Tax Working Group
Te Awheawhe Tāke

**Tax Working Group Information Release**

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***This paper contains advice that has been prepared by the Tax Working Group Secretariat for consideration by the Tax Working Group.***

***The advice represents the preliminary views of the Secretariat and does not necessarily represent the views of the Group or the Government.***

# Coversheet: **Distributional analysis**

*Background Paper for Session 5 of the Tax Working Group*
*March 2018*

## Purpose of discussion

This background paper is for the Group's information. It provides:

- an overview of distributional information on household income, wealth and consumption; and
- a preview of initial distributional analysis using household income, expenditure and wealth data.

## Key points for discussion

- How can distributional analysis help the Group to reach judgments for the interim report?
- What are the Group's top priorities for further distributional analysis?

## Recommended actions

We recommend that you:

a **note** that the secretariat's initial distributional analysis may change as the secretariat refines its analysis and undertakes further quality assurance.

b **note** that the secretariat will provide further distributional analysis of specific policies under consideration by the Group in future sessions.

# Distributional analysis

*Background Paper for Session 5*
*of the Tax Working Group*

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***The advice represents the preliminary views of the Secretariat and does not necessarily represent the views of the Group or the Government.***

***The Tax Working Group will release its interim report containing its recommendations in September and the views of the Group will be informed by public submissions alongside Secretariat advice.***

March 2018

*Prepared by the Inland Revenue Department and the New Zealand Treasury*

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# Executive Summary

This paper provides an overview of distributional information on income, wealth and consumption. It provides a preview of initial distributional analysis of tax policy using household income, expenditure and wealth data.

The paper includes new analysis of household wealth and the potential incidence of capital income and wealth taxation. It uses household wealth statistics from Statistics NZ that were not available at the time of the previous 2010 Tax Working Group.

Some of the analysis has only recently been completed by the secretariat. The secretariat will refine its methods and undertake further quality assurance, which may change some of the results.

Further distributional analysis will be provided to the Group in future sessions through analysis of specific policies under consideration. A separate session on distributional analysis to inform the Group's interim report is also planned in July.

This paper makes the following key points:

- The Treasury maintains a model for distributional analysis of the existing tax and transfer system that focusses on household income. For potential new taxes on capital income or wealth, the secretariat will provide distributional analysis using available information on the distribution of wealth, although this will inevitably depend on assumptions and be subject to some data limitations.

- Household wealth is distributed less equally than annual household income. Income before taxes and transfers is distributed less equally than disposable income and consumption.

- Capital income and self-employment income is distributed much less equally than wages and salaries. Taxes and transfers reduce inequality in disposable income.

- Household wealth is concentrated in the top twenty percent of households, which hold about seventy percent of total household net worth.

- Average wealth rises with age, which is consistent with a life-cycle pattern where individuals smooth their consumption and accumulate savings for retirement. While lifecycle patterns and/or intergenerational differences are an important factor in explaining differences in wealth, there is also considerable wealth inequality within age groups. There are also significant differences in average wealth by ethnicity.

- The revenue from potential taxes on wealth or capital gains (excluding owner-occupied housing) would be expected to be mostly paid by the wealthiest twenty percent of households in a given year. However, this is based on a one year snapshot of wealth data and does not take account of lifetime effects or behavioural responses to taxation.

# 1. Introduction

## 1.1 Purpose

1. This paper is for the Group's information.

2. Distributional analysis can be used to inform judgments about fairness. The TWG considered papers on fairness at its meeting on 9 February. The secretariat paper on fairness noted there are complex links between inequality and wellbeing.

3. The secretariat proposes to focus its future efforts on refining its distributional analysis of specific tax policies considered by the Group. There is also a session on distributional analysis of the Group's preferred options scheduled for July.

## 1.2 Content and scope

4. This paper provides an overview of:
    a. distribution of household income, wealth and consumption;
    b. a high level summary of how tax policy can influence distributional outcomes; and
    c. indicative distributional analysis of taxes on capital income and wealth.

# 2. Distribution of household income, consumption and wealth

5. This submissions background paper and earlier secretariat paper on 'fairness and tax' provided the main measures of income, consumption and wealth inequality. This section provides greater detail about the composition of income, wealth and consumption across the distribution.

6. There are a range of distributional concepts and indicators. In particular, measures of inequality require decisions about the following:[1]

    - "What is measured" – this concerns the definition of income (eg, gross or disposable) or other indicator of wellbeing (eg, wealth or consumption).

    - "When is it measured" - involves the choice of accounting period. Annual data is commonly used. The choice of longer time periods (eg, over a lifetime) introduces complexities and are prone to data limitations.

    - "Unit of analysis" – a decision must be made regarding the basic unit of analysis, for example whether this is the individual, household, or family.

7. Although these choices all involve value judgements, in practice the choice is often strongly influenced by data availability. There are also broader concepts of inequality such as inequality of socio-economic status, equality of opportunity or access to community resources, which we do not discuss in this paper.

8. Much of the following analysis uses Statistics NZ's Household Economic Survey (HES) (see Appendix A for more general information about the survey). The analysis is based on sample survey data and subject to sampling and non-sampling error. As such, there should be some care when interpreting income, expenditure, or wealth estimates as the confidence intervals around any point estimates may be wide.[2] Some of the analysis has only recently been completed by the secretariat. The secretariat will refine its methods and undertake further quality assurance, which may change some of the results.

## 2.1 Income distribution

9. The definition of income matters for measuring income inequality. Figure 1 presents income inequality using different income concepts. The inequality measure is the "80:20 percentile ratio" which is the ratio of income at the 80th percentile divided by the level of income at the 20th percentile. There are other inequality measures, including the Gini score or shares of income held by a proportion the population (eg, top 10% share of income).

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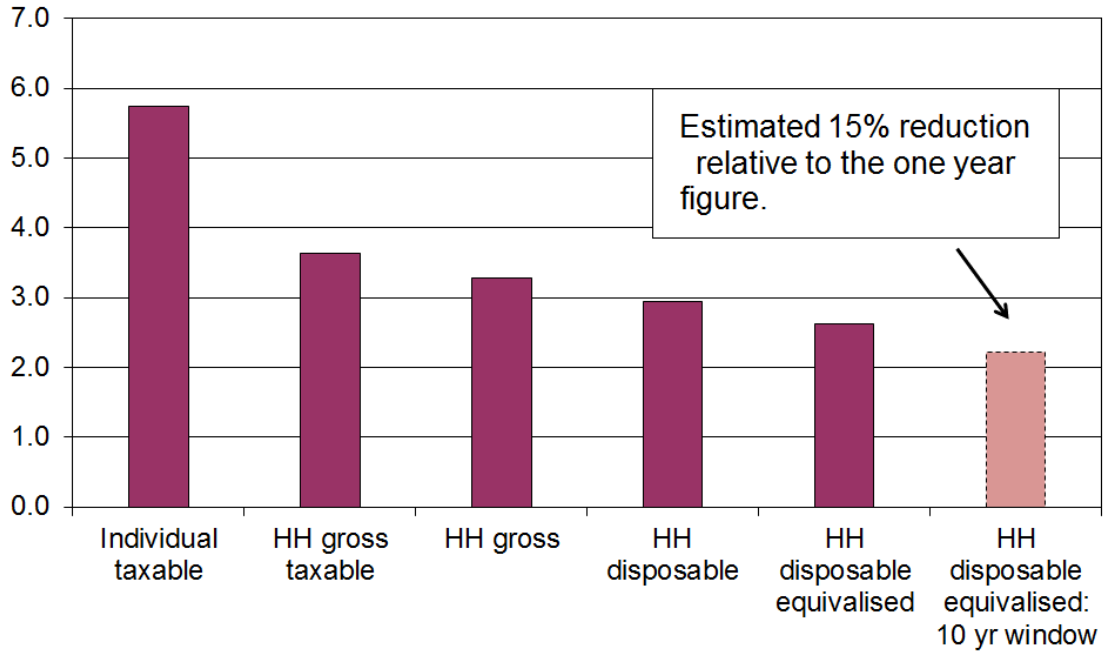
1 Creedy (1999)

2 Access to the HES data was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975.

10. Figure 1 shows that measured income inequality is lower when the focus moves from individuals to households. Household gross taxable income includes all income subject to income tax, and therefore excludes non-taxable transfers such as Working for Families tax credits and Accommodation Supplement payments. When these are included, inequality drops further ("HH gross"). Taking personal income tax into account further reduces the inequality measure ("HH disposable"), as does the adjustment for household size and composition ("HH disposable equivalised"). The 80:20 ratio is more than halved in going from individual taxable income to equivalised disposable household income. The latter is considered the best available income concept to use when using income to assess the material wellbeing of the population, and of subgroups within it (Perry, 2017).

**Figure 1:** Dispersion of incomes based on varying income concepts




Source: Perry (2017)

11. The measure of household income that we primarily use is based on the HES definition of "regular" income. This includes taxable income and income from regular non-taxable payments (eg, non-taxable government transfers). It will exclude certain types of "economic income" that are not in the statistical definition of income – including most capital gains or wealth accumulating inside trusts, companies or pension funds (unless there are regular payments to the household). It does not include "irregular" sources of income such as inheritances or gifts.

12. Figure 2 and Table 2 show the distribution of annual income by income source, adjusted for household size and composition (ie, number of adults and children) for all households. This adjustment is termed 'equivalisation' (see footnote for Figure 2 and Annex A for more technical information). Table 1 provides the definition of each income source in HES.

13. Income from salaries and wages are nearly two-thirds of total regular household income. Income is also received from other sources, particularly self-employment, transfers and New Zealand superannuation. Investment income is around 6% per cent of regular household income, although this does not include capital gains and will understate capital income in other ways (eg, wealth accumulating in companies, trusts and investment funds).

14. Income from investment income and self-employment is much more unequally distributed than wage income. For example, the top income decile receives 29% of wage income, 53% of self-employed income and 45% of investment income. Government transfers tend to make the distribution more equal, so that the top decile receives 29% of overall income.

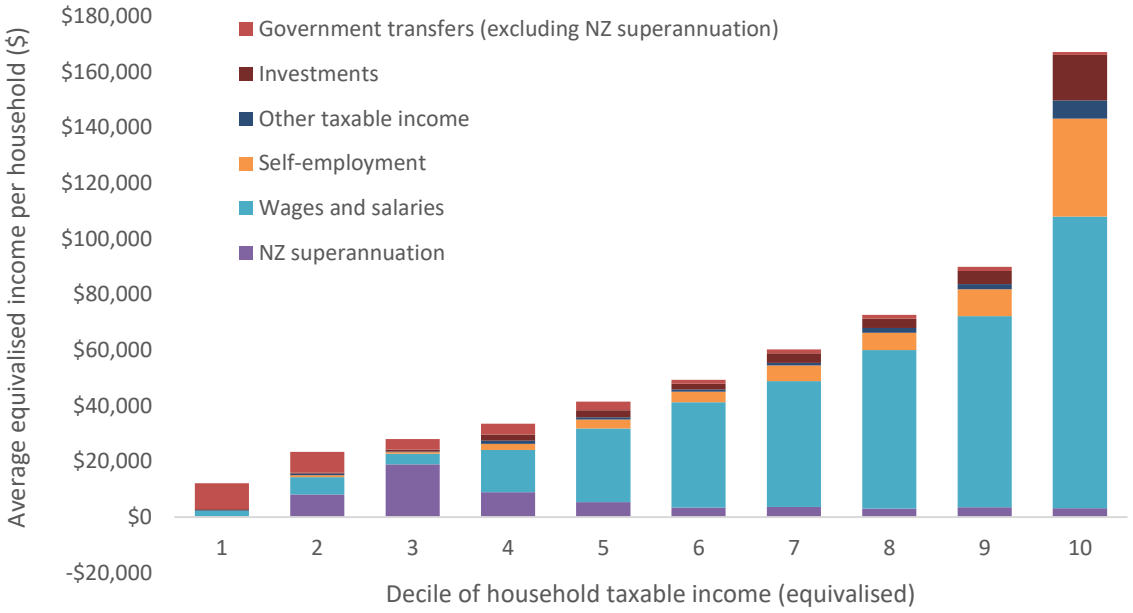
**Table 1**: Definition of income used in the Household Economic Survey (HES)

| Income source | Description |
|---|---|
| Wages and salaries | 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 income | 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'). |
| Investment income | 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 income | Includes income received from both job-related superannuation schemes and other private schemes. |
| New Zealand Superannuation and war pensions | In addition to New Zealand Superannuation, this category includes the veterans, war disablement, and surviving spouse pensions. |
| Other government benefits | Includes all family assistance payments such as those made as part of the Working for Families package. This category also includes main benefits (eg job seeker support, sole parent support, supported living payment), and orphans or unsupported child benefit, emergency benefit, student allowances and supplements. |
| Other sources of regular and recurring income | Includes income received from trusts, annuities, alimony, educational scholarships, and income protection insurance. |
| 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. |

