$7,000,000	$9,000,000	$11,000,000	$13,000,000	$15,000,000
Deductions - carry forward losses	$0	$0	-$2,000,000	-$3,000,000	$0	$0	$0	$0	$0	$0
Taxable income - after deductions for carry forward losses	-$3,000,000	-$2,000,000	$0	$1,000,000	$5,000,000	$7,000,000	$9,000,000	$11,000,000	$13,000,000	$15,000,000
Tax payable	$0	$0	$0	$280,000	$1,400,000	$1,960,000	$2,520,000	$3,080,000	$3,640,000	$4,200,000
Total carry forward losses	$3,000,000	$5,000,000	$3,000,000	$0	$0	$0	$0	$0	$0	$0
Company facing temporary shock:										
Assessable income	$2,000,000	$2,000,000	$2,000,000	$1,200,000	$1,800,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000	$2,500,000
Allowable deductions:										
Expenses - excluding depreciation	-$200,000	-$200,000	-$200,000	-$1,000,000	-$500,000	-$200,000	-$200,000	-$200,000	-$200,000	-$200,000
Deductions - depreciation	-$200,000	-$200,000	-$200,000	-$800,000	-$800,000	-$800,000	-$800,000	-$800,000	-$800,000	-$800,000
Taxable income - before deductions for carry forward losses	$1,600,000	$1,600,000	$1,600,000	-$600,000	$500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Deductions - carry forward losses	$0	$0	$0	$0	-$500,000	-$100,000	$0	$0	$0	$0
Taxable income - after deductions for carry forward losses	$1,600,000	$1,600,000	$1,600,000	-$600,000	$0	$1,400,000	$1,500,000	$1,500,000	$1,500,000	$1,500,000
Tax payable	$448,000	$448,000	$448,000	$0	$0	$392,000	$420,000	$420,000	$420,000	$420,000
Total carry forward losses	$0	$0	$0	$600,000	$100,000	$0	$0	$0	$0	$0
Company facing fluctating returns:										
Assessable income	$3,000,000	$2,073,359	$2,223,938	$1,749,035	$1,169,884	$2,733,591	$694,981	$3,660,232	$1,691,120	$23,166
Allowable deductions:										
Expenses - excluding depreciation	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000
Deductions - depreciation	-$463,320	-$463,320	-$463,320	-$463,320	-$463,320	-$463,320	-$463,320	-$463,320	-$463,320	-$463,320
Taxable income - before deductions for carry forward losses	$1,536,680	$610,039	$760,618	$285,714	-$293,436	$1,270,270	-$768,340	$2,196,911	$227,799	-$1,440,154
Deductions - carry forward losses	$0	$0	$0	$0	$0	-$293,436	$0	-$768,340	$0	$0
Taxable income - after deductions for carry forward losses	$1,536,680	$610,039	$760,618	$285,714	-$293,436	$976,834	-$768,340	$1,428,571	$227,799	-$1,440,154
Tax payable	$430,270	$170,811	$212,973	$80,000	$0	$273,514	$0	$400,000	$63,784	$0
Total carry forward losses	$0	$0	$0	$0	$293,436	$0	$768,340	$0	$0	$1,440,154
Company facing a sustained shock:										
Assessable income	$3,000,000	$3,000,000	$2,000,000	$1,000,000	$500,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Allowable deductions:										
Expenses - excluding depreciation	-$500,000	-$500,000	-$500,000	-$500,000	-$2,500,000	-$500,000	-$500,000	-$500,000	-$500,000	-$500,000
Deductions - depreciation	-$1,000,000	-$1,000,000	-$1,000,000	-$1,000,000	$0	-$400,000	-$400,000	-$400,000	-$400,000	-$400,000
Taxable income - before deductions for carry forward losses	$1,500,000	$1,500,000	$500,000	-$500,000	-$2,000,000	$100,000	$100,000	$100,000	$100,000	$100,000
Deductions - carry forward losses	$0	$0	$0	$0	$0	-$100,000	-$100,000	-$100,000	-$100,000	-$100,000
Taxable income - after deductions for carry forward losses	$1,500,000	$1,500,000	$500,000	-$500,000	-$2,000,000	$0	$0	$0	$0	$0
Tax payable	$420,000	$420,000	$140,000	$0	$0	$0	$0	$0	$0	$0
Total carry forward losses	$0	$0	$0	$500,000	$2,500,000	$2,400,000	$2,300,000	$2,200,000	$2,100,000	$2,000,000
Company investing to update its product line:										
Assessable income	$25,000,000	$25,000,000	$12,000,000	$15,000,000	$20,000,000	$30,000,000	$30,000,000	$30,000,000	$30,000,000	$30,000,000
Allowable deductions:										
Expenses - excluding depreciation	-$18,000,000	-$19,000,000	-$16,100,000	-$18,000,000	-$19,000,000	-$18,000,000	-$18,000,000	-$18,000,000	-$18,000,000	-$18,000,000
Deductions - depreciation	-$750,000	-$750,000	-$900,000	-$950,000	-$1,800,000	-$1,800,000	-$1,800,000	-$1,800,000	-$1,800,000	-$1,800,000
Taxable income - before deductions for carry forward losses	$6,250,000	$5,250,000	-$5,000,000	-$3,950,000	-$800,000	$10,200,000	$10,200,000	$10,200,000	$10,200,000	$10,200,000
Deductions - carry forward losses	$0	$0	$0	$0	$0	-$9,750,000	$0	$0	$0	$0
Taxable income - after deductions for carry forward losses	$6,250,000	$5,250,000	-$5,000,000	-$3,950,000	-$800,000	$450,000	$10,200,000	$10,200,000	$10,200,000	$10,200,000
Tax payable	$1,750,000	$1,470,000	$0	$0	$0	$126,000	$2,856,000	$2,856,000	$2,856,000	$2,856,000
Total carry forward losses	$0	$0	$5,000,000	$8,950,000	$9,750,000	$0	$0	$0	$0	$0
A terminal company:										
Assessable income	$500,000	$5,000,000	$1,000,000	-	-	-	-	-	-	-
Allowable deductions:										
Expenses - excluding depreciation	-$3,000,000	-$2,000,000	-$500,000	-	-	-	-	-	-	-
Deductions - depreciation	-$1,000,000	-$1,000,000	-$1,000,000	-	-	-	-	-	-	-
Taxable income - before deductions for carry forward losses	-$3,500,000	$2,000,000	-$500,000	$0	$0	$0	$0	$0	$0	$0
Deductions - carry forward losses	$0	-$2,000,000	$0	-$2,000,000	$0	$0	$0	$0	$0	$0
Taxable income - after deductions for carry forward losses	-$3,500,000	$0	-$500,000	-$2,000,000	$0	$0	$0	$0	$0	$0
Tax payable	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
Total carry forward losses	$3,500,000	$1,500,000	$2,000,000	$0	$0	$0	$0	$0	$0	$0
Tax payable as proportion of taxable income - before losses:										
Start up company	0.0%	0.0%	0.0%	7.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Company facing temporary shock	28.0%	28.0%	28.0%	0.0%	0.0%	26.1%	28.0%	28.0%	28.0%	28.0%
Company facing fluctuating returns	28.0%	28.0%	28.0%	28.0%	0.0%	21.5%	0.0%	18.2%	28.0%	0.0%
Company facing a sustained shock	28.0%	28.0%	28.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Company investing to update its product line	28.0%	28.0%	0.0%	0.0%	0.0%	1.2%	28.0%	28.0%	28.0%	28.0%
A terminal company	0.0%	0.0%	0.0%							
Tax payable as a proportion of net economic income if losses cashed out:										
Start up company	-28.0%	-28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Company facing temporary shock	28.0%	28.0%	28.0%	-28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Company facing fluctuating returns	28.0%	28.0%	28.0%	28.0%	-28.0%	28.0%	-28.0%	28.0%	28.0%	-28.0%
Company facing a sustained shock	28.0%	28.0%	28.0%	-28.0%	-28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
Company investing to update its product line	28.0%	28.0%	-28.0%	-28.0%	-28.0%	28.0%	28.0%	28.0%	28.0%	28.0%
A terminal company	-28.0%	28.0%	-28.0%							

Source: Sapere using the approach used by the Australian Treasury to analyse the effects of loss restrictions https://treasury.gov.au/publication/business-tax-working-group-final-report-on-the-tax-treatment-of-losses/final-report-on-the-tax-treatment-of-losses/chapter-2-the-tax-treatment-of-losses

As illustrated in **Table 13**, if taxpayers were provided with a refund equal to 28% of the value of their tax losses, all companies would face a constant 28% effective rate of tax (or subsidy) on the net economic profit (or loss) that they derive each year.

However, if restrictions are imposed on the use of losses, the effective tax rates imposed on the net economic incomes that taxpayers are legally required to pay on the actual net economic income they derive will vary over time and across taxpayers.

In effect, the imposition of restrictions on the use of losses imposes a:

- higher effective marginal rate of tax on the loss they incur in the year in which they incur that loss (i.e. they pay a 0% effective tax rate, rather than receiving a 28% refund of the value of that loss); and
- lower effective tax rates on the net economic income they derive in the years in which they are able to claim a deduction for the losses they have carried forward.

In general, such loss restrictions will impose higher effective tax rates on those companies that:

- derive the greatest tax losses (e.g. start-up companies, companies making significant investments, companies that invest in assets that generate risky, highly geared, net economic income); and
- have to wait the longest periods of time before they can claim deductions for the losses they carry forward (e.g. companies experiencing permanent declines in their profitability, or terminating their operations).

Now consider the effects that loss restrictions have on the on the effective marginal tax rates that taxpayers expect to be legally required to pay on the net economic income their expect to derive from their investments in the future (i.e. the effects of loss restrictions on "prospective" estimates of effective tax rates).

As illustrated in **Table 14**, loss restrictions also alter the effective tax rates that companies expect to have to be liable to pay on the net economic incomes they expect to derive from alternative investments. Specifically, loss restrictions tend to:

- increase the effective tax rates that are imposed on the net economic income generated by investments in riskier assets that are expected to generate losses in some years; and
- leave the effective tax rates imposed on less risky investments that are not expected to generate losses unaffected.

Table 14: Effects of loss restrictions on "retrospective" effective tax rates imposed on the net economic incomes derived by different types of companies

	Possible before-tax return on the investment	Probability of return being relised	Before-tax expected return	After-tax expected return	Effective tax rate
Less risky investment:					
	$40.00	50.00%	$20.00	$14.40	28.00%
	$20.00	50.00%	$10.00	$7.20	28.00%
Total	**$60.00**	**100.00%**	**$30.00**	**$21.60**	**28.00%**
More risky investment:					
	$120.00	10.00%	$12.00	$8.64	28.00%
	$100.00	20.00%	$20.00	$14.40	28.00%
	$80.00	20.00%	$16.00	$11.52	28.00%
	$20.00	10.00%	$2.00	$1.44	28.00%
	-$40.00	20.00%	-$8.00	-$8.00	0.00%
	-$60.00	20.00%	-$12.00	-$12.00	0.00%
Total		**100.00%**	**$30.00**	**$16.00**	**46.67%**

Source: Table 1 and Table 2, Chapter 2, Australian Treasury (2012), *Final Report on the Tax Treatment of Losses*, Business Tax Working Group, https://treasury.gov.au/publication/business-tax-working-group-final-report-on-the-tax-treatment-of-losses/final-report-on-the-tax-treatment-of-losses/chapter-2-the-tax-treatment-of-losses

The adverse effects that loss restrictions can have on investment decisions are well recognised by tax policy officials in both New Zealand and Australia,[48] as well as the NZ government. Indeed, we note that the NZ government has recently decided to allow start-up companies engaging in intensive research and development activities to "cash out" their tax losses for research and development expenditure. The changes were introduced in the Taxation (Annual Rates for 2015–16, Research and Development, and Remedial Matters) Bill enacted on 24 February 2016.[49]

Although it is well recognised that loss restrictions have the potential to increase the effective tax rates imposed on the net economic income generated by riskier assets, however, neither "retrospective" or "prospective" estimates of effective tax rates typically explicitly take those effects into account. This is due to the practical difficulties associated with accounting for the effects of loss restrictions, which vary significantly across taxpayers due to differences in their portfolios of assets and differences in the profitability of those investments over time.

This means that when interpreting and applying either "retrospective" or "prospective" estimates of effective tax rates, it is essential to bear in mind that those estimates will underestimate actual effective tax rates to the extent that they ignore the effects of such loss restrictions.

[48] See, for example, the Australian Treasury's Business Tax Working Group *Final Report on the Tax Treatment of Losses*, https://treasury.gov.au/publication/business-tax-working-group-final-report-on-the-tax-treatment-of-losses/final-report-on-the-tax-treatment-of-losses/chapter-2-the-tax-treatment-of-losses

[49] For a discussion of this decision and its effects see "*Cash out" of research and development tax losses A special report from Policy and Strategy*, Inland Revenue. April 2016. https://taxpolicy.ird.govt.nz/en/publications/2016/2016-sr-cash-out-tax-losses/cash-out-research-and-development-tax-losses

3.2 Estimates of the effective tax rates imposed on the real economic incomes of illustrative households

3.2.1 Effective tax rates imposed on low wealth/low income households

Consider first the effective tax rates imposed on the net real economic incomes of illustrative low wealth/low income households who earn less than $48,000 of net real economic income each year, which as noted in section 3.1.3, include both:

- single, unemployed, or underemployed individuals who are eligible to receive benefits from Jobseeker Support and the Accommodation Supplement; and
- sole parents, who are eligible to receive benefits through either:
  - Sole Parent Support and the Accommodation Supplement; or
  - Working for Families Tax Credits and the Accommodation Supplement.[50]

Specifically, as noted in section 3.1.3, it is assumed for simplicity that the low wealth/low income households hold all of their net wealth in the form of their human capital, which generates taxable income in the form of limited amounts of wage and salary income that supplement the benefits they receive.

In reality, however, even low wealth/low income households are likely to hold some of their wealth in the non-financial assets they own (e.g. consumer durables). To the extent that this is the case, the effective tax rates imposed on their net economic incomes will be lower than those estimates outlined below.

Single unemployed, or underemployed, individuals receiving benefits from Jobseeker Support and the Accommodation Supplement

The first illustrative low wealth/low income household we consider is one that comprises a single individual who has no dependents, is either unemployed or underemployed, living in rental accommodation, and receiving benefits from Jobseeker Support and the Accommodation Supplement.

As illustrated in in **Figure 40**, if all of the net real economic income of such an individual was subject to tax at the statutory rates of tax applying to their personal income (i.e. in the presence of a comprehensive income tax on the net real economic income of that individual), that individual would face:

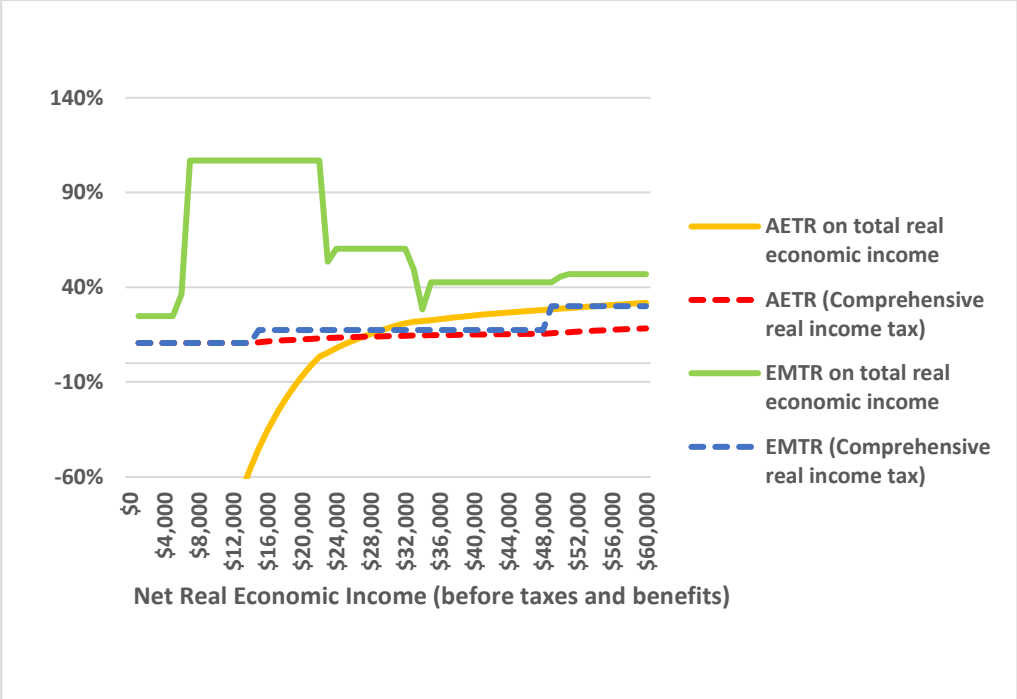
- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 40**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net

[50] This report uses the benefits that applied over the period 1 April 2022 to 31 March 2023. Those benefits are subject to an annual adjustment to offset the effects of inflation. https://www.workandincome.govt.nz/products/benefit-rates/benefit-rates-april-2022.html

real economic income through to 17.5% on each dollar of income they earn in excess of $14,000 and up to $48,000;

- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 40**). Those average effective tax rates would range from 10.5% on net real economic incomes up to $14,000 to around 15.5% on incomes of $48,000.

Figure 40: Effective tax rates imposed on the net real economic incomes of low wealth single individuals (aged 21) receiving Jobseeker Support and the Accommodation Supplement



However, as a result of the government's decision not to index the income tax base for the effects of inflation and to provide low income earners with Jobseeker Support and Accommodation Support that are abated as the income and assets of the individual increase, such an individual faces:

- high effective marginal tax rates that increase rapidly from around 25% on low levels of net real economic income, to very high effective marginal tax rates (e.g. in excess of 100%) for those on real economic incomes of around $10,000 per annum (as illustrated by the solid green line) that are well in excess of the statutory marginal rates of tax that would apply if all of their economic income was subject to tax and they did not receive any benefits (as illustrated by the dotted blue line in **Figure 40**). The effective marginal tax rate reduces to around 43% for such households earning $48,000 of net real economic income. As previously noted, inflation significantly increases the effective marginal rates of tax imposed on income and those effective tax rates are increased further by the abatement of benefits as the income and assets of the individual increase:
  - Jobseeker Support benefit abates at a rate of 70% of each dollar of income they earn in excess of $160 per week;
  - Accommodation Supplement is not abated as their income increases until they are no longer receiving a main benefit, but is asset tested;
  - Jobseeker Support is included in their taxable income and taxed at their respective statutory marginal tax rates;

- large negative average effective rates of tax (e.g. in excess of negative 100%) on their low levels of real economic income (as indicated by the orange line) that are well below the average effective tax rates that would apply if they did not receive any benefits (as illustrated by the dotted red line in **Figure 40**). This indicates that at low levels of income, such households receive a net subsidy from the government (i.e. the benefits they receive exceed the amount of tax they are required to pay on any income they receive). These negative average effective tax rates increase rapidly as their net economic and taxable incomes increase as a result of the benefit abatement rates outlined above (i.e. become less negative and then more positive as their net real economic and taxable incomes increase). For example, the average effective tax rate increases to around 28% for such households earning $48,000 of net real economic income. In addition, it is also important to note that the average tax rates illustrated in **Figure 41** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:
  - negative121% to negative 130% for net real economic incomes of around $10,000 per annum; and
  - 28% to 26% for net real incomes of around $48,000 per annum.

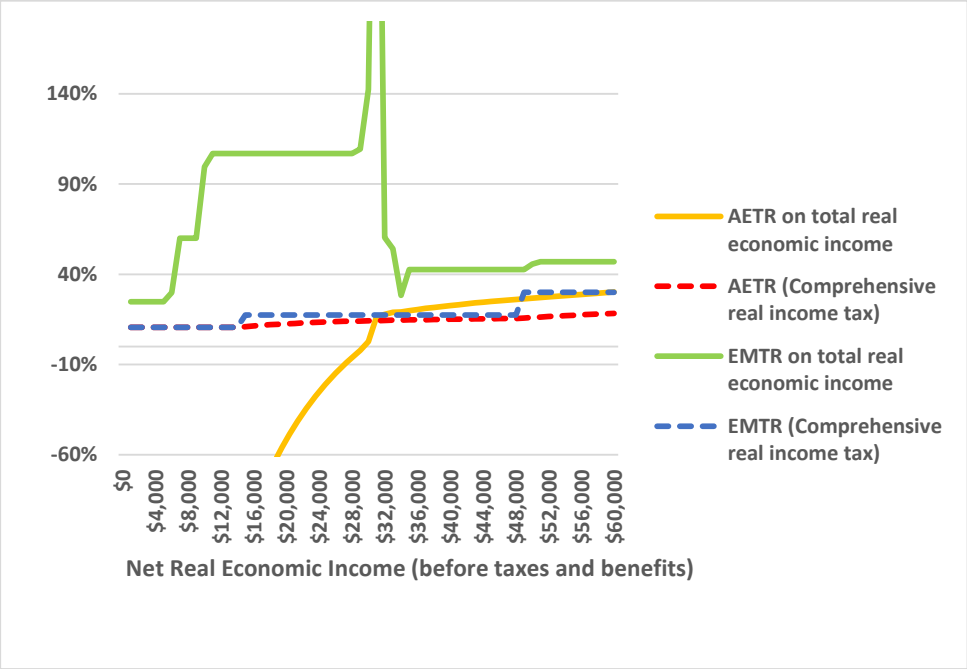
Sole parents receiving Sole Parent Support and the Accommodation Supplement

Now consider the effective tax rates that apply to a low wealth/low income household that comprises a single parent who is either unemployed or underemployed, has a dependent child, is living in rental accommodation and receiving benefits from Sole Parent Support and the Accommodation Supplement.

Once again, as illustrated in **Figure 41**, if all of the net real economic income of such a sole parent household was subject to a comprehensive real income tax levied at statutory rates of personal income tax, that household would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 41**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income through to 17.5% on each dollar of income they earn in excess of $14,000 and up to $48,000;
- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 41**). Those average effective tax rates would range from 10.5% on net real economic incomes up to $14,000 to around 15.5% on incomes of $48,000.

Figure 41: Effective tax rates imposed on the net real economic incomes of low wealth sole parents (aged 21) with one child receiving Sole Parent Support and the Accommodation Supplement



However, as a result of the government's decision not to index the income tax base for the effects of inflation and to provide such sole parent households with benefits that abate as their incomes and assets increase, they face:

- high effective marginal tax rates that increase rapidly from around 25% on low levels of net real economic income, to very high effective marginal tax rates (e.g. in excess of 100%) for those on real incomes of around $10,000 per annum (as illustrated by the solid green line) that are well in excess of the statutory marginal rates of tax that apply to their taxable income (as illustrated by the dotted blue line in **Figure 41**). The effective marginal tax rate reduces to around 43% for such households earning $48,000 of net real economic income. Once again, those very high effective marginal tax rates are the result of the combined effects of inflation and the abatement of their benefits as their incomes and assets increase:
  - Sole Parent Support benefit abates at a rate of 30% of each dollar of income they earn in between $160 and $250 per week, and at 70% for each dollar of income they earn a week in excess of $250;
  - Accommodation Supplement is not abated as their income increases until they are no longer receiving a main benefit, but is asset tested;
  - Sole Parent Support benefits are included in their taxable income and taxed at their respective statutory marginal tax;
- large negative average effective rates of tax (e.g. in excess of negative100%) on their low levels of real economic income (as indicated by the orange line) that are well below the average effective tax rates that would apply if they did not receive any benefits (as illustrated by the dotted red line in **Figure 41**). Once again, those negative average effective tax rates indicate that at low levels of income, such households receive a net subsidy from the government (i.e. the benefits they receive exceed the amount of tax they are required to pay on any income they receive. These negative average effective tax rates increase rapidly as their net economic and taxable incomes increase as a result of the benefit abatement rates outlined above (i.e. become

less negative and then more positive as their net real economic and taxable incomes increase). For example, the average effective tax rate increases to around 26% for such households earning $48,000 of net real economic income. In addition, it is also important to note that the average tax rates illustrated in **Figure 41** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:

- negative 210% to negative 220% for net real economic incomes of around $10,000 per annum; and
- 26% to 24% for net real incomes of around $48,000 per annum.

Sole parents receiving Sole Parent Support, the Accommodation Supplement and the Family Tax Credit

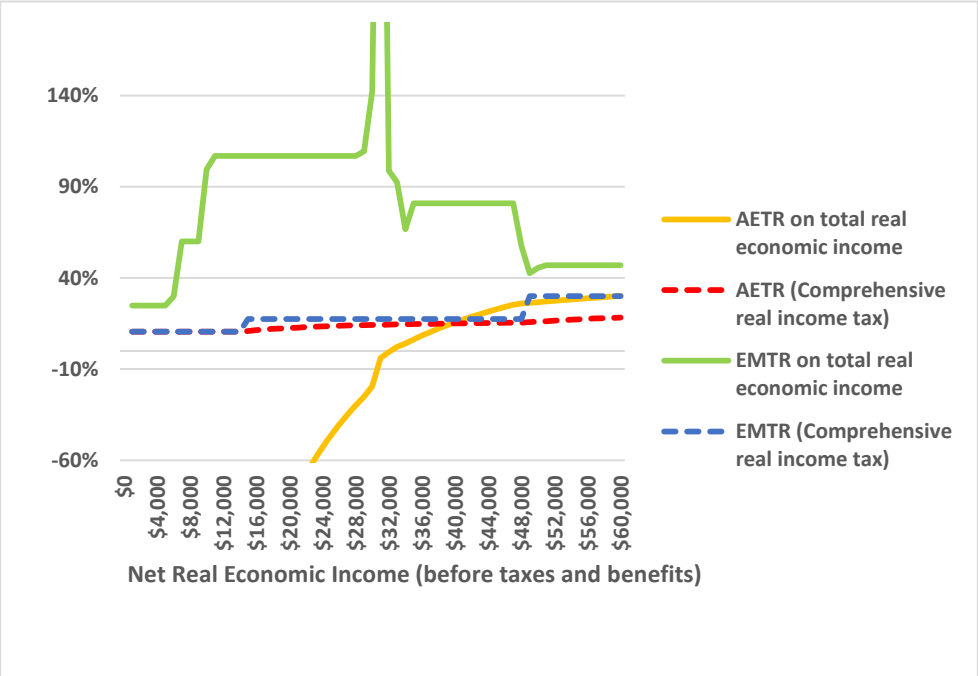
Now consider the effective tax rates that are imposed on the net real economic income of a household that comprises a sole parent, who is working at least 20 hours a week, living in rental accommodation and receiving benefits in the form of Sole Parent Support, the Accommodation Supplement, and the Family Tax Credit.[51]

Once again, as illustrated in **Figure 42**, if all of the net real economic income of such a sole parent household was subject to a comprehensive real income tax levied at statutory rates of personal income tax, that household would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 42**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income through to 17.5% on each dollar of income they earn in excess of $14,000 and up to $48,000;
- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 42**). Those average effective tax rates would range from 10.5% on net real economic incomes up to $14,000 to around 15.5% on incomes of $48,000.

[51] Such a sole parent household would not be eligible to receive other Working for Families tax credits such as the In Work Family Tax Credit (IWTC) and Minimum Family Tax Credit (MFTC), since they are receiving Sole Parent Support, which is an income tested benefit.

Figure 42: Effective tax rates imposed on the net real economic incomes of low wealth young single parents (with one child) who work at least 20 hours a week and receive Sole Parent Support, the Accommodation Supplement and Family Tax Credits



However, as a result of the government's decision not to index the income tax base for the effects of inflation and to provide such sole parent households with benefits that abate as their incomes and assets increase, they face:

- high effective marginal tax rates that increase rapidly from around 25% on low levels of net real economic income, to very high effective marginal tax rates (e.g. in excess of 100%) for those on real incomes of around $10,000 per annum (as illustrated by the solid green line) that are well in excess of the statutory marginal rates of tax that apply to their taxable income (as illustrated by the dotted blue line in **Figure 42**). The effective marginal tax rate reduces to around 58% for such households earning $48,000 of net real economic income. Once again, those very high effective marginal tax rates are the result of the combined effects of inflation and the abatement of their benefits as their incomes and assets increase:
  - Sole Parent Support benefit abates at a rate of 30% of each dollar of income they earn in between $160 and $250 per week, and at 70% for each dollar of income they earn a week in excess of $250;
  - Accommodation Supplement is not abated since they are receiving a main benefit, but it is asset tested;
  - Sole Parent Support benefits are included in their taxable income and taxed at their respective statutory marginal tax;
  - Accommodation Supplement is, in this case, abated at a rate of 25% and is also asset tested; and
  - Family Tax Credit abates at a rate of 27% of each dollar of income they earn in excess of $42,700;
- large negative average effective rates of tax (e.g. in excess of negative100%) on their low levels of real economic income (as indicated by the orange line) that are well below the average effective tax rates that would apply if they did not receive any benefits (as illustrated by the

dotted red line in **Figure 42**). Once again, those negative average effective tax rates indicate that at low levels of income, such households receive a net subsidy from the government (i.e. the benefits they receive exceed the amount of tax they are required to pay on any income they receive). These negative average effective tax rates increase rapidly as their net economic and taxable incomes increase as a result of the benefit abatement rates outlined above (i.e. become less negative and then more positive as their net real economic and taxable incomes increase). For example, the average effective tax rate increases to around 26% for such households earning $48,000 of net real economic income. In addition, it is also important to note that the average tax rates illustrated in **Figure 42** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:

- negative 277% to negative 286% for net real economic incomes of around $10,000 per annum; and
- 26% to 24% for net real incomes of around $48,000 per annum.

Summary of the results for low wealth/low income households

In summary, the effective tax rates imposed on the incomes of the representative low wealth/low economic income households considered are largely the result of the combined effects of:

- decisions made by government's regarding the design of the income tax and benefit systems, particularly their decisions to:
  - tax the nominal incomes of individuals, rather than their net real incomes, which results in "bracket creep" and individuals facing higher effective marginal rates of tax on their personal incomes than they would otherwise have faced in the absence of information, or if the government had decided to index the income tax base for the effects of inflation;
  - provide benefits to households with low incomes, which significantly reduces the average effective rates of tax imposed on their incomes (e.g. to negative average effective tax rates for households receiving the lowest incomes);
  - reduce (i.e. "abate") those benefits rapidly as their taxable incomes increase, which results in the application of much higher effective marginal rates of tax on the additional income they receive in the form of benefits to levels well in excess of the statutory marginal rates of tax imposed on their wage and salary income. It is those very high effective marginal tax rates that are responsible for the rapid rate of increase in the average effective tax rates imposed on their incomes (i.e. the rapid abatement of their benefits);
  - to provide subsidised education and health services to all individuals regardless of their levels of wealth and income, which reduces their effective tax rates;
- decisions made by individuals, opportunities (or lack of opportunities) and events over their lives that have, in combination, resulted in their current household composition and low income levels.

In particular, these results highlight the complex and challenging trade-offs that governments face in the course of designing the tax and benefit systems as a result of their potentially conflicting objectives of:

- improving distributional equity. Attempts to improve distributional equity through the introduction of more progressive statutory marginal rates of income tax, or the abatement of

benefits as income increases, can reduce the economic efficiency with which the income tax and benefit systems raise and redistribute revenue (i.e. by discouraging work, saving and investment); and

- increasing economic efficiency. Attempts to increase the economic efficiency of the tax and benefit systems (e.g. by reducing the progressivity of the income tax system) can reduce the perceived equity of those systems.

3.2.2 Effective tax rates imposed on medium wealth/medium income households

Now consider the effective tax rates imposed on the net real economic incomes of illustrative medium wealth/medium income households who earn between $48,000 and $500,000 of net real economic income each year, which as noted in section 3.1.4, include:

- single individuals, with no dependents, who rent their accommodation, earn most of their income in the form of wages and salaries and do not receive benefits in the form of Working for Families tax credits;
- working couples with two dependent children who live in their own home, earn most of their income in the form of wages and salaries as well as income from their savings and investments, and who receive Working for Families tax credits; and
- older retired couples, with no dependents, who live in their own homes and earn a higher proportion of their income in the form of income from their higher levels of savings and investment, and who receive NZ Super.

Single employed individuals, no children, living in rental accommodation, earning all of their income in the form of wages and salaries, no benefits

Consider first the effective tax rates that are imposed on the net real economic income of a medium wealth/medium income household that comprises a single individual with no dependent children, living in rental accommodation who is:

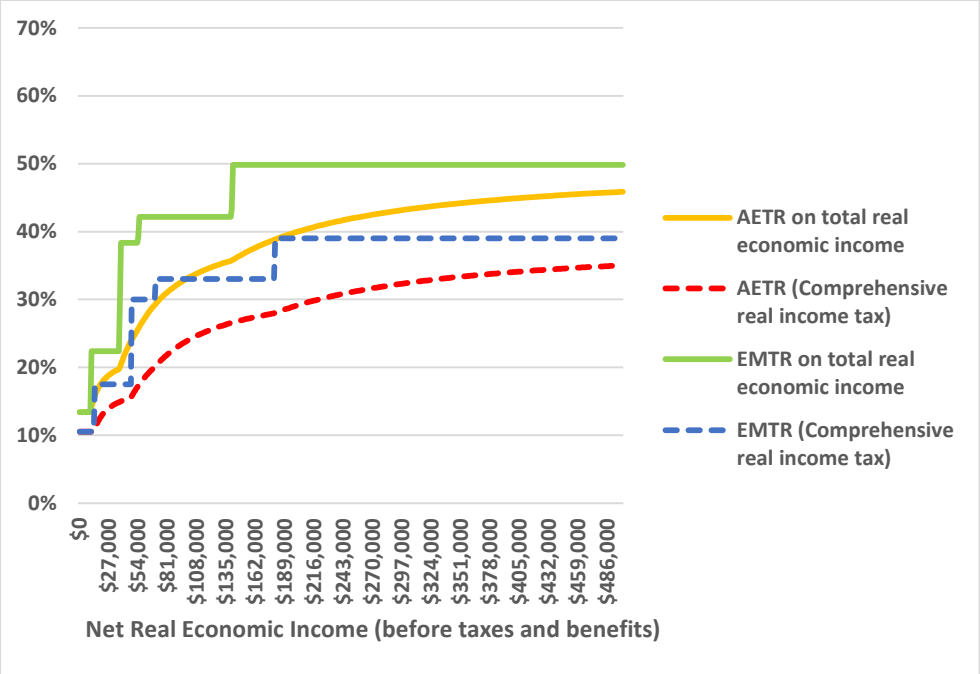
- holding most (90%) of their net wealth in the form of their human capital, which generates taxable wage and salary income;
- holding the remainder (10%) of their net wealth in the form of assets that generate non-taxable income (e.g. consumer durables, which generate non-taxable imputed rental income). Once again, it is assumed that the individual is renting their accommodation and, as a result, does not hold some of their net wealth in the form of owner-occupied housing;
- not receiving any Working for Families tax credits.

As illustrated in **Figure 43**, if all of the net real economic income of such an individual was as subject to a comprehensive real income tax levied at statutory rates of personal income tax, that individual would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 43**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income to 39% on the last few dollars of a net real economic income in excess of $180,000;

- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 43**). Those average effective tax rates would range from around 15.5% on net real economic incomes of $48,000 to around 35% on incomes of $500,000.

Figure 43: Effective tax rates imposed on the net real economic incomes of medium wealth single individuals who live in rental accommodation, earn most of their income in the form of wages and salaries and are not receiving benefits



However, as a result of the government's decision not to index the income tax base for the effects of inflation, that individual faces:

- effective marginal rates of tax on their real economic income (as illustrated by the solid green line) that are much higher than the statutory marginal rates of tax that apply to their taxable income (as illustrated by the dotted blue line in **Figure 43**). For example, such households face an effective marginal tax rate that increases from around 13% on their first few dollars of net real economic income to around 50% on their last few dollars of a $500,000 income;
- average effective rates (as indicated by the orange line) that are much higher than those that would apply under a comprehensive real income tax (as indicated by the illustrated by the dotted red line in **Figure 43**). For example, such households earning net real economic income of $48,000 would face an average effective tax rate of around 24% and if they earned $500,000 they would face an average effective tax rate of around 46%. It is also important to note, however, that the average tax rates illustrated in **Figure 43** would be lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:
  - 33% to 32.1% for net real economic incomes of around $100,000 per annum; and
  - 45.9% to 45.7% for net real incomes of around $500,000 per annum.

Working couples, living in their own home, two dependent children, earning most of their income in the form of wages and salaries and income from a Portfolio Investment Entity, receiving Working for Families tax credits

As individuals grow older, have children, and their wealth and income increases, so too does their ability to save and invest a greater proportion of their income and derive that income in forms that are either not taxable (e.g. capital gains), or are taxable at concessional rates of tax (e.g. income from savings held in Portfolio Investment Entities, or income from investments in private companies). This increased ability to earn income from other financial and physical assets and choose the form in which to derive that income enables them to reduce their effective tax rates.

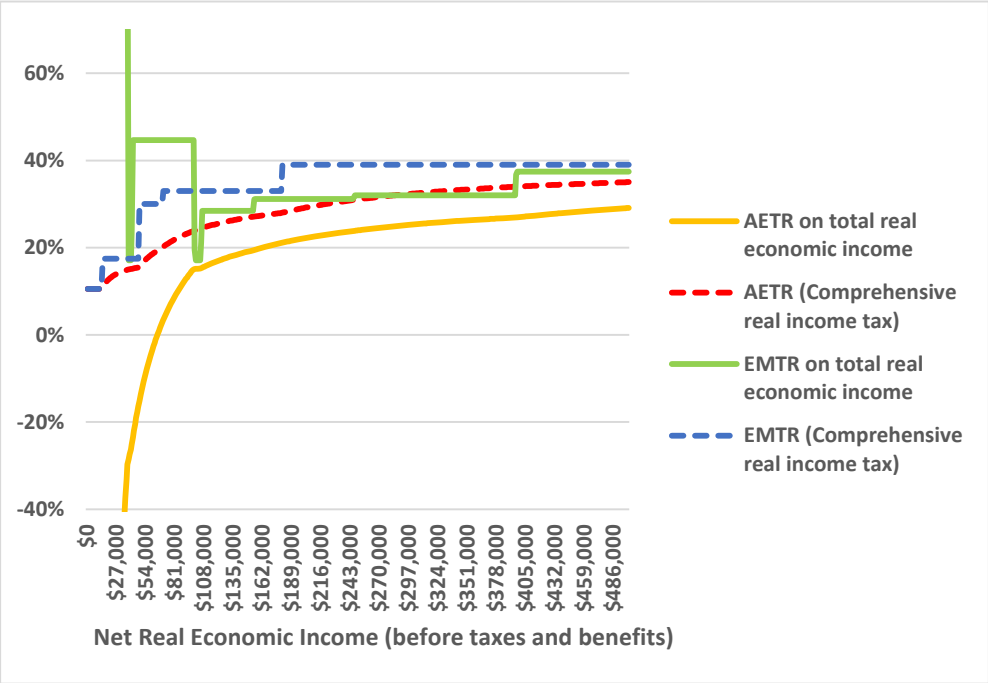
As a result, we now consider the effective tax rates that are imposed on the net real economic income of a medium wealth/medium income household that comprises a couple, with two dependent children, who live in their own home and:

- derive 80% of their net real economic income in the following forms:
  - 60% is earned in the form of wage and salary income (50% each), that is taxable at their respective statutory marginal rates of personal income tax; and
  - 40% is earned in the form of income earned through investments in a Portfolio Investment Entity that generates 50% of its return in the form of taxable income and the remaining 50% in the form of non-taxable capital gains;
- derive 20% of their net real economic income in the form of assets that generate non-taxable income (e.g. consumer durables and owner-occupied housing, which generate non-taxable imputed rental income, as well as non-taxable capital gains in the value of that housing); and
- receive Working for Families tax credits.

Once again, as illustrated in **Figure 44**, if all of the net real economic income of such a household was subject to a comprehensive real income tax levied at statutory rates of personal income tax, that household would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 44**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income to 39% on the last few dollars of a net real economic income in excess of $180,000;
- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 44**). Those average effective tax rates would range from around 15.5% on net real economic incomes of $48,000 to around 35% on incomes of $500,000.

Figure 44: Effective tax rates imposed on the net real economic incomes of medium wealth working couples with two dependent children who live in their own home, earn most of their income in the form of wages and salaries as well as income from a PIE, and receive Working for Families tax credits



However, as a result of the government's decision not to index the income tax base for the effects of inflation and to provide medium wealth/medium income households who have dependent children with benefits such as Working for Families tax credits that abate as their incomes increase, such a household faces:

- very high effective marginal rates of tax (e.g. in excess of 100%) on their lower levels of income (as illustrated by the solid green line) that are much higher than the statutory marginal rates of tax that apply to their taxable income (as illustrated by the dotted blue line in **Figure 44**). The effective marginal tax rates reduce to around 45% at real incomes of around $48,000 and to around 37% for incomes of $500,000 per annum. Those high effective marginal tax rates are the result of the combined effects of inflation and the abatement of their benefits as their incomes and assets increase:
  - Family Tax Credit and the In Work Tax Credit abate at a rate of 27% for each dollar of income above the relevant thresholds;
  - Minimum Family Tax Credit abates at a rate of 100% for each dollar earned in excess of the relevant threshold;
- effective marginal tax rates on their higher levels of income (as illustrated by the solid green line) that can be lower than the statutory marginal rates of tax that apply to their taxable income (as illustrated by the dotted blue line in **Figure 44**) due to the effects of the Working for Families Tax Credits; and
- large negative average effective rates of tax (as indicated by the orange line) on their lower levels of income, followed by average effective tax rates on their higher levels of income that are lower than those that would apply if they did not receive any benefits (as illustrated by the dotted red line in **Figure 44**). For example, such households earning net real economic income of $48,000 would face an average effective tax rate of around negative 16% and if they earned $500,000 they would face an average effective tax rate of around 29%. Those lower average

effective tax rates are the result of the benefits provided by the Working for Families Tax Credits. In addition, it is also important to note that the average tax rates illustrated in **Figure 44** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:

– 15.1% to 11.8% for net real economic incomes of around $100,000 per annum; and
– 29.1% to 28.4% for net real incomes of around $500,000 per annum.

