

Fiscal incidence in New Zealand: The distributional effect of government expenditure and taxation on households in 1987/88, 1997/98 and 2006/07

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Abstract

This paper examines how the net distributive impact (fiscal incidence) of government expenditure and taxation on households changed between 1987/88 and 2006/07. We analyse the static effect of the government on households by comparing the distribution of “final incomes” (market income minus tax plus transfers and in-kind services) with the distribution of market and disposable income. As well as including cash benefits and income tax, this study includes government expenditure on housing, education and health services and revenue from indirect taxes. This paper extends Treasury’s fiscal incidence study of 1987/88 and 1997/98 (Crawford and Johnston, 2004) using 2006/07 Household Economic Survey (HES) and administrative data and is intended to be part of a continuing series.

Use of Statistics New Zealand data

Access to data used in this study 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 in this study are the work of the New Zealand Treasury and not Statistics New Zealand.

¹ We are indebted to the many staff from Treasury and from other government departments who have generously provided data and advice for this project.

DRAFT

Research questions and aim

Our paper researches how the distributional impact of government expenditure and taxation on households changed between 1987/88, 1997/98 and 2006/07. In addition, we examine the effects of these changes on measures of household income equality. Our aim is to improve knowledge of income distribution in New Zealand and of the effects of government expenditure and taxation on different income deciles and on measures of equality between 1988 and 2007.

Introduction

Our paper and accompanying slide pack investigate how the distributional impact of government spending and taxation on households changed between 1987/88, 1997/98 and 2006/07, and the effects of these changes on income equality measures. As well as including cash benefits and income tax, this study includes government expenditure on housing, education and health services and revenue from indirect taxes. We therefore go beyond standard measures of disposable income (market income plus transfers less income tax) to calculate final household income (disposable income plus in-kind social services less indirect taxes). This paper extends Treasury's fiscal incidence study of 1987/88 and 1997/98 (Crawford and Johnston, 2004) using 2006/07 HES and other administrative data. We believe the results are the most comprehensive currently available on the distribution of New Zealand government expenditure, although we also freely acknowledge their limitations.

Section one of this paper discusses how fiscal incidence studies improve knowledge of the impact of government expenditure and taxation on different types of households, and also our understanding of some of the distributive effects of policy changes. Section two outlines key changes in New Zealand society and the economy, and the methodology of our study. Sections four and five outline the results for different types of expenditure, taxation and household income. Section six discusses the results for the bottom decile in additional detail, including possible under-reporting of income and the limitations of our static approach to income distribution. Section seven briefly discusses other limitations, while section eight is the conclusion.

1. Why researchers are interested in fiscal incidence

Researchers quantify fiscal incidence in order to understand how governments affect the distribution of income, defined in a considerably broader sense than usual, received by households. Because of the valuable results they provide on the distributional impact of government spending and taxation, many countries conduct regular fiscal incidence studies. For instance, Britain's Office of National Statistics has annually charted changes in the distribution of different types of household income since 1977 (Jones, 2009), while the Australian Bureau of Statistics reports fiscal incidence on a five year cycle (Harding, Warren and Lloyd, 2006, p. 5). Changes in fiscal incidence in the United States have also been researched (Reynolds and Smolensky, 1977; Wolff and Zacharias, 2007). Comparative studies have become more common as researchers have sought to improve their knowledge of final income distribution in different countries (Harding, et al., 2006; Paulus, Sutherland and Tsakoglou, 2009; Smeeding, Saunders, et al., 1993). Fiscal incidence results have increasingly influenced policy decisions, with the United Kingdom's 2011 Budget statement outlining

how changes to taxes, tax credits and benefits would affect households (Her Majesty's Treasury, 2011, pp. 73-85).

Fiscal incidence studies have found that cash benefits play the largest role in reducing inequality. However, indirect benefits, such as the provision of health and education are "still unambiguously pro-poor". The top quintile fund a large part of income redistribution in developed countries. Compared to income taxation, indirect taxes tend to be a relatively regressive form of revenue collection on a static basis. On a life-time basis, however, people's consumption, and therefore the proportion of indirectly tax they pay over their life-time, will be more closely related to their income than at a particular point in time (Harding, et al., 2006, pp. 2, 16-17, 20; Jones, 2008, p. 37; Wolff and Zacharias, 2007, pp. 703-704).