Source: Statistics NZ

**Figure 2**: Household income for all households (adjusted for size and composition of household, 2015)[3]

[3] Figure 2 and Table 2 were calculated using HES data produced through the Treasury's micro-simulation model of the tax and welfare system (all calculations should be considered as estimations). Results are for all households (ie, include zeros) based on 2014/15 and projected for tax year 2018/19. All income sources presented are equivalized for household size and averaged within the decile using the 1988 Jensen equivalence scale. Equivalised income per




Source: Treasury, Statistics NZ

**Table 2**: Sources of household income by income decile for all households (adjusted for size and composition of household)

| Decile | Wages and salaries | Self-employment | Investment income | Government transfers (excluding NZ Super) | NZ Super | Other taxable income | Total income |
|---|---|---|---|---|---|---|---|
| 1 | 1% | 0% | 1% | 27% | 1% | 1% | 2% |
| 2 | 2% | 1% | 1% | 22% | 14% | 4% | 4% |
| 3 | 1% | 1% | 2% | 11% | 32% | 1% | 5% |
| 4 | 4% | 3% | 6% | 12% | 15% | 7% | 6% |
| 5 | 7% | 5% | 7% | 9% | 9% | 5% | 7% |
| 6 | 10% | 6% | 6% | 4% | 6% | 6% | 9% |
| 7 | 12% | 8% | 9% | 4% | 6% | 6% | 10% |
| 8 | 15% | 9% | 9% | 4% | 5% | 12% | 13% |
| 9 | 19% | 14% | 13% | 4% | 6% | 12% | 16% |
| 10 | 29% | 53% | 45% | 3% | 5% | 44% | 29% |
| Total | 100% | 100% | 100% | 100% | 100% | 100% | 100% |
| % of total inc. | 64% | 12% | 6% | 6% | 10% | 3% | 100% |

Source: Treasury, Statistics NZ

15. Distributions can be visually represented by concentration curves (or Lorenz curves) that show the percentage of income earned by the cumulative percentage of the population.[4] The 45 degree line indicates the line of perfect equality where 10% of

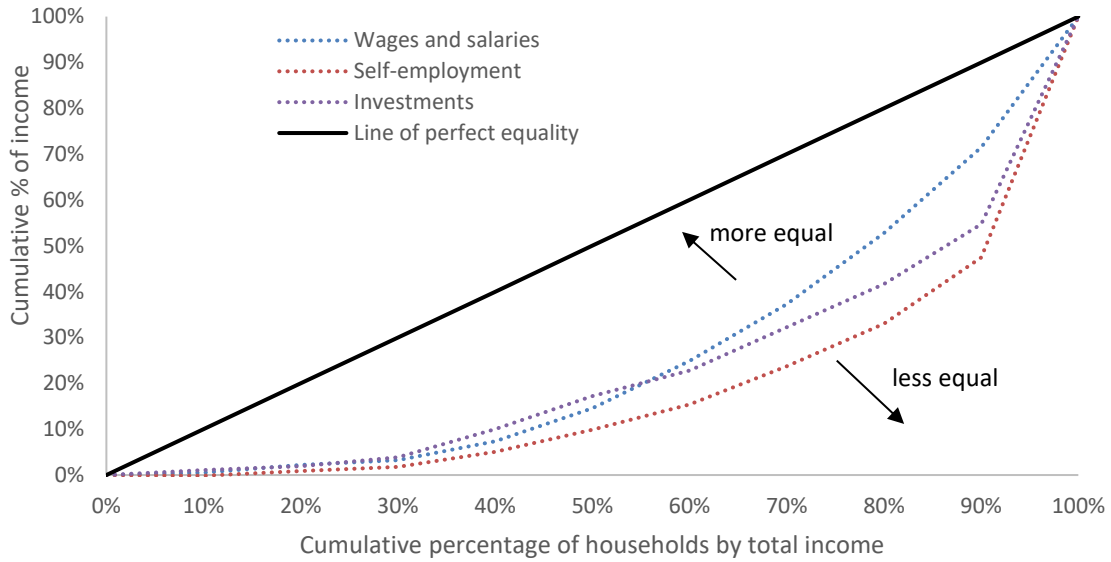
household is lower than unequivalised income per household on average, so income levels should not be considered indicative of actual average incomes per household. The 1988 Jensen equivalence scale is used throughout this paper.

[4] One of the most used properties of this framework is that it can be used to generate a single summary statistic of the income distribution, namely the Gini score.

the population would earn 10% of the total income and so on. Curves that are further away from the 45 degree line indicate greater inequality of the distribution.

16. Figure 3 compares the distributions of income from self-employment, investments and wages over the distribution of total income. This also shows that self-employment and investment income are less equally distributed than wages and salaries.

**Figure 3:** Concentration (Lorenz) curves for income sources, 2015

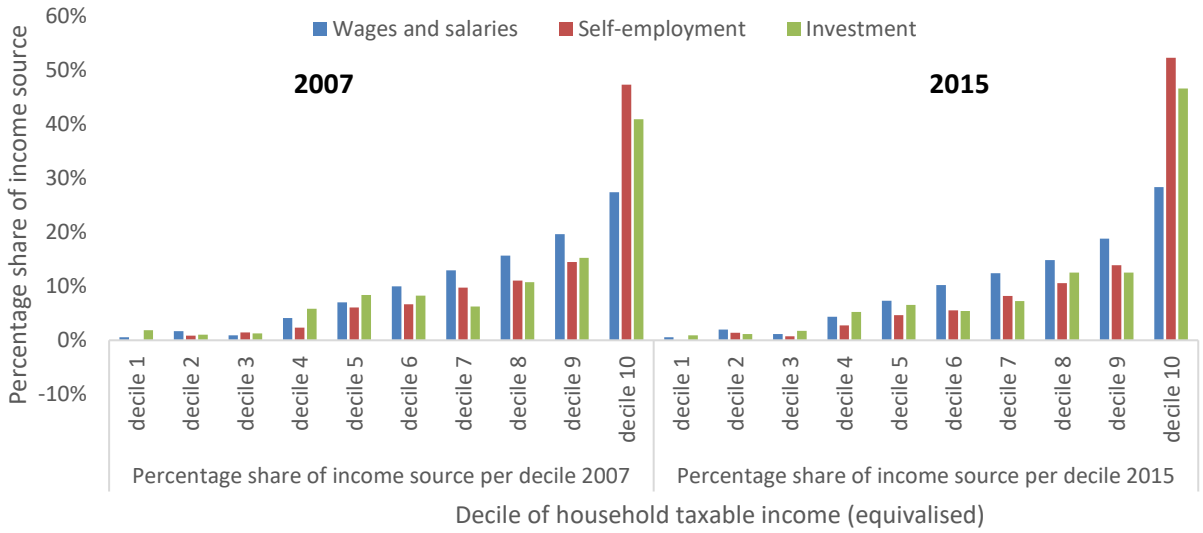



Source: Treasury, Statistics NZ

17. The distribution of wages, self-employment and investment income are shown for 2007 and 2015 in Figure 4. The distributions have not changed significantly between 2007 and 2015, although the top 10% share of investment and self-employed income in 2015 was somewhat higher than 2007.

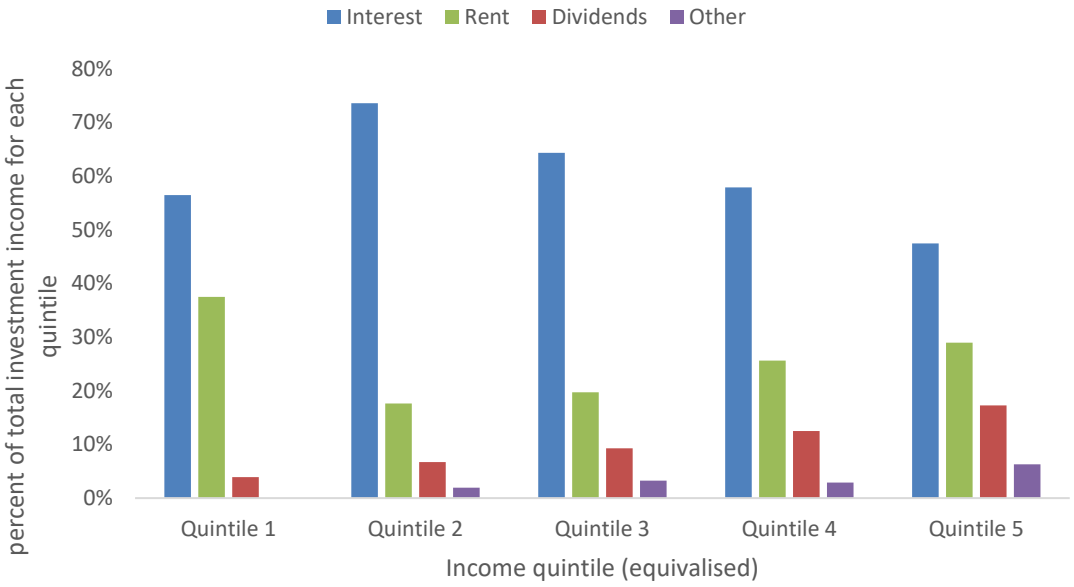
18. The composition of investment income (interest, dividends, rents, etc) for each income quintile is presented in Figure 5. Interest income is the main source of investment income for all income quintiles, with dividends and rents contributing a higher proportion of investment income for higher income households.

**Figure 4**: Distribution of income source by decile, 2007 and 2015




Source: The Treasury, Statistics NZ

**Figure 5**: Source of investment income by income quintile (percentage of total), 2015




Source: The Treasury, Statistics NZ

## 2.2 Wealth distribution

19. Household wealth is important for the well-being of households, particularly for their financial security and resilience to income shocks. There is less data available on the distribution of household wealth compared with income data, both within and between countries (Murtin and Mira d'Ercole, 2015). In New Zealand, HES provides detailed distributional information on household assets and liabilities, although data is available for only one year (2014/15). In addition, Statistics NZ operated the Survey of Family, Income and Employment (SoFIE) between 2002 and 2010, which included information on household assets and liabilities.

20. Household net worth or wealth (these terms are used interchangeably) is made up of household non-financial and financial assets less household liabilities. Table 3 shows the asset and liability categories in HES. It is important to note that investment property that is directly owned by an individual is categorised as real estate, however real property held in a business or trust will have the equity value recorded as a financial asset.