Older retired couples, living in their own home, no dependent children, deriving most of their income from Portfolio Investment Entities and receiving NZ Super

Once individuals retire and cease to earn wage and salary income, they tend to rely on the income they derive from their savings and investments in the financial assets they own.

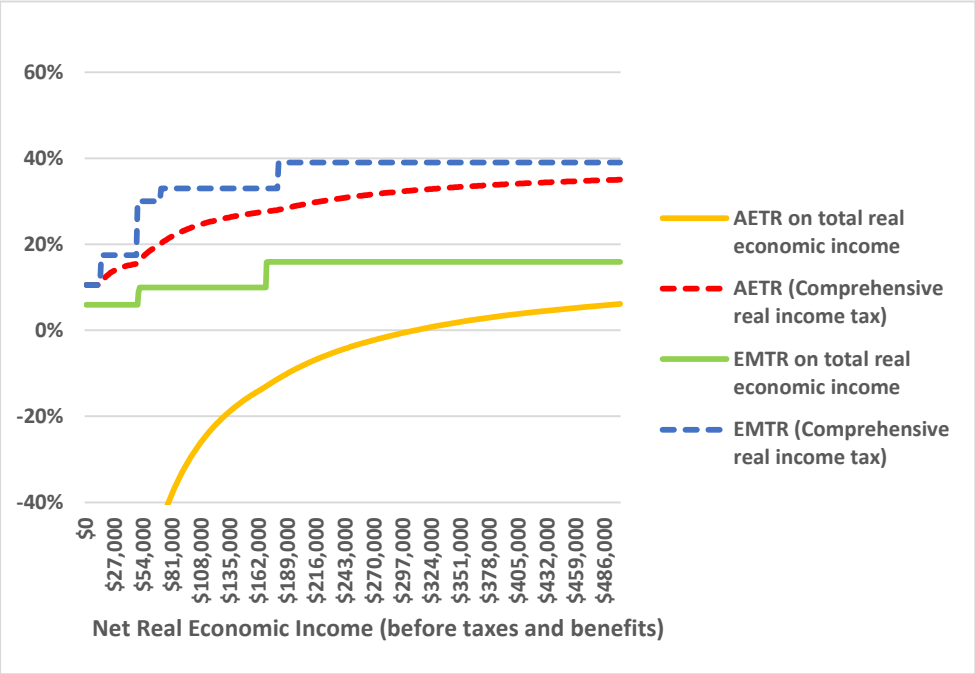
As a result, we now consider the effective tax rates that are imposed on an older retired couple who have no dependent children and own their own home, who:

- hold 80% of their net wealth in the form of their accumulated savings that are held in a PIE that generates 50% of its return in the form of taxable income and the remaining 50% in the form of non-taxable capital gains;
- hold 20% of their net wealth in the form of assets that generate income that is not taxable (e.g. imputed rental income from owner occupied housing and capital gains in the value of that housing); and
- receive NZ Super.

Once again, as illustrated in **Figure 45**, if all of the net real economic income of such a household was as subject to a comprehensive real income tax levied at statutory rates of personal income tax, that household would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 45**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income to 39% on the last few dollars of a net real economic income in excess of $180,000;
- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 45**). Those average effective tax rates would range from around 15.5% on net real economic incomes of $48,000 to around 35% on incomes of $500,000.

Figure 45: Effective tax rates imposed on the net real economic incomes of medium wealth older retired couples who own their own home and derive most of their income from the savings they hold in a PIE and NZ Super



However, as a result of the government's decision not to index the income tax base for the effects of inflation, to tax the incomes of individuals, rather than households, to concessionally tax the income that individuals earn through Portfolio Investment Entities and to provide individuals aged 65 and over with NZ Super, regardless of their wealth and income, such a household faces:

- effective marginal rates of tax on their real economic income (as illustrated by the solid green line) that that are significantly lower than the statutory marginal rates of tax that apply to their taxable income (as illustrated by the dotted blue line in **Figure 45**). For example, the effective marginal tax rate on their first few dollars of income is 6% increasing to 16% on an income of $500,000. Those lower effective marginal tax rates are the result of the concessional taxation of income earned through Portfolio Investment Entities as well as the non-taxation of capital gains in the value of assets;
- large negative average effective rates of tax on their low levels of income (as indicated by the orange line) that are significantly lower than the average effective tax rates that would apply if they did not receive any benefits (as illustrated by the dotted red line in **Figure 45**). Those low average effective tax rates increase to around negative 71% for an income of $48,000 and to around 6% on an income of $500,000. Those low average effective tax rates are the result of the combined effect of the concessional taxation of income from Portfolio Investment Entities, as well as the lump sum NZ Super subsidy, which significantly reduces the average effective tax rates imposed on lower levels of income. In addition, it is also important to note that the average tax rates illustrated in **Figure 45** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:
  - negative 29% to negative 39% for net real economic incomes of around $100,000 per annum; and

- 6.1% to 4.1% for net real incomes of around $500,000 per annum.

Summary of the results for medium wealth/medium income households

In summary, the effective rates of tax that are imposed on the net real economic incomes can differ significantly across medium wealth/medium income households due to the combined impact of the:

- government decisions:
  - not to index the income tax base to exclude the effects of inflation, which significantly increases the effective rates of tax they are legally required to pay on each additional dollar of real economic income they earn (e.g. assuming a risk adjusted real rate of return of 5%, even a low rate of inflation of 2% will result in their net taxable income being 40% higher than their actual net real economic income);
  - to tax individuals, rather than households, on the income they earn, which reduces the amount of tax that households with more than one income earner have to pay on their household income in relation to that paid by a single person earning the same amount of household income;
  - not to tax, or to concessionally tax, certain forms of income (e.g. the imputed rental income from the family home, as well as capital gains in the value of human capital and increases in the value of owner-occupied housing). This reduces the effective rates of tax imposed on the incomes of those households who choose to hold and invest a higher proportion of their savings in those assets that generate those non-taxable and concessionally taxed forms of income;
  - to provide certain forms of means tested subsidies to medium wealth households that are abated as their incomes increase, which increases the effective tax rates imposed on their income; and
  - to provide subsidised education and health services to all individuals regardless of their levels of wealth and income. Those non-means tested benefits do not alter the effective tax rates imposed on the incomes of households (i.e. since they are not abated as their incomes increase). However, they do reduce the average effective tax rates imposed on their incomes;
- decisions made by individuals regarding:
  - types of households in which they choose to reside (e.g. whether or not to marry and have children);
  - how much to work, consume, save and invest;
  - the types of assets in which to hold their savings and invest those savings;
  - the forms in which they earn that income; and
  - the entities through which they choose to save and invest (e.g. investment funds, Portfolio Investment Entities, as well as public and private companies).

In general, households at the lower end of the medium wealth/medium income spectrum who derive most of their income in the form of wages and salaries and who have lower levels of savings and investment face higher effective tax rates than those at the higher end of the spectrum. This is because those households in the upper end of the medium wealth/medium income spectrum have greater scope to earn more of their net real economic income in a form that is not taxable (e.g. the imputed rental income they derive from living in their own home and capital gains in the value of that home) or a concessionally taxed form (e.g. income they earn through Portfolio Investment Entities).

3.2.3 Effective tax rates imposed on high wealth/high income households

Finally, consider the effective tax rates imposed on the net real economic incomes of high wealth/high income households, which as noted in section 3.1.5 include:

- professional working couples with no dependents who are earning most of their income in the form of taxable wages and salaries and who are not receiving any benefits;
- self-employed couples with no dependents who are deriving most of their net economic income from their direct investment in a private company they own; and
- older retired couples with no dependents who are deriving most of their net economic income from their portfolio investment in a Portfolio Investment Entity (i.e. a PIE) and who are receiving benefits in the form of NZ Super.

Professional working couples, living in their own home, no dependents, deriving most of their income from taxable wages and salaries, not receiving benefits

Like most medium net wealth households, some high net wealth households derive a large proportion of their high net economic income from their investment, in previous years, in their human capital (e.g. through their university education).

As a result, we have estimated the effective tax rates that are imposed on the net economic income of a high net wealth household that comprises a professional work couple who have no dependents, live in their own home, are not eligible to receive any benefits, who are deriving:

- most of their net economic income in the form of the taxable income they receive in return for the labour services they provide (e.g. a couple of lawyers or accountants deriving wage and salary income from their respective employers, or the respective shares of income they derive from being part of a partnership of professionals); and
- the remainder of their net economic income in the form of:
  - taxable income from their savings (e.g. interest and dividend income); and
  - non-taxable income (e.g. the imputed rental income from owner-occupied housing and non-taxable capital gains in the value of any other physical assets they might own, such as investment properties they own).

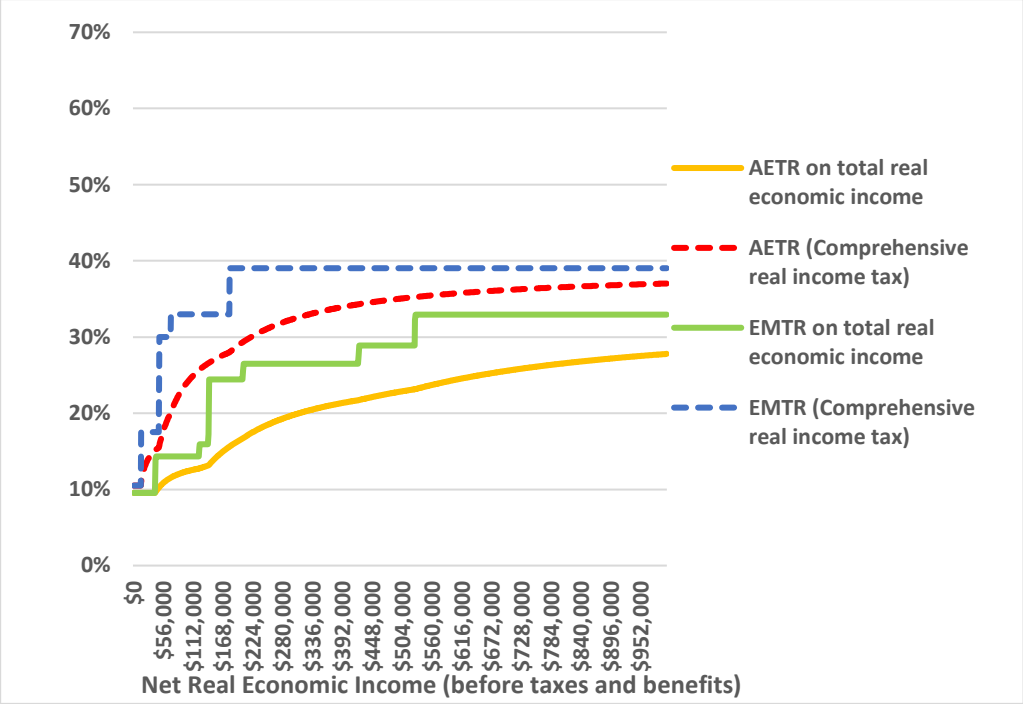
Specifically, it is assumed that professional working couple:

- derives 80% of their net economic income (50% each) in the following forms:
  - 60% of that income is assumed to come from wage and salary income that is taxable at their respective marginal tax rates;
  - 40% of that taxable income is assumed to be earned through their accumulated savings that are held in the form of units in Portfolio Investment Entities (i.e. PIEs) and subject to a final rate of tax equal to their Prescribed Investor Rates (i.e. their PIRs);
- derives 20% of their net real economic income in a form that is not taxable (e.g. the imputed rental income from owner-occupied housing and capital gains in the value of that housing).

Once again, as illustrated in **Figure 46**, if all of the net real economic income of such a household was as subject to a comprehensive real income tax levied at statutory rates of personal income tax, that household would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 46**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income to 39% on the last few dollars of a net real economic income in excess of $180,000;
- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 46**). Those average effective tax rates would range from around 35% on net real economic incomes of $500,000 to around 37.6% on incomes of $1,390,000.

Figure 46: Effective tax rates imposed on the net real economic incomes of high wealth professional working couples deriving most of their income from wages and salaries and the savings they hold in a PIE



However, as a result of the government's decision not to index the income tax base for the effects of inflation, to tax the incomes of individuals, rather than households, not to tax certain forms of income and to concessionally tax the income that individuals earn through a Portfolio Investment Entity, such a household faces:

- effective marginal rates of tax on their wage and salary income and income from savings (as illustrated by the green line) that are below the statutory marginal rates of tax that would be applied to their income if it was all taxable at their statutory marginal rates of personal tax (as indicated by the dotted blue statutory marginal tax rate schedule in **Figure 46**). For example, the effective marginal tax rate on the first few dollars of income is around 9.5%, which increases to 14% on an income of $48,000, 29% on an income of $500,000 and 33% on an income of $1,390,000. These lower effective marginal tax rates are the result of the non-taxable and concessionally taxed net economic income they derive, which is offset to some extent by the

effects of inflation. However, these high net wealth/high net economic income households still face progressive rates of tax (i.e. increasing marginal rates of tax);

- average effective rates of tax (as illustrated by the orange line) that are lower than those that would apply if all of the income they earned was taxable (as illustrated by the dotted red line in **Figure 46**). This is the result of the combined effect of the concessional taxation of income from Portfolio Investment Entities and owner-occupied housing. For example, such households face an average effective tax rate of around 9.5% on their low levels of income, increasing to around 10% on an income of $48,000, around 23% on an income of $500,000 and around 29% on an income of $1,390,000. In addition, it is also important to note that the average tax rates illustrated in **Figure 46** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:
  - 24.3% to 23.8% for net real economic incomes of around $600,000 per annum; and
  - 29.2% to 29.0% for net real incomes of around $1,390,000 per annum.

Self-employed couples, living in their own home, deriving most of their income from their direct investment in a company they own, no benefits

Other high wealth households choose to hold and invest a greater proportion of their savings in financial and physical capital, rather than human capital, particularly those assets that are expected to generate non-taxable capital gains (e.g. residential and commercial property).

Indeed, it is important to note that by deciding to apply progressive and high statutory marginal tax rates to high income individuals and not to tax, or concessionally tax, certain forms of income, governments have, in effect, decided to encourage high wealth households to hold and invest a much higher proportion of their savings in the form of assets that generate those concessionally taxed forms of income. This is because a dollar of tax saved is worth much more to a taxpayer facing the top marginal tax rate of 39% than it is to a taxpayer facing a lower marginal rate of tax. As a result, a high wealth individual facing the highest statutory marginal tax rate on their income will not only have a lot more disposable income to save and invest in concessionally taxed assets, but they will also be willing to pay higher prices for those assets. This is, of course, offset to some extent by the denial of deductions for capital losses in the value of those assets, which reduces that tax incentive to purchase assets generating non-taxable capital gains to some extent.

High wealth households can choose to either directly invest their savings by purchasing those assets, or by lending their savings to financial intermediaries who fund those investments (e.g. Portfolio Investment Entities).

For example, some high wealth households choose to invest a higher proportion of their savings directly in their privately owned businesses and derive their income from those businesses in the form of wages and salaries, directors fees and non-taxable capital gains in the value of their businesses and the assets owned by those businesses.

As a result, it is useful to consider the effective tax rates that are imposed on the net real economic incomes of households that comprise a self-employed couple who earn:

- 80% of their net real economic income in the following forms:
  - 60% of their income is derived in the form of income that is taxable at their respective statutory marginal rates of tax (e.g. directors fees, wages and salaries, dividends, interest);

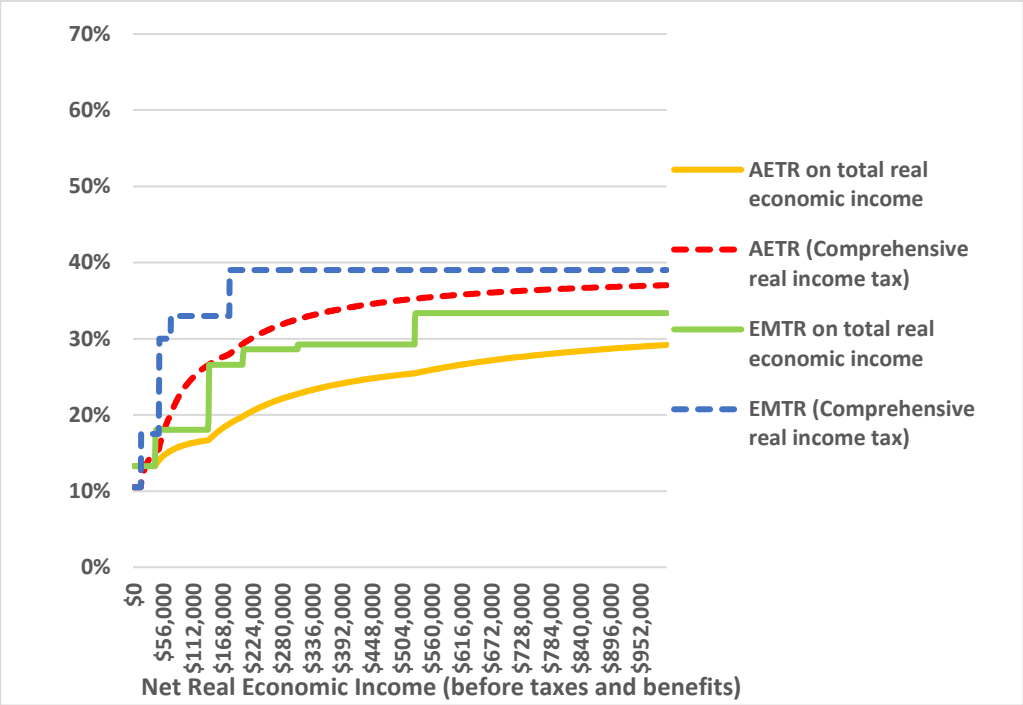
- 40% of their income is earned through other entities and taxable at statutory and effective marginal rates of tax that potentially differ from the statutory marginal rates of tax applying to their personal income. This includes the:
  - retained net income of the company (60%), which is taxable at the statutory marginal rate of company tax (28%). It is important to note, however, that as discussed further in section 3.3.4 of this report, the effective marginal rates of tax that are imposed on the income from such investments vary depending on a range of factors. As a result, for the purposes of this example, we have assumed that the income from that investment is subject to an effective rate of tax of 19% since it is estimated that:
    - a company that invests in activities other than commercial property (e.g. manufacturing) is subject to an effective marginal rate of tax of 18% on real income (i.e. assuming there is a real rate of return of 5% on the investment, the investment is 43% debt financed, the inflation rate is 2%, the tax and economic rates of depreciation are 4%, and the marginal investor is a non-resident);
    - a company that invests in commercial property is subject to an effective marginal rate of tax of 19.1% on real income (i.e. assuming there is a real rate of return of 5% on the investment, the investment is 43% debt financed, the inflation rate is 2%, the tax and economic rates of depreciation are 4%, and the marginal investor is a non-resident);
  - income that they derive from the financial assets in which they hold their savings (40%), which includes widely held superannuation fund investments and investments in Portfolio Investment Entities, which is concessionally taxed at their respective Prescribed Investor Rate (i.e. 28% for high net wealth households deriving high levels of net economic and taxable income). Once again, it is assumed that 50% of that PIE income is subject to tax;

- 20% of their net real economic income in a form that is not taxable (e.g. the imputed rental income from owner-occupied housing and capital gains in the value of that housing).

Once again, as illustrated in **Figure 47**, if all of the net real economic income of such a household was as subject to a comprehensive real income tax levied at their statutory rates of personal income tax, that household would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 47**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income to 39% on the last few dollars of a net real economic income in excess of $180,000;
- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 47**). Those average effective tax rates would range from around 35% on net real economic incomes of $500,000 to around 37.6% on incomes of $1,390,000.

Figure 47: Effective tax rates imposed on the net real economic incomes of high wealth couples deriving most of their income from a private company they own and the savings they hold in a PIE



However, as a result of the government's decision not to index the income tax base for the effects of inflation, to tax the incomes of individuals, rather than households, not to tax certain forms of income and to concessionally tax the income that individuals earn in the form of the retained earnings of a company and through a Portfolio Investment Entity, such a household faces:

- effective marginal rates of tax on their wage and salary income and income from savings (as illustrated by the green line) that are, for higher levels of income, below the statutory marginal rates of tax that would be applied to their income if it was all taxable at their statutory marginal rates of personal tax (as indicated by the dotted blue statutory marginal tax rate schedule in **Figure 47**). For example, the effective marginal tax rate on the first few dollars of income is around 13%, which increases to 18% on an income of $48,000, 29% on an income of $500,000 and 34% on an income of $1,390,000. This is the result of the non-taxable and concessionally taxed net economic income they derive, which is offset to some extent by the effects of inflation. However, these high net wealth/high net economic income households still face progressive rates of tax (i.e. increasing marginal rates of tax);
- average effective rates of tax (as illustrated by the orange line) that are, for higher levels of income, lower than those that would apply if all of the income they earned was taxable at their statutory marginal tax rates (as illustrated by the dotted red line in **Figure 47**). This is the result of the combined effect of the concessional taxation of the retained earnings of companies, as well as the income from Portfolio Investment Entities and owner-occupied housing. For example, such households face an average effective tax rate of around 13% on their low levels of income, increasing to around 14% on an income of $48,000, around 25% on an income of $500,000 and around 31% on an income of $1,390,000. In addition, it also important to note that the average tax rates illustrated in **Figure 47** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of

such subsidised services reduces the average effective tax rates on the real incomes of that household from:

- 26.4% to 25.9% for net real economic incomes of around $600,000 per annum; and
- 30.6% to 30.4% for net real incomes of around $1,390,000 per annum.

Older retired couples, living in their own home, deriving most of their income from a Portfolio Investment Entity and receiving NZ Super

Rather than directly invest in their own private companies, high net wealth households can decide instead to indirectly invest their savings in a portfolio of assets (e.g. older high net wealth individuals may decide to sell their direct investments and hold their accumulated savings in an interest in a Portfolio Investment Entity).

As a result, we have also estimated the effective marginal tax rates applying to the net economic income of a high net wealth household that comprises a couple who have no dependents, who live in their own home and are deriving:

- most of their net economic income in the form of taxable income earned through their interest in a Portfolio Investment Entity and benefits in the form of NZ Super; and
- the remainder of their net economic income in the form of non-taxable income derived from non-financial assets (e.g. the imputed rental income from owner-occupied housing and capital gains in the value of that housing).

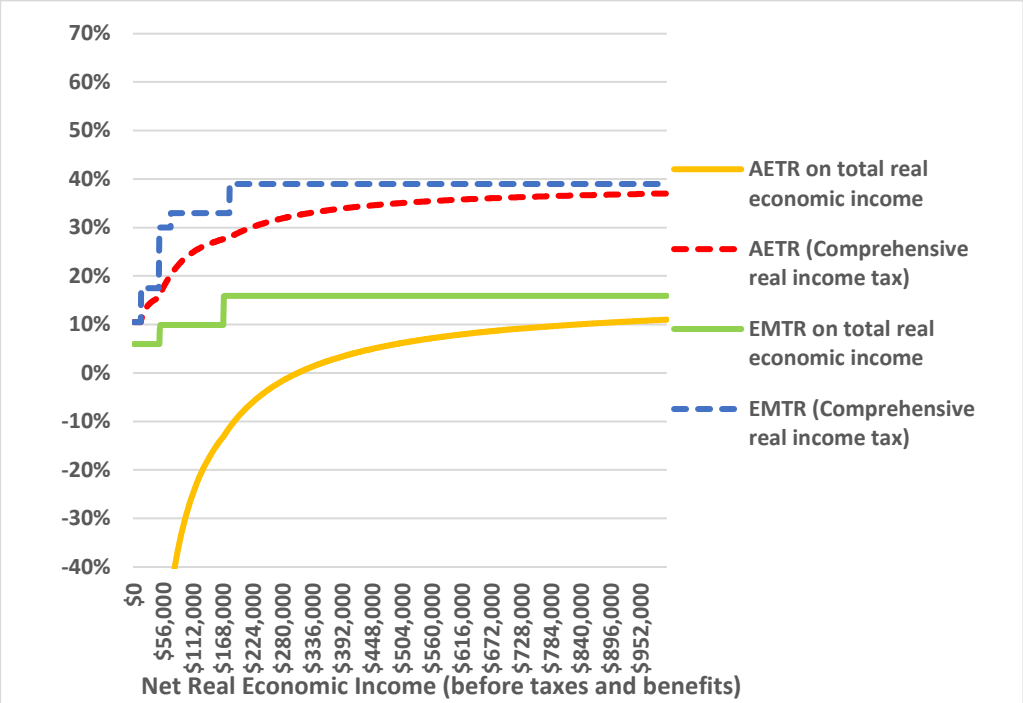
Specifically, it is assumed that those older couples:

- derive 80% of their net economic income from the savings they hold in a Portfolio Investment Entity that is taxable at their respective Prescribed Investor Rates. Once again it is assumed that 50% of the net real economic income earned by the PIE is in the form of taxable income and 50% is in a non-taxable form (i.e. capital gains);
- derive 20% of their net economic income in a form that is not taxable (e.g. the imputed rental income from owner-occupied housing and capital gains in the value of that housing);
- receive NZ Super.

Once again, as illustrated in **Figure 48**, if all of the net real economic income of such a household was as subject to a comprehensive real income tax levied at statutory rates of personal income tax, that household would face:

- effective marginal tax rates on their net real economic income that are the same as their statutory marginal rates of personal income tax (as illustrated by the dotted blue line in **Figure 48**). Those effective marginal rates of tax would range from 10.5% on the first few dollars of net real economic income to 39% on the last few dollars of a net real economic income in excess of $180,000;
- average effective tax rates on their net real economic income that are the same as the average tax rates imposed on their taxable income (as illustrated by the dotted red line in **Figure 48**). Those average effective tax rates would range from around 35% on net real economic incomes of $500,000 to around 37.6% on incomes of $1,390,000.

Figure 48: Effective tax rates imposed on the net real economic incomes of high wealth retired older couples deriving most of their income from the savings they hold in a PIE and NZ Super



However, as a result of the government's decision not to index the income tax base for the effects of inflation, to tax the incomes of individuals, rather than households, not to tax certain forms of income, to concessionally tax the income that individuals earn in through a Portfolio Investment Entity, and to provide all individuals aged 65 and over with NZ Super, regardless of their wealth and income, such a household faces:

- effective marginal rates of tax on their wage and salary income and income from savings (as illustrated by the green line) that are below the statutory marginal rates of tax that would be applied to their income if it was all taxable at their statutory marginal rates of personal tax (as indicated by the dotted blue statutory marginal tax rate schedule in **Figure 48**). For example, the average effective tax rate on their first few dollars of income is around 6% increasing to around 16% on an income of $500,000 and $1,390,000. This is the result of the subsidies provided by NZ Super and the concessional tax treatment of income from Portfolio Investment Entities and owner-occupied housing. However, these high wealth/high income households still face progressive rates of tax (i.e. increasing marginal rates of tax);
- large negative average effective rates of tax on their low levels of income (as illustrated by the orange line) that are significantly lower than those that would apply if all of the income they earned was taxable at their statutory marginal tax rates (as illustrated by the dotted red line in **Figure 48**). Those low average effective tax rates increase to around negative 71% for an income of $48,000, around 6% on an income of $500,000 and around 12% on an income of $1,390,000. This is the result of the combined effect of the subsidies provided by NZ Super, as well as the concessional tax treatment of income from Portfolio Investment Entities and owner-occupied housing. It is also important to note that the average tax rates illustrated in **Figure 48** would be even lower if we also take into account the effects of subsidised education and health services. For example, the provision of such subsidised services reduces the average effective tax rates on the real incomes of that household from:

- 7.7% to 6.1% for net real economic incomes of around $600,000 per annum; and
- 12.4% to 11.7% for net real incomes of around $1,390,000 per annum.

Summary of the results for high wealth/high income households

In summary, the effective tax rates imposed on the incomes of the illustrative high net wealth/high net economic income households considered once again differ across households, largely as a result of the combined effects of:

- decisions made by governments regarding the design of the income tax and benefit systems, particularly their decisions:
  - not to index the income tax system to exclude the effects of inflation, which tends to increase the effective tax rates imposed tax the nominal incomes of individuals, rather than their net real incomes, which results in "bracket creep" and individuals facing higher effective marginal rates of tax on their personal incomes than they would otherwise have faced in the absence of information, or if the government had decided to index the income tax base for the effects of inflation;
  - to impose higher statutory effective marginal rates of tax on those individuals that derive higher levels of income, including the recent decision to raise the top statutory marginal rate to 39%;
  - to reduce the adverse effects that those high statutory marginal rates of income tax have on saving and investment decisions by concessionally taxing the income derived from certain types of assets (e.g. by applying lower statutory PIR rates of marginal tax to income from PIEs); and
  - to provide subsidised education and health services to all individuals regardless of their levels of wealth and income;
- decisions made by individuals, opportunities and events over their lives that have, in combination, resulted in their current high levels of net wealth and net economic income.

In particular, the results highlight the complex and challenging trade-offs that governments face in the course of designing the income tax systems as a result of their potentially conflicting objectives of:

- improving distributional equity. Attempts to improve distributional equity through the introduction of more progressive statutory marginal rates of income tax, or the abatement of benefits as income increases, can reduce the economic efficiency with which the income tax and benefit systems raise and redistribute revenue (i.e. by discouraging work, saving and investment); and
- increasing economic efficiency. Attempts to increase the economic efficiency of income tax system (e.g. by reducing the tax rates imposed on the incomes that individuals derive from their savings they hold in PIEs) can reduce the perceived equity of the income tax system.

3.3 Effective marginal tax rates on income from savings and investment

The amount of tax, and average effective tax rate that individuals and households are legally required to pay on their economic income is equal to the sum of the amount of tax that they are legally required to pay on each dollar of economic income they earn (i.e. the effective marginal rate of tax imposed on each dollar of that economic income).

This means that, in order to determine the amount of tax and average effective tax rate that individuals and households are legally required to pay on their economic income, it is necessary to estimate the effective marginal tax rates that they are legally required to pay on each dollar of income they earn from each of the economic activities in which they engage. These economic activities include:

- working, which generates wage and salary income that is taxable at different effective marginal rates of tax due to differences in the:
  - eligibility of individuals and households for social welfare benefits and the magnitude of the benefits they receive (e.g. due to differences in their ages, taxable incomes, numbers of dependent children, etc); and
  - tax treatment of labour income and expenditure for tax purposes, such as differences in the:
    - statutory marginal rates of tax that apply to income from labour;
    - exemption of certain forms of labour income from tax (e.g. "non-market" services supplied by members of the household, such a non-paid cleaning, child minding and aged care services);
    - non-deductibility of certain expenses incurred in the course of supplying labour services (e.g. the non-deductibility of expenses incurred by employees);
  - rates at which those benefits are abated as their incomes increase;
- saving, which generates different forms of economic income that are subject to different effective marginal rates of tax due to differences in the:
  - types of assets in which those savings are held, which include debt instruments (e.g. deposits in bank accounts) and equity instruments (e.g. shares in companies);
  - tax treatment of the income and expenditure derived and incurred in relation to those assets, such as the differences in the:
    - statutory marginal rates of tax that apply to different forms of income earned through different types of entities (e.g. companies and trusts);
    - timing of recognition of that income and expenditure (e.g. as it is received, or as it accrues);
- investing, which also generates different forms of economic income that are subject to different effective marginal rate of tax due to differences in the:
  - types of economic activities and assets in which those investments are made (e.g. in companies engaged in manufacturing, retail sales of goods and services, or the production of agricultural goods and services); and
  - tax treatment of the income and expenditure derived and incurred in relation to those investments (e.g. due to differences in the tax treatment of the debt and equity finance that is used to fund that investment, differences in the timing of recognition of that income

and expenditure, differences between statutory and economic rates of depreciation, and differences in the proportion of the net income derived by the company that is distributed to shareholders rather than retained in the company to finance additional investment).

This is, of course, the reason why, over the last 30 years, New Zealand tax officials, in conjunction with the academic communities both in New Zealand and overseas, have been working on the development of better measures of the effective marginal tax rates that are imposed on the incomes that individuals and companies earn from their savings and investment that take into account a greater range of complexities of New Zealand's income tax system (e.g. dividend imputation).

As discussed further in section 4, the development of those better estimates of the effective marginal tax rates imposed on income from savings and investment is also important to develop a better understanding of both:

- the extent to which the complex features of the income tax and benefit systems unintentionally distort the decisions of individuals and companies to save and invest; and
- how capital markets adjust to those changes in savings and investment decisions and shift some of the actual economic burden of taxes and benefits onto individuals other than those legally liable to pay those taxes and entitled to receive those benefits.

As outlined in section 3.1.1, as the wealth of individuals and households increases, so too does the range of:

- assets in which they can choose to hold their higher levels of savings (i.e. the different "savings vehicles" in which they choose to hold their wealth);
- economic activities in which they choose to engage and assets in which they choose to invest;
- different entities through which they choose to legally structure their savings and investments (e.g. private companies, trusts, etc);
- different forms in which they derive their economic income (e.g. receipts of interest or dividend income, as well as accrued and realised capital gains in the values of their assets);
- different average and marginal effective rates of tax that are imposed on their incomes; and
- different overall amounts of tax they pay on the total economic income they earn.

As a result, in order to gain a better understanding of the reasons why higher wealth individuals and households pay different amounts of tax and different effective rates of tax on their economic income, the remainder of this section:

- defines some of the key terms we will be using to discuss the effects that an income tax has on saving and investment decisions (section 3.3.1);
- illustrates how effective marginal tax rates seek to estimate the extent to which the income tax system unintentionally distorts the returns that savers and investors derive from their savings and investment (section 3.3.2); and
- presents estimates of the effective marginal rates of tax imposed on the incomes of savers and investors in New Zealand. This includes:
  - OECD estimates of the effective marginal tax rates that New Zealand imposes on the incomes that savers derive from their savings (section 3.3.3); and
  - OECD and New Zealand estimates of the effective marginal tax rates that are imposed on the incomes of investors (section 3.3.4) under the assumptions that the marginal investor is either a non-resident, or a resident, of New Zealand.

3.3.1 Definition of savings and investment

Before proceeding to outline estimates of the effective marginal tax rates applying to savings and investment, it is useful to clarify the definitions of the terms that we will be using to discuss those effects.

For the purposes of this report, we use the term:

- "savers" to refer to those individuals and businesses that choose to retain (i.e. "save", rather than consume) a part of the income they derive in a year to finance increased expenditure in future years;
- "saving" to refer the activity of creating financial assets, which involves deciding:
  - how much of the income that is earned in the current year should be set aside to finance increased expenditure in future years, rather than spent in the current year (i.e. the level of saving); and
  - the form in which that money should be held (i.e. the pattern of saving, which involves determining the type of financial arrangement they decide to use to hold that money until it is required in future years);
- "savings" to refer to the stock of financial assets that individuals and business accumulate as a result of their saving activities both in the current and prior income years (e.g. the accumulated value of their deposits in banks and other financial institutions, interests in superannuation funds and trusts, as well as shareholdings in both private and public companies);
- "return on saving", or "income from saving", to refer to the amount of money (e.g. interest and dividends received, as well any accrued or realised gains in the value of those financial arrangements) that savers derive each year from their savings to compensate them for the:
  - opportunity cost of their saving activity (i.e. the next highest rate of return that they could have derived had they either spent their savings in the current period, or held those savings in the form of other alternative financial arrangements); and
  - risks associated with holding their savings in different types of financial assets, which differ across those alternative types of savings;
- "effective marginal tax rate on savings" to refer to a measure of the extent to which the income tax and/or benefit systems distorts the after tax return on savings away from what it would have been in the absence of those taxes and benefits;
- "investors" to refer to those entities involved in the process of creating and maintaining capital assets (i.e. human capital, intangible capital, and physical capital such as land and physical capital such as buildings, machinery and equipment) using either their own savings, and/or the savings of other New Zealand residents and/or non-residents to finance that investment. All individuals are engaged in the activity of investment to varying degrees. Low and middle income individuals typically save in their early years by delaying their entry into the workforce to invest in their education (i.e. invest in human capital). In addition, an increasing number of low and middle income individuals and households are building and renovating their own homes and rental properties. High income individuals also often own and control their own firms, which engage in investment in a wide range of capital assets (e.g. commercial property, manufacturing facilities and software firms);

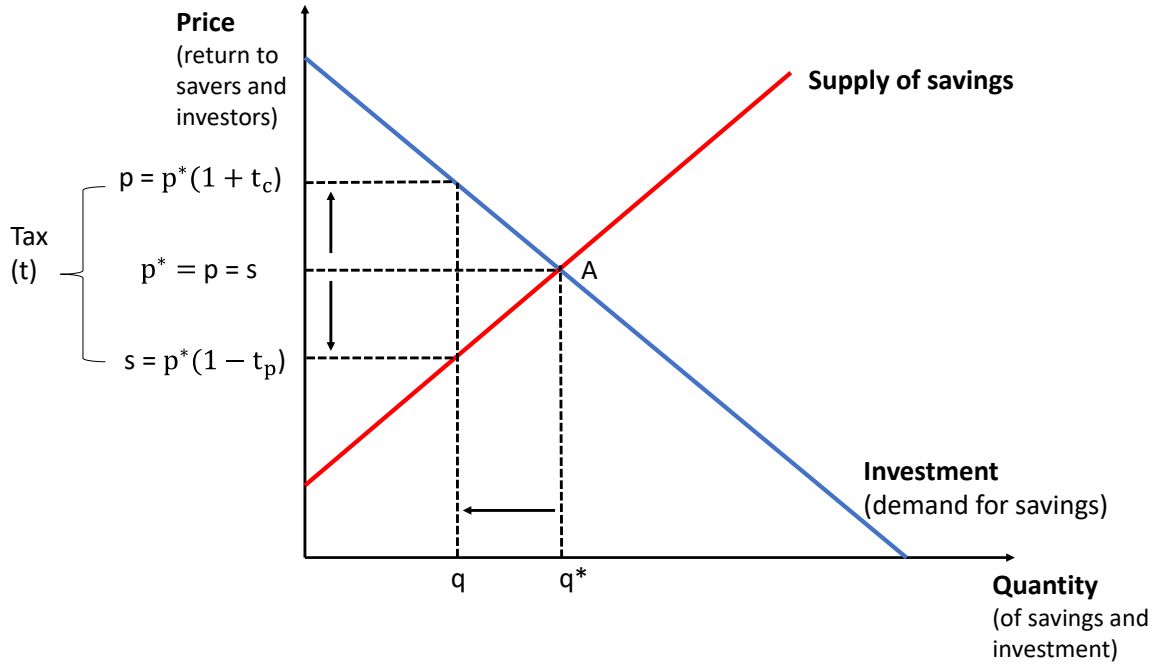
"investment" to refer to the activity of creating real assets (i.e. the process of capital formation), which involves deciding:
  - how much to invest each year (i.e. the level of investment); and
  - the types of real assets in which to invest (i.e. the pattern of investment);
- "investments" to refer to the stock of real assets that individuals and business accumulate as a result of their investment activities both in the current and prior income years (e.g. the accumulated value of the real assets that they fully or partly own, which include physical assets such as land, buildings and equipment, as well as human capital);
- "return on investment", or "income from investment", to refer to the amount of money (e.g. rental income that individuals and businesses receive and/or accrue, as well as any capital gains they accrue and/or realise as a result of their ownership of those assets) that investors derive each year from their investors to compensate them for the:
  - opportunity cost of their investment activity (i.e. the next highest rate of return that they could have derived had they either spent those savings in the current period, or invested those savings in an alternative type of real asset); and
  - risks associated with investing in different types of real assets, which differ across those alternative types of investments;
- "effective marginal tax rate on investment" to refer to a measure of the extent to which the income tax and/or benefit systems distort the after-tax rate of return on investment away from what it would have been in the absence of those taxes and benefits.

3.3.2 Effects of an income tax on savings and investment

Figure 49 provides a simple illustration of:

- how an income tax that is levied on the incomes derived by savers and investors in a closed economy (i.e. an economy where there is no international trade in goods and services, including financial and physical capital) unintentionally:
  - reduces the rates of return that savers and investors derive on their savings and investment, thereby reducing their willingness to save and invest; and
  - distorts the relative rates of return they derive from their investment, thereby distorting their patterns of saving and investment;
- how effective tax rates:
  - seek to estimate the extent to which the income tax system reduces and distorts the rates of return received by savers and investors;
  - but do not provide all of the information required to determine the extent to which those distorted rates of return unintentionally reduce levels, and distort patterns, of saving and investment and in so doing pass on some of the actual economic burden of the income tax onto other individuals in the community.