Fiscal incidence in New Zealand has been studied for 1981/82 (Snively, 1986), 1985/86 (New Zealand Planning Council, 1988), 1987/88 (Brasheres, 1990; Department of Statistics, 1990), and 1997/98 (Crawford and Johnston, 2004). In a Treasury Working Paper, Crawford and Johnston found that for all income deciles the real final incomes of households were, on average, at least the same in 1997/98 as in 1987/88, and in most cases had increased. Government intervention, through taxes, cash benefits and social services, had maintained the incomes of households in less well-off deciles over a period when market incomes had become less equal. However, no studies of fiscal incidence in New Zealand using unit-record data have occurred for years since 1997/98. Although household disposable income statistics are available for 1982-2009, they exclude the incidence of subsidised state housing, health and education services, and the cost to households of indirect taxes (Perry, 2010a, pp. 42-43). This leaves a sizable gap in our knowledge of the distribution of government expenditure and taxation between different income households. This study seeks to fill that gap and to provide a more comprehensive picture of the economic resources available to New Zealand households.

2. Changes in New Zealand's population, the economy and government policies

Fiscal incidence research in New Zealand has taken place against a background of gradual demographic changes, and of changes in the economy, labour market and in government policies. For instance, the New Zealand population has been gradually ageing. Whereas the median estimated age of New Zealand's population was 30.2 in 1988, the median age was 33.6 in 1998 and 36.1 in 2007. The proportion of people aged over 65 has also grown (Statistics New Zealand, 2010), This has increased the cost of health services.

There has also been considerable growth in the proportion of people participating in tertiary education (Crawford and Johnston, 2004, p. 17). For example, whereas 8.4% of those aged over 15 participated in tertiary education during 1998, 13.4% of those aged over 15 did so in 2007 (Ministry of Education, 2010). Participating in further education temporarily depresses people's income, but usually has a long-term payoff for them. Household Labour Force Study data indicates that the proportion of the population aged over 15 participating in the workforce was 65% in both 1988 and 1998 (December year). However, survey data indicates this had increased slightly to 68.5% in 2007.

Changes in the rate of unemployment and benefit receipt also affect government expenditure. In particular, by 2007 the number of people receiving the unemployment benefit was considerably lower than in both 1988 and 1998 (Ministry of Social Development, 2008, p. 174). The number of people receiving sickness and invalids

benefits has increased. Nevertheless, the proportion of New Zealanders receiving working age benefits has fallen after reaching a high plateau between about 1990 and 2000.

Different governments have different priorities and governments can respond to demographic and economic changes by modifying entitlement policy settings. For instance, during the 1990s the age of eligibility for New Zealand Superannuation was gradually increased to 65. Housing expenditure became more targeted during the 1980s, and this continued during the 1990s. During the early 1990s core benefit levels were reduced and the universal Family Benefit was abolished.

3. Methodology

Our research into the distributional effect of government expenditure and taxation on households uses the three income definitions shown in Table 1. *Market income* is income from wages and salaries or from running a business as a sole trader or in a partnership. *Disposable income* is income from employment, investments and cash benefits after deducting income tax. Fiscal incidence studies also investigate how the distribution of *final income*, which includes in-kind social services (such as subsidised or free housing, health and education) and deducts indirect taxes (such as sales tax and excise duties) are distributed (Chamberlain and Prante, 2007, p. 1).

Income category	Definition
Market income	The income households receive from wages and salaries, from investments, and from running their own businesses as sole traders or partnerships.
Disposable income	Is income from all sources after income tax has been deducted ("cash in hand"). Equals market income plus cash payments from the government less income tax.
Final income	Income after adjusting for payments to and benefits from central government. Income from wages, salaries, investments and self-employment, plus the government benefits households receive in cash or in kind, and less the income and consumption taxes households pay. Equals disposable income plus in-kind social services.

Data from the Household Economic Survey (HES), which Statistics New Zealand has run triennially since 1988, is core to our research into how taxes and government spending affect household income distribution. HES data provides comprehensive statistics relating to income and expenditure for the target population of the 98% of New Zealand's normally resident population living in private dwellings. The response rate in 2006/07 was about 62%, with data being successfully collected from 2,550 households (Statistics New Zealand, [2007]). Households are our unit of analysis. HES collects data on people's income and consumption over the previous 12 months. Obviously this data provides only a partial picture of a person's standard of living, and of the complex transfers of income and benefits that governments make over a person's lifetime.