**Table 3**: Household balance sheet in Household Economic Survey

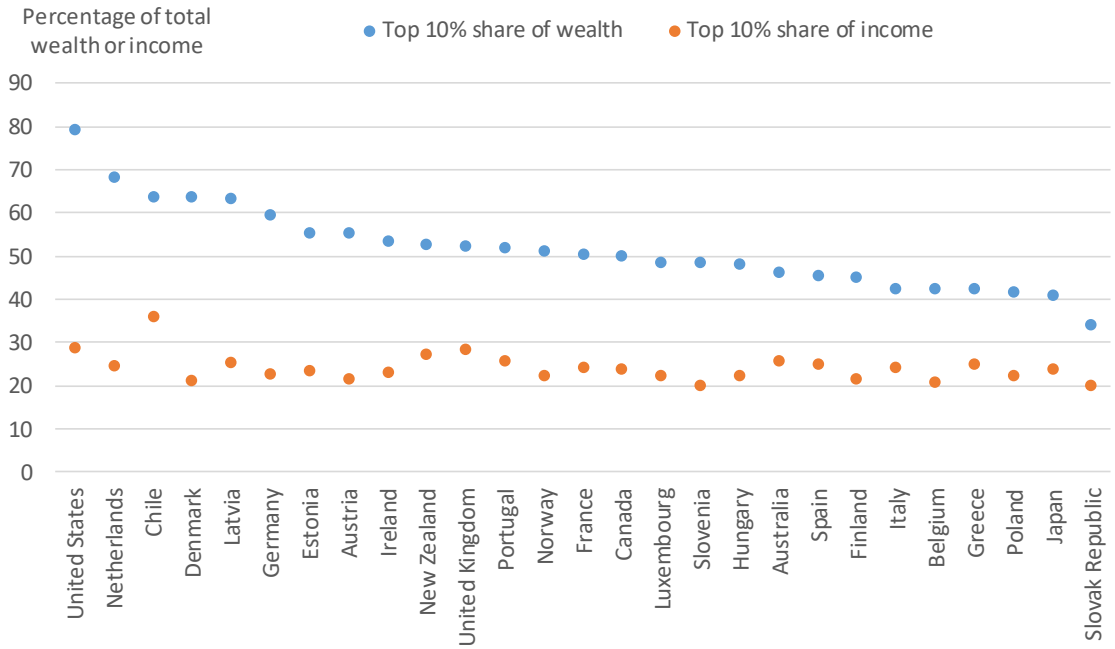
| **Assets** | **Liabilities** |
|---|---|
| **Real estate**<br>Owner-occupied residences<br>Other residential and non-residential property | **Real estate loans**<br>Owner-occupied residence loans<br>Other residential and non-residential property loans |
| **Other physical assets**<br>Consumer durables<br>Valuables | **Other liabilities**<br>Consumer durables loans<br>Other debt (eg credit cards)<br>Education loans |
| **Financial assets**<br>Currency and deposits<br>Investments (eg shares, mutual funds)<br>Net equity in unincorporated businesses<br>Net equity in trusts<br>Pension funds (superannuation funds) | |
| **Total assets** | **Total liabilities** |
| **Net worth (net wealth) = Total assets - Total liabilities** | |

Source: Statistics NZ

21. Wealth is distributed much less equally than income (Figure 6). Wealth inequality in New Zealand is around the average for OECD countries with available data.

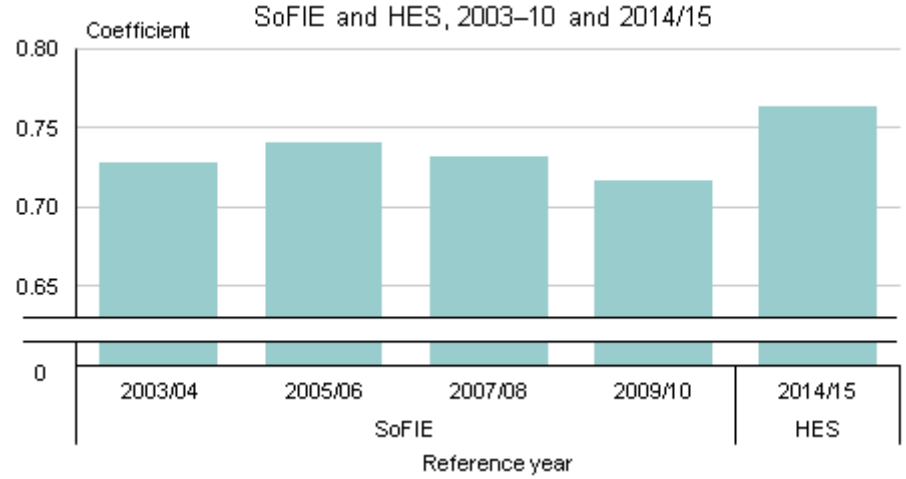
22. Net wealth inequality in New Zealand can be compared over time only by comparing HES estimates with the earlier estimates from SoFIE (Figure 7). There is tentative evidence that net wealth inequality increased slightly in the last decade. However, survey differences mean that we must be cautious about comparing the two surveys.[5]

**Figure 6:** Share of income and net wealth of the top 10 percent (2015)




Source: OECD

**Figure 7**: Gini coefficient – individual net worth

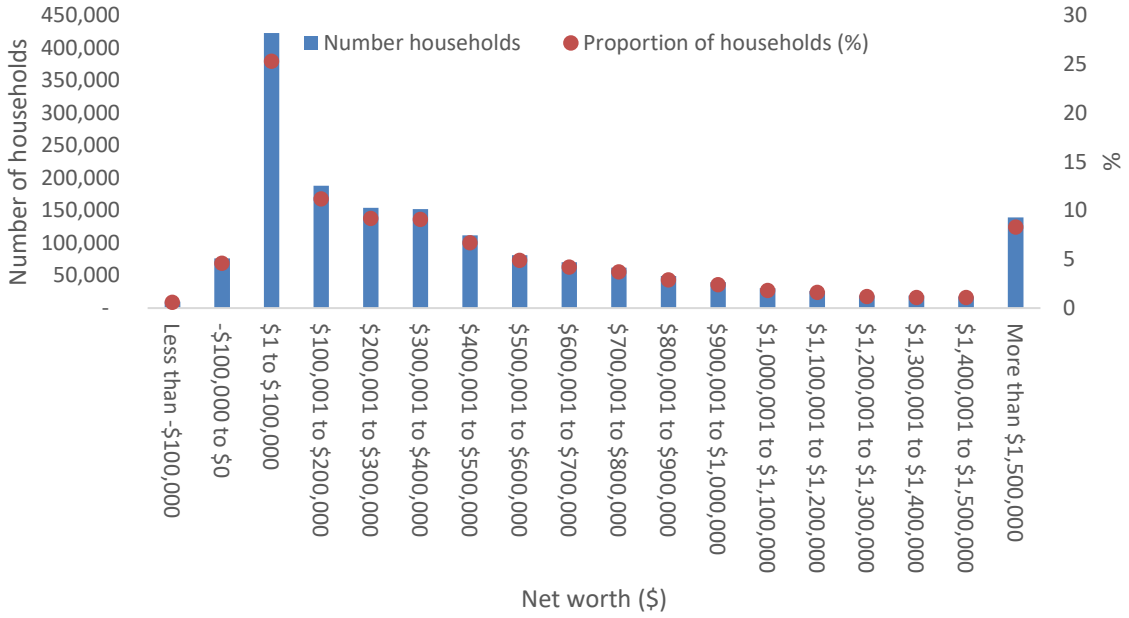



Source: Statistics NZ

[5] HES has greater coverage of assets and liabilities including trusts and unincorporated businesses than SoFIE. Other differences include questionnaire structure, subject population, and breadth and depth of questions. Therefore, these survey differences may account for the differences in measured wealth inequality as well as changes in the actual financial position of households.

23. Figure 8 presents the distribution of household net worth. Household net worth is concentrated in the top twenty percent of households, which hold about seventy percent of total household net worth. From a total of 1.67 million households, thirty per cent of households hold net worth of less than $100,000.

**Figure 8:** Distribution of household net worth by net worth band, 2015

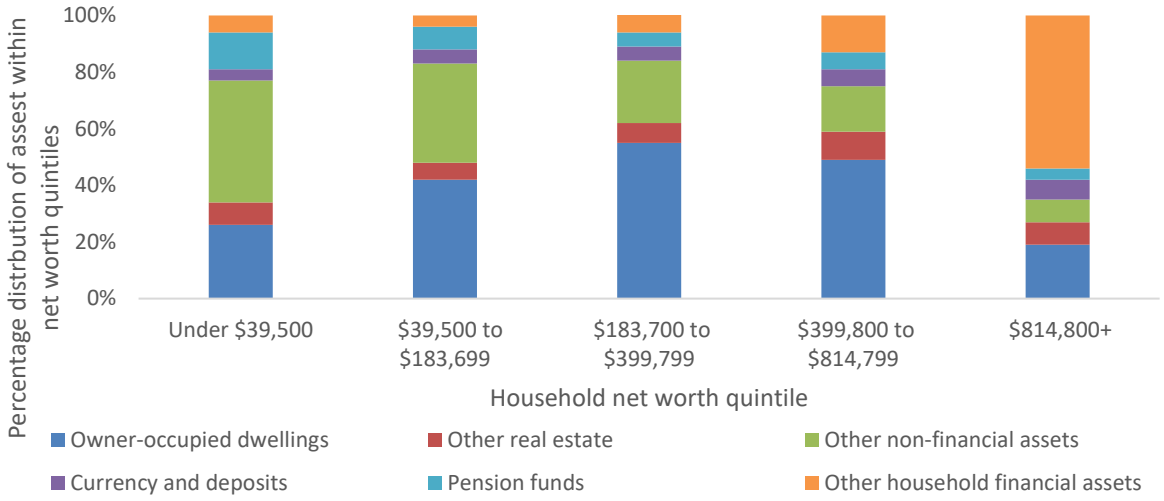



Source: Statistics New Zealand

24. The composition of assets varies over the net worth distribution (Figure 9). Real estate is a higher proportion of assets of low and middle net worth households. The wealthiest twenty percent of households hold mostly financial assets, although this will include real property that is held in businesses and trusts.

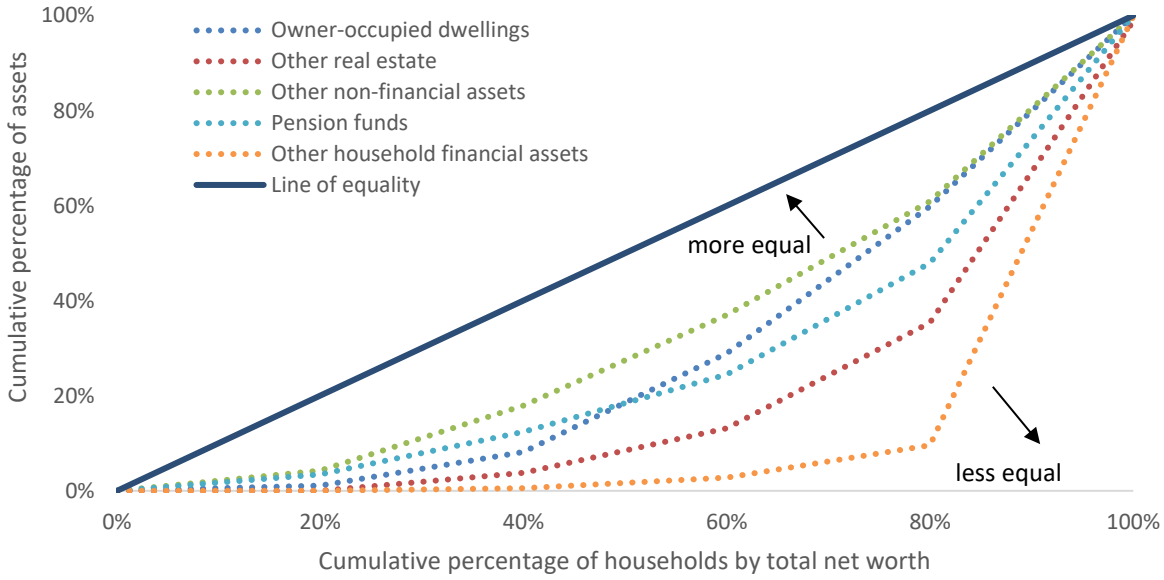
25. Figure 10 shows concentration (or Lorenz) curves to show the distribution of different types of assets. Unsurprisingly, owner-occupied dwellings and consumer durables are more equally distributed than investment property and financial assets.