Figure 49: Effects of an income tax on savings and investment in a closed economy



Initially, it is assumed that the capital market in that closed economy is in equilibrium at point A where the quantity of savings supplied by savers (as illustrated by the solid red supply of savings function) is equal to the quantity of savings demanded by investors to finance their investments (as illustrated by the solid blue investment demand for savings function). At that equilibrium point A, the:

- rate of return at which savers are willing to supply an additional unit of savings (i.e. s, which is equal to the rate of return they need to compensate them for the opportunity cost of their decision to save) is equal to the rate of return that investors are willing to pay for that additional unit of savings to finance additional investment (i.e. p, which reflects the rate of return they expect to derive from investing that additional unit of savings); and
- quantity of savings that savers are willing to supply at that prevailing market rate of return (i.e. q*) is equal to the quantity of savings that investors are willing to purchase at that prevailing market rate of return (i.e. q*).

Now consider the effects of imposing an income tax at a marginal rate of tax t on the incomes that savers derive from their savings and investors derive from their investments. This unintentionally:

- drives a tax wedge (i.e. t) between the post-tax rate of return received by savers (i.e. s) and the gross of tax return required by investors (i.e. p). This tax wedge comprises the:
  - tax wedge that the income tax drives between the post-tax rate of return received by savers and the return they derived before the introduction of the income tax (i.e. (s-p*) = τ_p which is the personal marginal tax rate on the income of savers); and
  - tax wedge that the income tax drives between the gross of tax rate of return that investors need to derive on their investments after the income tax is introduced and the rate of return they needed to derive on their investment before that income tax was introduced (i.e. (p*-p) = τ_c which is the corporate marginal tax rate on income from investment);

- encourages savers and investors to:
  - reduce their levels of saving and investment (i.e. from q* to q); and
  - alter their patterns of saving and investment, since different savings vehicles and investments are subject to different effective marginal rates of tax; and
- in so doing, passes some of the economic burden onto other individuals in the community, which is discussed further in section 4.1.2 of this report.

Effective marginal tax rates seek to provide estimates of the extent to which the income tax system distorts the rates of return received by savers and investors in relation to the rates of return they would have received in the absence of that income tax. Specifically:

- effective marginal tax rates on savings seek to provide estimates of the extent to which income tax reduces the after tax rates of return that savers derive from their different types of "savings vehicles" in relation to their pre-tax rates of return (i.e. EMTR on savings = (s-p*)/p*); and
- effective marginal tax rates on investment seek to provide estimates of the extent to which the tax system increases the user cost of capital for different types of investments in relation to the pre-tax user cost of capital (i.e. EMTR on investment = (p-p*)/p*).

However, EMTRs do not provide information on the extent to which the income tax system reduces the level, and distorts the pattern, of savings and investment and in so doing, passes on some of actual economic burden of the income tax onto other individuals. Rather, as discussed further in section 4.1.2, in order to determine the ultimate economic incidence of the income tax, additional information is required, including information on how sensitive saving and investment decisions are to those effective marginal tax rates (i.e. the relative price elasticities of the supply of savings and the investment demand for that savings).

In addition, as noted by Fullerton (1999), the effective marginal tax rate is a "forward-looking" measure of the extent to which the tax system provides an incentive to invest in a particular asset that may bear little relation to the average effective tax rate, which measures the amount of actual tax paid as a proportion of the actual income from capital in that year:

> The marginal effective tax rate is a forward-looking measure that summarizes the incentives to invest in a particular asset as provided by complicated tax laws. It may bear little relation to an industry's "average effective tax rate," defined as the actual tax paid in a particular year divided by the actual capital income in that year, because that measure averages over taxes on income from all past investment (minus credits on that year's new investment).[52]

3.3.3 Effective marginal tax rates on income from savings

The most detailed information on the effective marginal tax rates that are imposed on the savings of households in New Zealand and other OECD countries is outlined in the *Taxation of Household Savings* study published by the OECD (2018), which provides estimates of the EMTRs applying to the income that individuals derive from a range of different types of saving vehicles, including:

- bank deposits;
- corporate and government bonds;

[52] Fullerton, D. (1999). Marginal Effective Tax Rate, in *The Encyclopedia of Taxation and Tax Policy* (1999 Urban Institute Press), edited by J.J. Cordes, R.D. Ebel, and J.G. Gravelle.

- equities (i.e. shares);
- investment fund assets (i.e. marketable collective investment vehicles);
- private pensions;
- deposits in individual tax-favoured savings accounts;
- equity-financed owner-occupied residential property;
- equity-financed rental residential property;
- debt-financed owner-occupied residential property; and
- debt-financed rental residential property.[53]

The methodology used by the OECD to estimate those effective marginal tax rates on savings, which is set out in detail in Annex A of their study, is based on the method developed by King and Fullerton (1984). This involves estimating the extent to which the tax system proportionally alters the post-tax rate of return in relation to the pre-tax rate of return generated by that asset. Specifically, it involves:

- assuming a fixed pre-tax real rate of return on savings;
- calculating the minimum post-tax real rate of return that the saver would need to derive for that asset to make the investment worthwhile. This post-tax rate of return on the asset is estimated by explicitly modelling the stream of income generated by the assets, and taxes payable on that income, over time; and
- calculating the effective marginal tax rate on the income generated by the asset by:
  - taking the difference between the pre and post-tax rates of return on the asset; and
  - expressed that difference as a proportion of the pre-tax rate of return on the asset (i.e. dividing that difference by the pre-tax rate of return on the asset).

As outlined in **Table 15**, the income that New Zealand savers derive from different types of savings vehicles is subject to different tax treatment due to differences in the:

- timing of recognition of the income derived from, and expenditure incurred in relation to, those financial assets. Specifically, savers can be taxed on the income they derive, and expenditure they incur, in relation to a financial asset:
  - on their acquisition of the asset;
  - over the period of time that they hold (i.e. own) the asset. Like Australia, but unlike most other OECD countries, New Zealand recognises the income and expenditure derived and incurred in relation to certain financial assets as it accrues, rather than when it is realised. This accrual recognition of income and expenditure, however, is limited to certain financial arrangements (i.e. debt and near debt instruments) and to certain taxpayers (i.e. those who derive $100,000 or more of income from those financial arrangements or hold $1 million of more in value of those financial arrangements); and
  - on disposal of the asset. Unlike most other OECD countries, New Zealand does not tax the capital gains realised on the sale of assets held on "capital" account (e.g. shares held by individuals);

[53] OECD (2018), *Taxation of Household Savings*, OECD Tax Policy Series, No. 25, OECD Publishing, Paris. https://www.oecd-ilibrary.org/taxation/taxation-of-household-savings_9789264289536-en

- statutory marginal rates of tax that are imposed on the incomes that individuals earn from these savings vehicles, which can differ:
  - across those assets due to the concessional tax treatment of certain forms of savings (e.g. savings for retirement); and
  - across individuals, due to differences in the personal statutory marginal rates of tax that are imposed on the incomes of individuals.

The estimated effective marginal rates of tax that are imposed on the incomes that individuals earn from their different types of savings vehicles in New Zealand, which are set out in **Table 16** below, show how those EMTRs differ depending on the:

- income of the individual, which influences the statutory marginal rate of tax that is imposed on their income. EMTRs are presented for:
  - low-income individuals (i.e. individuals earning 67% of the average wage);
  - average income individuals (i.e. individuals earning 100% of the average wage); and
  - high income individuals (i.e. individuals earning 500% of the average wage);
- real rate of return generated by the asset (i.e. 2%, 3% and 4%);
- inflation rate (i.e. the actual current rate of inflation as well as OECD average rate of inflation, which is used to facilitate comparisons in EMTRs across countries). In both cases, the assumed rate of inflation used is an average of inflation rates over the period 2011 to 2016; and
- length of time over which the asset is held.

As outlined in **Table 16**, there are significant differences in the effective marginal rates of tax imposed on the incomes of savers in New Zealand:

- the highest effective marginal rates of tax are imposed on high income savers who:
  - face the highest statutory marginal rates of tax on their income from savings (i.e. those with incomes that are five times more than average income);
  - hold their savings in assets that yield relatively low real rates of return that is taxed as it accrues (e.g. bank deposits and bonds). For example, a high income individual who holds their savings in bank deposits yielding a real rate of return of 2% faces a 51.2% EMTR on their income from savings in the presence of inflation, but only 33% (i.e. the top statutory marginal tax rate at that time) in the absence of inflation;
- the lowest effective marginal rates of tax are imposed on low income savers who:
  - face the lowest statutory marginal rates of personal tax on their income from savings (i.e. those earning incomes that are 67% of average income);
  - hold their savings in the form of expected to generate most of their income in the form of either non-taxable capital gains, or capital gains that are only taxable on the sale of those assets after a longer holding period (i.e. due to the deferral of tax on that income).

Table 15: Different tax treatment of the income from different saving vehicles in New Zealand (2016)

FORM OF SAVING	TAX TREATMENT								
	ACQUISITION OF ASSET			HOLDING OF ASSET			DISPOSAL OF ASSET		
	Personal income tax treatment			Personal income tax	Other taxes		Personal income tax or capital gains tax		
	Interest expense deductible	Amount of acquisition deductible	Transaction tax	Income from asset	Income from asset	Value of asset	Realised income from asset	Original value of asset	Capital gains
Bank accounts	N	N	N	Y	N	N	N	N	NA
Bonds	Y	N	N	Y	N	N	N	N	Y (accrual rules)
Shares	Y	N	N	Y	N	N	N	N	N
Investment funds	Y	N	N	N	Y (PIE regime)	N	N	N	N
Private pensions	N	N	N	Y	N	N	N	N	NA
Tax-favoured savings accounts	NA	NA	NA	NA	NA	NA	NA	NA	NA
Owner-occupied residential property	N	N	N	N	N	Y	N	N	N
Rented residential property	Y	N	N	Y	N	Y	N	N	N

Notes:

New Zealand taxes income and expenditure in relation to bonds (i.e. debt instruments) on a realisations basis at the relevant statutory marginal tax rate of the investor if they earn less than $100,000 of income from financial arrangements or $1 million in value held in financial arrangements, otherwise income and expenditure in relation to financial arrangements is subject to the accrual rules, which recognises that interest income and expenditure as it accrues.

Under the Portfolio Investment Entity (PIE) regime, income earned from the PIE is attributed to the investor each year and taxed annually at their "prescribed investor rates" (i.e. at their relevant personal income tax rates). The final distribution to the investor is not taxed.

On 1 July 2007, the NZ Government introduced KiwiSaver, which is government subsidised, tax favoured, retirement savings account for residents aged 18 to 65

Source: OECD (2018).

Table 16: Different EMTRs imposed on income from different saving vehicles (2016)

	EFFECTIVE MARGINAL TAX RATES ON INCOME FROM SAVINGS																	
Income of saver (% of average wage)	Low income individual (67% of average wage)						Average income individual (100% of average wage)						High income individual (500% of average wage)					
Real rate of return	2%	3%		4%			2%	3%		4%			2%	3%		4%		
Inflation	Actual	Actual	0%	Actual	Actual	OECD Average	Actual	Actual	0%	Actual	Actual	OECD Average	Actual	Actual	0%	Actual	Actual	OECD Average
Holding period:																		
Average	5	6 months	5	10	5		5	6 months	5	10	5		5	6 months	5	10	5	
Pensions and property	20	10	20	30	20		20	10	20	30	20		20	10	20	30	20	
Savings vehicle:																		
Bank deposits	27.1%	23.9%	17.5%	23.9%	22.3%	26.8%	46.5%	41.0%	30.0%	41.0%	38.3%	46.0%	51.2%	45.1%	33.0%	45.1%	42.1%	50.6%
Corporate bonds:																		
issued at par	27.1%	23.9%	17.5%	23.9%	22.3%	26.8%	46.5%	41.0%	30.0%	41.0%	38.3%	46.0%	51.2%	45.1%	33.0%	45.1%	42.1%	50.6%
issued at discount	26.4%	23.8%	17.2%	22.4%	21.3%	25.8%	45.4%	40.9%	29.3%	38.7%	36.8%	44.4%	49.9%	44.9%	31.4%	42.6%	40.5%	48.9%
Government bonds:																		
issued at par	27.1%	23.9%	17.5%	23.9%	22.3%	26.8%	46.5%	41.0%	30.0%	41.0%	38.3%	46.0%	51.2%	45.1%	33.0%	45.1%	42.1%	50.6%
issued at discount	26.4%	23.8%	17.2%	22.4%	21.3%	25.8%	45.4%	40.9%	29.3%	38.7%	36.8%	44.4%	49.9%	44.9%	31.4%	42.6%	40.5%	48.9%
Shares:																		
100% of company profit distributed	-16.3%	-14.4%	-10.5%	-14.4%	-13.4%	-16.1%	3.1%	2.7%	2.0%	2.7%	2.6%	3.1%	7.8%	6.8%	5.0%	6.8%	6.4%	7.7%
50% of company profit distributed	-8.1%	-7.2%	-5.3%	-7.2%	-6.7%	-8.1%	1.6%	1.4%	1.0%	1.4%	1.3%	1.5%	3.9%	3.4%	2.5%	3.4%	3.2%	3.8%
0% of company profit distributed	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Investment funds	27.1%	23.9%	17.5%	23.9%	22.3%	26.8%	43.4%	38.3%	28.0%	38.3%	35.7%	42.9%	43.4%	38.3%	28.0%	38.3%	35.7%	42.9%
Pension funds:																		
deductible contributions	27.1%	23.9%	17.5%	23.9%	22.3%	26.8%	43.4%	38.3%	28.0%	38.3%	35.7%	42.9%	43.4%	38.3%	28.0%	38.3%	35.7%	42.9%
non-deductible contributions	27.1%	23.9%	17.5%	23.9%	22.3%	26.8%	43.4%	38.3%	28.0%	38.3%	35.7%	42.9%	43.4%	38.3%	28.0%	38.3%	35.7%	42.9%
Tax-favoured savings accounts	na	na	17.5%	na	na	na	na	na	30.0%	na	na	na	na	na	33.0%	na	na	na
Residential property:																		
Equity financed																		
Owner-occupied	30.0%	20.0%	20.0%	20.0%	15.0%	20.0%	30.0%	20.0%	20.0%	20.0%	15.0%	20.0%	30.0%	20.0%	20.0%	20.0%	15.0%	20.0%
Rented	48.4%	35.2%	35.2%	35.2%	28.6%	35.2%	61.5%	46.0%	46.0%	46.0%	38.3%	46.0%	64.7%	48.6%	48.6%	48.6%	40.6%	48.6%
Debt financed																		
Owner-occupied	53.1%	41.0%	36.2%	38.4%	32.5%	40.7%	69.6%	56.1%	47.8%	51.6%	44.9%	55.5%	73.6%	59.7%	50.5%	54.8%	47.9%	59.0%
Rented	48.4%	35.2%	35.2%	35.2%	28.6%	35.2%	61.5%	46.0%	46.0%	46.0%	38.3%	46.0%	64.7%	48.6%	48.6%	48.6%	40.6%	48.6%

Source: OECD (2018).

3.3.4 Effective marginal tax rates on income from investment

As discussed further below, the effective marginal rates of tax that are imposed on the income that investors derive from their different forms of investment depend on whether the marginal investor is either:

- a non-resident of New Zealand for tax purposes and subject to tax on only the income they derive from New Zealand sources; or
- a resident of New Zealand for tax purposes and subject to tax on their worldwide income.

EMTRs when the marginal investor is not a New Zealand resident

Consider first the effective marginal tax rates that are imposed on income from investment when the marginal investor is not a resident of New Zealand for tax purposes.

As discussed further below, there are three main official sources of such estimates of the effective marginal rates of tax imposed on income from investment:

- New Zealand Treasury EMTR estimates – 1972 to 1998;
- OECD EMTR estimates – 2017 to 2020; and
- New Zealand Inland Revenue cost of capital and EMTR estimates – 2000 to 2020.

New Zealand Treasury EMTR estimates – 1972 to 1998

In order to inform the extensive process of domestic and international tax reform in New Zealand over the late 1980s and early 1990s, tax policy officials from the New Zealand Treasury developed and applied an adapted version of the user cost of capital framework developed by King and Fullerton (1984) to estimate the effective marginal tax rates applying to different savings vehicles and forms of investment under the assumption that the marginal investor is a non-resident.[54]

The King-Fullerton methodology is based on the "neoclassical" investment model pioneered by Jorgenson (1963) and Hall and Jorgenson (1967), under which it is assumed firms invest in capital to the point where the marginal product of capital equals the user cost of capital.[55]

[54] King, M. A. and Fullerton, D. (1984), *The Taxation of Income from Capital*. Chicago: University of Chicago Press. The original King Fullerton model was developed for a "classical" income tax system that involves the "double" taxation of investment income – once when it is earned by the company and again when it is distributed as dividends to shareholder without any credits for the company tax already paid on that income. As a result, it required modification so that it could be applied to New Zealand's income tax system which provides individuals earning dividend income with an "imputation credit" for the income tax already paid by the company on that investment income. This imputation credit can then be used by the shareholder to reduce the amount of personal income tax that they would otherwise have had to pay on their dividend income.

[55] Jorgenson, D. (1993), "Introduction and Summary", in D.W. Jorgenson and R. Landau (eds) *Tax Reform and the Cost of Capital: An International Comparison, Brookings*, Washington D.C

Over the 1990s, that adapted version of the "King-Fullerton" model was then subsequently:

- further developed and documented by Benge (1997);[56]
- documented and applied by ex-New Zealand Treasury tax policy officials working for Arthur Andersen[57] and Ernst & Young,[58] to provide advice to both government and private sector clients on a range of domestic and international tax issues; and
- documented and applied by Moes (1999) to estimate the EMTRs on income from capital in New Zealand over the period 1972 to 1998.[59] The formulae used to estimate those EMTRs on income from investment are set out in **Table 17** below.

The EMTRs on investment estimated by Moes (1999) are set out in the figures and table below. Specifically:

- estimates of the effective marginal tax rates imposed on investments that are financed:
  - solely by debt are illustrated in **Figure 50**;
  - solely by equity are illustrated in **Figure 51**;
  - by 35% debt and 65% equity are illustrated in **Figure 52** for the period 1972 to 1998 and in **Figure 53** for the period 1988 to 1998;
- **Table 18** sets out the detailed EMTR estimates for investments funded by 35% debt and 65% equity that are illustrated in **Figure 52**.

A comparison of **Figure 50** and **Figure 51** reveals the significantly higher effective marginal rates of tax that have faced investors in assets that are debt financed, rather than equity financed, over the period 1972 to 1998.

The figures below also illustrate the:

- very high and disparate effective marginal rates of tax that applied to investments prior to the commencement of New Zealand's extensive process of domestic and international tax reform, in the mid 1980s; and

---

[56] See, Benge, M. (1997) Taxes, corporate financial policy and investment decisions in Australia. Economic Record, 73, 1-15, as well as Benge, M. (1998), Depreciation provisions and investment incentives under full imputation. *Economic Record*, 74, 329-345 and Benge, M. (1998) *Taxes, Corporate Financial Policy and Investment Decisions in Australia* , Ph.D. dissertation, Australian National University, April 1998, https://openresearch-repository.anu.edu.au/bitstream/1885/144270/2/b20128149_Benge_M.pdf

[57] See, for example, Arthur Anderson (1998), *An International Perspective: Examining how other countries approach business taxation.* An information paper commissioned by Review of Business Taxation following the release of a *Strong Foundation* on 23 November 1998. The Appendix to that document outlines the adapted version of the King Fullerton model that was developed to estimate effective tax rates in economies with dividend imputation regimes such as Australia and New Zealand https://webarchive.nla.gov.au/awa/20180316084138/http://rbt.treasury.gov.au/

[58] See, for example, EYEcon (2002), *International Trends in Dividend Taxation*, submission by the ASX to the Australian Board of Taxation's, Review of International Taxation Arrangements, 2002, https://taxboard.gov.au/sites/taxboard.gov.au/files/migrated/2015/07/052a.pdf.

[59] Moes, A. (1999), *Effective Tax Rates on Capital in New Zealand – Changes 1972-1998*, Treasury Working Paper 99/12, https://www.treasury.govt.nz/sites/default/files/2018-01/twp99-12.pdf. The Technical Appendix to that paper documents the adapted version of the original King Fullerton model.

- extent to which that program of tax reform, in conjunction with lower rates of inflation, have significantly reduced both the EMTRs imposed on investment in different assets, as well as the differences in those EMTRs across assets.

In addition to deterring saving and distorting the form in which savers decide to hold their savings, income taxes also have the unintended effects of:

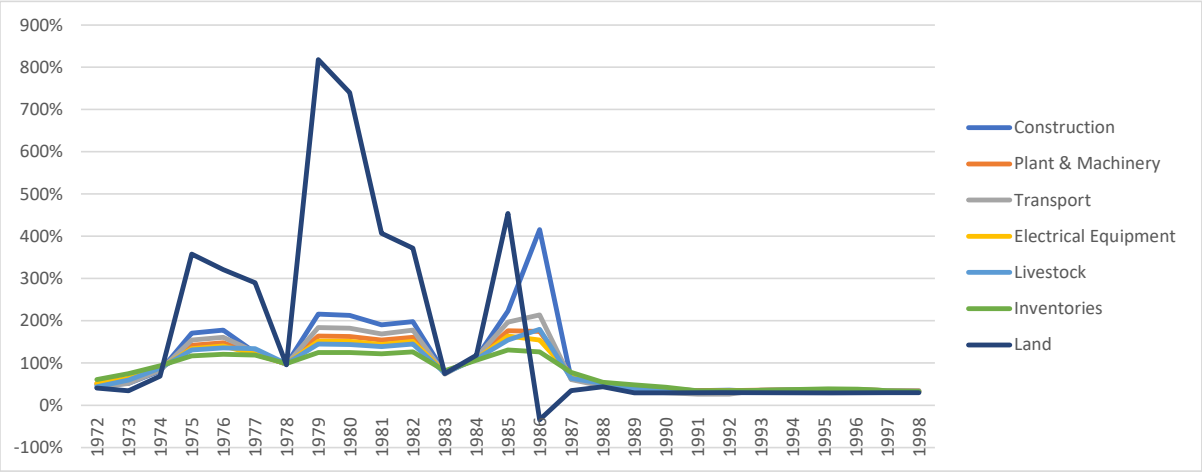
- reducing the level of investment by reducing the after-tax rate of return generated by those investments; and
- distorting the pattern of investment by altering the relative rates of return from alternative investments. This is because the income tax system imposes different effective marginal rates of tax on the income that investors derive from different forms of investment due to differences in the:
  - statutory marginal rates of tax that are imposed on different types of income (e.g. interest and dividend income that is taxable and capital gains realised on the sale of assets held on "capital account" that are exempt from tax);
  - tax treatment of debt and equity finance, since interest expense is tax deductible whereas dividends are paid out of after-tax profits;
  - timing of recognition of certain forms of taxable income and expenditure (e.g. the recognition of some forms of taxable income and deductible expenditures as they accrue and others only when they are received or realised);
  - effects of inflation on different forms of income, due to the lack of indexation of the tax base to exclude changes in taxable income and expenditure that are purely due to inflation.

Table 17: Formulae used to estimate EMTRs over the period 1972 to 1998

Variable	Symbol	Formula
World real rate of return	w	
Domestic inflation	π	
Effective taxation of non-residents' debt	$\hat{\tau}_d$	
Post-company-tax nominal return on debt	i_d	$i_d = \frac{w+\pi}{1-\hat{\tau}_d}$
Company tax rate	τ_{comp}	
Discount rate debt	ρ_d	$\rho_d = (1-\tau_{comp}) * i_d$
Depreciation allowance	d	
Depreciation tax loading	α	
Economic rate of depreciation	δ	
Present value of depreciation deductions	A	$A = \frac{\alpha * d * \tau_{comp}}{\rho_d + \alpha * d}$
Required real rate of return on asset (break-even)	p	
Tax rate for residents	m	$p = \frac{(1-A)}{(1-t_{comp})}(\rho + \delta - \pi) - \delta$
Real post-tax return to residents	s	$s = (1-m) * i_d - \pi$
Tax wedge on investment	$wedge1$	$wedge1 = p - w$
Effective tax rate on investment	$etr1$	$etr1 = \frac{(p-w)}{p}$
Tax wedge on domestic saving	$wedge2$	$wedge2 = w - s$
Effective tax rate on domestic saving	$etr2$	$etr2 = \frac{(w-s)}{w}$
Combined tax wedge	$wedge$	$wedge = p - s$
Combined effective tax rate	etr	$etr = \frac{(p-s)}{p}$

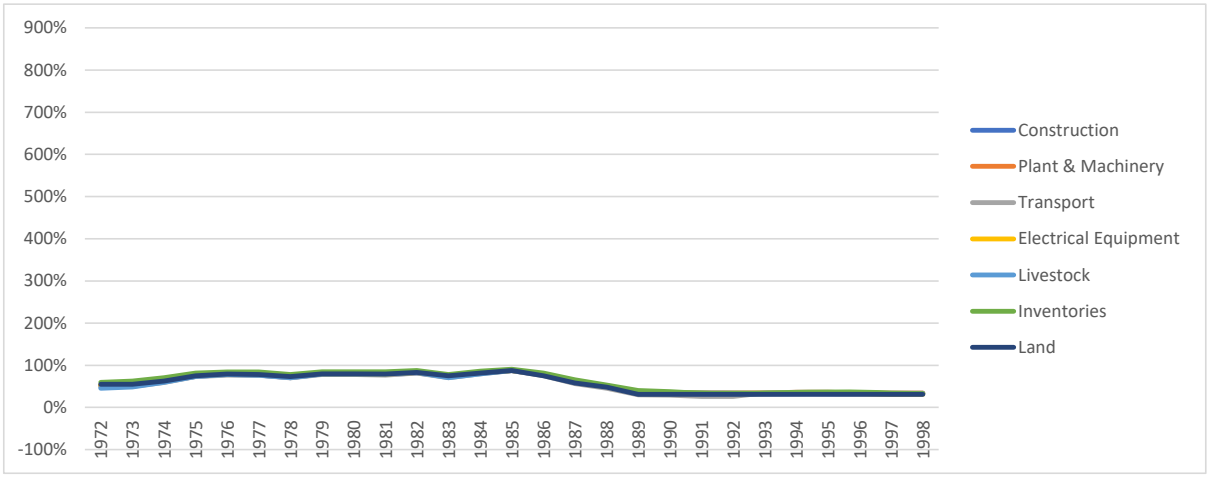
Source: Moes (1999).

Figure 50: EMTRs on 100% debt financed investment, 1972 to 1998



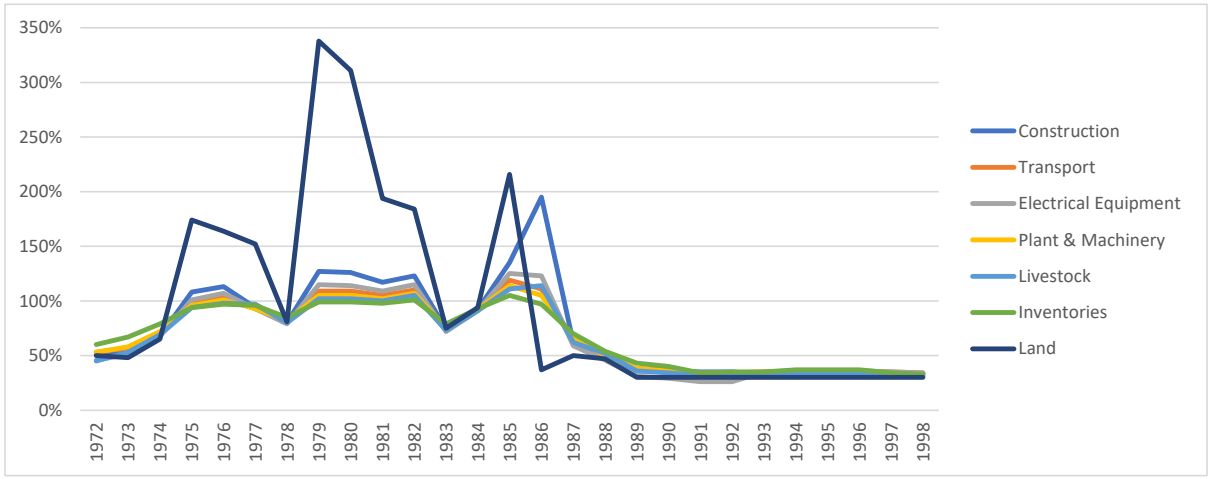
Source: Moes (1999).

Figure 51: EMTRs on 100% equity financed investment, 1972 to 1998



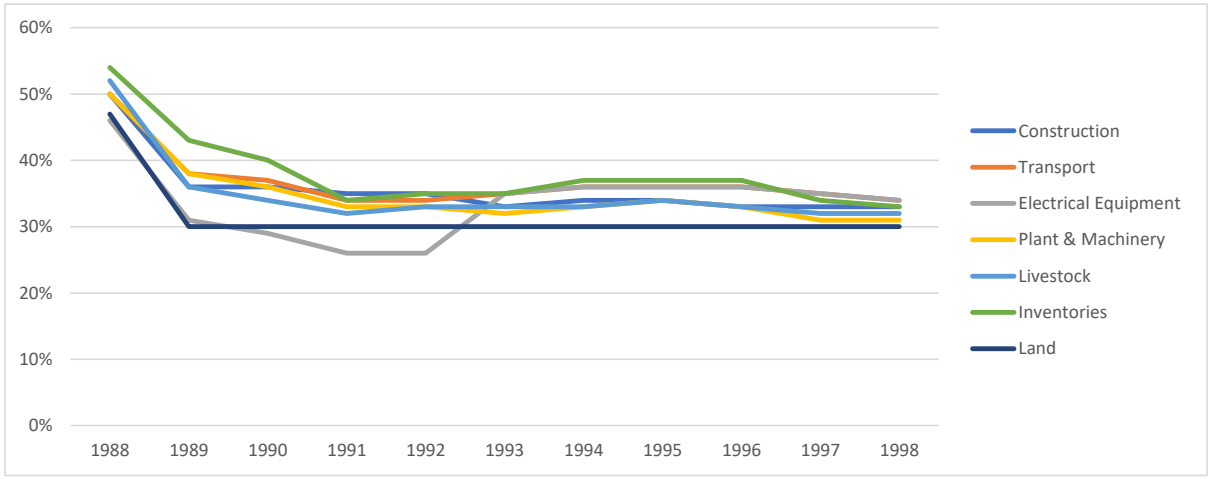
Source: Moes (1999).

Figure 52: EMTRs on 35% debt and 65% equity financed investment, 1972 to 1998



Source: Moes (1999).

Figure 53: EMTRs on 35% debt and 65% equity financed investment, 1988 to 1998



Source: Moes (1999).

Table 18: Estimated EMTRs over the period 1972 to 1998

Underlying regime	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	1998
Domestic inflation	0.05	0.10	0.13	0.16	0.15	0.15	0.10	0.16	0.16	0.16	0.15	0.04	0.09	0.15	0.18	0.10	0.05	0.07	0.05	0.01	0.01	0.01	0.03	0.03	0.03	0.01	0.00
Company tax rate	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.45	0.48	0.48	0.28	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Personal tax rate	0.46	0.45	0.50	0.57	0.60	0.60	0.59	0.60	0.60	0.60	0.63	0.66	0.66	0.66	0.57	0.48	0.41	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
ETR non-res. debt	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
ETR non-res. equity	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.49	0.27	0.27	0.27	0.27	0.27	0.27	0.27	0.27
EMTRs when investment is 100% debt financed	**1972**	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Construction	0.48	0.52	0.81	1.71	1.78	1.25	0.97	2.16	2.13	1.90	1.98	0.77	1.13	2.23	4.16	0.62	0.49	0.38	0.37	0.35	0.36	0.33	0.34	0.34	0.34	0.33	0.33
Plant & Machinery	0.52	0.61	0.87	1.42	1.48	1.22	0.98	1.64	1.63	1.54	1.61	0.78	1.11	1.76	1.75	0.70	0.50	0.41	0.39	0.34	0.35	0.36	0.37	0.37	0.37	0.35	0.34
Transport	0.42	0.52	0.83	1.54	1.61	1.26	0.97	1.84	1.82	1.69	1.78	0.74	1.14	1.97	2.14	0.61	0.45	0.33	0.30	0.26	0.26	0.36	0.37	0.37	0.37	0.35	0.34
Electrical Equipment	0.52	0.64	0.88	1.34	1.40	1.21	0.98	1.52	1.51	1.44	1.51	0.78	1.10	1.64	1.54	0.72	0.50	0.42	0.39	0.33	0.34	0.32	0.34	0.34	0.34	0.31	0.31
Livestock	0.44	0.60	0.88	1.31	1.36	1.34	0.98	1.45	1.44	1.39	1.45	0.76	1.10	1.54	1.80	0.64	0.51	0.38	0.36	0.32	0.33	0.33	0.34	0.34	0.34	0.32	0.32
Inventories	0.61	0.75	0.93	1.17	1.21	1.19	0.99	1.25	1.25	1.22	1.26	0.82	1.07	1.31	1.26	0.78	0.54	0.48	0.43	0.34	0.35	0.35	0.38	0.39	0.38	0.34	0.33
Land	0.41	0.34	0.69	3.58	3.21	2.90	0.96	8.18	7.40	4.07	3.72	0.75	1.18	4.54	-0.34	0.35	0.44	0.29	0.29	0.30	0.30	0.30	0.29	0.29	0.29	0.30	0.30
EMTRs when investment is 100% equity financed	**1972**	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Construction	0.52	0.53	0.61	0.74	0.78	0.77	0.71	0.79	0.79	0.78	0.82	0.73	0.81	0.87	0.77	0.61	0.50	0.35	0.35	0.35	0.35	0.33	0.33	0.33	0.33	0.33	0.33
Plant & Machinery	0.53	0.54	0.62	0.75	0.79	0.78	0.72	0.80	0.79	0.79	0.83	0.74	0.81	0.88	0.77	0.62	0.51	0.36	0.35	0.34	0.34	0.35	0.36	0.36	0.35	0.34	0.34
Transport	0.48	0.50	0.59	0.73	0.77	0.76	0.70	0.78	0.78	0.77	0.82	0.71	0.80	0.87	0.75	0.57	0.46	0.30	0.29	0.26	0.26	0.35	0.36	0.36	0.35	0.34	0.34
Electrical Equipment	0.53	0.55	0.63	0.75	0.79	0.78	0.73	0.80	0.80	0.79	0.83	0.74	0.82	0.88	0.78	0.62	0.50	0.36	0.35	0.33	0.33	0.32	0.33	0.33	0.33	0.31	0.31
Livestock	0.46	0.49	0.60	0.74	0.78	0.77	0.71	0.79	0.79	0.79	0.83	0.71	0.80	0.88	0.78	0.61	0.52	0.34	0.34	0.32	0.32	0.32	0.33	0.33	0.33	0.32	0.32
Inventories	0.60	0.63	0.71	0.82	0.84	0.84	0.78	0.85	0.85	0.85	0.88	0.78	0.86	0.91	0.82	0.66	0.53	0.40	0.38	0.34	0.34	0.34	0.36	0.37	0.36	0.34	0.33
Land	0.55	0.55	0.63	0.75	0.79	0.78	0.73	0.80	0.80	0.79	0.83	0.75	0.82	0.88	0.75	0.58	0.48	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31	0.31
EMTRs when investment is 35% debt and 65% equity financed	**1972**	**1973**	**1974**	**1975**	**1976**	**1977**	**1978**	**1979**	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**	**1987**	**1988**	**1989**	**1990**	**1991**	**1992**	**1993**	**1994**	**1995**	**1996**	**1997**	**1998**
Construction	0.51	0.52	0.68	1.08	1.13	0.94	0.80	1.27	1.26	1.17	1.23	0.74	0.92	1.35	1.95	0.62	0.50	0.36	0.36	0.35	0.35	0.33	0.34	0.34	0.33	0.33	0.33
Transport	0.53	0.57	0.71	0.98	1.03	0.93	0.81	1.09	1.09	1.05	1.10	0.75	0.92	1.19	1.11	0.65	0.50	0.38	0.37	0.34	0.34	0.35	0.36	0.36	0.36	0.35	0.34
Electrical Equipment	0.46	0.51	0.68	1.01	1.07	0.93	0.79	1.15	1.14	1.09	1.15	0.72	0.91	1.25	1.23	0.59	0.46	0.31	0.29	0.26	0.26	0.35	0.36	0.36	0.36	0.35	0.34
Plant & Machinery	0.53	0.58	0.72	0.96	1.01	0.93	0.82	1.05	1.05	1.02	1.07	0.75	0.92	1.14	1.05	0.66	0.50	0.38	0.36	0.33	0.33	0.32	0.33	0.34	0.33	0.31	0.31
Livestock	0.45	0.53	0.69	0.94	0.98	0.97	0.80	1.02	1.02	1.00	1.05	0.73	0.91	1.11	1.14	0.62	0.52	0.36	0.34	0.32	0.33	0.33	0.33	0.34	0.33	0.32	0.32
Inventories	0.60	0.67	0.79	0.94	0.97	0.96	0.85	0.99	0.99	0.98	1.01	0.79	0.93	1.05	0.97	0.70	0.54	0.43	0.40	0.34	0.35	0.35	0.37	0.37	0.37	0.34	0.33
Land	0.50	0.48	0.65	1.74	1.64	1.52	0.81	3.38	3.11	1.94	1.84	0.75	0.94	2.16	0.37	0.50	0.47	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30

Source: Moes (1999).

OECD EMTR estimates – 2017 to 2020

In addition to publishing estimates of the effective marginal tax rates applying to income from different savings vehicles, the OECD has also published estimates of the effective marginal rates of tax applying over the period 2017 to 2020 to income derived from investments in four main asset classes:

- buildings (i.e. non-residential structures, such as manufacturing plants and office buildings);
- inventories (i.e. stocks of goods and services used in production or purchased for resale);
- acquired intangibles (i.e. research and development assets and pre-packaged software); and
- tangible assets (i.e. tangible assets that are not buildings, such as machinery and equipment).

Those OECD estimates for New Zealand, which are set out in **Table 19** below, indicate that:

- New Zealand imposes relatively high effective marginal rates of tax on the income that non-resident investors derive from their investment in New Zealand, but those rates do not differ significantly across those different asset classes (i.e. it suggests those rates are relatively uniform across those investments); and
- highest effective marginal rate of tax in 2020, which is the latest year for which these estimates are available, applied to income from investment in inventories (21.9%) and the lowest rate applied to income from acquired intangibles (15.3%).

Table 19: OECD estimates of EMTRs on investment over the period 2017 to 2020

Year	Effective marginal tax rate			
	Buildings	Inventories	Acquired intangibles	Tangible assets
2017	26.7%	21.5%	15.2%	18.2%
2018	27.1%	21.1%	15.0%	18.1%
2019	27.8%	21.4%	15.1%	18.2%
2020	20.6%	21.9%	15.3%	18.4%

Source: OECD, https://stats.oecd.org/, Public Sector, Taxation and Market Regulation, Corporate Tax Statistics, Effective Tax Rates. EMTRs estimated using country-specific interest and inflation rates.

It is important to note, however, that those OECD effective marginal tax rate estimates:

- only cover a limited range of assets (i.e. buildings, inventories, acquired intangibles and tangible assets);
- only take into account the effects of the company tax rate, tax depreciation rates and the tax treatment of inventories. They do not take into account the effects of other taxes, such as non-resident withholding taxes, the Approved Issuer Levy or thin capitalisation provisions;
- make assumptions that may not be the most appropriate for New Zealand.

New Zealand Inland Revenue cost of capital and EMTR estimates – 2000 to 2020

In view of the inherent limitations of the OECD estimates, the New Zealand Inland Revenue has adopted a modified version of the OECD approach to estimating effective marginal tax rates for the purposes of preparing its Long-Term Insights Briefing (LTIB).[60] That briefing, which it is required to prepare under the Public Service Act 2020 and make available to the public at least every three years, provides:

- information about medium and long-term trends, risks, and opportunities that affect, or may affect, New Zealand society; and
- information and impartial analysis of the trends, risks and opportunities that have been identified, including policy options for responding to them.