**Figure 9**: Distribution of household assets for each net worth quintile, 2015[6]




Source: Statistics NZ

**Figure 10:** Concentration curves for household assets, 2015[7]




Source: The Treasury, Statistics NZ

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[6] Other household non-financial assets include consumer durables and valuables. Other household financial assets include: 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.

Quintiles are formed by dividing the population into 5 groups – ranking households by their net worth. Total includes a small number of households with no assets or liabilities. More information about the interpretation of wealth measures estimated from HES is available from Statistics NZ (2016).

[7] This visual represents the cumulative percentage of assets held by the population by level of net worth. The 45 degree line indicates the line of perfect equality – where 10% of the population would hold 10% of the wealth. Curves that are further away from the 45 degree line indicate greater inequality of the distribution.

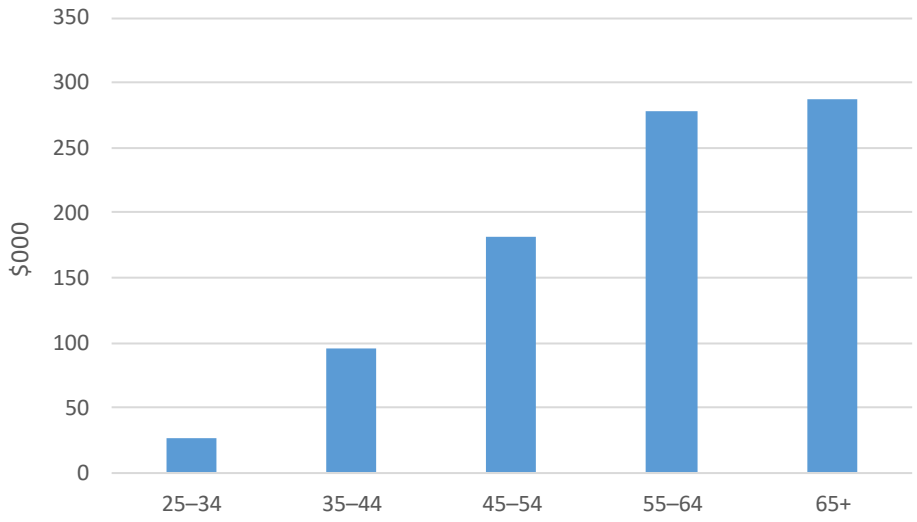
*Trusts*

26. HES data shows that a significant amount of household wealth is held in trusts. Nineteen percent of households had involvement in a trust (322,000 households) in 2015 (Statistics NZ, 2016).[8] About twelve percent of owner-occupied dwellings were held by trusts. For households with assets in their trust, the median value of those assets was around $700,000. For households that had liabilities in their trust, the median value of those liabilities was close to $300,000. A large proportion of trust assets and liabilities relate to farms and owner-occupied dwellings.

*Demographics*

27. Older individuals are wealthier on average than younger individuals, which is consistent with a lifecycle pattern of accumulating savings over a working life for retirement. Figure 11 shows the median individual net worth for different age groups.[9]

**Figure 11**: Median individual net worth by age group, 2015




Source: Statistics NZ

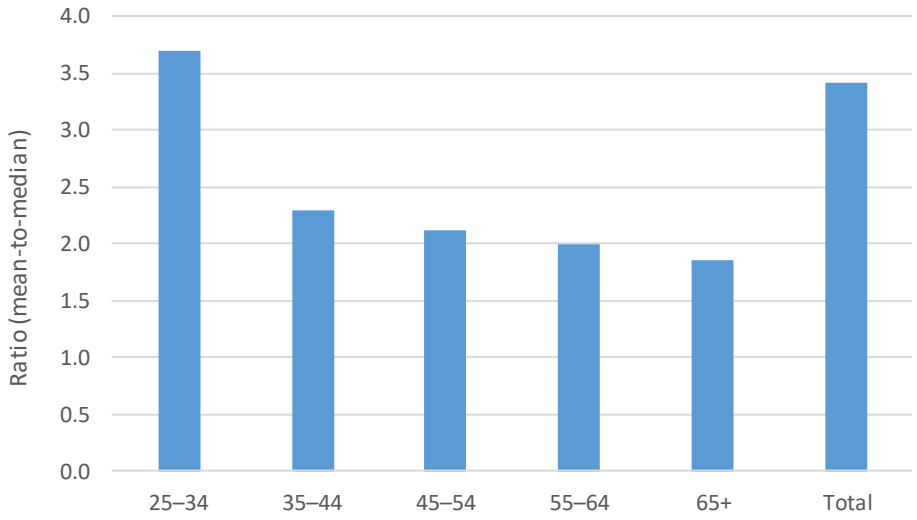
28. There is net wealth inequality both within and between age groups. A readily available, although imperfect, indicator for inequality is the "mean to median ratio". The ratio of mean to median net wealth is an approximate indicator of inequality because the distance between mean and median will reflect extreme values at the top of the distribution (which influence the mean). The larger the ratio, the more the distribution of net worth is concentrated in the wealthy. Figure 12 shows that the mean (average) net wealth of the total population is around 3.5 times the median. Within the age groups 35-44, 45-54, 55-64 and 65+, net wealth inequality is around half that

[8] This means at least one household member was involved as a settlor, beneficiary, trustee, or with another type of involvement, but excludes those who are only independent trustees.

[9] HES collects demographic information on individuals. Note individual net worth is different to household net worth discussed above. Shows median of all individuals (including a small number of individuals with no assets or liabilities).

of the whole population. The inequality within the 25-34 age group is around the same level as for the total population.

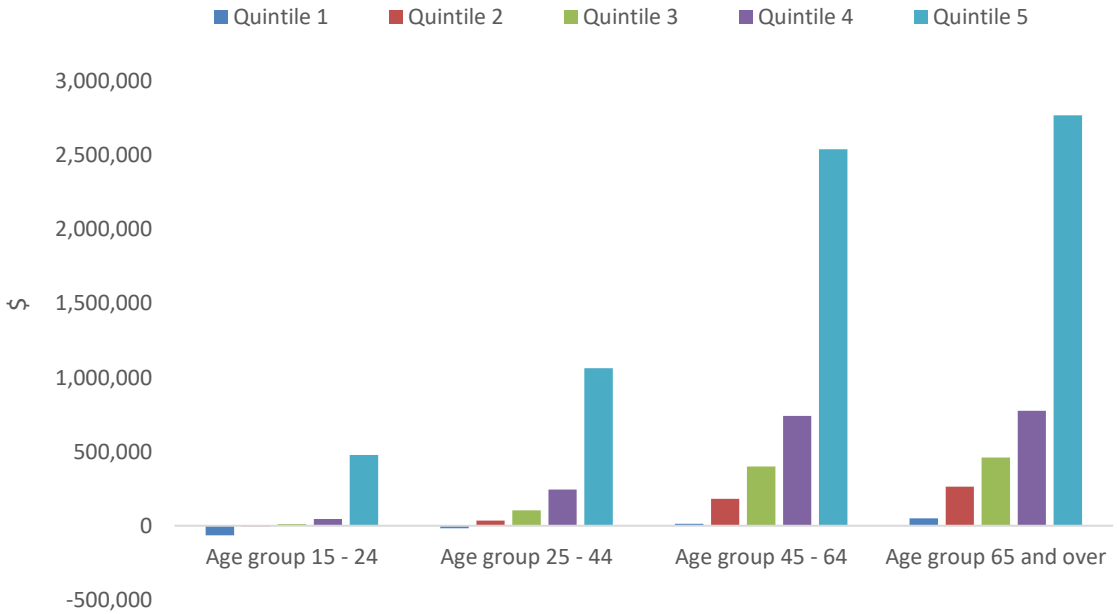
**Figure 12**: Inequality of individual net worth by age group (mean-to-median ratio), 2015




Source: Statistics NZ, The Treasury

29. Figure 13 shows the distribution of household net worth within age groups defined by the age of the oldest member of the household. It shows there are substantial difference in levels of net wealth within these age categories, as well as between age groups.

**Figure 13**: Mean household net worth for net worth quintiles of each age group (age is that of oldest member of household), 2015



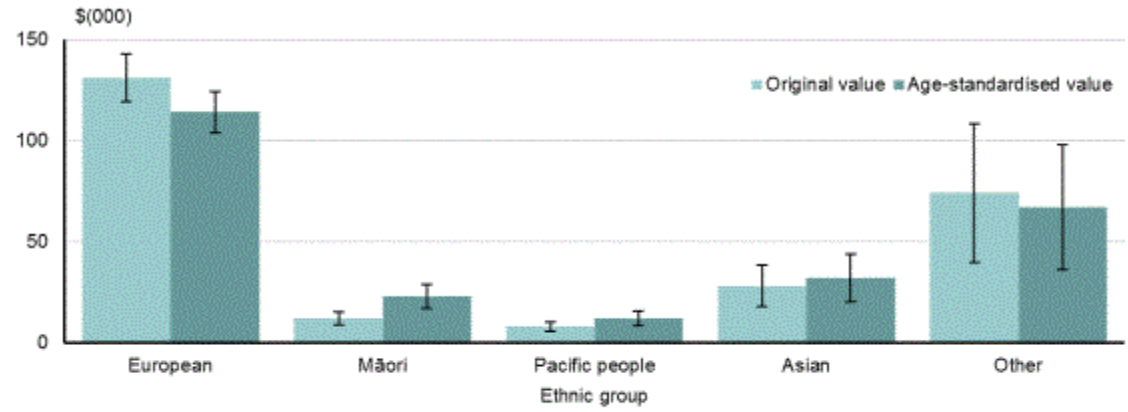

Source: The Treasury, Statistics NZ

*Ethnicity*

30. Individual wealth can be considered for different ethnic groups.[10] It is important to note that this is based on survey measures of individual ownership of assets and liabilities. HES did not collect the value of any assets or liabilities that are communally owned. For example, Māori who live on their papakainga or marae may own their own houses but the land is often owned by a collective trust entity (Statistics NZ, 2016b).

31. As net wealth increases with age, the wealth profile of different ethnic groups will be affected by their differing age structures. To adjust for the effects of age on the Māori and Pacific populations that have a much younger age structure than the total population, Statistics NZ has published 'age standardised' measures of median wealth. Figure 14 shows how age standardisation affects the median net worth of ethnic groups.[11]

**Figure 14**: Median net worth by ethnic group, actual and age-adjusted, 2015




Note: The 'Other' ethnic group includes the 'New Zealander' responses, MELAA (Middle Eastern, Latin American, African ethnicity responses) and all other ethnicities not included elsewhere.

Source: Statistics NZ

32. There is a large difference in the median net wealth of European people compared with other ethnic groups even after removing the effects of age structures. The median net wealth of European people was $114,000, more than three times that of the Asian population ($32,000), five times that of Māori ($23,000), and nine times greater than Pacific people ($12,000). The median personal net worth for the total population was $87,000.

33. The composition of net wealth by ethnicity is shown in Table 4. Wealth held directly in real estate (ie, not held in a business or trust) is around 30 percent of overall wealth.

[10] This section is based on Statistics NZ (2016b).

[11] Age is standardised by re-scaling the underlying weights of the unit record data for each ethnic group – to reflect a 'standard' age distribution. The age distribution for the overall population of the net worth sample is used.

Māori hold a smaller proportion of net wealth in real estate (on average) and Pacific and Asian people hold greater proportions of their wealth in real estate (on average).

Table 4: Composition of wealth by ethnic group

| | European | Māori | Pacific people | Asian | Other | All |
|---|---|---|---|---|---|---|
| Owner-occupied dwellings | 24 | 19 | 41 | 37 | 32 | 25 |
| Other real estate | 6 | 2 | 20 | 13 | 7 | 6 |
| Other non-financial assets | 14 | 21 | 22 | 16 | 20 | 15 |
| Financial wealth | 56 | 58 | 17 | 34 | 41 | 54 |
| **Total** | **100** | **100** | **100** | **100** | **100** | **100** |

Source: Treasury, Statistics New Zealand

34. While Māori and Pacific people have lower average net worth than European people, there is also greater wealth inequality within Māori and Pacific people than within European people (using the mean-to-median ratio for each ethnic group as an indicator of wealth inequality).

35. With regard to gender, median net worth is $86,000 for women and $88,000 for men. Mean (average) net worth is $264,000 for women and $332,000 for men. The larger difference in mean wealth than median wealth indicates there is greater wealth inequality amongst men than amongst women.

### 2.3 Consumption distribution

36. A problem with annual income data is that there is a lifetime pattern of income (earnings typically increase through a working life and then fall in retirement). However, lifetime income is not practical to measure. Consumption (measured by household expenditure) is a better proxy of lifetime income. This is because households may smooth consumption in anticipation of future income and will reflect spending from non-measured income sources (eg, capital gains income or concealed sources) or borrowing. The level of inequality of household consumption is much lower than for market income, and slightly below that of disposable income in 2013 (Ball and Creedy, 2015).

37. Figures 15 and 16 show the distribution of income and expenditure by decile of income and expenditure respectively. There are quite different income and spending distributions when households are ranked by income and expenditure. Figure 15 shows that households in low income deciles spend more than their disposable income (in total) whereas high income deciles show much higher income than spending. However, when households are ranked by expenditure (Figure 16), all deciles have greater disposable income than spending (in total).

**Figure 15**: Distribution of expenditure and income by *income* decile, 2013

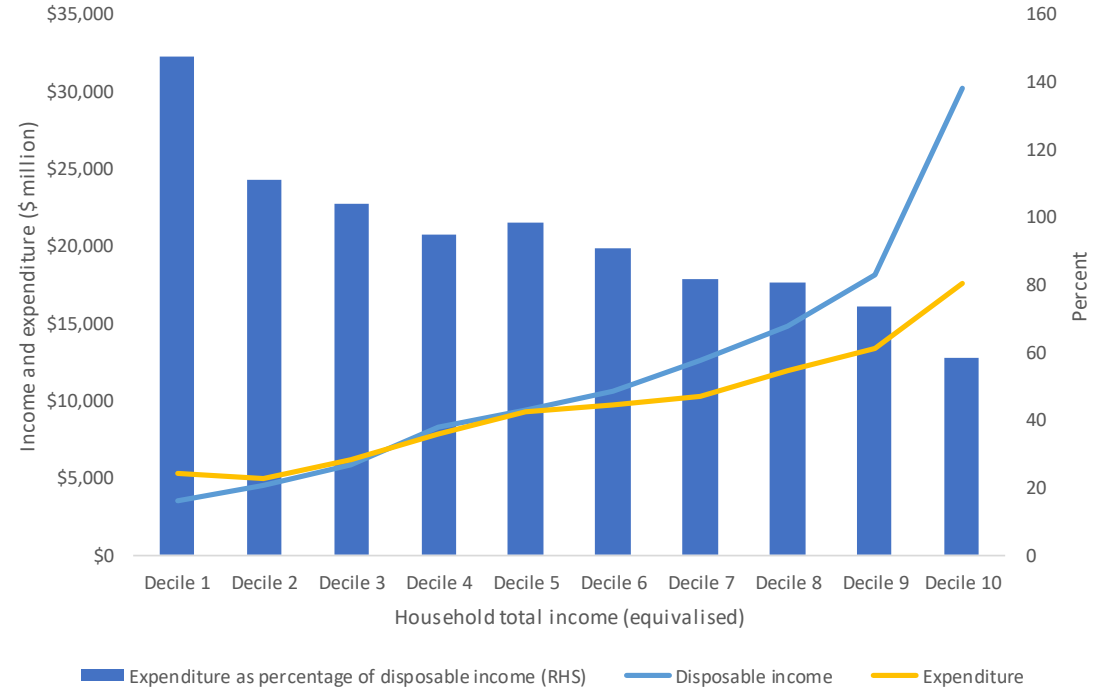
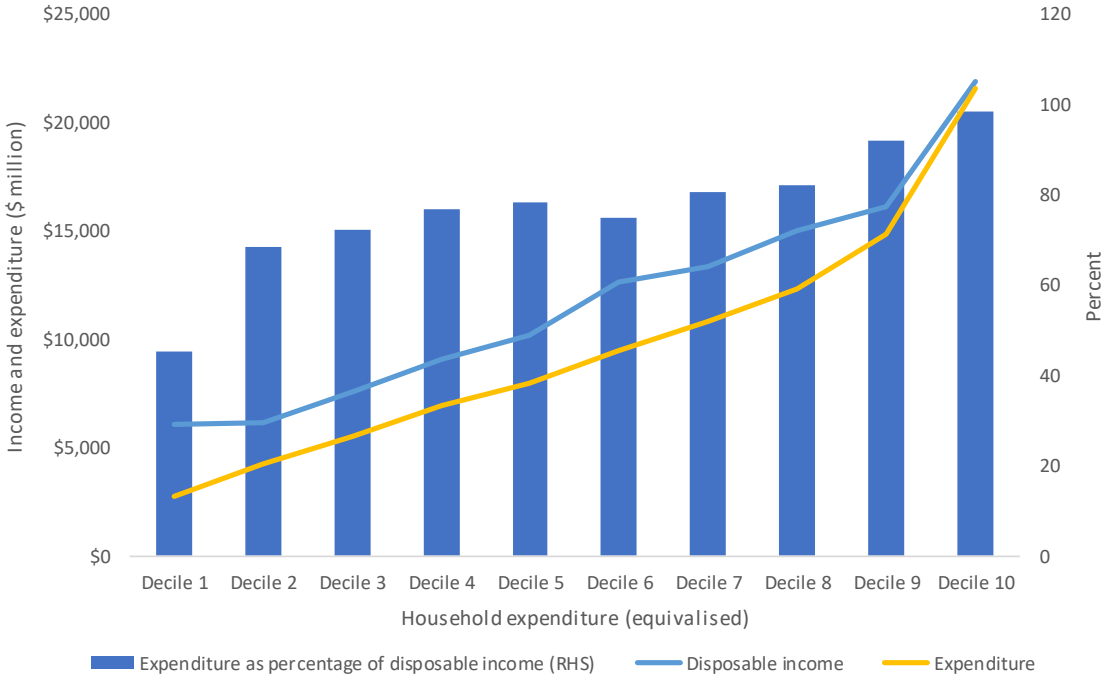



**Figure 16**: Distribution of expenditure and income by *expenditure* decile, 2013



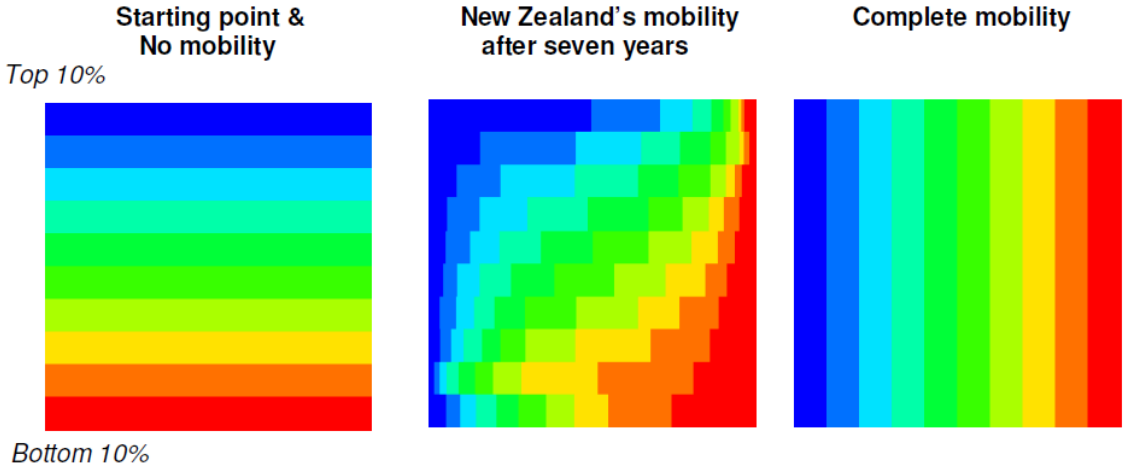
## 2.4 Income mobility

38. Income mobility refers to movement of individuals between income levels over time. As a general rule, the longer households are in low income (poverty persistence), the greater the risk of material deprivation. Changes in income over time are to be expected as there is a lifetime pattern for income.

39. There is significant income mobility in the short term (based on a longitudinal study over 2002 to 2009; Carter and Imlach Gunasekara, 2012). The largest increases in income could be seen for those started out in the lowest income groups and stability or declines in incomes were found in those who were in the highest income group at the start.

40. Figure 17 is a graphical presentation that colour codes people by their decile in the first year and follows them across time. The box with horizontal coloured stripes, on the left, is the starting point. If there was no relative income mobility between 2002 and 2009 then the middle box would also have horizontal stripes. Conversely, complete income mobility would produce the vertical stripes in the right hand box. The middle box shows the actual level of income mobility.

**Figure 17**: Transitions in the relative position of income over seven years (2002-2009)



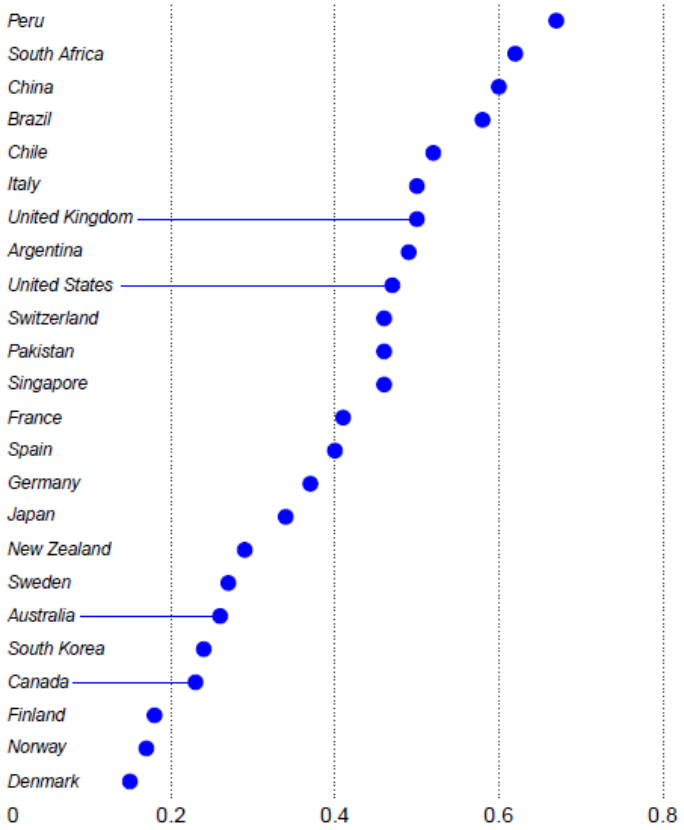

Source: Carter and Imlach Gunasekara (2012)

41. Over 60 percent of the population changed income decile groups over two years (Carter et al, 2014). The movements in income groups were more likely to be of a short distance (to adjacent income groups) rather than long distance. Over 70 percent of the population stay in the same or move to an adjacent income group in the next year. The patterns of mobility were greater over the eight year period with only 20 percent of the population staying in the same income decile group. Taking into account mobility in income over eight years the measured income inequality (Gini) is reduced by 15%, from 0.35 to 0.29.