Specifically, Chapter 4 and Appendix 2 of Inland Revenue's first LTIB examine how the New Zealand tax system is likely to affect incentives for firms to invest into New Zealand and benchmarks New Zealand's tax settings against those in other countries. This involves estimating the effective marginal rates of tax using a modified version of the OECD approach that considers:

- a broader set of assets than that considered by the OECD, namely:
  - commercial and industrial buildings that are assumed to have an economic depreciation rate of 2.69%;
  - plant, machinery and equipment that is assumed to have a variety of different economic and tax depreciation rates;
  - a zero-depreciation asset that is assumed to neither appreciate nor depreciate in real terms;
  - inventories;
  - appreciating assets, that are assumed to appreciate in value at a real rate of 1% per annum, and
  - assets for which capital expenditure can be deducted immediately (i.e. expensed);
- a wider range of inflation rates, debt levels and real interest rates that are more appropriate for New Zealand, rather than the assumed 35% debt level and 1% inflation rate that is assumed by the OECD for the purposes of its estimates;
- the effects that Non Resident Withholding Tax (NRWT), Approved Issuer Levy (AIL) and thin capitalisation rules that apply to interest income have on effective marginal tax rates;
- the effective marginal tax rates that apply to incomes from investments by three main types of companies:
  - domestic companies where the marginal investor is a foreign shareholder. The cost of capital and EMTRs for these types of companies are discussed further below and include:
    - domestic companies where the marginal investor is a foreign portfolio investor;
    - foreign-controlled companies where the marginal investor is a foreign direct investor; and

[60] Inland Revenue Department (2022). *Tax, foreign investment and productivity, Long-term insights briefing,* August 2022. https://www.taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/2022/2022-other-final-ltib/2022-other-final-ltib-pdf.pdf?modified=20220831073650&modified=20220831073650

  - domestic small and medium enterprises (SMEs) where the marginal investor is not a foreign shareholder. These effective marginal tax rate estimates for these SMEs are discussed further in the next section.

The estimated costs of capital and EMTRs for domestic companies with marginal foreign shareholders are set out in **Table 20**, **Table 21**, **Table 22** and **Table 23** below.

Table 20 outlines the costs of capital and effective marginal tax rate estimates for domestic companies where the **marginal investor is a foreign portfolio investor**. Specifically, it is assumed that:

- the foreign investor requires a real rate of return on their debt and equity finance of 3%, net of any New Zealand taxes;
- an Approved Issuer Levy of 2% applies to the interest income of those foreign portfolio investors; and
- different economic and tax depreciation rates apply to plant, machinery and equipment; and
- different rates of inflation (i.e. 0% and 2%) and proportions of debt finance apply (i.e. rather than the 1% inflation and 35% debt financed investment assumed by the OECD estimates).

As outlined in the LTIB, **Table 20** indicates that:

- when there is no inflation, the:
  - EMTRs on fully equity financed assets (i.e. b=0%) is 28% (i.e. the statutory rate company tax rate) provided that tax rates of depreciation reflect economic rates of depreciation;
  - EMTRs on partly debt financed assets will be lower, but still the same across all assets so long as tax rates of depreciation are equal to economic depreciation rates. If there was no AIL, EMTRs for all these assets would be 0.0%. By contrast, with AIL of 2%, EMTRs would all be approximately 2% and with an average level of debt of 43%, EMTRs for assets where economic depreciation is deductible would all be 18.7%;
- EMTRs on assets will differ if tax rates of depreciation differ from actual economic rates of depreciation. In particular, for fully equity-financed investment, EMTRs will be greater than 28% if tax depreciation is slower than economic depreciation and less than 28% if economic income is only partially taxed or if tax depreciation is quicker than economic depreciation (e.g. the EMTR rises to 30.7% if economic depreciation is 2.69% DV for commercial and industrial buildings but tax depreciation is only 2.00%). Even in the absence of inflation, difficulties in measuring or applying economic depreciation or deliberate decisions to provide certain tax concessions will lead to a variety of EMTRs;
- when the inflation rate is 2%:
  - EMTRs will differ across assets even if depreciation deductions reflect the actual economic rate of depreciation, since inflation erodes the real value of those depreciation deductions;
  - firms benefit from being able to deduct nominal interest expense, which offsets to some extent any reductions in the economic value of their depreciation deductions:
    - for some assets, inflation coupled with the ability to deduct nominal interest expense will reduce EMTRs (e.g. inflation of 2% reduces the EMTRs on zero depreciating assets that are 43% debt financed from 18.7% to 11.2%) and can even result in negative EMTRs (e.g. inflation of 2% reduces the EMTRs on appreciating assets and assets that can be immediately expensed that are 43% debt financed

from 9.1% to negative 0.3%, and from negative 12.9% to negative 23.3%, respectively);

- for most assets, however, inflation is likely to increase EMTRs and discourage investment, particularly for very short-lived investment in depreciable assets and for inventory (e.g. inflation of 2% can increase the EMTRs on 43% debt financed inventory from 18.7% to 27.6%).

Table 20: Costs of capital and EMTRs for domestic companies with marginal portfolio shareholders, r* = 3%, AIL = 2%

	Commercial and industrial buildings	Plant, machinery and equipment					Zero-depreciating assets	Inventory	Appreciating assets	Expensing
d	2.69%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		-1.00%	
d*	2.00%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		0.00%	
Costs of capital										
Inflation = 0%										
b = 0%	4.33%	4.17%	4.17%	4.17%	4.17%	4.17%	4.17%	4.17%	3.78%	3.00%
b = 100%	3.20%	3.06%	3.06%	3.06%	3.06%	3.06%	3.06%	3.06%	2.67%	2.20%
b = 43%	3.84%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.69%	3.30%	2.66%
Inflation = 2%										
b = 0%	4.59%	4.93%	4.89%	4.70%	4.52%	4.39%	4.17%	4.93%	3.78%	3.00%
b = 100%	2.79%	3.10%	3.07%	2.91%	2.75%	2.61%	2.34%	3.10%	1.95%	1.68%
b = 43%	3.81%	4.14%	4.11%	3.93%	3.76%	3.63%	3.38%	4.14%	2.99%	2.43%
EMTRs										
Inflation = 0%										
b = 0%	30.7%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	28.0%	20.6%	0.0%
b = 100%	6.3%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	-12.3%	-36.2%
b = 43%	22.0%	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	18.7%	9.1%	-12.9%
Inflation = 2%										
b = 0%	34.6%	39.1%	38.7%	36.2%	33.6%	31.7%	28.0%	39.1%	20.6%	0.0%
b = 100%	-7.6%	3.2%	2.4%	-3.0%	-9.2%	-14.8%	-28.4%	3.2%	-54.0%	-78.3%
b = 43%	21.3%	27.6%	27.0%	23.7%	20.1%	17.3%	11.2%	27.6%	-0.3%	-23.3%

Notes:
r* = assumed real cost of debt and equity finance
d = diminishing value (DV) rate of economic depreciation
d* = diminishing value (DV) rate of tax depreciation
b = the debt ratio (i.e. debt/debt+equity). b = 0% when fully equity financed, b = 100% when fully debt financed
Source: Table 4.1, p. 46, Inland Revenue Department (2022). *Tax, foreign investment and productivity, Long-term insights briefing,* August 2022.

Table 21 outlines estimates of the costs of capital and effective marginal tax rate estimates for domestic companies where **the marginal investor is a foreign direct investor** that derives income that is subject to non-resident withholding tax (i.e. NRWT);

As noted in the LTIB, although AIL is likely to be the main tax imposed on interest payments to non-resident shareholders, foreign-controlled companies are required to levy NRWT rather than AIL on interest payments to related parties. This means that the costs of capital and EMTRs for such companies will be influenced by the rates of NRWT that are applied to their foreign direct investors, which will depend on:

- whether or not the marginal investor is resident in a jurisdiction with which NZ has a Double Tax Agreement (DTA). When the marginal investor is a resident of a country with which NZ has a DTA, the rates of NRWT applying to their income are reduced;
- whether, and to what extent, the marginal investor can claim a credit for the NRWT imposed on their income against their tax liabilities in their county of residence.

Specifically, **Table 21** indicates that:

- AIL increases the costs of capital for domestic companies with marginal foreign portfolio investment, but only by very small amounts (which can be seen by comparing the third and fourth rows of data in the table);
- the combined effects of AIL and NRWT:
  - result in even smaller increases in the costs of capital for foreign-controlled companies that can claim credits for NRWT (which can be seen by comparing the fourth and fifth rows of data in the table);
  - has a bigger effect on costs of capital for foreign-controlled companies that cannot make use of credits for NRWT (which can be seen by comparing the fourth and sixth rows of data in the table);
- the tax biases between the different types of company are small in relation to tax biases between different types of assets (which can be seen by comparing the relatively small differences in the cost of capital going down the rows of the table, in relation to the differences in the costs of capital across those rows).

Table 21: Costs of capital for domestic companies with marginal foreign portfolio shareholders and for foreign-controlled companies, r* = 3%, inflation = 2%, debt = 43%

	Commercial and industrial buildings	Plant, machinery and equipment					Zero-depreciating assets	Inventory	Appreciating assets	Expensing
d	2.69%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		-1.00%	
d*	2.00%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		0.00%	
Costs of capital										
No AIL or NRWT	3.77%	4.10%	4.07%	3.89%	3.71%	3.58%	3.34%	4.10%	2.95%	2.40%
Domestic companies with marginal foreign shareholders AIL = 2%	3.81%	4.14%	4.11%	3.93%	3.76%	3.63%	3.38%	4.14%	2.99%	2.43%
Foreign controlled companies: AIL = 2% and NRWT = 10%										
NRWT creditable	3.80%	4.13%	4.10%	3.91%	3.74%	3.61%	3.36%	4.13%	2.97%	2.42%
NRWT not creditable	3.88%	4.21%	4.18%	4.00%	3.83%	3.70%	3.45%	4.21%	3.06%	2.49%

Notes:
r* = assumed real cost of debt and equity finance
d = diminishing value (DV) rate of economic depreciation
d* = diminishing value (DV) rate of tax depreciation
Source: Table 4.2, p. 50, Inland Revenue Department (2022). *Tax, foreign investment and productivity, Long-term insights briefing,* August 2022.

Appendix 6 of the LITB also provides estimates of the impact that changes to company tax rates, depreciation provisions and research and development tax credits over the period 2000/01 to 2020/21 have had on both the costs of capital and effective marginal tax rates (under the assumptions under the assumptions of a real world interest rate of 3%, 2% inflation and an AIL or 2%).[61]

Table 22 outlines the impact of those changes on the costs of capital, which indicates that over that 20-year period there has only been a slight increase the weighted average cost of capital for the nine types of asset that Stats NZ includes in its estimates of net capital stock (i.e. from 3.75% to 3.83%).

In particular, **Table 22** indicates that:

- the weighted average costs of capital:
  - rose slightly to 3.78% in 2005/06 when depreciation rates were scaled back for buildings but increased for short-lived machinery and equipment;
  - dropped to 3.59% in 2008/09 (when the company tax rate was cut from 33% to 30% and the 15% R&D tax credit was introduced);
  - increased back to 3.68% in 2009/10 (when the R&D tax credit was repealed) and then to 3.77% in 2010/11 (when depreciation loading was removed). Despite a further cut in the company tax rate to 28%, the weighted average increased to 4.06% in 2011/12 because of the removal of building depreciation. In the last couple of years, there has been some decline in costs of capital because of the reintroduction of an R&D tax credit and the restoration of depreciation deductions for commercial and industrial buildings;
- the costs of capital for inventories are estimated to have fallen from 4.44% to 4.14% over this period because of the cut in the company tax rate in 2008/09 and again in 2011/12;
- the lowest costs of capital are for research and development due to the expensing of the costs of those assets and the research and development tax credit, which is in line with the intent of successive governments to encourage such activities;
- the cost of capital for exploration is less than the 3% real assumed cost of funds to the economy because of expensing;
- other investments have hurdle rates of return that exceed the 3% real cost of funds.

However, the LTIB also notes that not too much should be read into the exact numbers provided for the different types of assets since they depend on a reasonably tenuous method of estimating economic depreciation.

These cost of capital estimates are used by the LTIB to estimate the EMTRs imposed on the income from those assets over that 20 year period, which are outlined in **Table 23** and exhibit the same trends as outlined above for the costs of capital. As noted in the LTIB, since cost of capital for research and development is negative in three years and the tax wedge is also negative, this leads to very high positive EMTRs, which are meaningless. If the cost of capital were to fall, the calculated EMTR would

[61] Appendix 6, pp. 38-44, Inland Revenue Department (2022), *Tax, foreign investment and productivity, Technical appendices to support Inland Revenue's long-term insights briefing (LTIB),* August 2022. https://www.taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/2022/2022-other-final-ltib/2022-other-final-ltib-appendices-pdf.pdf?modified=20220831073852&modified=20220831073852

rise. As a result, in those cases where costs of capital are negative, EMTRs are not reported and are recorded with the '***' symbol.

Table 22: Costs of capital for domestic companies with marginal foreign portfolio shareholders and for foreign-controlled companies, r* = 3%, inflation = 2%, debt = 43%

	Exploration	Land improvements	Non-residential buildings	Other construction	Plant, machinery and equipment	Residential buildings	Research and development	Software	Transport equipment	Weighted average	Inventories
Weight	0.80%	2.60%	23.40%	16.40%	19.90%	24.40%	2.40%	3.70%	6.40%		
2000/01	2.33%	4.08%	3.62%	3.77%	4.12%	3.46%	2.33%	4.71%	4.16%	3.75%	4.44%
2001/02	2.33%	4.08%	3.62%	3.77%	4.12%	3.46%	2.33%	4.71%	4.16%	3.75%	4.44%
2002/03	2.33%	4.08%	3.62%	3.77%	4.12%	3.46%	2.33%	4.71%	4.16%	3.75%	4.44%
2003/04	2.33%	4.08%	3.62%	3.77%	4.12%	3.46%	2.33%	4.71%	4.16%	3.75%	4.44%
2004/05	2.33%	4.05%	3.62%	3.77%	4.12%	3.46%	2.33%	4.71%	4.16%	3.75%	4.44%
2005/06	2.33%	4.05%	3.79%	3.77%	4.00%	3.62%	2.33%	4.24%	4.02%	3.78%	4.44%
2006/07	2.33%	4.05%	3.79%	3.77%	4.00%	3.62%	2.33%	4.24%	4.02%	3.78%	4.44%
2007/08	2.33%	4.05%	3.79%	3.77%	4.00%	3.62%	2.33%	4.24%	4.02%	3.78%	4.44%
2008/09	2.39%	3.91%	3.69%	3.67%	3.87%	3.54%	-1.25%	4.08%	3.89%	3.59%	4.26%
2009/10	2.39%	3.91%	3.69%	3.67%	3.87%	3.54%	2.39%	4.08%	3.89%	3.68%	4.26%
2010/11	2.39%	3.91%	3.69%	3.79%	4.11%	3.54%	2.39%	4.40%	4.13%	3.77%	4.26%
2011/12	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2012/13	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2013/14	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2014/15	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2015/16	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2016/17	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2017/18	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2018/19	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	2.43%	4.27%	4.03%	4.06%	4.14%
2019/20	2.43%	3.83%	4.43%	3.72%	4.01%	4.20%	-1.11%	4.27%	4.03%	3.98%	4.14%
2020/21	2.43%	3.83%	3.81%	3.72%	4.01%	4.20%	-1.11%	4.27%	4.03%	3.83%	4.14%

Source: Table A6.3, p. 42, Inland Revenue Department (2022). *Tax, foreign investment and productivity, Long-term insights briefing,* August 2022.

Table 23: Effective marginal tax rates 2000/01 to 2020/21, r* = 3%, inflation = 2%, b = 0.43, AIL = 2%

	Exploration	Land improvements	Non-residential buildings	Other construction	Plant, machinery and equipment	Residential buildings	Research and development	Software	Transport equipment	Weighted average	Inventories
Weight	0.80%	2.60%	23.40%	16.40%	19.90%	24.40%	2.40%	3.70%	6.40%		
2000/01	-29.02%	26.47%	17.02%	20.47%	27.15%	13.38%	-29.02%	36.36%	27.88%	20.00%	32.38%
2001/02	-29.02%	26.47%	17.02%	20.47%	27.15%	13.38%	-29.02%	36.36%	27.88%	20.00%	32.38%
2002/03	-29.02%	26.47%	17.02%	20.47%	27.15%	13.38%	-29.02%	36.36%	27.88%	20.00%	32.38%
2003/04	-29.02%	26.47%	17.02%	20.47%	27.15%	13.38%	-29.02%	36.36%	27.88%	20.00%	32.38%
2004/05	-29.02%	25.84%	17.02%	20.47%	27.15%	13.38%	-29.02%	36.36%	27.88%	19.99%	32.38%
2005/06	-29.02%	25.84%	20.85%	20.47%	25.02%	17.08%	-29.02%	29.29%	25.30%	20.60%	32.38%
2006/07	-29.02%	25.84%	20.85%	20.47%	25.02%	17.08%	-29.02%	29.29%	25.30%	20.60%	32.38%
2007/08	-29.02%	25.84%	20.85%	20.47%	25.02%	17.08%	-29.02%	29.29%	25.30%	20.60%	32.38%
2008/09	-25.50%	23.32%	18.69%	18.33%	22.52%	15.23%	***	26.55%	22.79%	16.45%	29.50%
2009/10	-25.50%	23.32%	18.69%	18.33%	22.52%	15.23%	-25.50%	26.55%	22.79%	18.43%	29.50%
2010/11	-25.50%	23.32%	18.69%	20.83%	26.99%	15.23%	-25.50%	31.75%	27.40%	20.45%	29.50%
2011/12	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2012/13	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2013/14	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2014/15	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2015/16	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2016/17	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2017/18	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2018/19	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	-23.25%	29.77%	25.56%	26.13%	27.59%
2019/20	-23.25%	21.67%	32.23%	19.32%	25.18%	28.53%	***	29.77%	25.56%	24.55%	27.59%
2020/21	-23.25%	21.67%	21.30%	19.32%	25.18%	28.53%	***	29.77%	25.56%	21.72%	27.59%

Source: Table A6.4, p. 42, Inland Revenue Department (2022). *Tax, foreign investment and productivity, Long-term insights briefing,* August 2022

Overall, the summary to Chapter 4 of Inland Revenue's LTIB notes that:

- if depreciation deductions are set to mirror how assets would depreciate in the absence of inflation, they will not be neutral in the presence of even small amounts of inflation. Rather, they will tend to favour investment in assets that have lower rates of economic depreciation relative to assets with higher rates of economic depreciation. New Zealand's tax settings are likely to contain these biases;
- there is evidence of significant biases between different tangible assets with different economic depreciation rates;
- although New Zealand's costs of capital and EMTRs are often high relative to other countries, at times EMTRs will be negative and costs of capital will be less than the cost to New Zealand of importing capital. In these cases, investment is effectively being subsidised by the tax system;
- inflation tends to increase costs of capital and EMTRs for many types of assets that are already relatively heavily taxed. This is especially the case for plant, machinery and equipment with high economic rates of depreciation and for inventories. At the same time, inflation can reduce costs of capital and increase tax subsidies for assets that would be subsidised and have negative EMTRs even if there were no inflation;
- accounting for NRWT and AIL adds to costs of capital and EMTRs slightly. NRWT will also introduce some variability in tax imposts between companies that are foreign controlled and domestic companies with marginal foreign portfolio shareholders, although at average debt levels the biases between these two types of companies seems quite small relative to the tax biases between different types of asset; and
- the main focus of the LTIB is on the case that underpins the OECD model where non-residents are marginal shareholders in companies operating in New Zealand. It is when non-residents are marginal shareholders that New Zealand's relatively high costs of capital and EMTRs are likely to arise. If, instead, New Zealanders are marginal shareholders, it becomes more likely that EMTRs will be low or negative.[62] The EMTRs that arise when the marginal investor is a non-resident are discussed further below.

EMTRs when the marginal investor is a non-resident for some investments and a resident for other investments

As outlined above, traditionally the effective marginal tax rates that a small, open, capital importing country such as New Zealand imposes on income from investment are estimated under the assumptions that:

- capital is internationally mobile; and
- the marginal investor is a non-resident.

Although New Zealand is a small, open, capital importing nation, however, this does not necessarily mean that the marginal investor for all investments is a non-resident.

Rather, a more realistic assumption is that for some investments, the marginal investor will be a non-resident, whereas for other investments, the marginal investor will be a resident. As noted by Gordon

[62] p. 40, Inland Revenue Department (2022). *Tax, foreign investment and productivity, Long-term insights briefing*, August 2022. https://www.taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/2022/2022-other-final-ltib/2022-other-final-ltib-pdf.pdf?modified=20220831073650&modified=20220831073650

and Bovenberg (1994), capital is not fully mobile internationally as is traditionally assumed when examining the effects of taxing income from capital in an open economy. Rather, empirical evidence, such as real interest rate differentials across countries, suggest there are important barriers to international capital mobility. Gordon and Bovenberg:

- identify a variety of possible explanations for the immobility of capital and discuss their consistency with the empirical evidence; and
- conclude that the explanation they find most convincing is asymmetric information between investors in different countries. In particular, they note that foreign investors are at a handicap relative to domestic investors due to their poorer knowledge of domestic markets. As a result, they are likely to be less successful when setting up new firms, and they are vulnerable to being overcharged if they acquire existing domestic firms.[63]

As a result, when estimating the effective marginal tax rates applying to the income that firms derive from their investments in small, open, capital importing countries such as New Zealand, it is important to recognise the possibility that for some investments, the marginal investor will be a non-resident, whereas for other investments, it will be a resident investor.

As outlined further below, this is the approach that has been used by:

- Fabling et al (2013) to estimate the effective marginal rates of tax applying to the income that different types of firms in New Zealand derive from their investments over the period 1999/2000 to 2009/2010; and
- the New Zealand Inland Revenue Department to provide more recent estimates of the effective marginal rates of tax applying to income from investments by small and medium enterprises (SMEs).

Firm level EMTR estimates – 1999 to 2009

Fabling et. al. (2013) have estimated the effective marginal tax rates imposed on the income that different types of firms in New Zealand derive from their investments, using data for 1999/2000 to 2009/10 from the Longitudinal Business Database.[64]

The Longitudinal Business Database is a large research database that holds de-identified microdata about businesses in New Zealand which comes from a range of Stats NZ surveys and government agencies. It complements the Integrated Data Infrastructure database, which contains microdata about people and households. The two databases are linked through tax data.

Following Devereux and Griffith (2003), the authors:

- constructed a forward-looking measure of user cost of capital, which captures the effective tax burden of a hypothetical investment project;

---

[63] Gordon, R.H. and A.L. Bovenberg (1994), *Why is Capital so Immobile Internationally? Possible Explanations and Implications for Capital Income Taxation*, NBER Working Paper No. 4796, https://www.nber.org/system/files/working_papers/w4796/w4796.pdf

[64] Fabling, R., N. Gemmell, R. Kneller and L. Sanderson (2013), *Estimating Firm-Level Effective Marginal Tax Rates and the User Cost of Capital in New Zealand*, New Zealand Treasury Working Paper 13/29, December 2013, https://www.treasury.govt.nz/sites/default/files/2014-11/twp13-29v2.pdf

- examined how the user cost of capital and effective marginal tax rates across firms as a result of differences in their:
  - foreign or domestic ownership;
  - asset structures; and
  - debt/equity financing;
- outlined how those EMTRs have:
  - changed over time as a result of:
    - the increase in fiscal depreciation allowances for most asset types in April 2005;
    - reductions to the company tax rate and top marginal tax rate and removal of 20% depreciation loading across all asset types which took place over the 2010/11 and 2011/12 financial years; and
  - been altered by New Zealand's dividend imputation regime, which provides shareholders with a credit for any income tax paid at the company level that they can use to offset the amount of personal income tax payable on their dividend income.

Since the Longitudinal Business Database does not identify the marginal investor, but does provide information on the extent to which firms are owned by domestic and foreign shareholders, it is assumed that the marginal investor:

- is a non-resident for firms that are predominantly foreign owned. This means that the user cost of capital and EMTRs for firms that are predominantly foreign owned are assumed to be determined by the rate of company tax that is applied to the income they derive from their investments; and
- can be either a non-resident or a resident for firms that are predominantly owned by New Zealand shareholders. Rather than simply assuming that the marginal investor is a resident for all firms that are predominantly New Zealand owned, it is assumed instead that each dollar of new investment by those firms is funded using a combination of domestic and foreign sourced funds. Firms are assumed to use these two sources of funds in the same proportions as their current capital stock. This means that, as outlined in **Table 24** and discussed further below, the user cost of capital and EMTRs for resident firms are assumed to be determined by a weighted sum of the user cost of capital that would apply if the marginal investor is a non-resident (which is determined by the company marginal tax rate) and the user cost of capital that would apply if the marginal investor is a non-resident (which is determined by personal marginal tax rate), where the weights are the proportions of their capital owned by resident and non-resident shareholders respectively.

Fabling et. al. (2013) estimate the effective marginal tax rates imposed on income from investment using two alternative approaches:

- the more common approach used in the literature, which involves estimating the hypothetical tax rate which, if applied to the gross-of-tax rate of return on the marginal investment, would yield the net-of-tax rate of return. That is, they define the EMTR on income from investment as the difference between the gross-of-tax return, r, and net-of-tax return, r*, expressed as a proportion of the gross-of-tax return, r (i.e. EMTR = (r-r*)/r); and
- the less common approach, which expresses the difference between the gross-of-tax return, r, and net-of-tax return, r*, as a proportion of the former (i.e. EMTR = (r-r*)/r*).

When the capital market is in equilibrium and all arbitrage opportunities have been exhausted, the pre-tax rate of return that delivers a post-tax return of r* is simply C_{net} and the effective marginal tax rate can be estimated using the following expression:

$$EMTR = \frac{(C_{net} - r^*)}{C_{net}} = 1 - \frac{(1-\tau)r^*}{\{1-\tau(Z+k)\}(r^*+\delta) - (1-\tau)\delta}$$

where:

C_{net} = the net user cost of capital, which is estimated using the equations outlined in **Table 24** below, depending on whether the marginal investor is a resident or non-resident;

r = the world rate of interest (assumed to be 5%)

r_E = the real rate of return on equity (assumed to be 5%)

r^* = the real cost of funds (i.e. the required after-tax rate of return, which as outlined in **Table 24** depends on whether the investment is debt or equity financed)

τ = the statutory corporate marginal rate of tax on income

m = the top personal statutory marginal rate of tax on income

Z = the present value of depreciation allowances (discounted at the nominal discount rate i^*)

k = the value of any investment tax credits available (e.g. the loading applied to statutory rates of depreciation)

δ = the rate of economic depreciation (i.e. a weighted average of the depreciation rates applying to the firm's assets)

π = the inflation rate (assumed to be 2%)

Table 24: User cost of capital measures for different sources of finance

	Net user cost of capital	Gross user cost of capital
Foreign-sourced or corporate taxation:	$C_{net} = \frac{\{1-\tau(Z+k)\}(r^*+\delta)}{1-\tau} - \delta$ With debt financing: $r^* = \left[r(1-\tau) - \frac{\tau\pi}{1+\pi}\right]$	$C = \frac{\{1-\tau(Z+k)\}(r^*+\delta)}{1-\tau}$ With equity financing: $r^* = r_E$
Domestic shareholder-level taxation:	$C_{net} = \frac{\{1-m(Z+k)\}(r^*+\delta)}{1-m} - \delta$ With debt or equity financing: $r^* = \left[r(1-m) - \frac{m\pi}{1+\pi}\right]$	$C = \frac{\{1-m(Z+k)\}(r^*+\delta)}{1-m}$

Source: Table 1, p.7, Fabling et al (2013)

Using the methodology outlined above, Fabling et al (2013) provide estimates of the user cost of capital and effective marginal rates of tax imposed in 2010/11 on income from investment in different types of assets which are set out in **Table 25** below. Specifically, the:

- top panel provides estimates of the user cost of capital for investments in each of the different classes of assets that where the marginal investor is:
  - a foreign investor that that finances the investment using either debt or equity finance; or
  - a resident investor that uses a combination of debt and equity to finance the investment;
- middle panel provides estimates of the EMTRs imposed on investment (using the more common measure EMTR = (r-r*)/r) where the marginal investor is:
  - a foreign investor that that finances the investment using either debt or equity finance; or
  - a resident investor that uses a combination of debt and equity to finance the investment;
- bottom panel provides estimates of those EMTRs using the less common measure (i.e. EMTR = (r-r*)/r*).

As outlined in the top panel of **Table 25**, in 2010/11 the user cost of capital differed across investments in different types of assets. Specifically:

- for investments by foreign firms (i.e. where the marginal investor is a non-resident), the user cost of capital for:
  - debt financed investments in different types of assets ranged from 4.2% for land to 5.0% for computers;
  - equity financed investments is greater (since debt investments are concessionally taxed in relation to equity investments), ranging from 7.1% for land to 7.9% for computers;
- for investments by New Zealand firms (i.e. where the marginal investor is a non-resident for some investments and a resident for others), the user cost of capital for investments in different types of assets ranged from 3.9% for land to 5.0% for computers.

Similarly, as outlined in the middle panel of **Table 25**, in 2010/11 the effective marginal rates of tax that were imposed on investment income also differed across investments in different types of assets. Specifically:

- for investments by foreign firms (i.e. where the marginal investor is a non-resident), the effective marginal tax rates imposed on:
  - debt financed investments in different types of assets ranged from 30.0% for land to 41.3% for computers;
  - equity financed investments are greater (since debt investments are concessionally taxed in relation to equity investments), ranging from 30.0% for land to 37.0% for computers;
- for investments by New Zealand firms (i.e. where the marginal investor is a non-resident for some investments and a resident for others), the effective marginal tax rates imposed on the income from investments in different types of assets ranged from 35.5% for land to 49.0% for computers.

As noted by the authors, these results indicate that:

- with the exception of investments in land, the EMTRs lie close to but above the statutory rate as a result of the effects of inflation, which increases the nominal taxable income generated by investments, but not the real income derived from those investments;

- EMTRs are similar across asset types (excluding land and, to a lesser degree, buildings) at around 33% to 41% for foreign firms and around 42% to 49% for domestic firms. Investments in land, which is not depreciable for tax purposes, are subject to an EMTR that is equal to the statutory marginal tax rate facing the investor (i.e. the company tax rate or the personal income tax rate), while investments in other assets face EMTRs in excess of those relevant statutory marginal tax rates. Despite the higher user cost of capital for foreign investors that use equity to finance their investments, the EMTRs imposed on the income that foreign investors derive from those equity financed investments are still lower than the EMTRs that apply on that income when the investments are debt financed;
- long-lived assets tend to have lower user cost capital and EMTRs than shorter-lived assets (compare buildings to vehicles to computers) reflecting both tax and non-tax effects; and
- industry differences in asset composition, as determined, for example, by technology differences, are unlikely to have large impacts on firms' estimated user cost of capital, since it would seem from these hypothetical asset-specific user costs of capital that there is little inter-asset variation. This inference is consistent with the firm-level estimates that are discussed further below.

Table 25: Hypothetical net user cost of capital and EMTRs for different classes of assets (2010/11)

Net User Cost of Capital	Land	Buildings	Furniture	PME	Computers	Vehicles	Intangibles
100% Debt (foreign)	4.2%	4.5%	4.8%	4.9%	5.0%	4.9%	4.9%
100% Equity (foreign)	7.1%	7.4%	7.8%	7.8%	7.9%	7.8%	7.8%
Debt-Equity (domestic)	3.9%	4.4%	4.8%	4.9%	5.0%	4.9%	4.8%
EMTR	**Land**	**Buildings**	**Furniture**	**PME**	**Computers**	**Vehicles**	**Intangibles**
100% Debt (foreign)	30.0%	35.2%	39.7%	40.5%	41.3%	40.5%	40.2%
100% Equity (foreign)	30.0%	32.5%	35.6%	36.3%	37.0%	36.3%	36.0%
Debt-Equity (domestic)	35.5%	42.1%	47.3%	48.1%	49.0%	48.1%	47.7%
EMTR expressed as proportion of world rate of return (5%)	**Land**	**Buildings**	**Furniture**	**PME**	**Computers**	**Vehicles**	**Intangibles**
100% Debt (foreign)	25.0%	31.6%	38.4%	39.7%	41.0%	39.7%	39.1%
100% Equity (foreign)	42.9%	48.2%	55.3%	56.9%	58.6%	56.9%	56.1%
Debt-Equity (domestic)	27.8%	36.8%	45.4%	46.9%	48.5%	46.9%	46.2%

Notes: Statutory tax rates: τ = 0.30; m = 0.355 (tax year ending 31 March 2011).
Source: Table 4, p.16, Fabling et al (2013)

In addition to providing the above estimates of the user cost of capital and EMTRs applying to the income derived from investments in different types of assets, Fabling et al (2013) also provide "firm-level" estimates of user costs of capital and the EMTRs applying to the investment income of firms in different industries in New Zealand. These estimates are set out in **Table 26** below, which provides sample estimates of those firm-level user costs of capital and EMTRs using the alternative assumptions regarding the alternative the cost of capital under different approaches to financing that are set out in **Table 24** above.

Specifically:

- the top panel in **Table 26** shows that:
  - the average net user cost of capital across the sample of firms varied from 0.46 to 0.62 in 2000/01 (from 0.048 to 0.062 in 2010/11), which is a fairly narrow range, partly reflecting the closeness of the top personal and corporate statutory marginal tax rates at those times;
  - the effective marginal tax rates on income from investment range from 37% to 47% in 2010/11 (and somewhat higher in 2000/01 and 2005/06, reflecting the higher statutory marginal rates of tax on income in those years);
  - the user cost of capital is lower for investments subject to shareholder level taxation than for those financed by corporate taxation (i.e. $C_{net}^{S} < C_{net}$), since the latter are financed through a mixture of debt and equity finance where the use cost of equity finance is greater;
  - by contrast, the opposite is the case for EMTRs (i.e. $EMTR^{S} > EMTR$), since the top personal tax rate exceeds the company tax rate;
  - the EMTRs imposed on income from investment are only moderately higher than the statutory marginal company tax rate (i.e. 30%) and top tax rate over most of this period (i.e. 39% falling to 35.5% in 2010), which reflects the relatively low inflation rate and statutory rates of depreciation that are close to actual economic rates of depreciation;
  - removal of the 20% depreciation loading in April 2010 raised EMTRs for the 2010/11 year. Nevertheless, using shareholder-level taxation, the $EMTR^{S}$ is typically about ten percentage points above the comparable statutory rate, which reflects the impact that even low rates of inflation, in combinations with higher statutory tax rates and real depreciation allowances (despite 20% loading for most asset classes prior to 1 April 2010) can have on the real after-tax return to capital;
- the bottom panel in **Table 26** shows that estimates of the average gross user cost of capital (i.e. C_{gross} and C_{gross}^{S}), which range from around 20% to 21%, can be significantly greater than the net user costs of capital.

The results of the detailed firm-level estimates of the effective marginal tax rates imposed on income from investments are illustrated in **Figure 54**, which indicates that:

- the EMTRs that are imposed on the incomes that firms derive from their investments differ between both firms in the same industry and firms in different industries;
- the differences between the EMTRs that apply to the investments made by firms within the same industry (i.e. intra-industry differences in EMTRs) are much larger than the difference in the EMTRs that apply to the incomes that firms in different industries derive from their investments (i.e. inter-industry differences in EMTRs).

As illustrated in **Figure 55**, the distribution of those EMTRs across firms is not even, or normally, distributed around an average EMTR. Rather, it is highly skewed and even bi-modal (i.e. there are considerable differences in EMTRs across firms), which is likely due to the foreign/domestic ownership distinction.

Table 26: Sample average user costs of capital and effective marginal tax rates

Year	C_{net}	C^S_{net}	EMTR	$EMTR^S$
2000/01	0.062 (0.012)	0.046 (0.003)	0.392 (0.03)	0.494 (0.036)
2005/06	0.061 (0.012)	0.044 (0.002)	0.379 (0.019)	0.481 (0.019)
2010/11	0.062 (0.011)	0.048 (0.003)	0.374 (0.024)	0.467 (0.028)
Year	C_{gross}	C^S_{gross}	Implied average $\delta(C_{gross} - C_{net})$	
2000/01	0.261 (0.089)	0.245 (0.09)	0.199	
2005/06	0.269 (0.082)	0.252 (0.083)	0.208	
2010/11	0.27 (0.082)	0.256 (0.082)	0.209	

Notes:

C_{net} is the net measure of the user cost of capital

C_{gross} is the gross measure of the user cost of capital

C^S_{net} is the net measure of the user cost of capital allowing for taxation at the shareholder level

C^S_{gross} is the gross measure of the user cost of capital allowing for taxation at the shareholder level

$EMTR$ is the effective marginal tax rate on income from investment

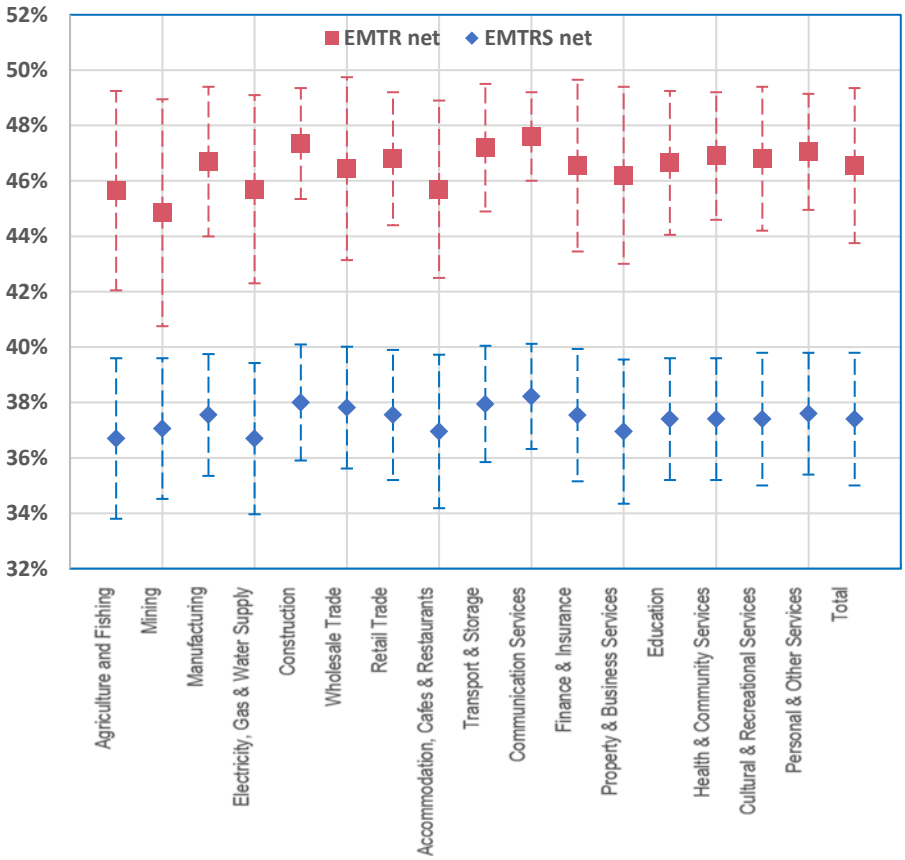
$EMTR^S$ is the effective marginal tax rate on income from investment allowing for taxation at the shareholder level

Standard deviations of estimates are indicated in parentheses.

User costs of capital and EMTRs are calculated using firm characteristics at the end of the preceding financial year.

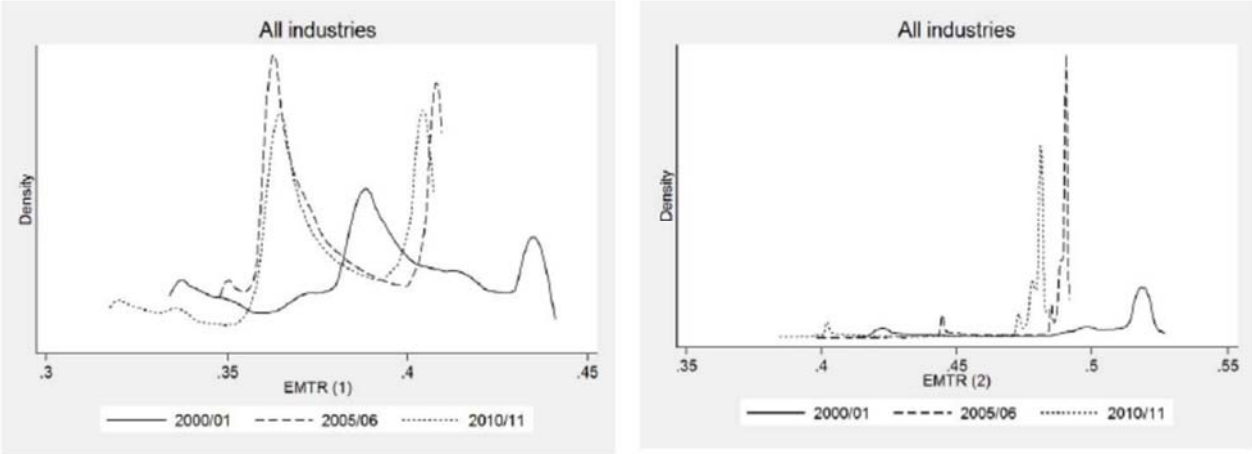
Source: Table 5, p.17, Fabling et al (2013)

Figure 54: Effective marginal tax rates across and within industries



Source: Figure 3, p.20, Fabling et al (2013)

Figure 55: Shifts in EMTR densities, 2000/01 to 2010/11



Source: Appendix 2, Figure 2.3, p.43, Fabling et al (2013)

New Zealand Inland Revenue EMTR estimates for investments in SMEs

More recently, the Inland Revenue's *Tax, foreign investment and productivity, long-term insights briefing* (LTIB) has also provided effective tax rate estimates under the assumption that the marginal investor is a resident, which is a somewhat more realistic assumption for small and medium sized enterprises (SMEs) that have predominantly New Zealand shareholders.