## 2.5 Intergenerational mobility

42. Intergenerational mobility examines the relationship between the circumstances of parents and the circumstances of their children as adults. In New Zealand, the income of a father explains around 30 percent of the variance in their sons' income (Figure 18).[12] This is similar to other developed countries. The results suggest that some of the effect of parents' income on the income of their children occurs because children from better-off families tend to spend longer in the education system, which is supported by international research (Corak, 2012).

**Figure 18**: Estimates of the effect of $1 of father's earnings on son's earnings[13]




Source: Corak (2016)

43. International research suggests generally countries with high income inequality have relatively low intergenerational mobility, although New Zealand and Australia are both countries in which intergenerational mobility is higher than would be expected by the level of income inequality (Corak, 2012). The main factors that research

[12] This is based on data from the Dunedin longitudinal study. Parents' incomes is measured when the participants were aged 13 and 15, together with data on the incomes of participants at age 32. When data on the incomes of participants' parents was collected the average age of fathers was 42. In our dataset, parents are therefore more likely than their children to be in their peak earning years.

[13] Note: The horizontal distance displays the intergenerational earnings elasticity between fathers and sons (i.e., the percentage difference between the adult earnings of a son for a one percentage point difference in the father's earnings). The higher the value, the tighter the link between parent and child earnings, and the lower the degree of intergenerational mobility. The New Zealand estimate is from Gibbons (2010).

suggests significantly impact on intergenerational income mobility are wealth, parental employment, parental education and the structure of the household (particularly the number of sole parent households).

# 3. Tax policy and inequality

## 3.1 Policy levers that affect inequality

44. This paper is not making any recommendations or normative judgments about inequality. If it is a policy objective to influence distributional outcomes, there are several tax policy levers to consider:
    - *Progressivity of the existing tax rates and thresholds.* In principle, the income tax system could be made more progressive through changes to income tax rates and thresholds. This could be achieved by reducing income tax liabilities for lower earners, although the revenue loss would need to be made up through higher taxes elsewhere. Higher income tax rates have been ruled out of scope in the TWG's terms of reference.
    - *Changing or broadening tax bases.* For example, introducing taxes on capital gains, land or wealth would affect distributional outcomes.
    - *Taxpayer compliance*. In principle, measures such as anti-avoidance rules or simplifying the tax system could influence distributional outcomes (depending on the measure), particularly in cases where those on higher incomes have greater incentive or opportunity than those in lower incomes to engage in strategies designed to minimise their tax liabilities.

45. There are important policy levers that are outside the scope of the TWG, including:
    - *Changes to the size and mix of government expenditure.* Most income re-distribution is achieved through transfer payments and other government spending rather than taxes.
    - *Education and skills policy.*
    - *Regulatory and other structural policies* that influence the size, structure and distribution of economic activity, such as trade and employment relations policies.

## 3.2 Tax policy and inequality

46. The distributional impact of tax policies requires detailed analysis of specific proposals. The secretariat will provide distributional analysis for tax proposals considered by the group. This will usually take the form of analysing the impact of policy proposals on households across the income and wealth distribution. The extent of distributional analysis will be limited, in some cases, by data availability and subject to modelling assumptions.

47. As a broad framework for thinking about tax reform, the OECD has recently published an empirical analysis that looks at the effect of different tax policies on economic growth and inequality (Table 5). The results are average estimates using data from 34 OECD countries over 1980-2014. While it gives a broad guide to how shifts in the tax mix may be expected to impact on growth and inequality, specific

analysis of prospective policy changes is required that take into account country-specific characteristics and the overall package of policy changes.

**Table 5:** Summary of average historical effects on income equality and output[14]

| Adjusting other taxes, while keeping government size constant. Effects of: | Equality: Poor/rich | Average output | Income of the poor | Income of the rich |
|---|---|---|---|---|
| Lower tax wedge on upper-middle incomes | ☹ | ☺ | ☺ | ☺ |
| Lower tax wedge on lower-middle incomes | ☺ | ☺ | ☺ | ☺ |
| Reduction in the effective CIT rate | n.s. | ☺ | ☺ | ☺ |
| Change in standard VAT rate | n.s. | n.s. | n.s. | n.s. |
| More use of environmental taxes | ☹ | n.s. | ☹ | ☺ |
| More use of recurrent property taxes on immovable property | n.s. | ☺ | ☺ | ☺ |
| More use of inheritance taxes | ☺ | ☺ | ☺ | ☺ |
| Cut in taxes on net wealth | ☹ | ☺ | ☺ | ☺ |

Source: Akgun, Cournède and Fournier (2017)

### 3.3 Distributional analysis of tax policy

48. The Treasury maintains a model for distributional analysis of existing tax and transfer settings using HES data. The Treasury's model provides estimates of impacts over the distribution of household income, but not wealth, nor does it model tax bases outside the current system, such as a capital gains tax or environmental taxation.

49. To estimate the distributional impact of potential taxes on capital gains and wealth, HES wealth data can be used in conjunction with some assumptions. A significant disadvantage is that it only provides a snapshot of one year and there does not provide a guide to lifetime effects. Other modelling approaches would be needed on a case-by-case basis for specific policies considered by the Group (eg, specific environmental taxes).

50. An initial distributional analysis using wealth data is described below. This type of distributional analysis is non-behavioural. It does not take into account household or business responses to tax policy changes that could change market prices and quantities. For example, in analysing a capital gains tax, non-behavioural distributional analysis does not take into account potential changes to house prices and rents on the welfare of households. The economic incidence of taxes on income and wealth is assumed to be borne by those that receive the income or own the wealth.

[14] Note: Output results relate to long-term GDP per capita and income results to long-term levels of household disposable income (adjusted by household size). The poor are defined as the bottom income quintile and the rich as the top one. The sign of the change in tax (increase or decrease) is chosen so that the average output effect is positive, to facilitate comparisons. Output changes can be considered equivalent to changes in average household disposable income. The equality effect reflects the difference between the effect on the poor and the effect on the rich. Other dimensions of well-being than income, such as effects on consumption choices or environmental quality, do not enter this assessment. PIT is personal income tax, CIT is corporate income tax and VAT is value added tax. For a given instrument, the size of the smiley reflects the relative size of the effect across the different outcomes. N.s. denotes lack of statistical significance.

Behavioural responses would require an economic model that specifies how households and firms behave. The assumptions and results from such economic models are subject to significant uncertainty. The secretariat is also commissioning economic modelling to inform this type of analysis (eg, effect of a CGT on house prices).

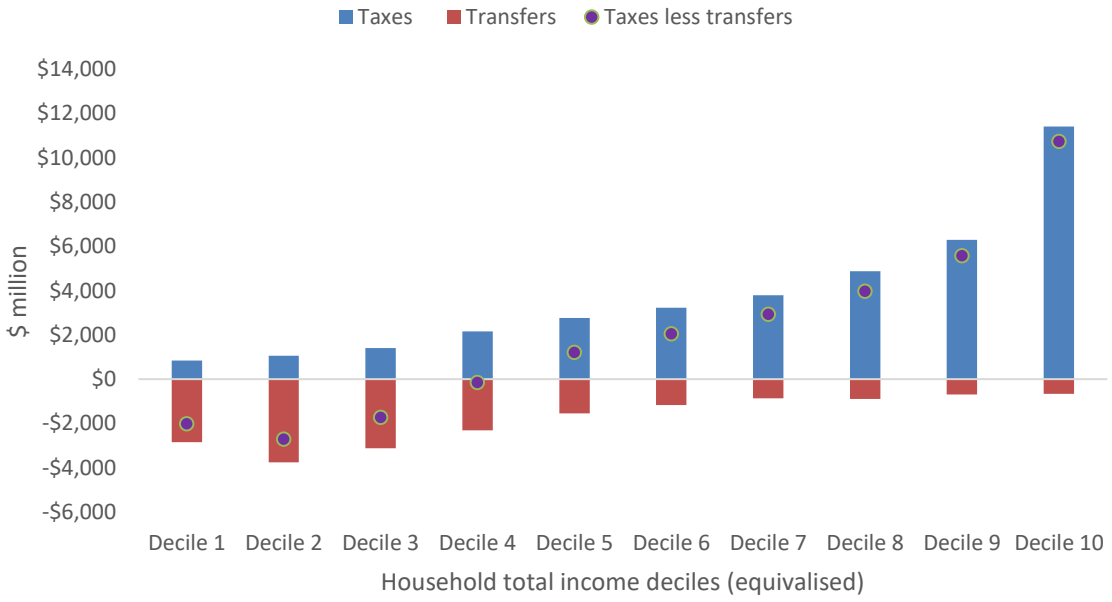
*Incidence of existing taxes and transfers*

51. Figures 19 to 22 show the incidence of taxes (income tax, GST and ACC levies) and government transfer payments, in dollars and as a percentage of total income. The distribution is shown over equivalised income deciles (ie, lowest income to highest income households) and equivalised expenditure deciles (ie, lowest spending to highest spending households).

52. Higher income deciles pay much more tax in dollar terms than lower deciles, although taxes as a percentage of income rise more gradually. Transfers are particularly important for progressivity, as measured by the rising effective average tax rate. Transfers received exceed tax paid in the bottom four income deciles and bottom three expenditure deciles.

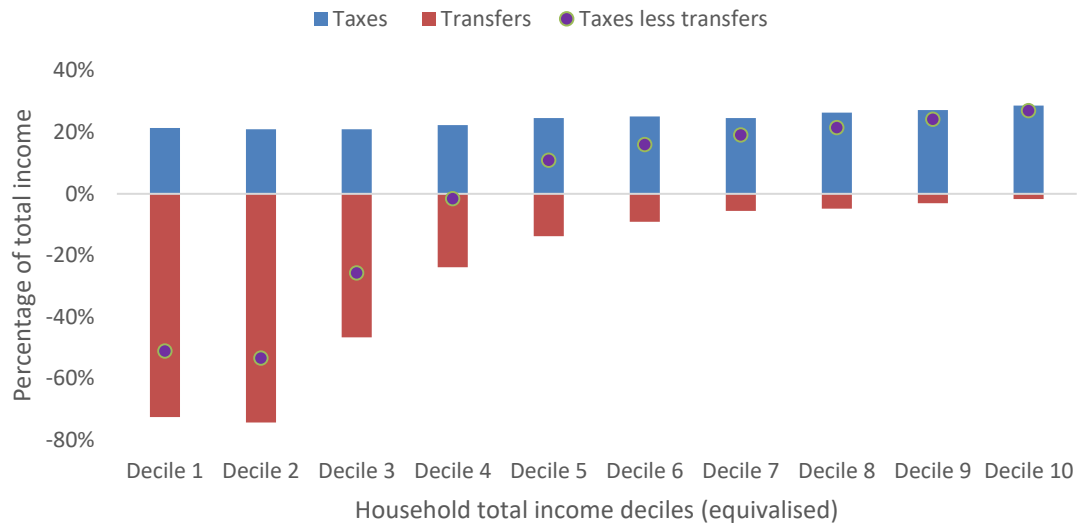
53. The effective average tax rates is somewhat flatter when looking at expenditure deciles compared with income deciles. This is because there are higher income but lower spending households and vice versa.