Specifically, in Appendix 2 of the *Technical appendices* to the LTIB,[65] Inland Revenue presents cost of capital and effective tax rate estimates under the assumptions that the:

- world real interest rate is either 3% or 5%;
- inflation rate is either 0% or 2%;
- rate of New Zealand tax on interest income of non-residents is set by the assumed 2% Approved Issuers Levy, which increases the domestic real interest rate to 3.10% or 5.14% respectively;
- marginal investor is a New Zealand resident individual who is taxable at a personal income tax rate of 33%;
- taxable profits of the firm are either:
  - fully distributed to New Zealand investors (see **Table 28**); or
  - fully retained indefinitely in the company (see **Table 29**).

The effective marginal tax rates under these assumptions are estimating using the same approach used by the OECD (i.e. EMTR = $\frac{\rho - r_w}{\rho}$ where r_w is the pre-tax real weighted average costs of funds in a capital importing country) except that the user cost of capital is estimated using the alternative formulae set out in **Table 27** below.

[65] Inland Revenue Department (2022), *Tax, foreign investment and productivity, Technical appendices to support Inland Revenue's long-term insights briefing (LTIB),* August 2022. https://www.taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/2022/2022-other-final-ltib/2022-other-final-ltib-appendices-pdf.pdf?modified=20220831073852&modified=20220831073852

Table 27: Formulae for estimating cost of capital where marginal investor is a resident

Distribution of profits	Real cost of capital
Profits fully distributed	$p = \frac{(1-A)(r'+d)}{1-m} - d$
Profits fully retained	$p = \frac{(1-A)(r'+d)}{1-\tau} - d$

Notes:

r′ = real after-tax rate of interest

d = economic rate of depreciation

m = statutory marginal rate of tax applying to personal income of the marginal resident investor

τ = statutory company tax rate

A = present value of tax savings from the future stream of depreciation deductions, as well as any investment tax credits

Source: Appendix 1, p. 9, Inland Revenue Department (2022), *Tax, foreign investment and productivity, Technical appendices to support Inland Revenue's long-term insights briefing (LTIB),* August 2022.

Table 28 outlines the costs of capital and EMTRs under the assumption that the company's profits are fully distributed. It indicates that:

- EMTRs are:
  - 2% (i.e. the rate of AIL), regardless of the real rate of interest. if inflation is 0% and tax rates of depreciation are equal to economic rates of depreciation;
  - lower for concessionally taxed assets (e.g. appreciating assets or assets that can be expensed);
  - higher for commercial and industrial buildings where it is assumed that the tax rate of depreciation is slightly lower than the economic rate of depreciation; and
  - significantly lower than the EMTRs applying to companies with marginal foreign shareholders. With a real interest rate of 3%, the highest EMTR is 7.2% for commercial and industrial buildings;
- inflation:
  - increases EMTRs slightly for very short-lived plant, machinery and equipment and for inventories;
  - makes EMTRs more negative for concessionally taxed assets and, together with those tax concessions, is largely responsible for the negative EMTRs that arise for many assets. As noted by the LTIB, those negative EMTRs are the result of the risk adjusted cost of capital being less than the real interest rate. They do not mean that those who invest their own capital in a business will pay negative amounts of tax. Rather, it reflects the fact that they will end up paying less tax than they would if they were earning interest.

Table 28: Cost of capital and EMTRs for SME without foreign marginal shareholders (profits fully distributed)

	Commercial and industrial buildings	Plant, machinery and equipment					Zero-depreciating assets	Inventory	Appreciating assets	Expensing
d	2.69%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		-1.00%	
d*	2.00%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		0.00%	
Costs of capital										
r* = 3%										
Inflation = 0%	3.23%	3.06%	3.06%	3.06%	3.06%	3.06%	3.06%	3.06%	2.57%	2.05%
Inflation = 2%	2.71%	3.10%	3.07%	2.88%	2.67%	2.50%	2.13%	3.10%	1.64%	1.43%
r* = 5%										
Inflation = 0%	5.31%	5.10%	5.10%	5.10%	5.10%	5.10%	5.10%	5.10%	4.61%	3.42%
Inflation = 2%	4.71%	5.14%	5.10%	4.86%	4.63%	4.47%	4.17%	5.14%	3.68%	2.80%
EMTRs										
r* = 3%										
Inflation = 0%	7.2%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	-16.8%	-46.3%
Inflation = 2%	-10.5%	3.2%	2.2%	-4.3%	-12.4%	-20.0%	-40.6%	3.2%	-82.8%	-109.9%
r* = 5%										
Inflation = 0%	5.9%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	-8.5%	-46.3%
Inflation = 2%	-6.2%	2.7%	1.9%	-3.0%	-8.0%	-11.9%	-19.8%	2.7%	-35.8%	-78.8%

Notes:

r* = real cost of debt and equity finance

d = economic rate of depreciation

d* = diminishing value rate of depreciation

Source: Table A2.8, p. 28, Inland Revenue Department (2022), *Tax, foreign investment and productivity, Technical appendices to support Inland Revenue's long-term insights briefing (LTIB),* August 2022.

The capital costs and EMTRs for an SME under the assumption that the company's profits are indefinitely fully retained and taxed at the company tax rate of 28% are set out in **Table 29**, which indicates that:

- the general structure of EMTRs is similar to the full distribution case;
- in the absence of inflation:
  - EMTRs for plant, machinery and equipment where economic depreciation is assumed to be deductible or inventories would be equal to the 2% rate of AIL;
  - EMTRs for appreciating assets, or assets where capital expenditure can be expensed, could be significantly negative;
- small levels of inflation make those EMTRs even more negative.

Table 29: Cost of capital and EMTRs for SME without foreign marginal shareholders (profits fully retained)

	Commercial and industrial buildings	Plant, machinery and equipment					Zero-depreciating assets	Inventory	Appreciating assets	Expensing
d	2.69%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		-1.00%	
d*	2.00%	100.00%	50.00%	10.00%	4.00%	2.00%	0.00%		0.00%	
Costs of capital										
r* = 3%										
Inflation = 0%	3.20%	3.06%	3.06%	3.06%	3.06%	3.06%	3.06%	3.06%	2.67%	2.20%
Inflation = 2%	2.79%	3.10%	3.07%	2.91%	2.75%	2.61%	2.34%	3.10%	1.95%	1.68%
r* = 5%										
Inflation = 0%	5.27%	5.10%	5.10%	5.10%	5.10%	5.10%	5.10%	5.10%	4.71%	3.67%
Inflation = 2%	4.79%	5.14%	5.10%	4.90%	4.72%	4.60%	4.38%	5.14%	3.99%	3.15%
EMTRs										
r* = 3%										
Inflation = 0%	6.3%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	-12.3%	-36.2%
Inflation = 2%	-7.6%	3.2%	2.4%	-3.0%	-9.2%	-14.8%	-28.4%	3.2%	-54.0%	-78.3%
r* = 5%										
Inflation = 0%	5.2%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%	-6.1%	-36.2%
Inflation = 2%	-4.3%	2.7%	2.0%	-2.0%	-5.8%	-8.7%	-14.2%	2.7%	-25.4%	-58.7%

Notes:

r* = real cost of debt and equity finance

d = economic rate of depreciation

d* = diminishing value rate of depreciation

Source: Table A2.9, p. 29, Inland Revenue Department (2022), *Tax, foreign investment and productivity, Technical appendices to support Inland Revenue's long-term insights briefing (LTIB),* August 2022.

4. Interpretation and application of effective tax rate estimates

Although effective tax rates can provide a more accurate indication of amount of tax, net of any benefits received, that individuals and households are legally required to pay on their net real economic income (i.e. the "legal" incidence of income taxes and benefits), it is important to note that the effective tax rate estimates outlined in section 3 do not provide an accurate indication of who actually bears the burden of income taxes or enjoys the benefits provided by the social welfare system (i.e. the actual "economic incidence" of those taxes and benefits).

Rather, as outlined in section 4.1, the actual economic incidence of a tax can differ significantly from its initial legal incidence as a result of the unintended effects that taxes can have on the decisions of individuals to consume, work, save and invest, which pass some or all of the burden of the tax onto other individuals in the community. This difference between the legal and actual economic incidence of a tax is outlined in:

- section 4.1.1, which considers the legal and economic incidence of a consumption tax in a closed economy and a small, open, economy, as well as its effects in the longer term; and
- section 4.1.2, which uses a similar approach to consider the legal and economic incidence of an income tax in a closed economy and a small, open, capital importing economy such as New Zealand, as well as its longer-term effects on the values of the capital assets that generate that income.

In addition, it is also important to note that the scope for further income tax and benefit reform in New Zealand to reduce unintended differences in the effective tax rates imposed on the incomes of households is limited by a wide range of practical constraints, that are outlined in section 4.2. The existence of those practical constraints means that simply observing differences in the effective rates of tax that are imposed on the net real economic incomes of households does not necessarily mean that it is either feasible, or desirable, to seek to reform the income tax and benefit systems to either reduce or eliminate those differences. Those practical constraints include:

- information constraints (section 4.2.1);
- conflicting objectives (section 4.2.2);
- unavoidable economic costs (section 4.2.3); and
- legislative constraints (section 4.2.4).

4.1 Economic incidence of taxes and subsidies

4.1.1 Economic incidence of a consumption tax or subsidy

Economic incidence of a commodity tax in a closed economy

The difference between the legal and economic incidence of a tax or a subsidy (i.e. a negative tax, or a lower, "concessional" rate of tax) is typically illustrated by considering the impact of imposing a tax on a particular commodity in a "closed economy" (i.e. in an economy where there either no international

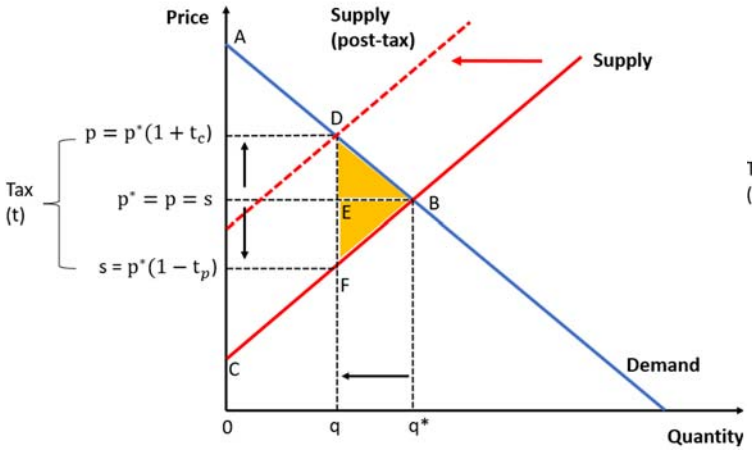
trade, or where the commodity in question is not traded).[66] This is illustrated in the two diagrams set out in **Figure 56** below, which illustrate the effects of imposing such a commodity tax on either the:

- producers of that commodity by legally requiring them to pay tax at a rate t on the value of each unit of the commodity they sell (e.g. through the imposition of a sales tax on that commodity), the effects of which are illustrated in the left hand diagram and outlined in greater detail in **Box 2**; or
- consumers of that commodity by legally requiring them to pay tax at a rate of t on each unit of the commodity they purchase (e.g. through the imposition of a "direct" consumption tax on that commodity – that is, a tax that is payable by consumers of the commodity directly to the government), the effects of which are illustrated in the right hand diagram and outlined in greater detail in **Box 3**.

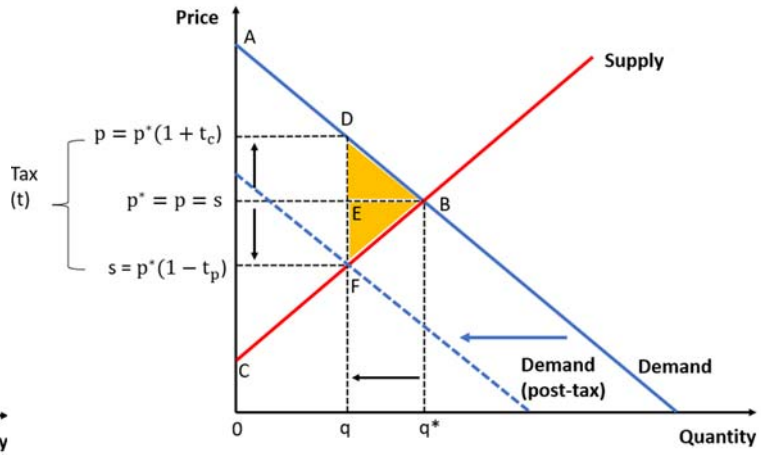
As illustrated in **Figure 56** and outlined in greater detail in **Box 1**, it is assumed that before the introduction of the commodity tax, the market for that commodity is initially in equilibrium at point B, where the quantity of the commodity supplied by domestic producers (i.e. q*) is equal to the quantity of that commodity demanded by consumers (i.e. q*) at the prevailing market price of that commodity (i.e. p*), which is the same as the price that producers receive for their supplies of that commodity (i.e. s) and the price that consumers pay for that commodity (i.e. p).

Figure 56: Legal and economic incidence of a commodity tax in a closed economy

Producers legally required to pay the tax



Consumers legally required to pay the tax



Now consider the effects of imposing a tax (t) on either the value of the commodity supplied by the producers of that commodity, or the value of the commodity that is purchased and used by the consumers of that commodity.

[66] See, for example Box 2.1, p. 11 of the Productivity Commission (2015), *Tax and Transfer Incidence in Australia*, Commission Working Paper, October 2015, https://www.pc.gov.au/research/completed/tax-and-transfer-incidence

As outlined in greater detail in **Box 2** and **Box 3**, regardless of whether producers or consumers are legally required to pay the commodity tax to the government, such a commodity tax:

- drives a wedge between the:
  - lower price that the producers of the commodity receive for each unit of the commodity they supply (i.e. s); and
  - higher price that the consumers or the commodity pay for each unit of the commodity they consume (i.e. p);
- unintentionally encourages:
  - producers to "avoid" the commodity tax (i.e. reduce the amount of commodity tax they are legally required to pay) by:
    - reducing the quantities of the commodity they produce (i.e. from q* to q) and using their resources to increase their production of other commodities that are substitutes in production with that commodity (i.e. other commodities that require similar resource inputs, factors of production, and similar production technologies);
    - shifting some of the tax onto the suppliers of the inputs they purchase from other firms and factors of production they use by reducing the prices they are willing to pay for those inputs and factors of production;
    - shifting some of the tax onto the consumers of the commodity by increasing the prices they charge consumers for that commodity;
  - consumers to "avoid" the commodity tax (i.e. reduce the amount of commodity tax they are legally required to pay) by reducing the quantity of the commodity they consume (i.e. from q* to q) and increasing their consumption of other substitutable commodities that are either not subject to the tax, or subject to a lower rate of tax (i.e. other commodities that are substitutes in consumption with the commodity subject to tax to the extent that they satisfy similar needs of the consumer);
- reduces the net benefits that:
  - producers derive from supplying the commodity by an amount equal to the area p*BFs, which is equal to the sum of the:
    - amount of the commodity tax that is actually borne by those producers (i.e. area, p*EFs which is the actual economic incidence of that tax on those producers);
    - additional excess burden that is borne by producers as a result of the tax encouraging them to produce less of that commodity than they would have in the absence of the commodity tax (i.e. area EBF);
  - consumers derive from using the commodity by an amount equal to the area pDBp* which is equal to the sum of the:
    - amount of the commodity tax that is actual borne by consumers (i.e. area pDEp*); and
    - additional excess burden that is borne by consumers as a result of the tax encouraging them to consume less of the commodity than they would have in the absence of that tax (i.e. area DBE);
- imposes a net cost (i.e. "deadweight cost" or "excess burden") on the community as a whole (i.e. area DBF), which is equal to the sum of the:
  - additional excess burden borne by producers (i.e. area EBF); and
  - additional excess burden borne by consumers (i.e. area DBE).

This illustrates how the legal incidence of a commodity tax, as well measures of that legal incidence (e.g. statutory marginal tax rates and effective marginal tax rates), can provide an unreliable guide as to the:

- actual commodity tax burden that is ultimately borne by producers and consumers. The amounts of the commodity tax that the producers and consumers of that commodity are legally required to pay are determined by the effective marginal rate of tax that is imposed on that commodity and the quantities of the commodity they produce and consume. By contrast, it is the sensitivity of their production and consumption decisions to those effective marginal rates of commodity tax that determines the actual amount of that commodity tax burden that they ultimately bear (i.e. the relative slopes, or price elasticities, of the supply of that commodity and the demand for that commodity). In general:
  - suppliers of the commodity will bear more of the actual commodity tax burden if their production decisions are less sensitive to the effective marginal rate of commodity tax than are the decisions of consumers (i.e. if the slope of the supply of that commodity is less than the slope of the demand for that commodity due to the lower ability of those suppliers to produce other alternative substitutable commodities that are either not taxed, or concessionally taxed);
  - consumers will bear more of the actual commodity tax burden if their consumption decisions are less sensitive to the effective marginal rate of commodity tax than are the decisions of the suppliers of that commodity (i.e. if the slope of the demand for that commodity is less than the slope of the supply of that commodity due to the lower ability of consumers to increase their consumption of other alternative substitutable commodities that are either not taxed, or concessionally taxed);
- actual economic burden that producers and consumers bear as a result of the imposition of a tax on a commodity. Even if it was possible to estimate the proportion of the tax burden that is actually borne by the producers and consumers of the commodity, it is important to note that this will underestimate the net economic costs that are borne by producers and consumers as a result of that tax. This is because the actual economic cost that a commodity tax imposes on producers, consumers and the nation as a whole is greater than the amount of revenue raised by that tax by an amount referred to as the "excess burden" or "deadweight cost" of that cost. This is because a commodity tax does not just raise revenue from the producers and consumers of that commodity and redistribute that revenue to the government. Rather, in the course of raising that revenue it also imposes an additional economic cost on consumers, producers and the nation as a whole by unintentionally:
  - reducing levels and distorting patterns of consumption, thereby imposing a further burden on consumers in addition to their commodity tax burden; and
  - reducing levels and distorting patterns of production, thereby imposing a further burden on producers in addition to their commodity tax burden.

Box 1: The market for the commodity in a closed economy before the introduction of a commodity tax

As illustrated in **Figure 56**, prior to the introduction of the commodity tax in a closed economy the:

- quantity of the commodity that producers are willing to supply at any prevailing market price is illustrated by the solid red line (i.e. the supply function before tax). The upward slope of that supply function indicates that in order to be willing to supply an additional unit of that commodity, producers need to receive a higher price to compensate them for the additional (i.e. "marginal") cost of supplying that additional unit of output. Specifically, the slope of the supply function indicates the ability of producers to alter the quantity of the commodity they supply in response to a change in the relative price they are paid for supplying that commodity in relation to other commodities that are substitutes in production (i.e. the price elasticity of supply, which reflects the ability of producers to use their inputs and production technologies to produce other alternative commodities that are "substitutes in production"). In general, the supply function will be steeper (i.e. less sensitive to changes in the price) in those cases where there are fewer substitutes in production for the commodity on which the tax is imposed;
- quantity of the commodity that consumers are willing to purchase at any prevailing market price (assuming that the prices of all other goods and services, as well as their incomes, are held constant) is illustrated by the solid blue line blue line (i.e. the "income compensated" or "Hicksian" demand for that commodity). The downward slope of that demand function indicates that the quantity of the commodity that consumers are willing to purchase increases as the price that they have to pay for that commodity falls in relation to other commodities that are substitutes in consumption with the commodity on which the tax is imposed. In general, the demand function will be steeper (i.e. less sensitive to changes in the price) in those cases where there are fewer substitutes in consumption for the commodity on which the tax is imposed;
- market for the commodity is in equilibrium at point B where the quantity of the good supplied by producers (q*) is equal to the quantity of the commodity demanded by consumers at the prevailing market price (p*) which is equal to the price received by producers (p) and paid by consumers (s) for each unit of the commodity produced and consumed (i.e. the point at which the marginal benefit that consumers derive from their use of the last unit of that commodity equals the marginal costs that producers incur in order to supply that last unit);
- nation derives a net benefit from the production and consumption of the commodity (i.e. area ABC), which is equal to the sum of the:
  - net benefits producers derive from supplying the commodity (i.e. area p*BC). This "producer surplus" is equal in value to the difference between the:
    - gross revenue producers receive from supplying q* units of the commodity at its pre-tax prevailing market price of p* (i.e. p* multiplied by q*, which is equal to the market value, or "value in exchange", of q* units of that commodity); and
    - cost of supplying q* units of that commodity (i.e. area CBq*0)
  - net benefits consumers derive from their use of the commodity (i.e. area ABp*). This "consumer surplus" is equal in value to the difference between the:
    - gross value consumers derive from their use of q* units of the commodity (i.e. area ABq*0, which is the "value in use" that consumers derive from their use of q* units of the commodity and reflects the amount they would have been willing to pay to use those units of the commodity); and
    - what they actually had to pay in order to use q* units of the commodity (i.e. area p*Bq*0, which once again is equal to the market value of those q* units of the commodity).

Box 2: Effects of imposing a commodity tax on producers in a closed economy

As illustrated in the left hand diagram in **Figure 56**, if the producers of the commodity are legally liable to pay tax on the value of each unit of the commodity then this will:

- reduce the quantity of the commodity those producers are willing to supply at any prevailing market price, as illustrated by the shift in the pre-tax supply function (i.e. the solid red line), to the post-tax supply function (i.e. the dashed red line), by the full extent of the tax (i.e. t). After tax, producers will receive a lower post tax price for each unit of the commodity they supply (i.e. $s = p^*(1 - t_p)$, where t_p is the amount of the tax t that is actually borne by those producers);
- increase the price that consumers have to pay in order to purchase each unit of the commodity (i.e. $p = p^*(1 + t_c)$, where t_c is the amount of the tax t that is actually borne by those consumers). This will encourage them to reduce the quantity of that commodity they consume until a new post tax market equilibrium is reached at point D where the total quantity of the commodity (i.e. q) that consumers are willing to purchase at the post tax price they have to pay (i.e. p) is once again equal to the total quantity (i.e. q) that producers are willing to supply at the post tax price their receive (i.e. s). That is, the tax drives a wedge (i.e. t) between the price paid by consumers (i.e. p) and received by producers (i.e. s);
- reduce the net benefits that the nation as a whole derives from the production and consumption of the commodity (i.e. by an amount equal in value to the area pDBFs). Specifically, the tax will:
  - reduce the net benefits that producers derive from supplying the commodity by an amount (i.e. area p*BFs) that is equal in value to the producer surplus they derived before the tax (i.e. area p*BC) less the producer surplus they derive after the tax (i.e. area sFC);
  - reduce the net benefits that consumers derive from their use of the commodity by an amount (i.e. area pDBp*) that is equal in value to the consumer surplus they derived before the tax (i.e. area ABp*) less the consumer surplus they derive after the tax (i.e. area ADp);
- raise additional tax revenue (i.e. area pDFs), which is equal to the tax rate t multiplied by the post tax quantity of the commodity that is produced and consumed, q). The amount of that tax revenue that is ultimately paid by the producers and consumers of that commodity will depend on their relative abilities to "avoid" that tax by choosing to produce and consume other substitutable commodities (i.e. the relative slopes, or "price elasticity", of the supply and demand of the commodity). In general:
  - producers will bear a greater proportion of the tax if are less able to avoid the tax than consumers (i.e. if the slope of the supply function, which indicates the availability of other commodities that are substitutes in production with the commodity subject to tax, is steeper than the slope of the demand function, which indicates the availability of other commodities not subject to the tax that are substitutes in consumption);
  - consumers will bear a greater proportion of the burden of the tax in those cases where they are less able to avoid the tax than producers (i.e. where the demand function is steeper, that is less price elastic, than the supply function);
- impose a net cost on the nation as a whole since the amount of revenue raised by the tax (i.e. area pDFs) is less than the extent to which the tax reduces the net benefit derived by producers and consumers (i.e. area pDBFs) by an amount referred to as the "excess burden" or "deadweight cost" of taxation (i.e. the orange shaded area DBF). This excess burden is equal to the sum of the:
  - excess burden borne by producers (i.e. area EBF); and
  - excess burden borne by consumers (i.e. area DBE).

Box 3: Effects of imposing a commodity tax on consumers in a closed economy

As illustrated in the right hand diagram in **Figure 56**, if the consumers of the commodity are legally liable to pay tax on the value of each unit of the commodity then this will:

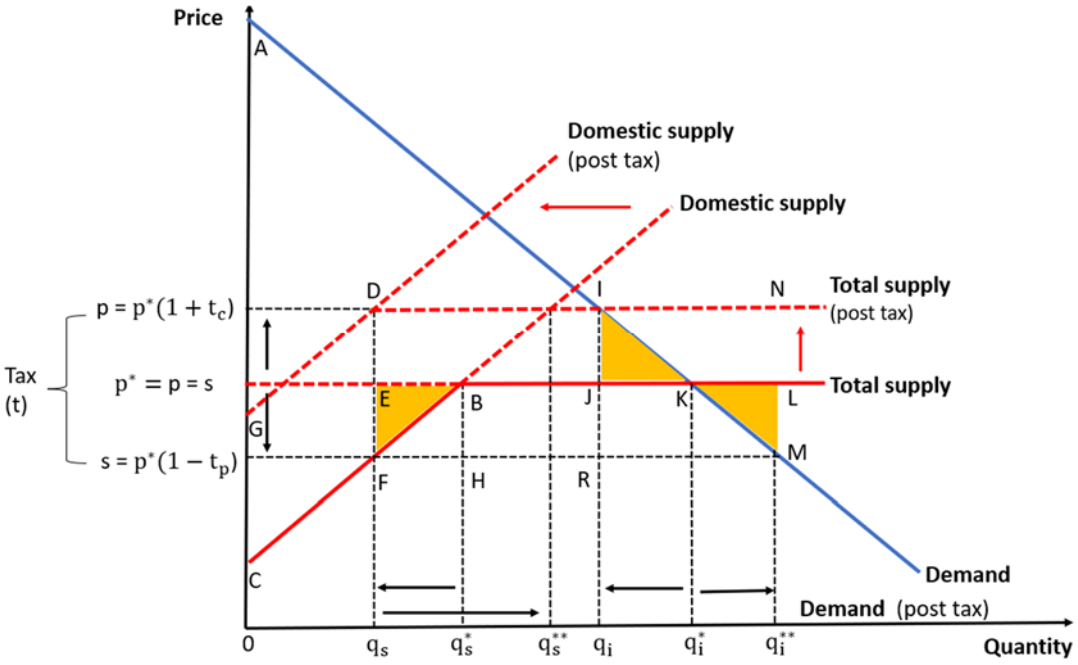
- reduce the quantity of the commodity those consumers are willing to purchase at any prevailing market price, as illustrated by the shift in the pre-tax demand function (i.e. the solid blue line) to the post-tax demand function (i.e. the dashed blue line), by the full extent of the tax (i.e. t). After tax, consumers will have to pay a higher post tax price for each unit of the commodity they purchase (i.e. $p = p^*(1 + t_c)$, where t_c is the amount of the tax t that is actually borne by those consumers);
- reduce the price that producers receive for each unit of the commodity they supply (i.e. $s = p^*(1 - t_p)$, where t_p is the amount of the tax t that is actually borne by those producers). This will encourage them to reduce the quantity of that commodity they supply until a new post tax market equilibrium is reached at point D where the total quantity of the commodity (i.e. q) that consumers are willing to purchase at the post tax price they have to pay (i.e. p) is once again equal to the total quantity (i.e. q) that producers are willing to supply at the post tax price their receive (i.e. s). That is, the tax drives a wedge (i.e. t) between the price paid by consumers (i.e. p) and received by producers (i.e. s);
- reduce the net benefits that the nation as a whole derives from the production and consumption of the commodity (i.e. by an amount equal in value to the area pDBFs). Specifically, the tax will:
  - reduce the net benefits that producers derive from supplying the commodity by an amount (i.e. area p*BFs) that is equal in value to the producer surplus they derived before the tax (i.e. area p*BC) less the producer surplus they derive after the tax (i.e. area sFC);
  - reduce the net benefits that consumers derive from their use of the commodity by an amount (i.e. area pDBp*) that is equal in value to the consumer surplus they derived before the tax (i.e. area ABp*) less the consumer surplus they derive after the tax (i.e. area ADp);
- raise additional tax revenue (i.e. area pDFs, which is equal to the tax rate t multiplied by the post tax quantity of the commodity that is produced and consumed, q). The amount of that tax revenue that is ultimately paid by the producers and consumers of that commodity will depend on their relative abilities to "avoid" that tax by choosing to produce and consume other substitutable commodities (i.e. the relative slopes, or "price elasticity", of the supply and demand of the commodity). In general:
  - producers will bear a greater proportion of the tax if are less able to avoid the tax than consumers (i.e. if the slope of the supply function, which indicates the availability of other commodities that are substitutes in production with the commodity subject to tax, is steeper than the slope of the demand function, which indicates the availability of other commodities not subject to the tax that are substitutes in consumption);
  - consumers will bear a greater proportion of the burden of the tax in those cases where they are less able to avoid the tax than producers (i.e. where the demand function is steeper, that is less price elastic, than the supply function);
- impose a net cost on the nation as a whole since the amount of revenue raised by the tax (i.e. area pDFs) is less than the extent to which the tax reduces the net benefit derived by producers and consumers (i.e. area pDBFs) by an amount referred to as the "excess burden" or "deadweight cost" of taxation (i.e. the orange shaded area DBF). This excess burden is equal to the sum of the:
  - excess burden borne by producers (i.e. are EBF); and
  - excess burden borne by consumers (i.e. area DBE).

Economic incidence of a commodity tax in an open economy

Now consider the more realistic case of where a tax is imposed on a commodity in a small, open economy, such as New Zealand, that relies on imports of that commodity to supplement the quantity supplied by domestic producers, which is illustrated in **Figure 57** below.

As illustrated in **Figure 57** and outlined in greater detail in **Box 4**, it is assumed that before the implementation of the commodity tax, the market for that commodity is initially in equilibrium at point K where the total quantity of that commodity supplied on the domestic market (i.e. q_i^* which is equal to the quantity of that commodity supplied by domestic producers q_s^* plus the quantity of imports of that commodity supplied by foreign producers $q_i^* - q_s^*$) is equal to the quantity of that commodity demanded by consumers (i.e. q_i^*) at the prevailing world price of that commodity (p*), which is equal to the price that domestic producers and importers receive for their supplied of the commodity on the domestic market (i.e. s) and the price that domestic consumer pay for that commodity (p).

Figure 57: Legal and economic incidence of a commodity tax in an open economy



Now consider the effects of imposing a commodity tax (t) at a:

- rate of tax of t_p on the producers of the commodity; and
- rate of tax of t_c on the consumers of the commodity.

Unlike in the closed economy, where the total wedge (t) affects both the supply of that commodity and the demand for that commodity, in the small open economy, the rate of tax imposed on the

suppliers of the commodity only affects the supply of that commodity and the rate of tax imposed on consumers of that commodity only affects the demand for that commodity.[67]

As illustrated in **Figure 57** and outlined in greater detail in **Box 5**, such a commodity tax:

- drives a wedge between the:
  - lower price that the producers of the commodity receive for each unit of the commodity they supply (i.e. s); and
  - higher price that the consumers or the commodity pay for each unit of the commodity they consume (i.e. p);
- unintentionally encourages:
  - domestic producers to "avoid" the commodity tax (i.e. reduce the amount of commodity tax they are legally required to pay) by:
    - reducing the quantities of the commodity they produce (i.e. from q_s^* to q_s) and using their resources to increase the quantities of other commodities that are substitutes in production with that commodity (i.e. other commodities that require similar resource inputs, factors of production, and similar production technologies);
    - shifting some of the tax onto the suppliers of the inputs they purchase from other firms and factors of production they use by reducing the prices they are willing to pay for those inputs and factors of production;
    - shifting some of the tax onto the consumers of the commodity by increasing the prices they charge consumers for that commodity;
  - foreign producers and importers of the commodity to increase the quantity of the commodity they supply from $(q_i^* - q_s^*)$ to $(q_i^* - q_s)$ (i.e. by $q_s^* - q_s$);
  - consumers to "avoid" the commodity tax (i.e. reduce the amount of tax they are legally required to pay) by reducing the quantity of the commodity they consume (i.e. from q_i^* to q_i and shifting their consumption into other substitutable commodities that are not taxed or concessionally taxed);
- alters the net benefits derived by producers and consumers of the commodity. Specifically, it:
  - reduces the net benefits domestic producers derive from supplying the commodity by an amount equal to the area p*BFs, which is equal to the sum of the:
    - amount of the commodity tax that is actually borne by those producers (i.e. area p*EFs, which is the actual economic incidence of that tax on those producers);
    - additional excess burden that is borne by producers as a result of the tax encouraging them to produce less of that commodity than they would have in the absence of the commodity tax (i.e. area EBF);
  - reduces the net benefits that consumers derive from using the commodity by an amount equal to the area pIKp*, which is equal to the sum of the:
    - amount of the commodity tax that is actual borne by consumers (i.e. area pIJp*); and
    - additional excess burden that is borne by consumers as a result of the tax encouraging them to consume less of the commodity than they would have in the absence of that tax (i.e. area IJK);

[67] For a further discussion of these different effects, see the discussion of the different effects of an income tax in a closed and open economy outlined in section 4.1.2 below.

- imposes a net cost (i.e. "deadweight cost" or "excess burden") on the community as a whole, which is equal to the sum of the:
  - additional excess burden borne by producers (i.e. area EBF), that arises as a result of the commodity tax unintentionally reducing their supplies of the commodity and distorting their patterns of production in favour of other goods and services that are either tax exempt from tax, or concessionally taxed; and
  - additional excess burden borne by consumers (IJK), that arises as a result of the commodity tax unintentionally reducing the consumption of the commodity and distorting patterns of consumption in favour of other goods and services that are either exempt from tax, or concessionally taxed.

In a closed economy, a consumption subsidy could have mitigated these welfare losses. In particular, a consumption subsidy set at a rate equal to the rate of tax imposed on suppliers of the commodity (t_p) could have avoided those welfare losses altogether. By contrast, in an open economy, such a consumption subsidy only adds to the welfare losses on the consumption side (i.e. by an amount equal in value to area KLM).[68]

[68] This difference in the effects of taxation in closed and open economies is discussed further in section 4.1.2 below.

Box 4: The market for the commodity in an open economy before the introduction of a tax on that commodity

As illustrated in **Figure 57**, prior to the introduction of the commodity tax in an open economy the:

- total quantity of the commodity that domestic and foreign producers are willing to supply at any prevailing market price is illustrated by the solid red kinked line (i.e. CBL, which is equal to the sum of the domestic supply of the commodity plus the foreign supply of the commodity which is the horizontal line p*L, which indicates that for a price of p*, the nation can import as much of the commodity that they need to meet domestic demand. However, it also indicates that unless foreign suppliers receive p*, net of any New Zealand taxes, they will not be willing to supply those imports);
- total quantity of the commodity that domestic consumers are willing to purchase at any prevailing market price (assuming that the prices of all other goods and services, as well as their incomes, are held constant) is illustrated by the solid blue line blue line (i.e. the "income compensated" or "Hicksian" demand for that commodity). The downward slope of that demand function indicates that the quantity of the commodity that consumers are willing to purchase increases as the price that they have to pay for that commodity falls in relation to other commodities that are substitutes in consumption with the commodity on which the tax is imposed. In general, the demand function will be steeper (i.e. less sensitive to changes in the price) in those cases where there are fewer substitutes in consumption for the commodity on which the tax is imposed;
- market for the commodity is in equilibrium at point K where the total quantity of the good supplied on the domestic market (i.e. q_i^* which is equal to the quantity of the commodity supplied by domestic producers q_s^* plus the quantity of the commodity imported $q_i^* - q_s^*$) is equal to the quantity of the commodity demanded by consumers at the prevailing market price (p*) which is equal to the price received by producers (p) and paid by consumers (s) for each unit of the commodity produced and consumed;
- nation derives a net benefit from the domestic production and consumption of the commodity (i.e. area p*BC plus AKp*), which is equal to the sum of the:
  - net benefits domestic producers derive from supplying q_s^* units of the commodity (i.e. area p*BC). This "producer surplus" is equal in value to the difference between the:
    - gross revenue producers receive from supplying q* units of the commodity at its pre-tax prevailing market price of p* (i.e. p* multiplied by q_s^* which is equal to the area p*Bq_s^*0, that is, the market value, or "value in exchange", of q_s^* units of that commodity); and
    - cost of supplying q_s^* units of that commodity (i.e. area CBq_s^*0);
  - net benefits consumers derive from their use of the commodity (i.e. area AKp*). This "consumer surplus" is equal in value to the difference between the:
    - gross value consumers derive from their use of q_i^* units of the commodity (i.e. area AKq_i^*0, which is the "value in use" that consumers derive from their use of the commodity and reflects the amount they would have been willing to pay to use q_i^* units of the commodity); and
    - what they actually had to pay in order to use q_i^* units of the commodity (i.e. p* multiplied by q_i^* which once again is equal to the market value of those q_i^* units of the commodity).

Box 5: Effects of imposing a commodity tax in a small open economy

As illustrated in **Figure 57**:

- the commodity tax (t) will:
  - drive a wedge between the:
    - post tax price that domestic producers and importers of the commodity receive for their supply of the commodity on the domestic market (i.e. $s = p^*(1 - t_s)$, where t_s is the amount of the tax t that is actually borne by those domestic producers and importers); or
    - price that consumers have to pay in order to purchase each unit of the commodity (i.e. $p = p^*(1 + t_p)$, where t_p is the amount of the tax t that is actually borne by those consumers). This will encourage them to reduce the quantity of that commodity they consume until a new post tax market equilibrium is reached at point I where the total quantity of the commodity (i.e. q_i) that consumers are willing to purchase at the post tax price they have to pay (i.e. p) is once again equal to the total quantity (i.e. q_i) that domestic producers and importers are willing to supply at the post tax price their receive (i.e. s). That is, the tax drives a wedge (i.e. t) between the price paid by consumers (i.e. p) and received by producers (i.e. s);
  - raise additional tax revenue that is equal to the:
    - amount of tax revenue raised from producers of the commodity (i.e. t_p multiplied by q_s, which is equal to area p*EFs), which will be greater the less sensitive the supply of the commodity is to changes in its relative price in relation to other goods and services that are substitutable in production with that commodity (i.e. the lower the price elasticity of supply of that commodity);
    - plus the amount of tax revenue raised from consumers of domestically produced commodity (i.e. t_c multiplied by q_i, which is equal to the area pIJp*), which will be greater the less sensitive the demand for that commodity is to changes in its relative price in relation to other goods and services that are substitutes in consumption with that commodity (i.e. the lower the price elasticity of demand for that commodity);
  - reduce the net benefits that the nation as a whole derives from the production and consumption by an amount equal to the sum of the:
    - reduction in the net benefit that domestic producers derive from supplying the commodity by an amount (i.e. area p*BFs) that is equal in value to the producer surplus they derived before the tax (i.e. area p*BC) less the producer surplus they derive after the tax (i.e. area sFC);
    - reduction in the net benefits that consumers derive from their use of the commodity by an amount (i.e. area pIKp*) that is equal in value to the consumer surplus they derived before the tax (i.e. area AKp*) less the consumer surplus they derive after the tax (i.e. area AIp);

- impose a net cost on the nation as a whole since the amount of revenue raised by the tax (i.e. area p*EFs that is raised from producers plus area pIJp* that is raised from consumers) is less than the extent to which the tax reduces the net benefit derived by producers (i.e. area p*BFs) and reduces the net benefits derived by consumers (i.e. area pIKp*) by an amount referred to as the "excess burden" or "deadweight cost" of taxation (i.e. the sum of the orange shaded areas EBF and IJK). This excess burden is equal to the sum of the:
  - excess burden borne by domestic producers of the commodity (i.e. area EBF), that arises as a result of the commodity tax unintentionally reducing their supply of the commodity and distorting their pattern of production in favour of assets generating tax exempt, or concessionally taxed, income; and
  - excess burden borne by consumers of the commodity (i.e. area IJK), that arises as a result of the commodity tax unintentionally reducing the consumption of the commodity and distorting patterns of consumption in favour of other goods and services that are either exempt from tax, or concessionally taxed.

In a closed economy, a consumption subsidy could have mitigated these welfare losses. In particular, a consumption subsidy set at a rate equal to the rate of tax imposed on suppliers of the commodity (t_p) could have avoided those welfare losses altogether. By contrast, in an open economy, such a consumption subsidy only adds to the welfare losses on the consumption side (i.e. by an amount equal in value to the orange shaded area KLM).

Economic incidence of a commodity tax in other markets and over time

Although **Figure 56** and **Figure 57** illustrate the effects that a commodity tax has on the producers and consumers of that commodity, as noted by Kotlikoff and Summers (1986) such a simple analysis has two major limitations.[69]

Economic incidence of a commodity tax in other markets

The first major limitation is that it only considers the effects of the tax on one market – namely the market for the commodity on which the tax is imposed (i.e. it is a "partial" equilibrium analysis).

Such a partial equilibrium analysis serves to illustrate that, regardless of who is legally required to pay the tax on the commodity, the ultimate economic burden of that tax and its associated "excess burden" is determined by the relative sensitivity of the supply of, and demand for, the commodity to changes in the price of that commodity (i.e. the relative slopes, or own price elasticity, of those supply and demand functions). In general, a greater (lower) proportion of the economic burden of the tax will be borne by producers (consumers) if the:

- supply of the commodity is less (more) sensitive to changes in its price;
- demand for that commodity is more (less) sensitive to changes in its price.

[69] Kotlikoff, L. J. and L.H. Summers (1986), *Tax Incidence*, NBER Working Paper No.1864, March 1986, https://www.nber.org/system/files/working_papers/w1864/w1864.pdf

However, it does not explicitly show how the commodity tax:

- unintentionally distorts the relative price of the commodity in relation to the prices of each of the other goods and services in the economy that are:
  - related in production to the commodity that is subject to tax, which include other goods and services that are:
    - substitutes in production with the commodity that is subject to tax (i.e. other goods and services that can be produced using similar inputs, factors of production such as land, labour and capital, and similar production technologies);
    - complements in production with the commodity that is subject to tax (i.e. other goods and services that are jointly produced when the commodity subject to tax is produced);
    - used as inputs into the production of the commodity that is subject to tax of other goods and services that are substitutes or complements in production with that taxed commodity. These inputs include raw materials, intermediate goods as well as factors of production (i.e. land, labour and capital);
  - related in consumption to the commodity that is subject to tax, which include other goods and services that are:
    - substitutes in consumption with the commodity that is subject to tax (i.e. other goods and services that meet same need of the consumer as the taxed commodity);
    - complements in consumption with the commodity that is subject to tax (i.e. consumed in combination with the taxed commodity to meet a particular need of consumers);
- thereby encourages the producers and consumers of the commodity and other related goods and services to "avoid" the tax by altering their levels and patterns of production and consumption, which shifts the ultimate economic incidence of the tax onto other individuals who are not legally required to pay the tax.

This makes it difficult to illustrate and determine the extent to which:

- producers of the commodity that is taxed are able to avoid the tax by passing some or all of it on to either:
  - suppliers of the inputs of materials and intermediate goods they use to produce the taxed commodity; and
  - suppliers and owners of the factors of production they use to produce the taxed commodity (i.e. land, labour and capital);
- consumers of the commodity are able to avoid the tax by reducing the quantity of the taxed commodity they consume and increasing their consumption of other substitutable consumer goods not subject to the tax, thereby shifting some of the economic burden of the tax onto the consumers of those other related goods and services.

In order to illustrate and determine who ultimately bears the economic burden of a commodity tax, a more "general" equilibrium analysis is required which identifies both the effects of the tax on the market for that commodity, as well as the markets for all other goods and services that are related in production and consumption to that commodity.

As noted by Kotlikoff and Summers (1986), the burden of a tax is not necessarily borne by those on whom that tax is levied and the measurement of that economic incidence of a tax is not an accounting

exercise. Rather, it involves the analysis of how that tax influences the prices of goods and services, as well as factors of production, and economic decisions:

> The distinctive contribution of economic analysis to the study of tax incidence has been the recognition that the burden of taxes is not necessarily borne by those upon whom they are levied. In general, the introduction of taxes, or changes in the mix of taxes, changes the economy's equilibrium. Prices of goods and rewards to factors are altered by taxes. In assessing the incidence of tax policies, it is necessary to take account of these effects. Changes in prices can lead to the shifting of taxes. Thus, for example, a tax on the hiring of labor by business may be shifted backwards to laborers in the form of lower wages or forward to consumers in the form of higher prices. The measurement of tax incidence is not an accounting exercise; rather it is an analytical characterization of economic equilibria under alternative assumptions about taxation.[70]

Economic incidence of a commodity tax over time

The second major limitation of the simple analysis set out in **Figure 56** and **Figure 57** is that it only considers the effects of the commodity tax at two discrete points in time, namely:

- when the market for the commodity is in equilibrium before the introduction of the commodity tax; and
- again when the market for the commodity regains equilibrium after the introduction of the commodity tax.

The main problem with such a "comparative static" analysis, however, is that it does not illustrate or analyse how the:

- markets for the commodity and other related goods and services adjust to the commodity tax over time. In reality, not all markets adjust immediately to the effects of a tax. Rather, most take time to adjust those changes; and
- actual economic incidence of the commodity tax changes over the time it takes these markets to adjust to the commodity tax.

In order to illustrate and determine those intertemporal effects of a commodity tax, a "dynamic" model is required that outlines how the:

- relative price of the commodity that is taxed changes over time in relation to all other goods and services that are related in production and consumption;
- sensitivity of the supply of, and demand for, the commodity changes over time; and
- ultimate economic incidence of the commodity tax changes over time in response to these changes in relative prices and price elasticities of supply and demand. For example, it is reasonable to expect that:
  - in the short run, producers may bear a greater proportion of the commodity tax, particularly in those cases where:
    - there are significant fixed costs associated with the production of the taxed commodity, which cannot be avoided in the short term (i.e. in those cases where the short term price elasticity of supply is relatively inelastic);

[70] p.1, Kotlikoff, L. J. and L.H. Summers (1986), *Tax Incidence*, NBER Working Paper No.1864, March 1986, https://www.nber.org/system/files/working_papers/w1864/w1864.pdf

- consumers are able to reduce their consumption of the taxed commodity and increase their consumption of other non-taxed, or concessionally taxed, commodities (i.e. in those cases where the price elasticity demand for the taxed commodity is relatively price elastic);

– in the longer term:
  - consumers may be able to avoid an even greater proportion of the tax if there is an increase in the supply of other substitutable commodities that are either exempt from tax or subject to concessional rates of tax;
  - producers of the taxed commodity are also likely to be able to pass on a greater proportion of the commodity tax to the owners of the factors of production they use to produce the taxed commodity, since in the longer term, all of their costs, including the costs of capital equipment, are variable;
  - a greater proportion of the ultimate economic burden of the commodity tax is likely to be passed onto the owners of those factors that are used to produce the taxed commodity that are either:
    - fixed in supply in the longer term (e.g. land); or
    - have fewer alternative uses (e.g. unskilled labour used to produce the taxed commodity, which might experience difficulties finding alternative employment opportunities).

Such a dynamic simulation model of the effects of a commodity tax (e.g. a consumption tax) is discussed further in section 4.1.2 below.

4.1.2 Economic incidence of an income tax or subsidy

Having illustrated the difference between the legal and economic incidence of a consumption tax in a closed and open economy, we now turn our attention to illustrating the legal and economic incidence of an income tax or subsidy (i.e. negative income tax, or the taxation of some forms of income at lower, concessional rates) in those same contexts.

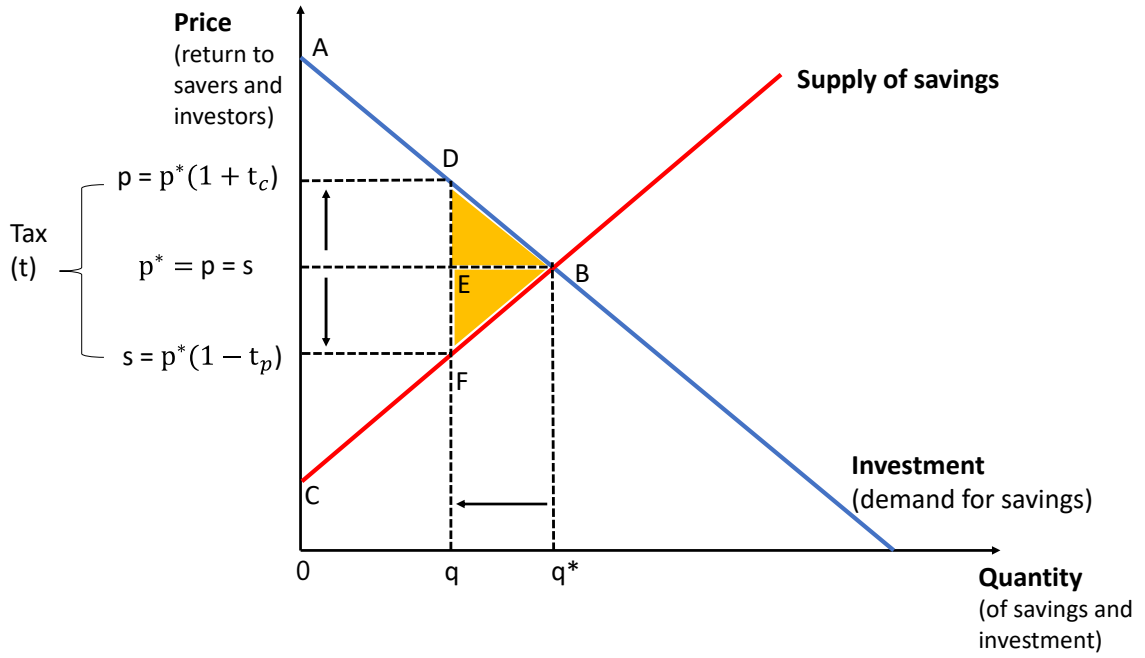
Economic incidence of an income tax in a closed economy

Consider first the effects of imposing an income tax, in a closed economy (i.e. in the absence of international capital flows), at a:

- personal rate of tax (i.e. t_p) on the income that individuals derive from their savings (e.g. the income they earn from the financial assets they own, which includes the interest income they derive from any debt instruments they own, as well as any dividend income they earn from any shares they might own in private or publicly listed companies); and
- company rate of tax (i.e. t_c) on the income that businesses derive from their investments (e.g. the income they derive from their investments in physical capital such as plant and equipment, commercial property and land).

This is illustrated in **Figure 58**, which is similar to **Figure 56** except in this case we are illustrating the effects of an income tax on the operation of the capital market (i.e. the market for the supply of savings and the investment demand for those savings) rather than the effects that a commodity tax has on the market for that commodity (i.e. the supply of that commodity and the demand for that commodity). As illustrated in **Figure 58** and outlined in greater detail in **Box 6,** it is assumed that before the introduction of the income tax, the capital market is in equilibrium at point B, where the quantity of savings supplied by individuals (i.e. q*) is equal to the quantity of those savings that businesses demand to finance their investment in capital assets (i.e. q*) at the prevailing world rate of return (p*) which is the same as the rate of return derived by both savers (i.e. s) and investors (i.e. p).

Figure 58: Legal and economic incidence of an income tax in a closed economy



Now consider the effects of imposing a tax at a:

- personal rate of tax (i.e. t_p) on the income that individuals derive from their savings; and
- company rate of tax (i.e. t_c) on the income that businesses derive from their investment.

As outlined in greater detail in **Box 6** and **Box 7**, such an income tax:

- drives a wedge between the:
  - lower post tax rate of return that savers receive on their savings (i.e. s);
  - higher pre-tax rate of return (i.e. interest rate) that investors must pay savers in order to obtain the funds they need to finance their investment (i.e. p);
- unintentionally encourages:
  - savers to "avoid" the income tax (i.e. reduce the amount of income tax they are legally required to pay) by:
    - reducing their levels of savings (i.e. from q* to q) and encouraging them to shift their savings into financial assets that are subject to concessional rates of income tax;
    - shifting some of the burden of the income tax onto investors in the form of higher interest rates;
  - investors to "avoid" the income tax (i.e. reduce the amount of tax they are legally required to pay) by reducing their level of investment (i.e. from q* to q and shifting their investment into other substitutable investments that are concessionally taxed);
- reduces the net benefits that:
  - savers derive from their savings by an amount equal to the area p*BFs, which is equal to the sum of the:
    - amount of the income tax that is actually borne by those savers (i.e. area p*EFs, which is the actual incidence of that tax on those savers);
    - additional excess burden that is borne by savers as a result of the income tax encouraging them to save less than they would have in the absence of the income tax and hold their savings in less preferred financial assets (i.e. area EBF);
  - investors derive from their investment by an amount equal to the area pDBp*, which is equal to the sum of the:
    - amount of the income tax that is actual borne by investors (i.e. area pDEp*); and
    - additional excess burden that is borne by investors as a result of the income tax encouraging them to invest less than they would have in the absence of that income tax and engage in less preferred patterns of investment (i.e. area DBE);
- imposes a net cost (i.e. "deadweight cost" or "excess burden") on the community as a whole (i.e. area DBF), which is equal to the sum of the:
  - additional excess burden borne by savers (i.e. area EBF); and
  - additional excess burden borne by investors (i.e. area DBF).

This illustrates how the legal incidence of an income tax, as well measures of that legal incidence (e.g. statutory marginal tax rates and effective marginal tax rates), can provide an unreliable guide as to the:

- actual income tax burden that is ultimately borne by savers and investors. The amounts of income tax that savers and investors are legally required to pay are determined by the effective marginal rates of tax that are imposed on their incomes. By contrast, it is the sensitivity of their

savings and investment decisions to those effective marginal rates of income tax that determines the actual amount of that income tax burden they ultimately bear (i.e. the relative slopes, or price elasticities, of the supply of savings, and the investment demand for those savings). In general:

  - savers will bear more of the actual income tax burden if their savings decisions are less sensitive to the effective marginal rates of tax imposed on their incomes than are the decisions of investors (i.e. if the slope of the supply of savings is less than the slope of the investment demand for savings due to the lower ability of those savers to hold those savings in other alternative substitutable forms of savings that are either not taxed, or concessionally taxed);
  - investors will bear more of the actual income tax burden if their investment decisions are less sensitive to the effective marginal rates of tax imposed on their income than are the decisions of savers (i.e. if the slope of the investment demand for savings is less than the slope of the supply of savings due to the lower ability of investors to increase their investment in other alternative substitutable forms of investment that are either not taxed, or concessionally taxed);

- actual economic burden that savers and investors bear as a result of the imposition of a tax on their income. Even if it was possible to estimate the proportion of the income tax burden that is actually borne by savers and investors, it is important to note that this will underestimate the net economic costs that those savers and investors will bear as a result of the imposition of a tax on their income. This is because the actual economic cost that an income tax imposes on savers, investors and the nation as a whole is greater than the amount of revenue raised by that tax by an amount referred to as the "excess burden" or "deadweight cost" of the income tax. This is because an income tax does not just raise revenue from savers and investors and redistribute that revenue to the government. Rather, in the course of raising that revenue it also imposes an additional economic cost on savers, investors and the nation as a whole by unintentionally:
  - reducing levels of savings and distorting patterns of savings, thereby imposing a further burden on savers in addition to their income tax burden; and
  - reducing levels of investment and distorting patterns of investment, thereby imposing a further burden on investors in addition to their income tax burden.

Box 6: The capital market (i.e. the market for savings and investment) in a closed economy before the introduction of an income tax

As illustrated in **Figure 58**, prior to the introduction of the income tax in a closed economy the:

- quantity of savings that savers are willing to supply at any prevailing rate of return (p*) is illustrated by the solid red line (i.e. the supply of savings before tax). The upward slope of that supply function indicates that in order to be willing to supply an additional unit of savings, savers need to receive a higher rate of return to compensate them for the additional (i.e. "marginal") cost of supplying that additional unit of savings (i.e. the opportunity cost of foregone consumption). Specifically, the slope of the supply function indicates the ability of savers to alter the quantity of savings they supply in response to a change in the relative rate of return they are paid for supplying those savings (i.e. the price elasticity of the supply of savings, which reflects the ability of savers to hold their savings in other "substitutable" forms of savings). In general, the supply of savings function will be steeper (i.e. less sensitive to changes in the rate of return to savings) in those cases where there are fewer substitutable forms of savings for the savings on which income tax is imposed;
- quantity of investment that investors are willing to undertake at any prevailing rate of return is illustrated by the solid blue line blue line (i.e. investment demand for savings). The downward slope of that investment demand function indicates that the quantity of the investment that investors are willing to undertake increases as the rate of return they have to pay for the savings falls in relation to other forms of investment that are substitutable with the investments on which the income tax is imposed. In general, the investment demand function will be steeper (i.e. less sensitive to changes in the rate of return to investment) in those cases where there are fewer substitutes for the investments on which the income tax is imposed;
- capital market is in equilibrium at point B where the quantity of savings supplied (q*) is equal to the quantity of savings demanded by investors at the prevailing market rate of return (p*) which is equal to the return paid by investors (p) and received by savers (s) for each unit of savings supplied and demanded (i.e. the point at which the marginal benefit that investors derive from their use of the last unit of savings equals the marginal costs that savers incur in order to supply that last unit);
- nation derives a net benefit from savings and investment (i.e. area ABC), which is equal to the sum of the:
  - net benefits savers derive from supplying their savings (i.e. area p*BC). This "producer surplus" is equal in value to the difference between the:
    - gross income savers receive from supplying q* units of savings at the pre-tax prevailing market rate of return of p* (i.e. p* multiplied by q*, which is equal to the market value, or "value in exchange", of q* units of savings); and
    - cost of supplying q* units of savings (i.e. area CBq*0)
  - net benefits investors derive from their use of those savings to invest (i.e. area ABp*). This "consumer surplus" is equal in value to the difference between the:
    - gross income investors derive from their use of q* units of savings (i.e. area ABq*0, which is the "value in use" that investors derive from their use of q* units of savings and reflects the amount they would have been willing to pay to use those savings to finance their investment); and
    - what they actually had to pay in order to use q* units of savings (i.e. area p*Bq*0, which once again is equal to the market value of those q* units of savings).

Box 7: Effects of imposing an income tax on savings and investment in a closed economy

As illustrated in **Figure 58**, if savers are legally liable to pay tax on the income they derive from their savings at their personal rate of tax (i.e. t_p) and investors are legally liable to pay tax on the income they derive from their investments at the company tax rate (i.e. t_c), then this will:

- drive a wedge between the:
  - post-tax rate of return that savers receive on their savings (i.e. $s = p(1 - t_p)$, which is less than the original pre tax rate of return p* by an amount equal to the rate of personal tax they pay on that income t_p);
  - pre-tax rate of return (i.e. interest rate) that investors have to pay savers in order to obtain the funds they need to finance their investment (i.e. $p = p^*(1 + t_c)$, which is greater than the original pre-tax return p* by an amount equal to the rate of company tax they pay on that income t_c);
- thereby reduce both the:
  - quantity of savings that savers are willing to supply at the lower post tax rate of return they receive for each unit of their savings (i..e from q* to q units of savings);
  - quantity of investment that investors are willing to undertake at the new higher pre-tax rate of return they have to pay savers for the funds they need to finance their investment (i.e. from q* to q units of investment);
- reduce the net benefits that the nation as a whole derives from savings and investment (i.e. by an amount equal in value to the area pDBFs). Specifically, the tax will:
  - reduce the net benefits that savers derive from supplying their savings by an amount (i.e. area p*BFs) that is equal in value to the producer surplus they derived before the tax (i.e. area p*BC) less the producer surplus they derive after the tax (i.e. area sFC);
  - reduce the net benefits that investors derive from their investments by an amount (i.e. area pDBp*) that is equal in value to the consumer surplus they derived before the tax (i.e. area ABp*) less the consumer surplus they derive after the tax (i.e. area ADp);
- raise additional tax revenue (i.e. area pDFs, which is equal to the tax rate t multiplied by the post-tax quantity of savings and investment q). The amount of that tax revenue that is ultimately paid by savers and investors will depend on their relative abilities to "avoid" that tax by reducing their levels of savings and investment and shifting their patterns of saving and investment to include greater quantities of assets that generate tax exempt, or concessionally taxed, forms of economic income (i.e. the relative slopes, or "price elasticity", of the supply of savings and investment demand for those savings). In general:
  - savers will bear a greater proportion of the tax in those circumstances where they are less able to avoid the tax than investors (i.e. where the supply of savings is steeper, that is less "price elastic", than the investment demand for those savings);
  - investors will bear a greater proportion of the tax in those cases where they are less able to avoid the tax than savers (i.e. where the investment demand for savings is steeper, that is less "price elastic", than the supply of savings function);

- impose a net cost on the nation as a whole since the amount of revenue raised by the tax (i.e. area pDFs) is less than the extent to which the tax reduces the net benefits derived by savers and investors (i.e. area pDBFs) by an amount referred to as the "excess burden" or "deadweight cost" of taxation (i.e. the orange shaded area DBF). This excess burden is equal to the sum of the:
  - excess burden borne by savers (i.e. are EBF); and
  - excess burden borne by investors (i.e. area DBE).

Economic incidence of an income tax in an open economy

Now consider the more realistic case of where an income tax is implemented in a small, open, capital importing economy, such as New Zealand, where the supply of domestic savings is supplemented by imported financial capital in order to finance a higher level of domestic investment than would have been possible using just domestic savings.

This is illustrated in **Figure 59** which is similar to **Figure 57** except in this case we are illustrating the effects of implementing an income tax on the operation of the capital market (i.e. on the supply of savings by domestic and foreign savers and the demand for those savings by domestic investors), rather than the effects of implementing a commodity tax on the operation of the market for that commodity (i.e. on the supply of that commodity by domestic and foreign producers and the demand for that commodity by domestic consumers).

As illustrated in **Figure 59** and outlined in greater detail in **Box 8**, it is assumed that before the implementation of the income tax, the capital market is initially in equilibrium at point K where the total quantity of savings supplied on the domestic market (i.e. q_i^* which is equal to the quantity of savings supplied by domestic savers q_s^* plus the quantity of "imported" savings supplied by foreign savers $q_i^* - q_s^*$) is equal to the quantity of savings demanded by domestic investors to finance their domestic investment (i.e. q_i^*) at the prevailing world rate of return (p*), which is equal to the rate of return to savers (s) and the rate of return to investors (p).

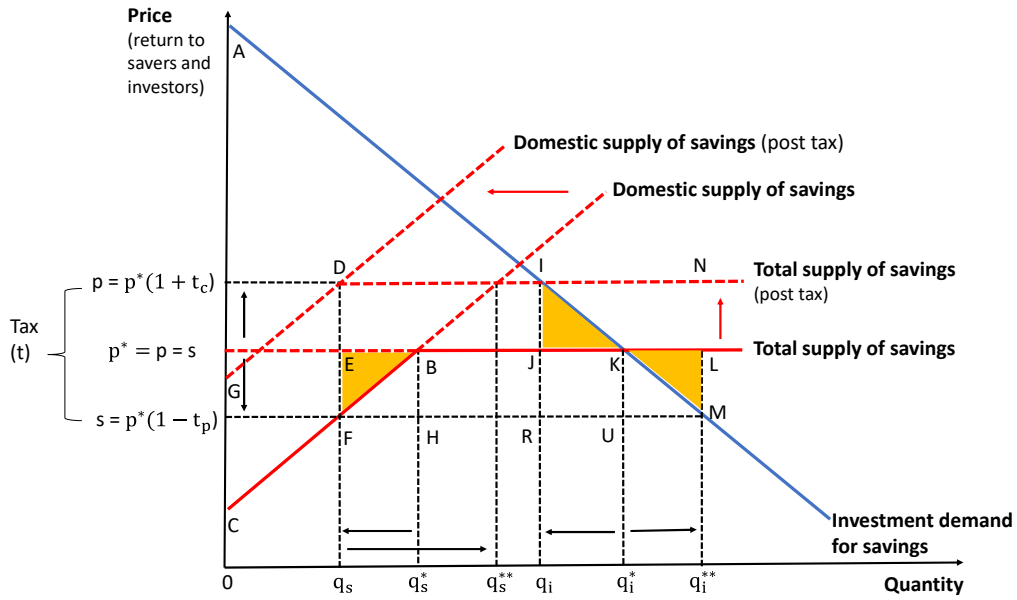
Now consider the effects of imposing an income tax (t) at a:

- personal rate of tax (i.e. t_p) on the income that individuals derive from their savings; and
- company rate of tax (i.e. t_c) on the income that businesses derive from their investment.

As noted by Bovenberg et. al. (1990), unlike in the closed economy, where the total wedge (t) affects both savings and investment, in the small open economy, the company tax only affects investment and the personal tax does not affect domestic investment, but it reduces domestic savings.[71]

[71] pp. 291-293, Bovenberg, A.L., K. Aramaki, K. Anderssen and S.K. Chand (1990). Tax Incentives and International Capital Flows: The Case of the United States and Japan, Chapter 8, Razin, A and J. Slemrod, eds *Taxation in the Global Economy*. https://www.nber.org/system/files/chapters/c7212/c7212.pdf

Figure 59: Legal and economic incidence of an income tax in an open economy



As illustrated in **Figure 59** and outlined in greater detail in **Box 9**, such an income tax:

- drives a wedge between the:
  - lower post-tax rate of return that savers receive on their savings (i.e. s);
  - higher pre-tax rate of return (i.e. interest rate) that investors must pay savers in order to obtain the funds they need to finance their investment (i.e. p);
- unintentionally encourages:
  - domestic savers to "avoid" the income tax (i.e. reduce the amount of income tax they are legally required to pay) by:
    - reducing their levels of savings (i.e. from q_s^* to q_s) and encouraging them to shift their savings into other financial assets that are either exempt from income tax or subject to concessional rates of income tax;
    - shifting some of the burden of the income tax onto investors in the form of higher interest rates;
  - foreign savers to increase the quantity of savings they supply from $(q_i^* - q_s^*)$ to $(q_i^* - q_s)$ (i.e. by $q_s^* - q_s$);
  - investors seeking to "avoid" the income tax (i.e. reduce the amount of tax they are legally required to pay) by reducing their level of investment (i.e. from q_i^* to q_i) and shifting their investment into other substitutable investments that are concessionally taxed;
- reduces the net benefits that:
  - domestic savers derive from their savings by an amount equal to the area p*BFs, which is equal to the sum of the:
    - amount of the income tax that is actually borne by those savers (i.e. area p*EFs, which is the actual incidence of that tax on those savers);
    - additional excess burden that is borne by savers as a result of the income tax encouraging them to save less than they would have in the absence of the income tax and hold their savings in less preferred financial assets (i.e. area EBF);

- investors derive from their investment by an amount equal to the area pIKp*, which is equal to the sum of the:
  - amount of the income tax that is actual borne by investors (i.e. area pIJp*); and
  - additional excess burden that is borne by investors as a result of the income tax encouraging them to invest less than they would have in the absence of that income tax and engage in less preferred patterns of investment (i.e. area IJK);

- imposes a net cost (i.e. "deadweight cost" or "excess burden") on the community as a whole which is equal to the sum of the:
  - additional excess burden borne by savers (i.e. area EBF); and
  - additional excess burden borne by investors (i.e. area IJK).

As noted by Bovenberg et. al. (1990), in a closed economy, a subsidy at the corporate level (i.e. an investment subsidy) could have mitigated these welfare losses. In particular, a subsidy for investors set at a rate equal to the rate of personal tax imposed on the incomes of savers (t_p) could have avoided those welfare losses altogether. By contrast, in an open economy, such an investment subsidy only adds to the welfare losses on the investment side (i.e. by an amount equal in value to area KLM).[72]

[72] pp. 291-293, Bovenberg, A.L., K. Aramaki, K. Anderssen and S.K. Chand (1990). Tax Incentives and International Capital Flows: The Case of the United States and Japan, Chapter 8, Razin, A and J. Slemrod, eds *Taxation in the Global Economy*. https://www.nber.org/system/files/chapters/c7212/c7212.pdf

Box 8: The capital market (i.e. market for savings and investment) in a small, open, capital importing economy before the introduction of an income tax

As illustrated in **Figure 59**, prior to the introduction of an income tax in a small, open economy the:

- total quantity of savings that domestic and foreign savers are willing to supply on the domestic capital market at any prevailing market rate of return is illustrated by the solid red kinked line (i.e. CBL, which is equal to the sum of the domestic supply savings plus the foreign supply of savings which is the horizontal line p*L, which indicates that at the prevailing international rate of return p*, the nation can import as much foreign savings that it needs to meet the investment demand for that savings. However, it also indicates that unless foreign savers receive a rate of return of p*, net of any New Zealand taxes, they will not be willing to supply those additional savings);
- total quantity of investment that domestic investors are willing to undertake at any prevailing market rate of return is illustrated by the solid blue line blue line (i.e. the investment demand for savings). The downward slope of that investment demand function indicates that the quantity of the investment that investors are willing to undertake increases as the rate of return they have to pay for the savings falls in relation to other forms of investment that are substitutable with the investments on which the income tax is imposed. In general, the investment demand function will be steeper (i.e. less sensitive to changes in the rate of return to investment) in those cases where there are fewer substitutes for the investments on which the income tax is imposed;
- capital market is in equilibrium at point K where the total quantity of savings supplied on the domestic market (i.e. q_i^* which is equal to the quantity of savings supplied by domestic savers q_s^* plus the quantity of "imported" savings $q_i^* - q_s^*$) is equal to the quantity of savings demanded by investors at the prevailing market rate of return (p*) which is equal to the rate of return received by both savers and investors;
- nation derives a net benefit from savings and investment (i.e. area p*BC plus AKp*), which is equal to the sum of the:
  - net benefits domestic savers derive from supplying q_s^* units of savings (i.e. area p*BC). This "producer surplus" is equal in value to the difference between the:
    - gross income savers receive from supplying q* units of savings at the pre-tax prevailing market rate of return of p* (i.e. p* multiplied by q_s^* which is equal to the area p*Bq_s^*0, that is, the market value, or "value in exchange", of q_s^* units of savings); and
    - cost of supplying q_s^* units of savings (i.e. area CBq_s^*0);
  - net benefits investors derive from their use of savings to finance their investments (i.e. area AKp*). This "consumer surplus" is equal in value to the difference between the:
    - gross income investors derive from their use of q_i^* units of savings (i.e. area AKq_i^*0, which is the "value in use" that investors derive from their use of savings and reflects the amount they would have been willing to pay to use q_i^* units of those savings); and
    - what they actually had to pay in order to use q_i^* units of those savings (i.e. p* multiplied by q_i^* which once again is equal to the market value of those q_i^* units of those savings).

Box 9: Effects of imposing an income tax on savings and investment in a small open economy

As illustrated in **Figure 59**, if savers are legally liable to pay tax on the income they derive from their savings at their personal rate of tax (i.e. t_p) and investors are legally liable to pay tax on the income they derive from their investments at the company tax rate (i.e. t_c), then this will:

- drive a wedge between the:
  - post-tax rate of return that savers receive on their savings (i.e. $s = p(1 - t_p)$, which is less than the original pre tax rate of return p* by an amount equal to the rate of personal tax they pay on that income t_p);
  - pre-tax rate of return (i.e. interest rate) that investors must pay savers to obtain the funds they need to finance their investment (i.e. $p = p^*(1 + t_c)$, which is greater than the original pre-tax return p* by an amount equal to the rate of company tax they pay on that income t_c);
- thereby:
  - reduce the quantity of savings that domestic savers are willing to supply at the lower post tax rate of return they receive for each unit of their savings (i.e. from q_s^* to q_s units of savings);
  - increase the quantity of savings that foreign savers are willing to supply from $(q_i^* - q_s^*)$ to $(q_i^* - q_s)$, that is by $(q_s^* - q_s)$;
  - reduce the quantity of investment that investors are willing to undertake at the new higher pre-tax rate of interest p (i.e. from q_i^* to q_i units of investment);
- raise additional tax revenue (i.e. area p*EFs, which is the amount of income tax revenue actually raised from domestic savers, and pIJp*, which is the amount of income tax revenue actually raised from investors). That is, the amount of that tax revenue that is ultimately paid by savers and investors will depend on their relative abilities to "avoid" that tax by reducing their levels of savings and investment in assets that generate taxable income and shifting their patterns of saving and investment towards other substitutable assets that generate income that is either not subject to income tax, or subject to a lower rate of income tax (i.e. the relative slopes, or "price elasticity", of the supply of savings and investment demand for those savings). In general:
  - savers will bear a greater proportion of the tax if are less able to avoid the tax than investors (i.e. if the slope of the supply of savings function, which indicates the availability of other substitutable forms of savings not subject to tax, is steeper than the slope of the demand function, which indicates the availability of other commodities not subject to the tax that are substitutes in consumption);
  - investors will bear a greater proportion of the burden of the tax in those cases where they are less able to avoid the tax than savers (i.e. where the investment function is steeper, that is less price elastic, than the supply of savings function);

- reduce the net benefits that the nation as a whole derives from savings and investment by an amount equal in value to the sum of the:
  - reduction in the net benefit that savers derive from supplying their savings by an amount (i.e. area p*BFs) that is equal in value to the net benefit they derived before the tax (i.e. area p*BC) less the net benefit they derive after the tax (i.e. area sFC);
  - reduction in the net benefit that investors derive from their investment by an amount (i.e. area pIKp*) that is equal in value to the net benefit they derived before the tax (i.e. area AKp*) less the net benefit they derive after the tax (i.e. area AIp);
- impose a net cost on the nation as a whole since the amount of revenue raised by the tax (i.e. area p*EFs that is raised from domestic savers and area pIJp* that is raised from investors) is less than the extent to which the tax reduces the net benefits derived by savers and investors (i.e. area p*BFs which is the reduction in the net benefit derived by domestic savers and pIKp* which in the reduction in the net benefit derived by investors) by an amount referred to as the "excess burden" or "deadweight cost" of taxation (i.e. the sum of the orange shaded areas EBF and IJK). This excess burden is equal to the sum of the:
  - excess burden borne by domestic savers (i.e. area EBF), that arises as a result of the income tax unintentionally reducing their level of savings and distorting their pattern of savings in favour of those forms of savings that generate either tax exempt, or concessionally taxed, income; and
  - excess burden borne by investors (IJK), that arises as a result of the income tax unintentionally reducing investment and distorting patterns of investment in favour of those forms of investments that generate either exempt, or concessionally taxed, income.

As noted by Bovenberg et. al. (1990), in a closed economy, an investment subsidy could have mitigated these welfare losses. In particular, a subsidy for investors set at a rate equal to the rate of personal tax imposed on the incomes of savers (t_p) could have avoided those welfare losses altogether. By contrast, in an open economy, such an investment subsidy only adds to the welfare losses on the investment side (i.e. by an amount equal in value to orange shaded area KLM).

Economic incidence of an income tax in other markets and over time

Once again, although **Figure 58** and **Figure 59** illustrate the effects and incidence of an income tax on savers and investors, as noted by Kotlikoff and Summers (1986) such a simple partial equilibrium, comparative static, analysis has two major limitations. [73]

Economic incidence of an income tax in other markets

The first major limitation of such a simple analysis is that it considers the effects of a single rate of income tax in "the" capital market for one type of saving instrument and one type of investment (i.e. it is a "partial" equilibrium analysis).

[73] Kotlikoff, L.J. and L.H. Summers (1986), Tax Incidence, National Bureau of Economic Research, Working Paper No. 1864, March 1986. https://www.nber.org/system/files/working_papers/w1864/w1864.pdf

Such a partial equilibrium analysis serves to illustrate that the ultimate economic burden of an income tax and its associated "excess burden" is determined by the relative sensitivity of the supply of savings, and the investment demand for those savings, to a change in the rates of return derived by savers and investors (i.e. the relative slopes, or own price elasticity, of those supply and demand functions). In general, a greater proportion of the economic burden of the income tax will be borne by investors if the:

- supply of savings is more sensitive to changes in the rate of return to savers (e.g. due to the existence of other non-taxed, or concessionally taxed, substitutable forms of savings); and
- investment demand for those savings is less sensitive to changes in the rate of return to investors (e.g. due to the lack of other non-taxed, or concessionally taxed, substitutable forms of investment).

However, it does not show how a real-world income tax:

- imposes different effective marginal rates of tax on the income that:
  - savers derive from the different types of financials assets in which they hold their savings, which unintentionally distorts the relative rates of return that they earn on:
    - substitutable forms of savings (e.g. government bonds and shares in private and public companies);
    - complementary forms of savings (e.g. different components of a hybrid financial arrangement);
  - investors derive from the different types of capital assets in which they invest (e.g. human capital and physical capital assets), which unintentionally distorts the relative rates of return and relative prices of capital assets that are:
    - substitutable forms of investment (e.g. investments in commercial property and manufacturing);
    - complementary forms of investment (i.e. component parts of joint investments);
- thereby encourages savers and investors to avoid the income tax by reducing their levels, and altering their patters, of savings and investment, which shifts the ultimate economic incidence of the tax onto other individuals who are not legally required to pay the tax.

This makes it difficult to illustrate and determine the extent to which savers and investors pass on some or all of the income tax onto other sections of the community.

As noted by Kotlikoff and Summers (1986), in order to illustrate and determine who ultimately bears the economic burden of an income tax, a "general" equilibrium analysis is required which identifies both the effects of the tax on the capital markets, as well as the markets for all other goods and services that are related in production and consumption to that commodity. Attempts to determine the actual economic incidence of taxes using information on the amount of tax paid by income class can yield results that mainly reflect the underlying assumptions that are made regarding the actual economic incidence of those taxes:

> Analytical work on tax incidence in various economic models of the type surveyed in this chapter has been complemented by empirical studies that have sought to evaluate the overall incidence of the tax system. Major studies of this type include Pechman and Okner (1974), Musgrave and Musgrave (1976), and Pechman (1984). Their approach and that of other authors working in this tradition is to postulate an incidence for each type of tax, and then use microdata on individuals to calculate the distribution of total tax burdens by income class. The striking finding of all these studies is that despite the apparent progressivity of the

income tax, the share of income paid in taxes does not rise with income. The total tax system appears to be roughly proportional over much of the income range.

A number of problems have been raised with empirical incidence studies of this sort. Perhaps most serious is the need to make assumptions about the ultimate incidence of various types of taxes. As our subsequent analysis will make clear, this is very difficult to determine. And conclusions about the effects of taxation on the distribution of income can be no better than the judgments about the incidence of individual taxes on which they are based. Devanajour, Fullerton, and Musgrave (1981) do, however, provide some evidence suggesting the results of judgmental studies are fairly close to those of full scale general equilibrium simulation exercises of the type described below.

A related problem with these incidence evaluations is that they measure taxes collected by the government from various income classes, but these tax collections may differ substantially from the tax burdens that are imposed on them. A good example is provided by the municipal interest exclusion in the United States. Taxpayers in high tax brackets tend to hold municipal bonds which are tax—free. But these bonds have lower yields than taxable bonds. Hence high bracket tax payers bear a burden imposed by the tax system even without transferring revenue to the government. Similar reasoning applies to investments in any tax favored activity. An understanding of the distributional impact of the tax system must be predicated on an understanding of its general equilibrium effect.[74]

Economic incidence of an income tax over time

This highlights the second major limitation of the simple analysis set out in **Figure 58** and **Figure 59**, which is that it only considers the effects of the income tax at two discrete points in time, namely:

- when the capital market is initially in equilibrium before the introduction of the income tax; and
- again when the capital market regains equilibrium after the introduction of the income tax.

The main problem with such a "comparative static" analysis, however, is that it does not illustrate or analyse how:

- capital markets, as well as the markets for other related goods and services that use the services provided by that capital, adjust to the income tax over time. In reality, not all markets adjust immediately to the effects of a tax. Rather, most take time to adjust those changes and the market may never actually reach its new equilibrium point. Rather, it is more likely to be in a constant state of adjusting to a wide range of changes that result in the market price following a complex path over time; and
- the actual economic incidence of the income tax changes over the time it takes these markets to adjust to the tax.

In particular, such a simple static, partial equilibrium analysis of the effects of an income tax does not illustrate how:

- the operation of the markets for the capital assets that generate taxable income and concessionally taxed forms of income (e.g. tax exempt capital gains) will capitalise that income tax and concessional rates of income tax into the prices of those assets;

---

[74] pp.10-11, Kotlikoff, L. J. and L.H. Summers (1986), *Tax Incidence*, NBER Working Paper No.1864, March 1986, https://www.nber.org/system/files/working_papers/w1864/w1864.pdf

- these changes in the cost of capital will alter the relative prices of the wide range of goods and services that are financed using those financial assets and produced using those physical assets; and
- in so doing, pass some or all of the actual economic incidence of the income tax and concessional rates of income tax onto other sections of the community, including individuals who have little or no income from savings and investment.[75]

At any point in time, domestic and international markets for both financial capital (i.e. the assets in which savings are held) and physical capital (e.g. investment in plant and equipment) are constantly adjusting in response to changes in the relative rates of return generated by those assets.

When savers or investors expect a particular asset to generate a higher risk adjusted rate of return in the future (e.g. due to the introduction of a new tax concession), this will increase their demand for that asset and drive up the market price of that asset, which will encourage an increase in the supply of that asset, which will then drive back down the risk adjusted rate of return that asset is expected to generate (i.e. domestic and capital markets are constantly seeking to "arbitrage away" any expected differences in the risk adjusted rates of return generated by those assets). As a result, the:

- existing owners of the asset at the time the new tax concession was announced or introduced will derive a benefit in the form of the capital gain in the value of that asset;
- whereas subsequent owners of that asset, who purchase that asset after the operation of the capital market has capitalised the value of that tax concession into the price of that asset, will not derive that capital gain and will only derive a normal risk adjusted rate of return on that asset. This is, of course, the reason why, contrary to popular opinion, many poorly informed savers and investors who are lured into purchasing assets that generate concessionally taxed forms of income in the hope of deriving higher rates of return are often disappointed to find that they only derive normal risk adjusted rates of return since the value of the tax concession has already been capitalised into the higher prices they have paid for those assets.