**Figure 19**: Taxes (Income tax, GST and ACC levies) and government transfers by income decile (2012/13)



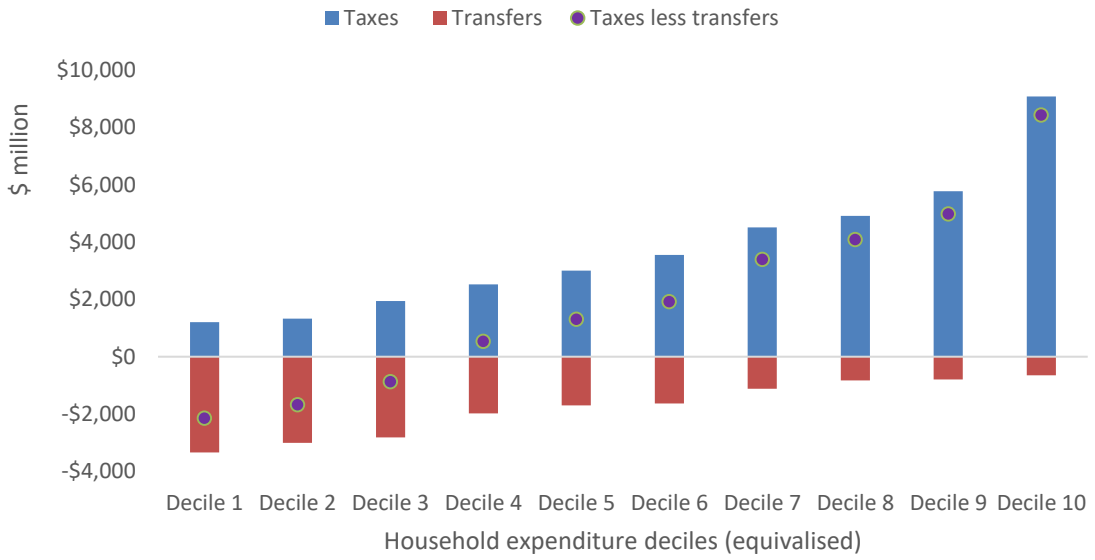

Source: The Treasury

**Figure 20**: Effective tax rate (income tax, GST and ACC levies less transfers) by income decile (2012/13)[15]




Source: The Treasury

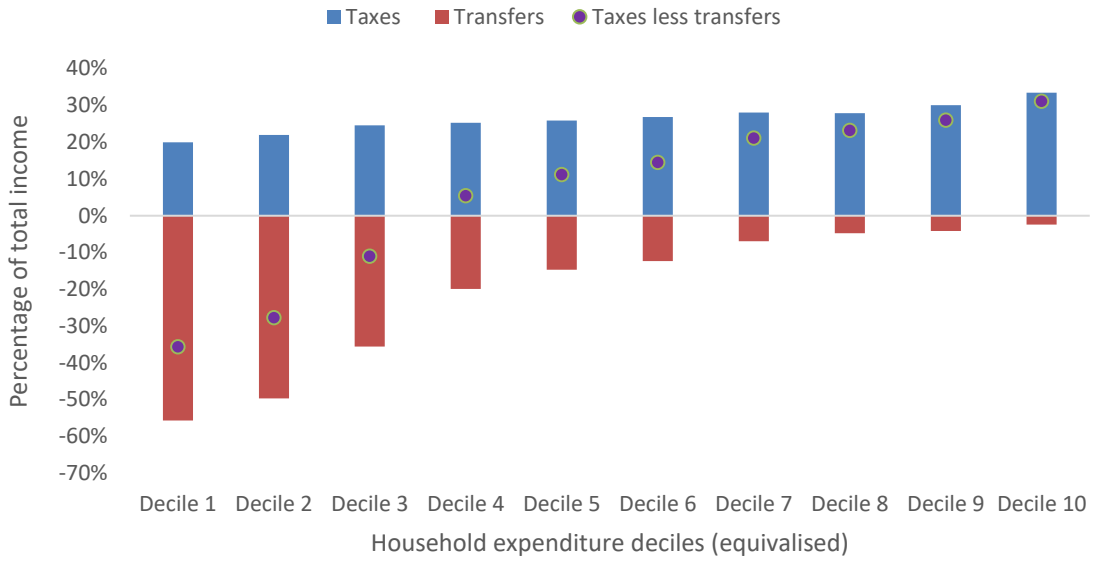
**Figure 21**: Taxes (Income tax, GST and ACC levies) and government transfers by expenditure decile (2012/13)




Source: The Treasury

[15] Figures 19 to 22 are estimates using HES 2014/15 Stats NZ integrated weights. Results are for all households (ie, include zeros) and use the 1988 Jensen equivalence scale. All estimates are based on sample survey data and as such are subject to sampling and non-sampling error. Access to the Household Economic Survey data was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975. The results presented here are the work of Treasury, not Statistics New Zealand.

**Figure 22**: Effective tax rate (income tax, GST and ACC levies less transfers) by expenditure decile (2012/13)




Source: The Treasury

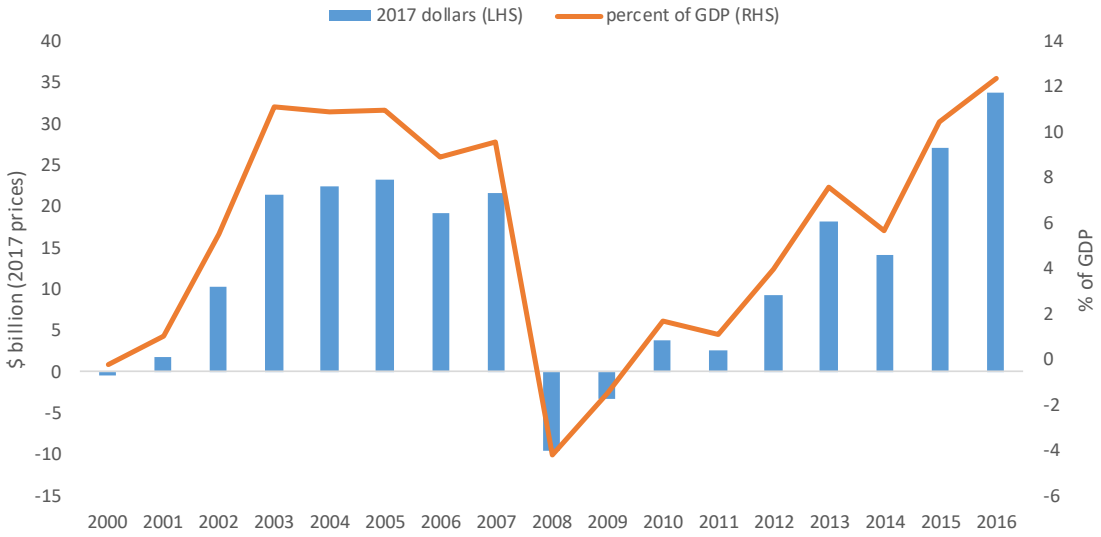
*Absence of taxation of income from capital gains*

54. The New Zealand income tax system does not have a general capital gains tax. A very approximate estimate of un-taxed capital gains can be estimated from changes in asset values. The estimated capital gains tax revenue from a comprehensive, accrual-based capital gains tax (including owner-occupied housing) may be useful to understand the magnitude of this feature of the tax system.

55. Over the last decade, an approximate estimate of tax revenue that could have been raised from a comprehensive, accrual-based CGT (including owner-occupied housing) is $12 billion per annum or 5% of GDP on average, based on appreciation of land and property values only (Figure 23).[16] Capital gains are highly volatile and this estimate should not be taken as indicative of future potential revenue, particularly as this estimate is for a historical period of rapid house price inflation.

[16] This is a rough estimate based on house price inflation (source: QVNZ house price index) applied to the land and housing asset base (including rental properties) from the RBNZ's households balance sheet data. It assumes an average marginal tax rate of 30%. It does not take into account any other asset types (eg, shares). It does not take into account any behavioural or market price changes potentially induced by a capital gains tax.

**Figure 23**: Estimated tax revenue from property under a comprehensive accrual-based capital gains tax (including owner-occupied housing), 2000 to 2016




Source: The Treasury

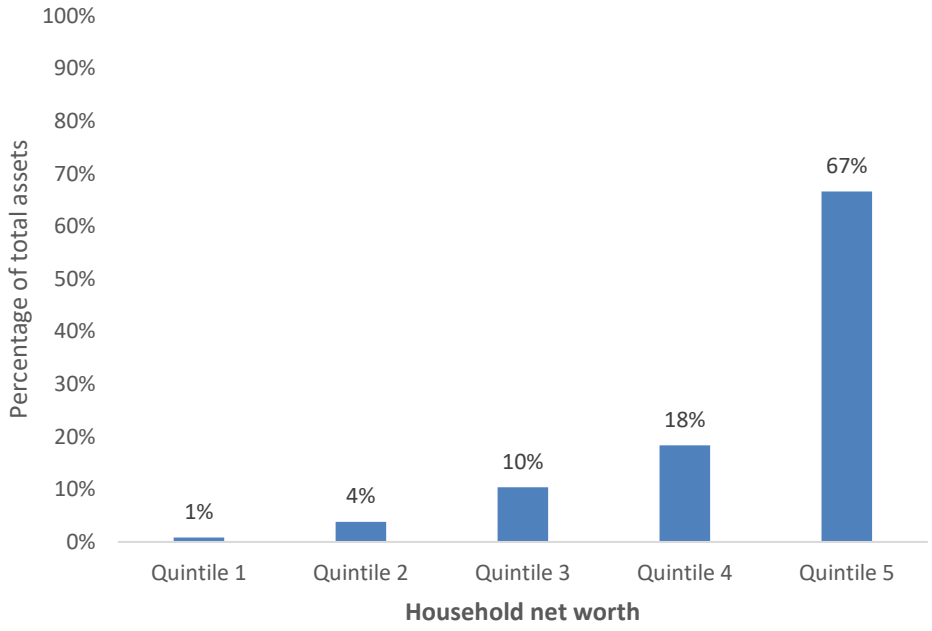
56. The distribution across households of the estimated tax revenue from a comprehensive and accrual-based CGT can be inferred from the distribution of household assets in 2015 excluding cash and deposits (which are not subject to capital gain). This is only a very rough indication and involves making a number of simplifying assumptions owing to data limitations. Around two-thirds of the asset base is held by those in the top net wealth quintile (see Figure 24). Figure 25 shows the impact on households by level of household net wealth. On a per household basis, the comprehensive capital gains tax is estimated to have a cost of $24,000 per year on average for the wealthiest quintile of households and $295 per annum on average for the lowest quintile of households.[17] As this is only looking at a one year snapshot of wealth data, it does not provide a picture of total impact over a lifetime.

57. With respect to a realisation-based capital gains tax that excludes owner-occupied housing, the revenue estimate will depend on the specifics of its design and modelling assumptions. As a rough guide, previous Treasury modelling of a realisation-based CGT (excluding owner-occupied housing) has projected tax revenue of around 1% of GDP after 10 years.[18] 1% of GDP is equivalent to around $2.7 billion per annum in 2016/17. Of course, actual capital gains would be much more volatile depending on the fluctuations of prices, and would depend on behavioural responses and other economic developments.

[17] This analysis does not take into account household changes over time, so the distributional impacts when viewed over a longer time period could be quite different.