Conversely, when savers or investors expect a particular asset to generate a lower risk adjusted rate of return in the future (e.g. due to the removal of an existing tax concession or an increase in the statutory marginal rate of tax imposed on the income it generates), this will reduce their demand for that asset and drive down the market price of that asset, which will encourage an decrease in the supply of that asset, which will then drive up the risk adjusted rate of return that asset is expected to generate. As a result, the:

- existing owners of the asset at the time the removal of a tax concession is announced will incur a cost in the form of the capital loss in the value of that asset. This is, of course, the reason why the removal of tax concessions often involves special transitional rules that seek to "grandparent" existing asset owners from the new tax treatment of those assets so they avoid incurring those capital losses;
- whereas subsequent owners of that asset, who purchase that asset after the operation of the capital market has capitalised the removal of that tax concession into the price of that asset, will not derive that capital loss and will only derive a normal risk adjusted rate of return on that asset.

[75] It is, of course, possible to use multiple partial equilibrium diagrams to illustrate how an income tax affects the several markets. In effect, however, such a set of multiple diagrams is really just a graphical example of a more "general" equilibrium model.

This highlights the need to consider how capital markets and asset prices adjust over time in response to income taxes and changes in those taxes (e.g. using a "dynamic" model that simulates those expected trends over time) when seeking to determine who ultimately bears the actual economic burden of income taxes and enjoys the benefits of concessionally taxed forms of economic income.

As noted by L.J. Kotlikoff and L.H. Summers (1986), in order to obtain accurate estimates of the actual economic incidence of taxes, it is important to take into account the extent to which those taxes are capitalised into the values of asset prices:

> The extreme volatility of asset prices in the American economy suggests that these "capitalization" effects are of substantial importance. The ratio of the market value of corporate capital to its replacement cost has varied by a factor of more than two over the last 15 years. The relative price of the stock of owner occupied housing has increased very substantially. Bulow and Summers (1984) point to evidence of substantial volatility in the prices of specific used capital goods. Even more extreme volatility has been observed in the relative price of non-reproducible assets such as land, gold, and Rembrandts. Such relative price changes represent important transfers of wealth, and must be considered if the incidence of tax changes is to be accurately assessed.[76]

Dynamic simulation model developed by Auerbach and Kotlikoff

One such dynamic simulation model is that developed and documented by Auerbach and Kotlikoff (1987) in their book on *Dynamic fiscal policy*[77] which:

- outlines a simple two-period life cycle model to introduce the various issues involved in solving a dynamic general equilibrium simulation model (Chapter 2) and then outlines the:
  - more realistic life cycle model with 55 overlapping generations of adults, competitive production, and the government institutions that is used throughout the book (Chapter 3);
  - algorithm used to find the equilibrium of that simulation model (Chapter 4);
- uses that simulation model to illustrate a range of issues including the:
  - choice of an appropriate tax base (Chapter 5);
  - impact of deficits on private investment, interest rates, and welfare under a variety of assumptions about the source of the deficit and the parameters of the private production technology (Chapter 6);
  - ambiguities inherent in the way fiscal deficits are customarily measured. This includes a discussion of using economic versus accounting definitions of deficit finance and the potential for fiscal illusion (Chapter 7);
  - effects of progressive taxation (Chapter 8);
  - effects of business tax incentives (Chapter 9);
  - impact of social security on the economy (Chapter 10); and

[76] p.60, Kotlikoff, L. J. and L.H. Summers (1986).

[77] See Chapter 8, Progressive Taxation, pp. 111 to 126, Auerbach, A.J., and L. J. Kotlikoff (1987). *Dynamic Fiscal Policy*. Cambridge: Cambridge University Press. https://kotlikoff.net/wp-content/uploads/2019/03/Dynamic-Fiscal-Policy_1.pdf

  - effects of changes in the birth rate on the economy in general and on the social security system in particular (Chapter 11).

As outlined further below, of particular relevance to this report are its findings in relation to the:

- choice of an appropriate tax base (Chapter 5);
- analysis of the effects of progressive tax systems (Chapter 8) on:
  - inter-generational redistribution of income;
  - supply of labour; and
  - welfare and economic efficiency; and
- analysis of the effects of investment incentives (Chapter 9) on the market values of capital assets and interest rates.

Choice of an appropriate tax base

In Chapter 5, Auerbach and Kotlikoff (1987) simulate the effects of alternative tax bases and find that:

- the consumption tax base generates significantly more long-run capital formation than either the wage tax or the income tax. Capital formation under the wage tax typically exceeds that under the income tax. The size of the long-run capital stock under a pure capital income tax is much smaller than under the income tax;
- proportional consumption taxation appears to be significantly more efficient than proportional income taxation. In contrast, the transition from a proportional income tax to a proportional wage tax typically generates an efficiency loss despite the fact that the proportional wage tax, like the consumption tax, does not distort saving decisions;
- the rankings of the four tax bases with respect to their effects on savings and efficiency are insensitive to reasonable variations in parameter values;
- policies that potentially raise the long-run level of capital per worker, such as shifting from an income tax to a wage tax, may nonetheless imply a lower level of long-run economic welfare and reduce economic efficiency;
- the short-run response to certain announced future changes in the tax base can be exactly opposite to those motivating the switch in tax bases.

Different effects of progressive and proportional tax systems

In Chapter 8, Auerbach and Kotlikoff (1987) simulate and compare the effects of six different proportional and progressive tax systems, each of which would collect the same amount of revenue as would a 15% proportional tax rate on income:

- three proportional tax systems:
  - a proportional income tax;
  - a proportional consumption tax;
  - a proportional labour income tax;
- three progressive tax systems:
  - a progressive income tax;
  - a progressive consumption tax;
  - a progressive labour income tax.

As noted in **Table 30**, which sets out the "steady states" of the economy under these six different tax systems:

- progressivity reduces the size of the tax base. This can be seen from the first line of **Table 30** which indicates that a higher average tax rate is required under progressive income, consumption, and labour income tax systems in order to raise the same amount of revenue;
- although the marginal tax rates are higher than average tax rates under progressive tax systems, the trends in those marginal tax rates over the lifetimes of taxpayers differ across the three income tax, consumption tax, and labour income tax systems. Specifically, as illustrated in **Figure 60**, which sets out how the steady state average tax rates (i.e. $\bar{\tau}_w$ = average tax rate on wages, $\bar{\tau}_y$ = average tax rate on income, $\bar{\tau}_y$ = average tax rate on consumption) and marginal tax rates (i.e. τ_w = marginal tax rate on wages, τ_y = marginal tax rate on income, τ_c = marginal tax rate on consumption) imposed on taxpayers vary over their lifetimes under the three different tax systems that all raise the same amount of revenue:
  - under an income tax, the marginal rate peaks at middle age after substantial assets accumulate and before labour earnings begin to decline;
  - similarly, under a labour income tax, the marginal tax rate also beaks in middle age and falls off even more sharply as retirement approaches since capital income is not included in the tax base. As a result, by the age of 45, the marginal tax rate under a proportional labour income tax system is less than that under a proportional income tax system;
  - by contrast, under a consumption tax, both the average and marginal tax rates increase over the lifetime of the taxpayer.

As a result, the authors note that if one had to rank the three progressive tax systems from the point of view of the extent to which progressivity reduces the size of the tax base:

- the worst would be a progressive income tax system;
- second worst would be a progressive labour income tax system; and
- the best would be a progressive consumption tax. As noted by the authors:
  - at first sight, this result might seem surprising since when the consumption tax becomes progressive and rates rise with age, it distorts the intertemporal consumption choice as well as the labour-leisure trade-off (i.e. that is, rising marginal consumption tax rates, like a capital income tax, increase the price of future consumption relative to current consumption). As a result, we might expect this additional distortion to lead to a substantial reduction in saving and in the long run capital stock;
  - on closer inspection, however, the capital stock declines less with the move to progressivity under the consumption tax than under the labour income tax, which continues to leave the intertemporal consumption decision undistorted.[78]

[78] pp. 114-116, Auerbach and Kotlikoff (1987).

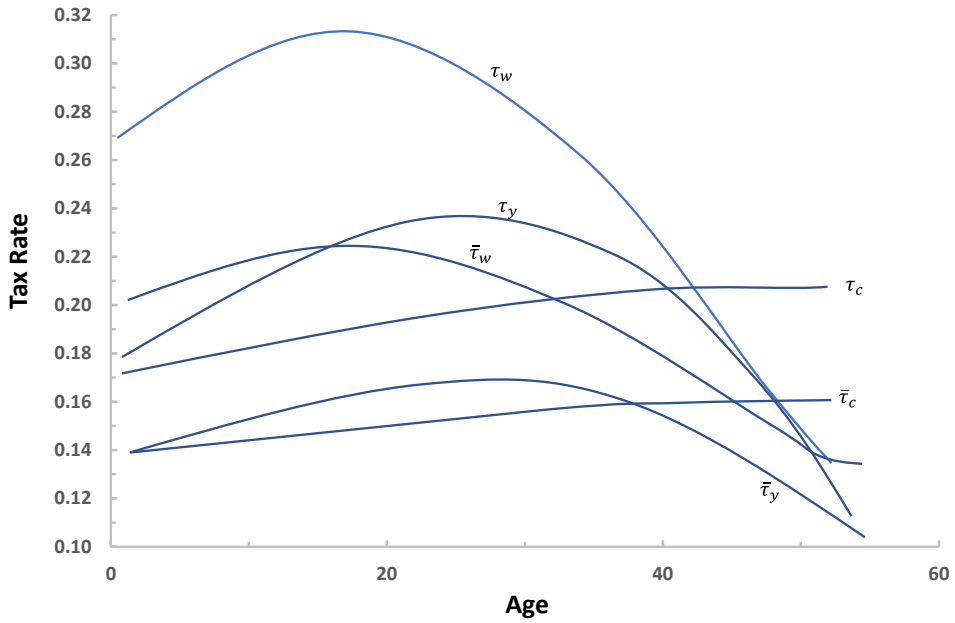
Table 30: Effects of progressive taxation – 15% proportional income tax revenue benchmark

	Income tax		Consumption tax		Labour income tax	
	Proportional	Progressive	Proportional	Progressive	Proportional	Progressive
Average tax rate*	0.150	0.157	0.176	0.180	0.201	0.210
Marginal tax rate at:						
age 5	0.150	0.192	0.176	0.216	0.201	0.287
age 25	0.150	0.236	0.176	0.246	0.201	0.301
age 45	0.150	0.182	0.176	0.259	0.201	0.188
Capital stock	95.1	87.0	117.7	117.4	100.1	95.2
Labour supply	19.1	18.5	19.0	18.5	18.6	17.9
National income	25.5	24.4	26.7	26.2	25.3	24.2

***** Aggregate average marginal tax rate

Source: Table 8.1, p.115, Auerbach and Kotlikoff (1987)

Figure 60: Lifetime profiles of marginal and average tax rates under different tax bases



Notes:

τ_w = marginal tax rate on wages
$\bar{\tau}_w$ = average tax rate on wages
τ_y = marginal tax rate on income
$\bar{\tau}_y$ = average tax rate on income
τ_c = marginal tax rate on consumption
$\bar{\tau}_y$ = average tax rate on consumption

Source: Figure 8.1, p.116, Auerbach and Kotlikoff (1987)

Effects of progressivity on the inter-generational redistribution of income

The results of the simulation also serve to illustrate the effects of progressivity on inter-generational redistribution of income. Specifically, the simulation results indicate that the:

- level of economic activity, individual welfare, and the capital stock under the labour income tax will be lower than under the consumption tax;
- switch from progressive to proportional labour income taxation shifts the burden of taxation somewhat from initial older to initial middle-aged and younger generations as well as to future generations. Under the progressive wage tax, average tax rates start declining around age 20 (which corresponds to a "real" age of 40). Given the larger marginal propensity of the initial elderly to consume, this redistribution and its associated change in the timing of tax payments over the lifespan are, in part, responsible for the decline in long-run savings;
- effects of switching from proportional consumption to progressive consumption taxation is quite different. Since the elderly are assumed to consume more than the young, a change to progressive consumption taxation shifts more of the burden of paying for the government's consumption initially onto the elderly. As noted in **Table 30**, the marginal consumption tax rate is 25.9% at age 45 (real age 65), but only 21.6% at age 5 (real age 25). As a result, the increased savings arising from this intergenerational redistribution virtually completely offsets the reduced savings generated by the increased distortion of intertemporal consumption choices.

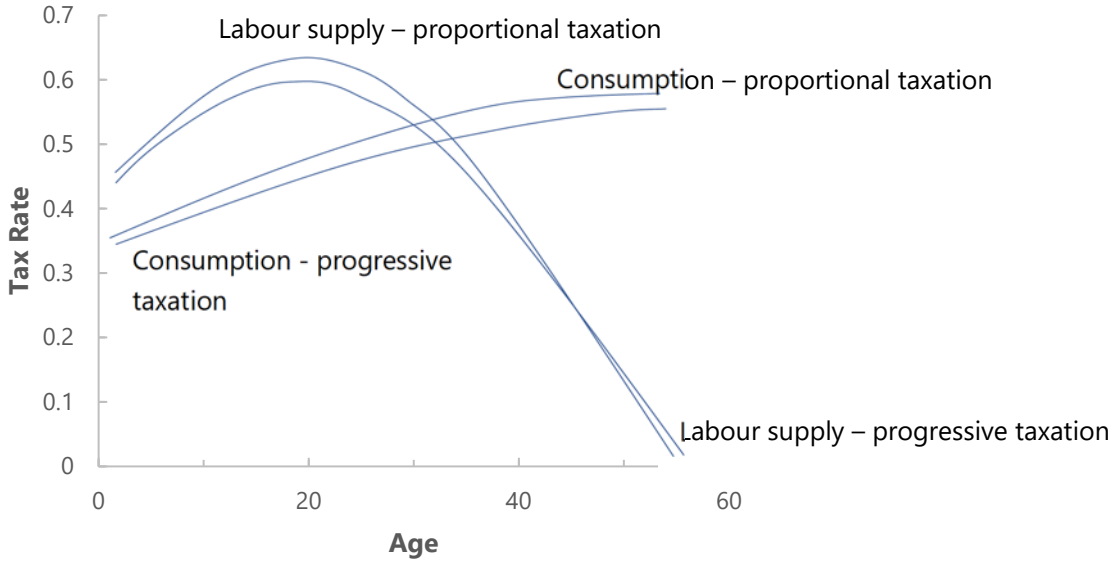
Effects of progressivity on the supply of labour

The simulation results also indicate the effects of progressivity on the supply of labour. Specifically, those simulation results indicate that:

- the progressive labour income tax has a stronger negative effect on savings due to the change in lifetime labour supply pattern, since for a typical individual, taxes occur much earlier in life under a wage tax than under a consumption tax. With higher marginal tax rates during the years of peak earnings, individuals are encouraged to engage in intertemporal labour substitution, working less in middle age and more when old. As a result, labour earnings, on the average, shift to later years, thereby lessening the need for life cycle savings. As illustrated in **Figure 61**:
  - under the proportional labour income tax, labour supply is 0.40 (i.e. 40 hours a week) at age 25 (real age 45) and 0.14 (14 hours a week) at age 45 (real age 65);
  - under the progressive version of the tax, the corresponding numbers are 0.38 and 0.16, respectively. Even though labour supply declines substantially along with consumption in the aggregate, it actually increases among older individuals;
  - under the progressive consumption tax provides no such direct incentive for intertemporal labour substitution. The corresponding changes in labour supply at the same two ages under the consumption tax are from 0.41 to 0.40 and from 0.17 to 0.16;
- the intergenerational redistribution effects associated with making a tax system more progressive are lower in the case of an income tax; and
- the marginal tax rate under the progressive income tax peaks after labour earnings do (owing to the presence of the income from accumulated capital in the tax base), which offsets the

tendency under the progressive labour income tax for labour supply to shift toward later years.[79]

Figure 61: Labour supply and consumption profiles under proportional and progressive income taxation



Source: Figure 8.2, p.118, Auerbach and Kotlikoff (1987)

Effects of progressivity on welfare and economic efficiency

The simulation results also indicate that:

- most of the increase in the steady state welfare of individuals arising from the switch from progressive consumption or labour income taxation to proportional income taxation is due not to efficiency gains, but to the intergenerational redistribution associated with changes in the timing of tax collections. Since increasing the degree of progressivity also involves intergenerational redistribution, changes in long-run individual welfare associated with changes in tax progressivity cannot be attributed to efficiency differences alone. Under two of the three tax bases, a move from progressive to proportional taxation is associated with an increase in long-run individual welfare. When government revenue equals that raised under a 15% proportional income tax a switch from the progressive income tax to a proportional income tax results in a wealth equivalent increase in steady state utility of 0.69%. In addition, nearly all generations alive at the initiation of this policy have greater utility;
- if the welfare of the current generation is kept constant and inter-generational lump sum transfers are used to shift the additional increases in welfare arising from the shift from progressive to proportional tax, it is possible to provide each subsequent generation a sustainable increase in utility equivalent to a 1.24% increase in full-time resources in the initial progressive income tax steady state. The switch to proportional wage taxation from its progressive version makes long-run cohorts better off by 0.84% of lifetime full resources, but neutralizing, through the use of lump sum transfers, the gains of initial generations allows a sustainable increase of 1.35% in the welfare of all subsequent generations;

[79] pp. 116-118, Auerbach and Kotlikoff (1987).

- under all three tax bases, a shift from progressive to proportional taxation would generate a large sustainable increase in the welfare of generations born after that switch to proportional taxation. However, in the absence of lump sum redistributions of that increase in welfare, much of that potential gain would be received by members of transitional generations. Specifically:
  - in the case of a shift from a progressive to a proportional consumption tax, enough is received by those alive initially that long-run cohorts are actually slightly worse off in the absence of such lump sum redistributions. Even with such transitional gains neutralized by those lump sum redistributions, the gains from reducing progressivity are smaller under a consumption tax than under the income tax;
  - a progressive wage tax is particularly more distortionary than its proportional counterpart. This can be explained by the fact that the:
    - burden of progressive consumption taxes falls even more heavily on the elderly, imposing a larger implicit lump sum tax on their assets, than the burden of the proportional consumption tax;
    - whereas the burden of progressive wage tax falls even less heavily on this group than the proportional wage tax. Thus, the same factors that explained (in Chapter 5) why a switch to proportional consumption taxation produces a greater efficiency gain than one to proportional wage taxation explains the difference in gains from getting rid of progressive taxation under each of the two bases.[80]

Effects of saving and investment incentives on the market values of capital assets and interest rates

In Chapter 9, Auerbach and Kotlikoff (1987) examine the effects of saving and investment incentives on the market values of capital assets and interest rates. Specifically, they:

- distinguish between:
  - savings incentives. The crucial feature of savings incentives is that they do not distinguish between new and old (i.e. existing) capital. Most such policies involve either a reduction in the rate of tax on the income generated by savings, or a tax deduction for savings itself;
  - investment incentives. An investment incentive applies to specific types of investment. Since it is very difficult to trace the components of income for a business back to the different assets used to produce that income, the only feasible way of achieving such an incentive is to provide favourable tax treatment associated with the new ownership or acquisition of those assets (e.g. through investment tax credits that refund a proportion of the purchase price of those assets, or accelerated depreciation allowances that enable the taxpayer to write of the asset at a faster rate than its statutory economic rate of depreciation). The key feature that distinguishes investment incentives from saving incentives is that investment incentives are only available for new assets;
- note that in a closed economy:
  - saving incentives shift the supply curve for new domestic capital;
  - investment incentives shift the demand curve;

[80] p.123, Auerbach and Kotlikoff (1987)

  - saving and investment incentives do not represent conceptually distinct policies and the real effects of taxes or subsidies are the same whether applied to saving or the demand for new capital (i.e. investment);
  - although both savings and investment incentives alter marginal incentives to accumulate new capital, investment incentives redistribute from the old to the young through asset (i.e. stock) market revaluation. Specifically:
    - savings incentives are structurally equivalent to shifts from income taxation to labour income taxation (i.e. the direction of the intergenerational transfer in wealth generated by savings incentives is the same as that associated with switching from income taxation to labour income taxation);
    - investment incentives are structurally equivalent to shifts from income taxation to consumption taxation (i.e. the direction of the intergenerational transfer in wealth generated by investment incentives is the same as that associated with switching from wage to consumption taxation);
    - consequently, investment incentives are more efficient than savings incentives for the same reason that consumption taxes are more efficient than labour income taxes.

Specifically, Auerbach and Kotlikoff (1987) have simulated the intertemporal effects of introducing a saving incentive (i.e. elimination of capital income taxation) and an investment incentive (i.e. full expensing of the asset) in either the absence or presence of adjustment costs on the:

- interest rate (i.e. r);
- market value of the capital stock expressed as a proportion of its replacement cost (i.e. q); and
- increase in the capital stock (valued at replacement cost) expressed as a fraction of income (i.e. S/Y).

The results of those simulations are:

- set out in **Table 31** both in the:
  - absence of transactions costs:
    - column 1 sets out the effects of the elimination of capital income taxation in the absence of transactions costs (i.e. b=0);
    - column 3 outlines the effects of full expensing of the asset in the absence of transactions costs (i.e. b=0);
  - presence of adjustment costs (i.e. b=10% of investment expenditure):
    - column 2 sets out the effects of the elimination of capital income taxation in the presence of adjustment costs (i.e. b=10% of steady state investment expenditure);
    - column 4 sets out the effects of full expensing of the asset in the presence of adjustment costs (i.e. b=10% of steady state investment expenditure);
- illustrated in:
  - **Figure 62**, which sets out the effects of saving and investment incentives on the market value of the capital stock expressed as a proportion of its replacement cost (i.e. q) in both the absence and presence of adjustment costs; and
  - **Figure 63**, which sets out the effects of saving and investment incentives on interest rates in both the absence and presence of adjustment costs.

In all cases, the initial steady state prior to the introduction of these saving and investment incentives is assumed to be an income tax regime that applies a 15% rate of tax to income from savings and investment.

The results of those simulations indicate the effects of adjustment costs on the:

- steady states of each of the three tax systems. Although steady state interest rates are not substantially affected by the presence of adjustment costs, this does not mean that steady state capital-output ratios are insensitive to adjustment costs. Since q is higher with adjustment costs, the implied marginal product of capital must be too. As a result, the capital-output ratio must be lower, which is confirmed by the lower savings rates in each case;
- transition from the initial tax system to either of the two alternative tax regimes. In this regard, the authors note that there are several additional differences arising from those adjustment costs:
  - under the capital income tax cut, the q rises initially by 2.7% as investment increases. This smooths the increase in capital intensity relative to the case of no adjustment costs;
  - the saving rate rises by much less in the first year and is below that in the no-adjustment cost case throughout the first 10 years of the transaction;
  - interest rates drop more quickly because the anticipated decline in q means capital losses must be subtracted from the marginal product of capital in determining the overall yield on assets. This reduced return to saving further contributes to the smoothing of the investment increase;
  - the switch to expensing has a more dramatic effect, with or without adjustment costs. The drop in q that occurs without adjustment costs because of the tax distinction between new and old capital is partly, but not completely, offset in the presence of adjustment costs by the increase in the before-tax cost of capital goods that comes from the rise in investment;
  - the saving rate rises in period 2 by a much smaller amount with adjustment costs since the coincident increase in labour supply outweighs the depressing effect of the initial increase in saving on the interest rate; and
  - for each of the tax reforms analysed, the long-run increase in the saving rate is proportionately smaller in the presence of adjustment costs.[81]

[81] pp. 139-140, Auerbach and Kotlikoff (1987)

Table 31: Effects of saving and investment incentives (with and without transactions costs)

Year	Elimination of capital income taxation		Full expensing	
	b=0	b=10	b=0	b=10
Initial steady state				
r	6.7	6.7	6.7	6.7
q	1.000	1.085	1.000	1.085
S/Y	3.7	3.5	3.7	3.5
Transition year 2				
r	6.6	6.4	6.9	6.1
q	1.000	1.114	0.840	0.990
S/Y	5.2	4.0	9.0	6.0
Year 5				
r	6.5	6.4	6.6	6.1
q	1.000	1.112	0.842	0.982
S/Y	5.0	4.0	8.2	5.8
Year 10				
r	6.4	6.4	6.3	6.0
q	1.000	1.110	0.844	0.974
S/Y	4.7	3.9	7.2	5.5
Year 150				
r	6.3	6.3	5.7	5.7
q	1.000	1.100	0.850	0.935
S/Y	4.0	3.6	4.4	4.0

Notes:

b = adjustment costs expressed as a proportion of steady state investment expenditure

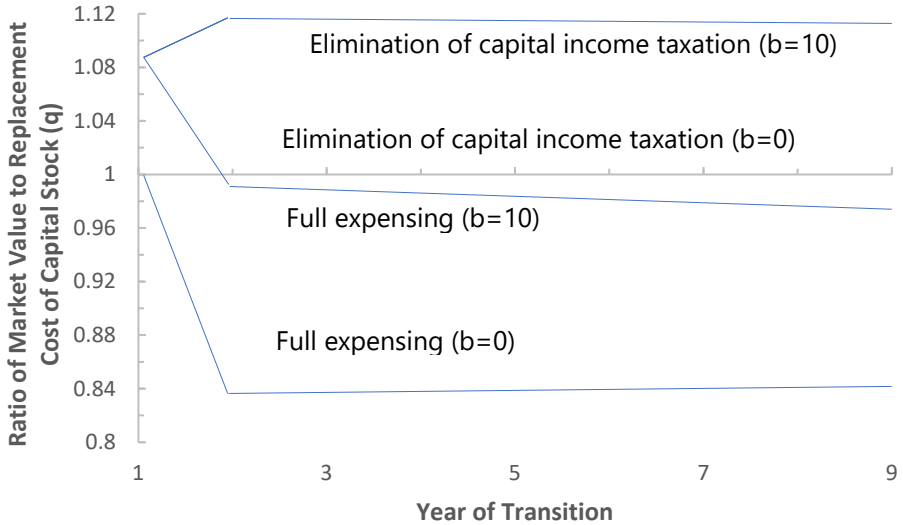
r = interest rate

q = the market value of the capital stock expressed as a proportion of its replacement cost

$\frac{S}{Y}$ = the increase in the capital stock (at replacement cost) as a fraction of income

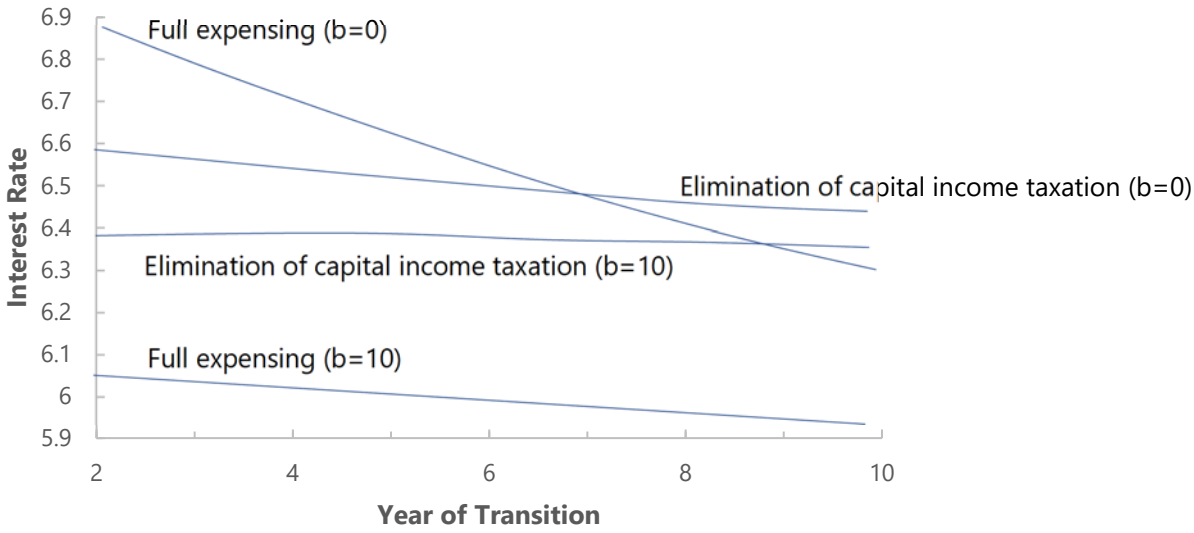
Source: Table 9.1, p. 137, Auerbach and Kotlikoff (1987)

Figure 62: Effects of saving and investment incentives on the market value of the capital stock expressed as a proportion of its replacement cost (with and without adjustment costs)



Source: Figure 9.1, p. 138, Auerbach and Kotlikoff (1987)

Figure 63: Effects of savings and investment incentives on interest rates (with and without transaction costs)



Source: Figure 9.2, p.139, Auerbach and Kotlikoff (1987)

4.2 Practical constraints on the reform of income tax and benefit systems

This section identifies the key factors that constrain the scope for further reform of New Zealand's income tax and benefit systems, which include:

- information constraints (section 4.2.1);
- conflicting objectives (section 4.2.2);
- unavoidable economic costs (section 4.2.3); and
- legislative constraints (section 4.2.4).

These practical constraints have significantly influenced the recommendations of the three major reviews of New Zealand's tax system that have been conducted since 1989, namely the:

- Consultative Committee on the Taxation of Income from Capital;[82]
- Tax Review 2001;[83] and
- Future of the Tax System – Tax Working Group.[84]

[82] Consultative Document on the Taxation of Income from Capital, https://taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/1989/1989-dd-taxation-income-capital/1989-dd-taxation-income-capital-pdf.pdf?modified=20200910102401&modified=20200910102401

[83] Tax Review 2001, Final Report, 12 October 2001, https://www.treasury.govt.nz/sites/default/files/2007-11/taxreview2001-report.pdf

[84] Future of Tax, Final Report Volume 1, Recommendations, Tax Working Group, 21 February 2019, https://taxworkinggroup.govt.nz/resources/future-tax-final-report.html

4.2.1 Information constraints

Information constraints have had, and are likely to continue to have, a profound effect on both the:

- determination of the economic efficiency of the tax and benefit systems and the actual economic incidence of those taxes and benefits (i.e. the individuals who eventually bear the actual economic burden of those taxes and enjoy those benefits); and
- design, review and reform of the tax and benefit systems.

When illustrating the effects of tax and benefit systems, however, it is typically assumed, for simplicity, that all individuals and businesses are fully informed regarding:

- their legal obligations to pay income tax and their legal rights to receive benefits under the social welfare system. In practice, however, the complexity of the legislation, regulations, case law and guidelines governing the income tax and benefit systems inevitably create uncertainty for taxpayers, beneficiaries and their professional advisors regarding their tax liabilities and benefit entitlements. This leads to differences of opinion across taxpayers, their advisors and IRD officials regarding the appropriate interpretation and application of that legislation and regulations, which the courts are ultimately called upon to resolve. Even high wealth/high income individuals, large companies, and their advisors, can be uncertain as to their income tax liabilities in view of the complexity of the tax treatment of their savings and investment portfolios and related economic activities;
- the extent to which the tax and benefit systems distort the relative risk-adjusted rates of return they expect to derive from not only the assets they currently own and their existing economic activities, but also from the other assets and alternative economic activities they could purchase and pursue in the future. In practice, however, while individuals and businesses might have some information on the different statutory marginal rates of tax applying to their savings and investments, they might not have detailed information on either the:
  - differences in the effective marginal rates of tax that are imposed on different forms of income from capital. Not all individuals and businesses have access to advisors who are capable of estimating the effective marginal tax rates that are imposed on the various forms of capital income and expenditure they derive and incur. Rather, they often have to rely on other more easily obtained sources of information (e.g. published statutory marginal rates of tax and "headline" tax rates, such as the company tax rate);[85] and
  - the extent to which some or all of those differences in effective marginal tax rates have already been capitalised into asset prices and the actual economic rates of return generated by alternative forms of savings, investment and economic activities. Once again, considerable uncertainty typically surrounds this issue and not all individuals and businesses have access to advisors who have the necessary skills and experience to provide the advice they need on these complex issues.

[85] See for example the "tax salience" literature, including Chetty, R., A. Looney, and K. Kroft. Salience and Taxation: Theory and Evidence. The American Economic Review 99.4 (2009): 1145-1177, https://dash.harvard.edu/bitstream/handle/1/9748525/Chetty_SalienceTaxation.pdf

Similarly, for simplicity, it is also typically assumed that key decision makers in government, and its advisors, either:

- already have access to all of the information they need to determine the efficiency and equity of the tax system and the effects of proposed changes to that tax system; or
- could obtain that information if they so desired (e.g. through the current survey of high wealth individuals being conducted at the government's request by Inland Revenue).

In practice, however, it is more realistic to assume that there will always be constraints on the availability of the detailed information that tax officials require, in theory, in order to determine the efficiency and equity of the current tax system and evaluate the merits of alternative approaches to tax reform. This includes accurate and up to date information on the:

- wide range of different assets in which individuals and households hold and invest their savings, and how those individuals and households and are constantly changing over time. Even if it was possible to obtain such accurate information by surveying high wealth individuals, such information is likely to become out of date over time as they change their portfolios in response to changes in relative rates of return;
- unintended effects that the income tax and benefits systems are having on their levels and patterns of savings and investment over time, and how this is passing some, or even all, of the actual economic burden of those income taxes onto other sections of the community, including low wealth/low income households (e.g. as a result of tax-induced increases in interest rates, rentals, house prices, as well as the overall cost of goods and services).

The existence of these long-term information constraints and their implications for the process of tax reform are, of course, well recognised by tax policy officials and the academic community. Indeed, it is the recognition of the existence of these information constraints that, until recently, has resulted in successive New Zealand governments:

- adopting a less informationally demanding approach to improving the economic efficiency and distributional equity of the income tax system that has involved:
  - reducing statutory marginal rates of income tax in order to reduce the disincentives to save and invest; and
  - broadening the tax base, where practicable, to:
    - raise a greater proportion of tax revenue using more efficient taxes, such as New Zealand's broad based indirect consumption tax (i.e. GST); and
    - include a wider range of economic income in the tax base in order to reduce the extent to which the income tax system unintentionally distorts patterns of saving and investment;
- rejecting more informationally demanding approaches to tax reform that deviate from that broad base, low rate approach to tax reform unless there is sufficient empirical evidence to suggest that such reforms are both feasible in practice and can be expected to significantly improve the efficiency and equity of the tax system. As discussed further below, although it is possible, in theory, to improve the efficiency and equity of the income tax system through more informationally demanding approaches to tax reform (e.g. corrective taxes and subsidies):
  - the information required to design, implement and administer the operation of such tax reforms is rarely available and the collection of that information can involve significant

additional administrative and compliance costs. Only limited information is available on the magnitude of the administrative and compliance costs arising from the tax system;[86]

  - those information constraints can result in such approaches to tax reform failing to achieve their intended objectives of improving the economic efficiency and distributional equity of the income tax system and imposing significant costs on the nation as a whole that are many times greater than the expected net benefit (i.e. since the deadweight costs of taxation increase exponentially as the tax rate increases). This means that the potential economic costs of poorly designed corrective taxes can be many times greater than their intended net benefits. The existence of these information constraints also help to explain the reasons why those involved in tax review and reform have to continue to rely on their judgement, in conjunction with simplifying assumptions they consider to be reasonably realistic, to:
    - assess the complex effects of the tax and benefits systems (e.g. on savings and investment decisions, economic growth, the overall welfare of the nation and the equity with which the benefits from economic growth are distributed throughout the community); and
    - make the complex trade-offs between their competing objectives (e.g. between economic efficiency and distributional welfare); and
- pursue less informationally demanding approaches to tax reform (e.g. the "broad base, low rate" approach of reducing high rates of income tax and broadening the tax base to reduce tax-induced distortions in relative rates of return and relative prices) and avoid more informationally demanding approaches, except in those cases where the potential benefits of the proposed reforms are expected to exceed their expected costs.

4.2.2 Conflicting objectives

Tax and benefit systems typically seek to achieve three main objectives:

- revenue sufficiency – that is, raise sufficient revenue to meet the government's expenditure needs and redistribute sufficient revenue and subsidised goods and services through the social welfare system to meet the needs of beneficiaries;
- economic efficiency, which requires:
  - efficiency in production, which involves:

[86] See, for example, Colmar Brunton (2005), *Measuring the tax compliance costs of small and medium-sized businesses – a benchmark survey, Final Report,* prepared for the New Zealand Inland Revenue Department, 20 June 2005. https://taxpolicy.ird.govt.nz/-/media/project/ir/tp/news/2005/2005-07-19-tax-compliance-cost-research/2005-07-19-report-sme-compliance-costs-pdf.pdf?sc_lang=en&modified=20200910055903&modified=20200910055903&hash=ECA8CD003F7C705DF663883A0BC9C668 See also Inland Revenue Department (2021), *2021 study on the time and cost of doing business taxes incurred by NZ small businesses,* https://www.ird.govt.nz/-/media/project/ir/home/documents/about-us/publications/research-and-evaluation-reports/small-and-medium-enterprises-compliance-costs/2021.pdf?modified=20221004234616&modified=20221004234616
For a review of the literature in this area and estimates of compliance costs for small businesses in New Zealand, see Gupta, R. and A. Sawyer (n.d.), Tax Compliance Costs for Small Businesses in New Zealand, https://www.business.unsw.edu.au/About-Site/Schools-Site/Taxation-Business-Law-Site/Documents/GUPTA-Ranjana-et-al-Tax-Compliance-Costs-for-Small-Business-in-New-Zealand.pdf and Alexander file:///C:/Users/jwallace/Downloads/Quantifying_compliance_costs_of_small_businesses_i.pdf

        - maximising the quantity of output that is achieved for a given quantity of inputs (i.e. achieving "technical efficiency"); and
        - maximising the value of output that is achieved for a given value of inputs (i.e. achieving "allocative efficiency");
    - efficiency in consumption;
    - efficiency in exchange, which requires that the level and pattern of goods and services supplied by producers to be equal to the level and pattern of goods and services demanded by consumers at prevailing market prices (i.e. efficiency in exchange requires simultaneous achievement of efficiency in both production and consumption);
    - dynamic efficiency, which requires that levels and patterns of production, consumption and resource use continue to be efficient over time;
- distributional equity, which requires both:
    - "vertical equity" (i.e. individuals with higher levels of income should be expected to pay higher amounts of tax); and
    - "horizontal equity" (i.e. individuals with similar levels of income should be expected to pay similar amounts of tax).

All other objectives of the tax and benefit systems are just component parts of these three main objectives. For example:

- "simplicity" is required to ensure the tax and benefit systems are as efficient and possible. Any unnecessary complexity can increase administrative and compliance costs of the tax system and thereby reduce the overall welfare of the nation as a whole by encouraging a less efficient use of the nation's scarce resources;
- "certainty" is also required to achieve all of the objectives outlined above. Any unnecessary uncertainty surrounding the tax system and its application can also impose net cost on the community as a whole by unintentionally altering economic decisions, particularly savings and investment decisions.

In practice, however, it is not possible to design a tax or benefit system that simultaneously achieves all of those objectives. Rather, in the course of designing a tax system to raise and redistribute revenue, it is inevitable that there will be some conflict between these objectives that will require trade-offs to be made between these conflicting objectives.

For example, in practice, conflicts arise between the:

- revenue sufficiency and economic efficiency objectives. For example:
    - attempts to increase the amount of revenue raised by:
        - increasing statutory marginal rates of income tax can have the unintended effect of reducing the economic efficiency of the tax and benefit systems (e.g. by further reducing the incentives of individuals to work, save and invest);
        - taxing a wider range of capital gains that are realised on the sale of assets can have the unintended effect of reducing the economic efficiency of the tax system to some extent (e.g. by locking taxpayers into the ownership of those assets and increasing administrative and compliance costs);
    - conversely, attempts to increase the economic efficiency of the tax system (e.g. by reducing the top marginal tax rate) can reduce the amount of revenue raised by government in the short term;

- revenue sufficiency and distributional equity objectives. For example:
  - attempts to increase the amount of revenue raised and redistributed by the tax and benefit systems can also have the unintended effect of actually reducing the distributional equity of the tax system to the extent that the actual economic burden, or benefit, of those taxes and benefits is passed onto individuals other than those legally liable to pay or receive those taxes and benefits;
  - conversely, attempts to improve the equity of the tax system (e.g. by introducing more progressive statutory marginal rates of tax) can narrow the tax base and reduce its ability to raise sufficient revenue;
- economic efficiency and distributional equity objectives. For example:
  - attempts to increase the economic efficiency of the tax system (e.g. by reducing the rate at which social welfare benefits are abated as the income of the beneficiary increases in an attempt to reduce the disincentive for the beneficiary to work) can have the unintended effect of reducing its distributional equity (e.g. by providing benefits to individuals on higher levels of income);
  - conversely, attempts to improve the distributional equity of the tax system (e.g. by introducing more progressive statutory rates of income tax) can have the unintended effect of reducing its economic efficiency (e.g. by reducing the incentives to work, save, invest, and produce goods and services, and increasing the complexity of the tax system, which increases administrative and compliance costs);
- simplicity and economic efficiency objectives. For example:
  - attempts to improve the simplicity of the tax system in order to reduce administrative and compliance costs can also reduce the efficiency of the tax system to some extent (e.g. by reducing the accuracy with which the tax system measures the actual income and expenditure that individuals and businesses derive and incur from their economic activities). This is, of course, the reason why tax simplification exercises do not simply seek to minimise administrative and compliance costs. It may be necessary to increase administrative and compliance costs in order to raise and redistribute revenue in a more efficient manner;
  - conversely, attempts to improve the economic efficiency of the tax system (e.g. by improving the accuracy with which real economic income through the indexation of the tax base for the effects of inflation) can make the tax system more complex, thereby reducing its efficiency to some extent by increasing administrative and compliance costs;
- simplicity and distributional equity objectives. For example:
  - attempts to improve the simplicity of the tax system in order to reduce administrative and compliance costs can reduce the ability of the tax and benefit systems to achieve their distributional equity objectives;
  - conversely, attempts to improve the distributional equity of the tax system (e.g. by increasing the top statutory marginal rate of tax) can reduce the simplicity and economic efficiency of the tax system. Indeed, much of the complexity in the existing tax and benefit systems is the result of past attempts to improve their distributional equity.

4.2.3 Unavoidable economic costs

The scope for further reform of the income tax and benefit systems is also constrained by a range of unavoidable economic costs. Those unavoidable economic costs include not only the unintended adverse effects that the income tax and benefit systems have on economic efficiency and distributional equity, but also the economic costs arising from other sources of inefficiency and inequity.

The tax and benefit systems are not the only potential sources of inefficiency and inequity. Rather, inefficiencies and inequities can arise as a result of market failure (i.e. the failure of capital markets and markets for goods and services to operate in an efficient manner).

When illustrating the effects of the tax system, it is typically assumed, for simplicity, that markets work efficiently and adjust efficiently to all sources of changes in relative prices and rates of return, including the unintended effects that the tax and benefit systems have on those relative prices and rates of return. In practice, however:

- markets can fail to operate efficiently for a variety of reasons including the existence of:
  - "imperfect information" (e.g. information asymmetries);
  - external costs and benefits that some economic activities impose on other sections of the community;
  - public good features of some goods and services (i.e. national defence services) which arise due to the:
    - difficulties and undesirability of excluding those who do not pay for the provision of those goods and services from enjoying the benefits arising from the supply of those goods and services (i.e. the problem of "non-excludability"); and
    - the consumption of one good or service does not reduce the amount of that good or service that is available for use by other individuals in the community (i.e. "jointness" in consumption);
  - imperfect competition in the markets for those goods and services (e.g. due to the existence of economies of scale in production and potential barriers to competitors entering the market);
- those market failures alter the manner in which the economy adjusts to the unintended tax-induced distortions in rates of return from alternative assets and economic activities; and
- governments can seek to use the tax system in an attempt to "correct" for the existence of those market failures and improve economic efficiency and the welfare of the nation as a whole (e.g. through the use of "Pigouvian" taxes on the consumption of goods and services that are considered to impose external costs on other sections of the community).

Additional inefficiencies and inequities also arise as a result of regulatory failure (i.e. the failure of government intervention to achieve its intended objectives). Not all government interventions succeed in improving the overall welfare of the nation as a whole by improving the economic efficiency with which the nation uses its resources and the distributional equity with which the income generated by that resource use is allocated across individuals in the community.

Indeed, even when government intervention does achieve its objectives to some extent, this typically comes at the expense of the economic costs that arise from the other unintended, unavoidable, adverse effects of those interventions. The tax and benefit systems are not the only forms of

government intervention that impose unintended economic costs on the nation as a whole. Other government interventions (e.g. regulation of electricity, gas, water utilities) also have the potential to unintentionally distort economic decisions to consume, produce, invest and use resources.[87]

4.2.4 Legislative constraints

Legislative constraints are another key factor that has had a significant impact on the design of the current tax and benefit systems and will continue to constrain the review and reform of those systems in the future.

These legislative constraints include the:

- long established legal conventions and traditions, case law and accounting practices that have shaped the current design of the tax and benefit systems (e.g. the long standing difference in the tax treatment of debt and equity that arises since interest expense is tax deductible whereas dividends are paid out of after-tax profits); and
- tax legislation and regulations applying in other jurisdictions, which includes the:
  - legislation and regulations that are governed by the international tax treaties and conventions to which New Zealand is a signatory. Although those treaties provide New Zealand with an opportunity to influence the international tax treatment of the income and expenditure that New Zealand residents derive and incur in relation to their foreign investments, at the same time, it also constrains the review and reform of New Zealand's international and domestic tax regimes to some extent; and
  - other international legislation, regulations and practices over which New Zealand has little control. As a small, open, capital importing nation, New Zealand cannot simply seek to independently review and reform its tax legislation, with no regard for how income and expenditure is treated for tax purposes in other jurisdictions. Rather, in view of the increasing internationalisation of the New Zealand economy and the globalisation of the world economy, both the current tax systems and direction of tax reform in other jurisdiction require careful consideration. This does not mean that New Zealand should simply seek to copy the tax systems in other jurisdictions and their reforms. Rather, it means that New Zealand needs to avoid unintentionally creating any inconsistencies that will reduce the overall welfare of the nation and its residents.

[87] For a discussion of the information required to design second best, corrective taxes, and the approaches to tax reform that can be used to minimise the information required (e.g. tops down and across the board reductions in taxes) see Lloyd P. J. (1974), A More General Theory of Price Distortions in Open Economies, *Journal of International Economics*, 4 (1974) 365 – 386., https://www.sciencedirect.com/science/article/abs/pii/0022199674900178

5. Conclusion

5.1 Effective tax rates need to be interpreted and applied with caution

In view of the complexity of the income tax and benefit systems, the statutory rates of tax and benefits set out in the *Income Tax Act 2007* and the *Social Security Act 2018* do not provide an accurate indication of the net amount of tax that individuals and households are legally required to pay on the economic income they earn.

Rather, as noted in section 2.2 of this report, it is necessary to estimate more accurate measures of the actual "effective" rates of tax that individuals are legally required to pay on their economic incomes, net of the tax concessions and other benefits that there are legally entitled to receive.

As outlined in section 3 of this report, while it is possible to estimate such effective tax rates, those estimates inevitably reveal significant variations in both the effective rates of tax that are imposed on the net real economic incomes of illustrative types of households (as outlined in section 3.2), as well as the effective rates of tax imposed on the economic incomes individuals earn from the different assets in which they hold their savings and invest (as outlined in section 3.3), that are due to the combined effects of:

- government decisions:
  - not to index the income tax base to exclude the effects of inflation;
  - to tax individuals, rather than households, on the income they earn;
  - not to tax, or to concessionally tax, certain forms of income (e.g. the imputed rental income from the family home, as well as capital gains in the value of human, financial and physical capital assets);
  - to provide certain forms of means tested subsidies to low and medium wealth households that are abated as their incomes increase, which increases the effective tax rates imposed on their income; and
  - to provide other subsidies to all households (e.g. subsidised education and health services), regardless of their levels of wealth and income;
- the decisions that individuals make regarding:
  - the types of households in which they choose to reside (e.g. whether or not to marry and have children);
  - how much to work, consume, save and invest;
  - the types of assets in which to hold their savings and invest those savings;
  - the forms in which they earn that income; and
  - the entities through which they choose to save and invest (e.g. investment funds, Portfolio Investment Entities, as well as public and private companies).

This makes it difficult to generalise about "the" effective rates of tax imposed on any particular type of household, or form of savings and investment, particularly for high wealth households who have the greatest flexibility to choose the form in which they hold their wealth and earn their income.

In addition, as outlined in section 4.1 of this report, although effective tax rates provide a potentially more accurate indication of the "legal" incidence of income taxes and benefits, they do not provide an

accurate indication of who ultimately bears the burden of those taxes or enjoys the benefits provided by tax concessions and other government subsidies.

Rather, additional information is required in order to determine the extent to which differences in the effective marginal rates of tax imposed on different forms of income will encourage individuals to change their savings and investment decisions and thereby, through the operation of capital markets, pass on some, or even all, of the economic incidence of those taxes and benefits onto other individuals (e.g. information on the sensitivity of savings and investment decisions to differences in the effective marginal rates of tax imposed on different forms of income from capital).

5.2 Practical constraints limit the scope for further reform of the income tax and benefit systems

As outlined in section 4.2 of this report, there are several practical constraints that limit the extent to which further reform of New Zealand's income tax and benefit systems are both feasible and desirable, including:

- information constraints, particularly the lack of the extensive information required in order to estimate the nature and extent of the unintended effects that the income tax and benefit systems have on both economic efficiency and distributional equity;
- conflicting objectives, particularly the inherent conflict that exists between the equity and efficiency objectives of the tax and benefit systems. Attempts to improve the equity of the tax and benefit systems can have the unintended effect of reducing economic efficiency. The ability of governments to make those complex trade-offs between conflicting objectives is also limited by the information constraints outlined above;
- unavoidable economic costs (e.g. the unavoidable adverse effects that taxes and benefits inevitably have on economic efficiency, which include the adverse effects of an income tax on work, saving and investment decisions, as well as the administrative and compliance costs arising from the operation of the tax and benefit systems); and
- legislative constraints (e.g. the long standing different tax treatment of debt and equity).

Although effective tax rate estimates help to identify those features of the income tax and benefit systems that may be in need of further review and reform, this does not mean that any reform that reduces those differences will improve economic efficiency or distributional equity.

Many of the remaining sources of differences in effective tax rates reflect difficult trade-offs between the competing objectives of the equity and efficiency of the tax system that to date, governments have found difficult to resolve. As a result, attempts to reduce differences in effective tax rates can result in the reversal of many complex, long standing tax policy decisions regarding the design of the income tax and benefit systems.

5.3 Consequent need to pursue less informationally demanding approaches to reform

The existence of those practical constraints and complex trade-offs has important implications for the approach that governments adopt to the review and reform of the income tax and benefit systems.

Although it is desirable to improve our understanding of both the equity and efficiency of the tax and benefit systems, it is also important to recognise the difficulties and considerable costs of obtaining the information required to develop a more detailed understanding of those effects.

Those costs include the:

- administrative costs associated with:
  - obtaining that information;
  - analysing that information (e.g. through the development and use of computable dynamic general equilibrium models that are capable of taking into account how capital markets, as well as markets for goods and services, are expected to adjust in both the short and longer term);
  - regularly updating that information, since it becomes rapidly obsolete as individuals change their savings and investment portfolios over time; and
- compliance costs, which can be significant when taxpayers (e.g. high wealth individuals) are asked to provide confidential information that is not required for accounting or taxation purposes; and
- potential unintended effects that such requests for information could have on savings and investments decisions (e.g. by creating a more uncertain environment for investment due to concerns that the government might be considering the introduction of comprehensive taxes on capital gains or wealth).

Those information constraints are the key reasons why, until recently, successive New Zealand governments have:

- adopted a less informationally demanding approach to improving the economic efficiency and distributional equity of the income tax system that has involved:
  - reducing statutory marginal rates of income tax in order to reduce the disincentives to save and invest; and
  - broadening the tax base, where practicable, to:
    - raise a greater proportion of tax revenue using more efficient taxes, such as New Zealand's broad based indirect consumption tax (i.e. GST); and
    - include a wider range of economic income in the tax base in order to reduce the extent to which the income tax system unintentionally distorts patterns of saving and investment;
- rejected more informationally demanding approaches to tax reform that deviate from that broad base, low rate approach to tax reform unless there is sufficient empirical evidence to suggest that such reforms are both feasible in practice and can be expected to significantly improve the efficiency and equity of the tax system.

References

Advani, A. and A. Summers (2020). How much tax do the rich really pay? New evidence from tax microdata in the UK. CAGE Policy Briefing no. 27 June 2020, https://warwick.ac.uk/fac/soc/economics/research/centres/cage/manage/publications/bn27.2020.pdf

Anderson, A. (1998). An International Perspective: Examining how other countries approach business taxation. An information paper commissioned by Review of Business Taxation following the release of a Strong Foundation on 23 November 1998. https://webarchive.nla.gov.au/awa/20180316084138/http://rbt.treasury.gov.au/

Armour, P., R. V. Burkhauser, and J. Larrimore (2014). Levels and Trends in U.S. Income and its Distribution: A Crosswalk from Market Income towards a Comprehensive Haig-Simons Income Approach. *Southern Economic Journal* 2014, 81(2), 271–293, https://www.jstor.org/stable/44114282.

Auerbach, A.J., and L. J. Kotlikoff (1987). *Dynamic Fiscal Policy*. Cambridge: Cambridge University Press. https://kotlikoff.net/wp-content/uploads/2019/03/Dynamic-Fiscal-Policy_1.pdf

Australian Treasury (2012), *Final Report on the Tax Treatment of Losses*, Business Tax Working Group, https://treasury.gov.au/publication/business-tax-working-group-final-report-on-the-tax-treatment-of-losses/final-report-on-the-tax-treatment-of-losses

Aziz, O.A., M. Gibbons, C. Ball, and E. Gorman (2012). *Fiscal Incidence in New Zealand: The Distributional Effect of Government Expenditure and Taxation on Household Income, 1988 to 2010,* Paper for New Zealand Association of Economists Conference 2012, New Zealand Treasury. https://www.nzae.org.nz/wp-content/uploads/2012/07/Aziz_Fiscal-Incidence-NZAE-2012-Conference-Paper.pdf

Aziz, O, Gremmell G. and A. Laws (2013), *The Distribution of Income and Fiscal Incidence by Age and Gender: Some Evidence from New Zealand*, Working Paper 10/2013, June 2013 https://researcharchive.vuw.ac.nz/xmlui/bitstream/handle/10063/2852/Working%20paper.pdf?sequence=1

Benge, M. (1997). Taxes, corporate financial policy and investment decisions in Australia. *Economic Record*, 73, 1-15.

Benge, M. (1998). Depreciation provisions and investment incentives under full imputation. *Economic Record*, 74, 329-345.

Benge, M. (1998). *Taxes, Corporate Financial Policy and Investment Decisions in Australia*. Ph.D. dissertation, Australian National University, April 1998, https://openresearch-repository.anu.edu.au/bitstream/1885/144270/2/b20128149_Benge_M.pdf

Bovenberg, A.L., K. Aramaki, K. Anderssen and S.K. Chand (1990). Tax Incentives and International Capital Flows: The Case of the United States and Japan, Chapter 8, Razin, A and J. Slemrod, eds *Taxation in the Global Economy*. https://www.nber.org/system/files/chapters/c7212/c7212.pdf

Buchanan, C. and P. Hartley (2000). *Equity as a Social Goal*. New Zealand Business Roundtable, Wellington, New Zealand. https://www.nzinitiative.org.nz/reports-and-media/reports/equity-as-a-social-goal/document/77

Chetty, R., A. Looney, and K. Kroft. Salience and Taxation: Theory and Evidence. *The American Economic Review* 99.4 (2009): 1145-1177, https://dash.harvard.edu/bitstream/handle/1/9748525/Chetty_SalienceTaxation.pdf

Chiang, Y and J. LaBelle (2022). *How Does Human Capital Affect Wealth Inequality?* Federal Reserve Bank of St.Louis, June 6 2022 https://www.stlouisfed.org/on-the-economy/2022/jun/how-does-human-capital-affect-wealth-inequality

Colmar Brunton (2005). *Measuring the tax compliance costs of small and medium-sized businesses – a benchmark survey, Final Report,* prepared for the New Zealand Inland Revenue Department, 20 June 2005. https://taxpolicy.ird.govt.nz/-/media/project/ir/tp/news/2005/2005-07-19-tax-compliance-cost-research/2005-07-19-report-sme-compliance-costs-pdf.pdf?sc_lang=en&modified=20200910055903&modified=20200910055903&hash=ECA8CD003F7C705DF663883A0BC9C668

Cullen, Hon Dr M. (2001). *Tax review a resource for all parties – Cullen*. Media statement. Inland Revenue. https://taxpolicy.ird.govt.nz/en/news/2001/2001-10-24-tax-review-report-released

Dwyer, T. (2004). *The Taxation of Shared Family Incomes, Perspectives on Tax Reform (2).* The Centre for Independent Studies, CIS Policy Monograph 61 https://www.cis.org.au/wp-content/uploads/2015/07/pm61.pdf

EYEcon (2002). *International Trends in Dividend Taxation*, submission by the ASX to the Australian Board of Taxation's Review of International Taxation Arrangements, 2002, https://taxboard.gov.au/sites/taxboard.gov.au/files/migrated/2015/07/052a.pdf.

Fabling, R., N. Gemmell, R. Kneller and L. Sanderson (2013). *Estimating Firm-Level Effective Marginal Tax Rates and the User Cost of Capital in New Zealand*. New Zealand Treasury Working Paper 13/29, December 2013, https://www.treasury.govt.nz/sites/default/files/2014-11/twp13-29v2.pdf

Fullerton, D. (1983). *Which effective tax rate?* National Bureau of Economic Research Working Paper No. 1123, May 1983, https://www.nber.org/system/files/working_papers/w1123/w1123.pdf

Fullerton, D. (1999). Marginal Effective Tax Rate, in The Encyclopedia of Taxation and Tax Policy (1999 Urban Institute Press), edited by J.J. Cordes, R.D. Ebel, and J.G. Gravelle, https://webarchive.urban.org/publications/1000538.html

Gordon, R.H. and A.L. Bovenberg (1994). *Why is Capital so Immobile Internationally? Possible Explanations and Implications for Capital Income Taxation*, NBER Working Paper No. 4796, https://www.nber.org/system/files/working_papers/w4796/w4796.pdf

Gupta, R. and A. Sawyer (n.d.). *Tax Compliance Costs for Small Businesses in New Zealand*. University of New South Wales Sydney https://www.business.unsw.edu.au/About-Site/Schools-Site/Taxation-Business-Law-Site/Documents/GUPTA-Ranjana-et-al-Tax-Compliance-Costs-for-Small-Business-in-New-Zealand.pdf

Inland Revenue Department (2021). *2021 study on the time and cost of doing business taxes incurred by NZ small businesses,* https://www.ird.govt.nz/-/media/project/ir/home/documents/about-us/publications/research-and-evaluation-reports/small-and-medium-enterprises-compliance-costs/2021.pdf?modified=20221004234616&modified=20221004234616

Inland Revenue Department (n.d.). *Information Sheet: Inland Revenue's high-wealth individuals research project on effective tax rates.* https://www.ird.govt.nz/-/media/project/ir/home/documents/about-us/high-wealth-research-project/hwi-research-project/info-sheet-on-effective-tax-rates.pdf?modified=20220602230929&modified=20220602230929

Inland Revenue Department (n.d.). *Revenue collected 2001 to 2022.* https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/revenue-collected-2001-to-2022

Inland Revenue Department (n.d.). *Taxable income distribution of individuals for the 2021 income year (based on random sample of individual taxpayers).* https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/income-distribution

Inland Revenue Department (2021). *Tax policy report: High Wealth Individual Research Project: Rationale and intended work.* Briefing Note, Reference: BN2021/269, 17 June 2021. https://www.ird.govt.nz/-/media/project/ir/home/documents/about-us/high-wealth-research-project/hwi-research-project/tax-policy-report.pdf?modified=20211202200102&modified=20211202200102

Inland Revenue Department (2022). *Tax, foreign investment and productivity, Long-term insights briefing*, August 2022. https://www.taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/2022/2022-other-final-ltib/2022-other-final-ltib-pdf.pdf?modified=20220831073650&modified=20220831073650

Inland Revenue Department (2022), *Tax, foreign investment and productivity, Technical appendices to support Inland Revenue's long-term insights briefing (LTIB),* August 2022. https://www.taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/2022/2022-other-final-ltib/2022-other-final-ltib-appendices-pdf.pdf?modified=20220831073852&modified=20220831073852

Jorgenson, D. (1993), "Introduction and Summary", in D.W. Jorgenson and R. Landau (eds) *Tax Reform and the Cost of Capital: An International Comparison, Brookings*, Washington D.C.

King, M. A. and D. Fullerton (1984). *The Taxation of Income from Capital*. Chicago: University of Chicago Press.

Kotlikoff, L. J. and L.H. Summers (1986). *Tax Incidence*. NBER Working Paper No.1864, March 1986, https://www.nber.org/system/files/working_papers/w1864/w1864.pdf

Leiserson, G. and D. Yagan (2021). *What Is the Average Federal Individual Income Tax Rate on the Wealthiest Americans?* The White House, 23 September 2021. https://www.whitehouse.gov/cea/written-materials/2021/09/23/what-is-the-average-federal-individual-income-tax-rate-on-the-wealthiest-americans/

Lloyd, P. J. (1974). A More General Theory of Price Distortions in Open Economies. *Journal of International Economics*, 4 (1974) 365 – 386., https://www.sciencedirect.com/science/article/abs/pii/0022199674900178

Moes, A. (1999). *Effective Tax Rates on Capital in New Zealand – Changes 1972-1998*. Treasury Working Paper 99/12, https://www.treasury.govt.nz/sites/default/files/2018-01/twp99-12.pdf.

Morrissey, S. (2018). *The start of a conversation on the value of New Zealand's human capital, New Zealand Treasury Discussion Paper*, No. 18/02, ISBN 978-1-988534-89-3, New Zealand Government, The Treasury, Wellington https://www.treasury.govt.nz/sites/default/files/2018-02/dp18-02.pdf

New Zealand Government (1989). *Consultative Document on the Taxation of Income from Capital*, https://taxpolicy.ird.govt.nz/-/media/project/ir/tp/publications/1989/1989-dd-taxation-income-capital/1989-dd-taxation-income-capital-pdf.pdf?modified=20200910102401&modified=20200910102401

New Zealand Treasury, *Vote Education, The Estimates of Appropriations 2022/23 - Education and Workforce Sector B.5 Vol.2, Estimated Actual Expenditure 2021/22*, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v2-educ.pdf

New Zealand Treasury, *Vote Tertiary Education, The Estimates of Appropriations 2022/23 - Education and Workforce Sector B.5 Vol.2, Estimated Actual Expenditure 2021/22*, https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v2-tered.pdf

New Zealand Treasury, *Vote Health, The Estimates of Appropriations 2022/23 - Health Sector B.5 Vol.5,* https://www.treasury.govt.nz/sites/default/files/2022-06/est22-v5-health.pdf

OECD (2018). *Taxation of Household Savings*, OECD Tax Policy Series, No. 25, OECD Publishing, Paris. https://www.oecd-ilibrary.org/taxation/taxation-of-household-savings_9789264289536-en

OECD (2022). *Taxing Wages*, https://www.oecd.org/tax/taxing-wages-20725124.htm

Productivity Commission (2015). *Tax and Transfer Incidence in Australia*, Commission Working Paper, October 2015, https://www.pc.gov.au/research/completed/tax-and-transfer-incidence

Rashbrooke, M., G. Rashbrooke, and A. Chin (2021). *Wealth inequality in New Zealand. An analysis of the 2014-15 and 2017-18 net worth modules in the Household Economic Survey*, Institute for Governance and Policy Studies, Victoria University of Wellington, May 2021, https://www.wgtn.ac.nz/__data/assets/pdf_file/0007/1935430/WP-21-10-wealth-inequality-in-New-Zealand.pdf

Robertson, Hon. G., and Hon. S. Nash (2019). *Govt responds to Tax Working Group report*, 17 April 2019. Beehive. https://www.beehive.govt.nz/release/govt-responds-tax-working-group-report

Stats NZ (n.d.). *Linking HES to the IDI*. https://www.stats.govt.nz/methods/child-poverty-statistics-technical-appendix-201718#:~:text=Linking%20HES%20to%20the%20IDI&text=The%20link%20rate%20of%20the,children%20(although%20age%20is).

Stats NZ (n.d.). *Household net worth data collection 2020/21, Methodology*, https://datainfoplus.stats.govt.nz/item/nz.govt.stats/ba211f92-b4ad-4b3c-9630-662138009889?_ga=2.239846538.842721483.1678237885-1947806122.1644993077

Stats NZ (n.d.). *Household net worth statistics: year ended June 2021,* https://www.stats.govt.nz/information-releases/household-net-worth-statistics-year-ended-june-2021/

Tax Review 2001, *Issues Paper*, https://www.treasury.govt.nz/sites/default/files/2007-11/taxreview2001-issues.pdf

Tax Working Group (2017). *Terms of Reference: Tax Working Group*, https://taxworkinggroup.govt.nz/resources/terms-reference-tax-working-group.html

Tax Working Group (2018). *Tax and fairness*, Background Paper for Session 2 of the Tax Working Group, Tax Working Group Information Release Document, September 2018. https://taxworkinggroup.govt.nz/sites/default/files/2018-09/twg-bg-tax-and-fairness.pdf

Tax Review 2001 (2001). *Final Report*, 12 October 2001, https://www.treasury.govt.nz/sites/default/files/2007-11/taxreview2001-report.pdf

Appendix A Information available on the wealth and incomes of households

Information available on the incomes of individuals and households

There are several sources of data available on the distribution different types of income earned by individuals and households in New Zealand (e.g. taxable income, gross cash income and net economic income as defined earlier in this section). Those data sources are in different states in terms of the detailed information they provide and the type of income they present. The main income data sources are:

- **Inland Revenue** tax statistics (https://www.ird.govt.nz/about-us/tax-statistics) on:
  - **revenue and refunds** (https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds), which includes information on the:
    - Taxable income distribution of individuals 2001 to 2021 (https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/income-distribution);
    - Wage and salary distributions for individuals 2001 to 2022 (https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/wage-salary-distributions);
    - Income of trusts and estates (IR6 returns) 2001 to 2021 (https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/trusts-ir6);
    - Donation tax credits 2004 to 2021 (https://www.ird.govt.nz/about-us/tax-statistics/revenue-refunds/dtc); and
  - **social policy** (https://www.ird.govt.nz/about-us/tax-statistics/social-policy), which includes information on:
    - Child support customers and cash collection 2008 to 2017 (https://www.ird.govt.nz/about-us/tax-statistics/social-policy/child-support-customers-collection); and
    - Working for Families Tax Credits 2001 to 2021 (https://www.ird.govt.nz/about-us/tax-statistics/social-policy/wfftc);
- **Ministry of Social Development** statistics (https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/statistics/index.html) on the:
  - main types of benefits at a national and regional level (https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/statistics/benefit/index.html);
  - social housing register (https://www.msd.govt.nz/about-msd-and-our-work/publications-resources/statistics/housing/index.html)
- **Stats NZ's household economic survey (HES)** (https://www.stats.govt.nz/help-with-surveys/list-of-stats-nz-surveys/about-the-household-economic-survey/), which is an annual survey including gross income data in the following categories of income sources. The HES gross income data can be cross tabulated with household's composition and household expenditure (every three years. the latest available is 2019) and wealth data (every three years the latest available is 2018):
  - Wages and salaries
  - Self-employment

  - Investments
  - Private superannuation
  - New Zealand Superannuation and war pensions
  - Other government benefits
  - Other regular sources
  - Total regular and recurring income
  - Total irregular Income
  - Total income all sources.

  While this data source includes the most detailed information, it is based on a sample of up to 5000 households including sampling errors (variability of sample compared to the whole population) and non-sampling errors (e.g. errors in sampling by interviewers, non-response bias). In addition, HES does not include information on the type of government benefits. Since 2018/2019 survey stats NZ uses Integrated Data Infrastructure (IDI) to replace the following sources of income for all eligible individuals with IRD administrative data:

  - income from wages and salaries
  - benefits and
  - other payments received from the New Zealand Government.

- **Integrated Data Infrastructure (IDI)** (https://www.stats.govt.nz/integrated-data/integrated-data-infrastructure/), which is a large research database that holds microdata about people and households. It contains full tax data related to individuals, including data provided by employers for each employee (the employee monthly schedule), self-employment income, and some investment income. That data is not accessible due to the timing and confidential nature of this work as it does not meet the access criteria of this database.
- **Census** (https://www.stats.govt.nz/topics/census), which is the only survey in New Zealand that covers the whole population. The latest census year is 2018. It provides information on broad topics including work, income and unpaid activities. This provides gross household income by household composition, household size, geography (regions, territorial authorities) at a very low detailed granular level and classifications using census data. It does not include wealth and housing expenditure data that are required for our analysis.

Information available on the wealth of individuals and households

An inequality analysis by the Ministry of Social Development (2019) using NZ treasury's unpublished analysis of wave2 (2003-2004) HES data shows that wealth is distributed much more unequally than income.

> "While much of the comparative evidence on inequalities that is currently available refers to household income, wealth is a critical dimension of households' economic well-being. How wealth is distributed is important for equity and inter-generational mobility, but also for the stability of the economic system and for its resilience to shocks. Wealth data is a critical component of the economic income that is used in the estimate of the effective tax rate." OECD wealth database-specific.

There are three sources of wealth data available with different characteristics:

- **Stats NZ's household net worth (HNW) survey (**https://www.stats.govt.nz/information-releases/household-net-worth-statistics-year-ended-june-2021/), which is the same as HES Income but includes additional questions on household assets and liabilities. It runs every three years and the latest HNW that was available at the time this report was prepared was run in 2018. The data is available for various household composition and income sources. The HNW includes the following assets and liabilities:
  - Owner-occupied dwellings
  - Other real estates
  - Other non-financial assets
  - Total number of households with non-financial (physical) assets
  - Currency and deposits
  - Pension funds
  - Other household financial assets
  - Total number of households with financial assets
  - Total number of households with assets
  - Owner-occupied residence loans
  - Other real estate loans
  - Education loans
  - Other loans and liabilities
  - Total number of households with liabilities
  - Total number of households with household net worth.

  The data are available for various household composition and income sources.

  While this is the most detailed wealth information available in New Zealand, the available evidence in the literature shows that household surveys do not fully capture the upper end of the wealth distribution, as the very wealthy are reluctant to take part, (Vermeulen, 2016; as cited in Rashbrooke et al. 2021).
- **The Reserve Bank's household balance sheet** (https://www.rbnz.govt.nz/statistics/series/households/household-balance-sheet) is an estimate of total assets and liabilities of New Zealand households and does not include any further breakdown for different household types and income sources.
- **The OECD Wealth Distribution Database (WDD**) (https://www.oecd.org/social/income-distribution-database.htm) is used by the OECD to benchmark and monitor economic inequality across countries, the OECD relies on two dedicated statistical databases: the OECD Income Distribution Database (IDD), which offers data on levels and trends in income inequality and poverty, and the OECD Wealth Distribution Database (WDD), which collects information on the distribution of household net wealth. OECD income distribution and poverty indicators for New Zealand are provided by Stats NZ, based on the Household Economic Survey (HES).

Appendix B Definition of terms

All other couples with child(ren) only households	Census 2018 - Household composition by child dependency status: 132 Couple with adult child(ren) only
All other households	Census 2018 - Household composition by child dependency status: 100 One-family household not further defined 200 Two-family household not further defined 211 Two 2-parent families with dependent child(ren) under 18 only 212 Two 2-parent families with adult child(ren) only 213 Two 2-parent families with dependent child(ren) under 18 and adult child(ren) only 214 Two 2-parent families with dependent child(ren) under 18 and at least one child of unknown dependency 215 Two 2-parent families with adult child(ren) and at least one child of unknown dependency 216 Two 2-parent families with dependent child(ren) under 18 and adult child(ren) and at least one child of unknown dependency 217 Two 2-parent families and all child(ren) of unknown dependency 221 One 2-parent family and one 1-parent family with dependent child(ren) under 18 only 222 One 2-parent family and one 1-parent family with adult child(ren) only 223 One 2-parent family and one 1-parent family with dependent child(ren) under 18 and adult child(ren) only 224 One 2-parent family + 1-parent family + dependent child(ren) under 18 + at least one child of unknown dependency 225 One 2-parent family + a 1-parent family + adult child(ren) + at least one child of unknown dependency 226 One 2-parent family + a 1-parent family + dependent child(ren) under 18 + adult child(ren) + at least one child of unknown dependency 227 One 2-parent family and one 1-parent family and all child(ren) of unknown dependency 231 Two 1-parent families with dependent child(ren) under 18 only

	232 Two 1-parent families with adult child(ren) only 233 Two 1-parent families with dependent child(ren) under 18 and adult child(ren) only 234 Two 1-parent families with dependent child(ren) under 18 and at least one child of unknown dependency 235 Two 1-parent families with adult child(ren) and at least one child of unknown dependency 236 Two 1-parent families with dependent child(ren) under 18 and adult child(ren) and at least one child of unknown dependency 237 Two 1-parent families with all child(ren) of unknown dependency 241 Two couples without child(ren) 242 Other two-family household with dependent child(ren) under 18 only 243 Other two-family household with adult child(ren) only 244 Other two-family household with dependent child(ren) under 18 and adult child(ren) only 245 Other two-family household with dependent child(ren) under 18 and at least one child of unknown dependency 246 Other two-family household with adult child(ren) and at least one child of unknown dependency 247 Other two-family household with dependent child(ren) under 18 + adult child(ren) and at least one child of unknown dependency 248 Other two-family household with all child(ren) of unknown dependency 311 Three-or-more family household without child(ren) 312 Three-or-more family household with dependent child(ren) under 18 only 313 Three-or-more family household with adult child(ren) only 314 Three-or-more family household with dependent child(ren) under 18 and adult child(ren) only 315 Three-or-more family household with dependent child(ren) + at least one child of unknown dependency 316 Three-or-more family household with adult child(ren) and at least one child of unknown dependency 317 Three-or-more family household with dependent child(ren) under 18 + adult child(ren) + at least one child of unknown dependency 318 Three-or-more family household with all child(ren) of unknown dependency

	400 Other multi-person household not further defined 411 Household of related people 421 Household of related and unrelated people 431 Household of unrelated people 611 Household composition unidentifiable
All other One parent with child(ren) only households	Census 2018 - Household composition by child dependency status: 152 One parent with adult child(ren) only 153 One parent with dependent child(ren) under 18 and adult child(ren) only 154 One parent with dependent child(ren) under 18 and at least one child of unknown dependency 155 One parent with adult child(ren) and at least one child of unknown dependency 156 One parent with dependent child(ren) under 18 and adult child(ren) and at least one child of unknown dependency 157 One parent and all child(ren) of unknown dependency 161 One parent with dependent child(ren) under 18 only and other person(s) 162 One parent with adult child(ren) only and other person(s) 163 One parent with dependent child(ren) under 18 and adult child(ren) only and other person(s) 164 One parent with dependent child(ren) under 18 and at least one child of unknown dependency and other person(s) 165 One parent with adult child(ren) and at least one child of unknown dependency and other person(s) 166 One parent with dependent child(ren) under 18 +adult child(ren) + at least one child of unknown dependency + other person(s) 167 One parent and all child(ren) of unknown dependency and other person(s)
One parent with dependent child(ren) only	Census 2018 - Household composition by child dependency status: 151 One parent with dependent child(ren) under 18 only 152 One parent with adult child(ren) only 153 One parent with dependent child(ren) under 18 and adult child(ren) only 154 One parent with dependent child(ren) under 18 and at least one child of unknown dependency

	155 One parent with adult child(ren) and at least one child of unknown dependency 156 One parent with dependent child(ren) under 18 and adult child(ren) and at least one child of unknown dependency 157 One parent and all child(ren) of unknown dependency 161 One parent with dependent child(ren) under 18 only and other person(s) 162 One parent with adult child(ren) only and other person(s) 163 One parent with dependent child(ren) under 18 and adult child(ren) only and other person(s) 164 One parent with dependent child(ren) under 18 and at least one child of unknown dependency and other person(s) 165 One parent with adult child(ren) and at least one child of unknown dependency and other person(s) 166 One parent with dependent child(ren) under 18 +adult child(ren) + at least one child of unknown dependency + other person(s) 167 One parent and all child(ren) of unknown dependency and other person(s)
Other one-family households	Census 2018 - Household composition by child dependency status: 121 Couple only and other person(s) 133 Couple with dependent child(ren) under 18 and adult child(ren) only 134 Couple with dependent child(ren) under 18 and at least one child of unknown dependency 135 Couple with adult child(ren) and at least one child of unknown dependency 136 Couple with dependent child(ren) under 18 and adult child(ren) and at least one child of unknown dependency 137 Couple and all child(ren) of unknown dependency 141 Couple with dependent child(ren) under 18 only and other person(s) 142 Couple with adult child(ren) only and other person(s) 143 Couple with dependent child(ren) under 18 and adult child(ren) only and other person(s) 144 Couple with dependent child(ren) under 18 and at least one child of unknown dependency and other person(s) 145 Couple with adult child(ren) and at least one child of unknown dependency and other person(s)

	146 Couple with dependent child(ren) under 18 and adult child(ren) + at least one child of unknown dependency + other person(s) 147 Couple and all child(ren) of unknown dependency and other person(s)
Wages or salary	Includes income received from all current and previous wage and salary jobs held over the reference period. This includes any job-related bonuses, commissions, redundancies, or other taxable income such as honoraria or directors fees.
Self-employment	The combined income received from self-employment activities. This could include net profit or loss received, wages or salaries, or lump sum payments from all current and previous self-employment jobs held over the reference period. It includes drawings (cash or goods the respondent takes out of the business instead of a 'wage').
Investments	Net profit or loss received from investments. Investments captured in this collection are rent, rents from Māori land or other leased land, dividends from New Zealand companies, royalties, or interest from: banks, other financial institutions, bonds, stocks, money market funds, debentures, or securities.
Private superannuation	Includes income received from both job-related superannuation schemes and other private schemes.
NZ Superannuation	Including Veterans, war disablement, surviving spouse, and other type of NZ Govt Pension.
Other govt benefits	
Other sources of income	Includes income received from trusts, annuities, alimony, educational scholarships, and income protection insurance.
Total irregular income	Includes income received from inheritances, matrimonial settlement, lump sum life insurance pay outs, lump sum bursaries and prizes, and gifts of money from other New Zealand households.
01 Owner-occupied dwellings	Owner-occupied dwelling is the main dwelling or other type of housing unit occupied by household members on a regular basis. They include a city dwelling occupied by some household members during the working week, but exclude holiday dwellings used on an occasional basis. The residence may or may not have a mortgage or loan secured against it. The land on which the residence is located is included.
02 Other real estate	This covers residential and non-residential buildings (other than owner-occupied dwellings) and land owned by household members. The real estate may be rented or leased to other parties, or it may be used exclusively by the household.
03 Other non-financial assets	These are assets that are tangible with a physical value, such as real estate, consumer durables, and valuables.
04 Household non-financial assets	These are assets that are tangible with a physical value, such as real estate, consumer durables, and valuables.

05 Currency and deposits	Currency and deposits is money in an account with a bank, building society, or other financial institution, and cash over NZ$ 1,000 in any currency not held in a bank.
06 Pension funds	Pension funds include entitlements in both employment-related social insurance pension schemes and private pension schemes. Pension schemes are sometimes known as retirement plans or superannuation schemes. They may be defined-benefit schemes (where the formula for defining a member's pension is agreed in advance) or defined-contribution schemes, such as KiwiSaver (the amount of the pension depends on the performance of the assets acquired with the member's contributions).
07 Other household financial assets	These are miscellaneous financial assets, that include loans made to trusts, other households, and money in overseas bank accounts.
08 Household financial assets	These are intangible assets whose value comes from a contractual claim, such as currency and deposits, shares, and pension funds.
09 Total household assets	Assets are something a person or household owns, such as property or investments.
10 Owner-occupied residence loans	Owner-occupied dwelling is the main dwelling or other type of housing unit occupied by household members on a regular basis. The residence may or may not have a mortgage or loan secured against it.
11 Other real estate loans	Other real estate loans are loans for constructing, purchasing, or improving other dwellings, buildings, and land. Examples are loans to purchase holiday homes and rental properties for investment purposes.
12 Education loans	Education loans are loans to cover study expenses. Respondents reported a variety of student loans, including student loans from overseas and from sources other than StudyLink.
13 Other loans and liabilities	These are miscellaneous loans and liabilities. They include amounts outstanding on credit cards, bank account overdrafts, and other lines of credit, if not included elsewhere.
14 Total household liabilities	This refers to total obligations such as a debt, mortgage, or loan. The liability's holder is obliged, under specific circumstances, to provide a payment or series of payments to whomever they are liable to.
15 Total household net worth	Net worth is the value of a person or household's assets, minus their liabilities.

About Sapere

Sapere is one of the largest expert consulting firms in Australasia, and a leader in the provision of independent economic, forensic accounting and public policy services. We provide independent expert testimony, strategic advisory services, data analytics and other advice to Australasia's private sector corporate clients, major law firms, government agencies, and regulatory bodies.

'Sapere' comes from Latin (to be wise) and the phrase 'sapere aude' (dare to be wise). The phrase is associated with German philosopher Immanuel Kant, who promoted the use of reason as a tool of thought; an approach that underpins all Sapere's practice groups.

For more information, please contact:

Kieran Murray
Phone: +64 4 915 7592

Mobile: +64 21 245 1061
Email: kmurray@thinkSapere.com

Wellington	Auckland	Sydney	Melbourne	Canberra
Level 9 1 Willeston Street PO Box 587 Wellington 6140	Level 8 203 Queen Street PO Box 2475 Shortland Street Auckland 1140	Level 18 135 King Street Sydney NSW 2000	Level 7 171 Collins Street Melbourne VIC 3000	PO Box 252 Canberra City ACT 2601
P +64 4 915 7590 F +64 4 915 7596	P +64 9 909 5810 F +64 9 909 5828	P +61 2 9234 0200 F +61 2 9234 0201	P +61 3 9005 1454 F +61 2 9234 0201 (Syd)	P +61 2 6100 6363 F +61 2 9234 0201 (Syd)

www.thinkSapere.com

independence, integrity and objectivity