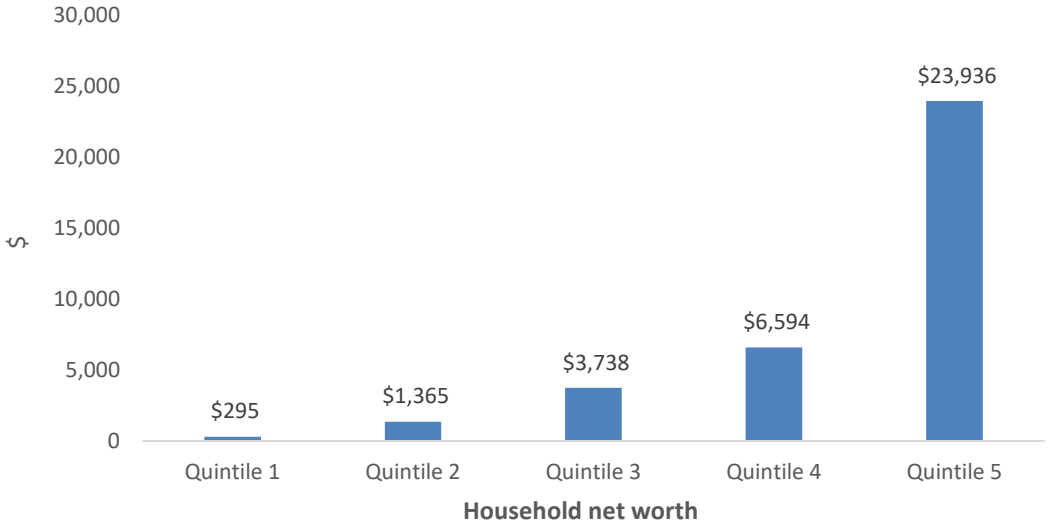
[18] The Treasury's revenue estimate prepared in October 2017 during the government formation period is available on the SSC website: http://www.ssc.govt.nz/sites/all/files/gfi-responses-green-dec17.pdf

**Figure 24**: Assets held that would be subject to comprehensive capital gains tax (including owner-occupied housing), 2015




Source: The Treasury

**Figure 25**: Annual tax revenue per average household from a comprehensive capital gains tax (based on average capital gains over 2008-2017)

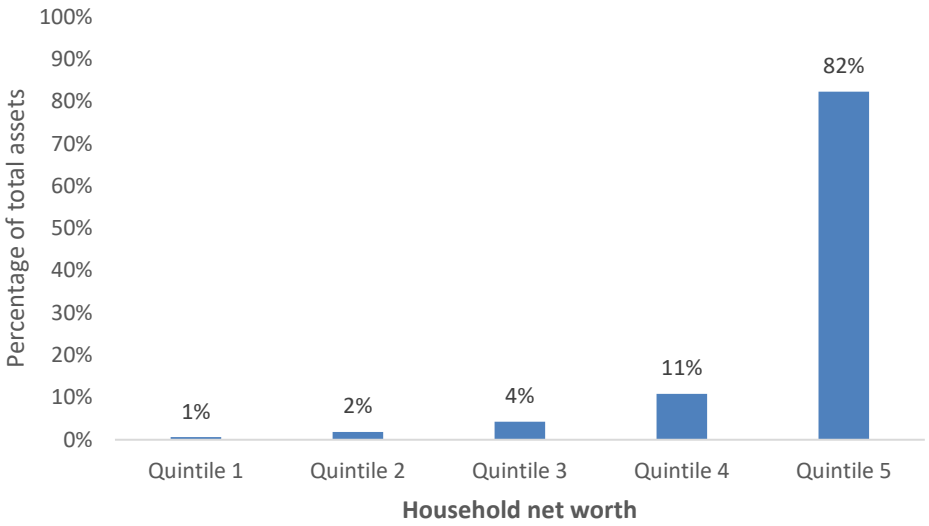



Source: The Treasury

58. We can analyse the distributional impact of a realisation-based capital gains tax that excludes owner-occupied housing using the distribution of assets excluding owner-occupied housing, cash or deposits. The distribution of these assets is more unequal than the distribution that included owner-occupied housing. The top net wealth quintile holds about 80% of assets that could be subject to a capital gains tax excluding owner-occupied housing (Figure 26).

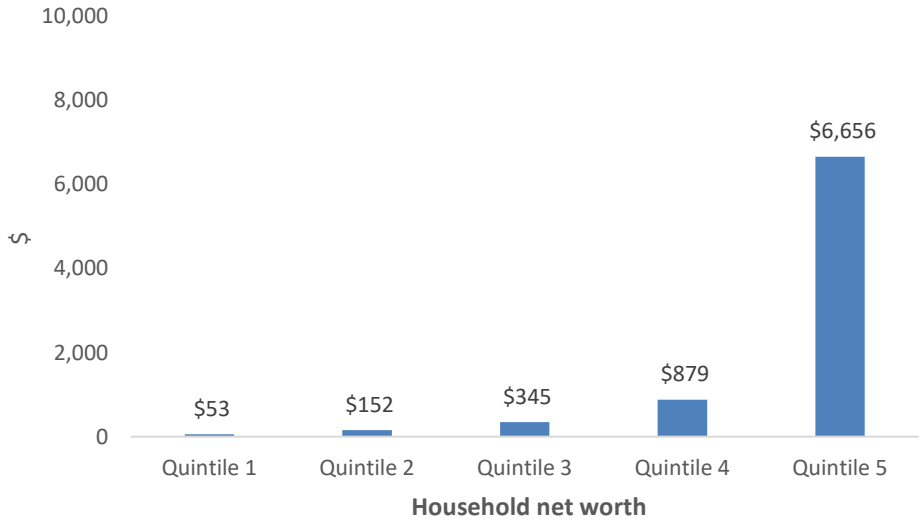
59. Assuming a realisation-based capital gains tax (excluding owner-occupied housing) could raise about $2.7 billion per annum in the long run (based on 2016/17 GDP), the average annual tax payment is $6,700 for households in the top net wealth quintile and $50 in the bottom wealth quintile (Figure 27). These are average amounts whereas actual tax payments would be highly variable for individual households depending on asset values and timing of sales.

**Figure 26**: Proportion of assets excluding cash, deposits and owner-occupied housing, 2015[19]




Source: The Treasury, Statistics NZ

**Figure 27**: Annual long-term tax revenue per average household from a realisation-based capital gains tax (2017 dollars, assuming wealth distribution as at 2015)




Source: The Treasury, Statistics NZ

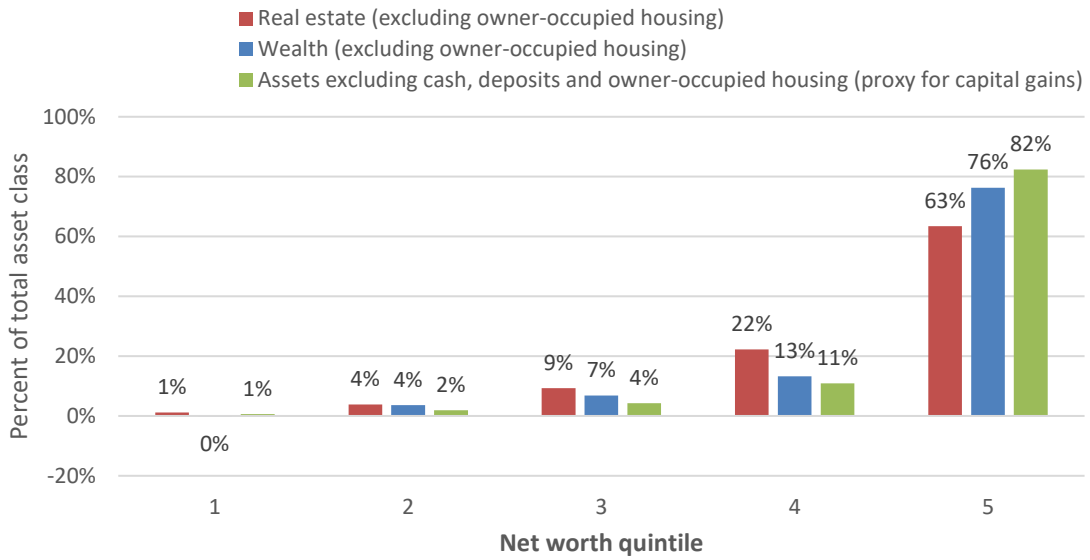
[19] The measure also excludes non-financial assets other than real estate, e.g. consumer durables.

*Taxation of wealth*

60. The distributional impact of taxation of wealth or a particular form of wealth (eg, land) will depend on their specific design and modelling assumptions. An indicative distributional estimate can be inferred from the distribution of net wealth and real estate (as a proxy for land). To make a comparison with a capital gains tax, the following charts also show the distribution of assets potentially subject to a CGT.

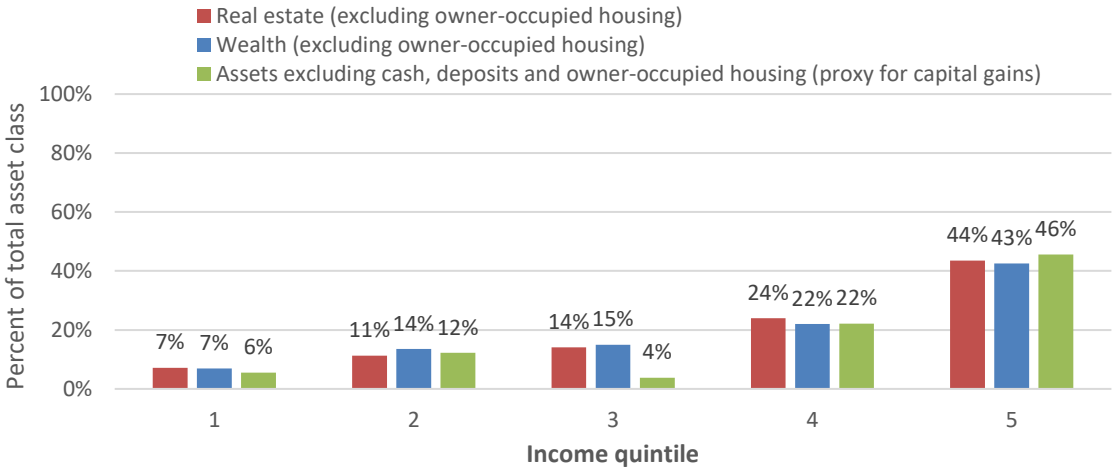
61. Figures 28 and 29 indicate the progressivity of these potential tax bases with respect to household wealth and income. All three tax bases are progressive with respect to wealth and income, although to a greater extent with respect to wealth.

**Figure 28**: Percentage of assets by net worth quintile, 2015




Source: Statistics NZ, The Treasury

**Figure 29**: Percentage of assets by income quintile, 2015




Source: Statistics NZ, The Treasury

# 4. Conclusion

62. Further distributional analysis will be provided to the Group for future meetings through analysis of specific policies under consideration. Therefore, the secretariat will focus its efforts on developing its modelling to inform the forward work programme, taking into account any feedback from the Group. There will also be a session on distributional analysis of the Group's preferred options in July to inform the Group's interim report.

# Appendix A: Household Economic Survey

The Household Economic Survey (HES) is a survey of around 5000 households that is re-weighted to provide data on the entire population of households in New Zealand. HES is an annual survey that collects a comprehensive range of statistics relating to household income and expenditure, and demographic information on households and individuals in New Zealand. The survey provides indicators on how personal and household income, housing costs, and living standards have changed over time.

The survey runs every year, from 1 July to 30 June of the following year. It covers people aged 15 years and over (15+) who usually live in New Zealand permanent private dwellings.

There are three versions of HES.

- HES (Income)
- HES (Expenditure)
- HES (Savings)

HES (Income) is the primary content and is conducted every year, but combined with HES (Expenditure) and HES (Savings) alternately in the two years in between the standalone HES (Income) year. HES (Income) provides statistics on household and personal income, housing costs, household and person demographics, and material well-being. Information on housing costs includes expenditure on mortgages, rents, rates, and building-related insurance. In HES (Expenditure), the survey also collects data on detailed expenditure by New Zealand households. In HES (Savings), the survey also collects data on what households own and owe to others.

Population re-weighting is used to estimate distributions over the entire population from the survey sample. Each unit in the sample is given a weight that indicates the number of people it represents in the final population estimate. Weighting ensures that estimates reflect the sample design, adjusts for non-response, and aligns estimates with current population estimates.

More information about the interpretation of wealth measures estimated from HES is available from Statistics New Zealand (2016).

Estimates using HES are based on sample survey data and are subject to sampling and non-sampling error. As such, there should be some care when interpreting income, expenditure, or wealth estimates as the confidence intervals around any point estimates may be wide. Access to the HES data was provided by Statistics New Zealand under conditions designed to give effect to the security and confidentiality provisions of the Statistics Act 1975.

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