Treasury's Taxwell micro-simulation model uses HES data to calculate how income taxes and cash benefits affect the incomes of individuals, families and households. HES data is weighted in Taxwell so that the data better resembles key characteristics

of New Zealand's demographic and beneficiary population characteristics. As well as using Taxwell output, this paper attributes government spending on state housing, health and education to households, and calculates the incidence on them of Goods and Services Tax (GST) and of excise duty. The attribution methods are summarised in Table 2.

Table 2: Government revenue and expenditure included in the 2006/07 fiscal incidence study and attribution methods	
Government revenue and expenditure areas	Attribution method
Personal income tax	HES surveys people on their income and Taxwell models tax payments
Goods and Services tax	HES survey data on consumption was used for attribution
Alcohol, tobacco and fuel excise duty	Those who HES reported as consuming these products were attributed the average amount of excise duty
Benefits including NZ Superannuation, Student Allowance and the Accommodation Supplement	Taxwell models NZS and six core income support benefit payments using HES data. Student Allowance expenditure was also modelled using HES data
Income Related Rents	HES and HNZC data on household characteristics, income, and region
Education expenditure	HES data on use of early childhood and tertiary education was used. Compulsory education expenditure was predominantly modelled on eligibility. Tertiary students who were not getting a Student Allowance were allocated Student Loan expenditure
Health expenditure	Since HES does not survey use of health services, we used Ministry of Health data on the average use of health services by age, gender, ethnicity, and deprivation index

The results for government expenditure allocations were scaled to match administrative totals for cash transfers, health, education and housing expenditure. In common with similar overseas studies, HES suffers from under-reporting of income. This problem is most apparent for the bottom income decile. Because we are using survey data small changes in the distribution of income should be treated cautiously and may not be statistically significant.

Approximately \$34.9 billion of taxation and \$33.9 billion of government expenditure was included for 2006/07. This is 65.3% of Core Crown tax revenue and 62.9% of Core Crown expenses, and is comparable to the previous fiscal incidence study (Crawford and Johnston, 2004, p. 10).²

The coverage of this study is similar to that of recent fiscal incidence studies in Australia and Britain. Some types of government expenditure and taxation are

² The previous study used the Crown Accounting Analysis framework (Crawford and Johnston, 2004, p. 11), which has been discontinued (Statistics New Zealand, 2005). However, information on how government expenditure was categorised for 1997/98 was available and we made the 2006/07 data comparable. The biggest change to Treasury expenditure data was excluding almost all school property costs. This meant excluding not just the capital charge (which is included in Vote Education but not Core Crown expenditure) but also depreciation.

frequently excluded from fiscal incidence studies. For instance, many researchers believe that there is no clear theoretical basis for allocating government spending on public goods such as defence, law and order, and the environment. Because their incidence is unclear, corporate taxes are also often excluded (Harding, et al., 2006, p. 5).

Only our 2006/07 analysis is new: for the two earlier time-periods published results were modified for comparative purposes. In particular, the 1987/88 and 1997/98 results were adjusted to ensure that deciles for these two time-periods contained equal numbers of households, rather than equal number of persons. The previous study had also deducted expenditure on individuals living in institutions. We attributed this expenditure to private households.

3.1 Results are for a particular time-period

Because HES surveys income and consumption for the previous 12 months, our research therefore does not show the benefits or taxes a household receives and pays in the longer term. For instance, households may move deciles over time, with movement sometimes being facilitated by government expenditure. Low income households, and particularly low income retired people, may have property wealth they derive substantial untaxed benefits from occupying. Other low income earners may have substantial human capital that allows them to borrow for current housing costs (e.g. a mortgage) and for other costs (Culyer, 1983 [1991], p. 134). Because loans are not income, drawings from student loans are not included in the incomes of tertiary students.

Ideally we would be able to study the distributional impact of government expenditure over the life-cycle. In future, we plan to model fiscal incidence for different life-cycle household types. Such analysis has been an important part of other New Zealand fiscal incidence studies (Department of Statistics, 1990, p. 8; Snively, 1986) and of research overseas (Australian Bureau of Statistics, 2007, pp. 6-9). An obvious limitation of life-cycle research, however, is that they are still static as government policy settings change over time. Section 6.1 discusses the limitations of our static approach further.

3.2 Cost of service approach

A 'cost of service approach' was taken, which assumes that the value delivered to the household equals the cost of providing the service (Chamberlain and Prante, 2007, pp. 56-59; Reynolds and Smolensky, 1977, p. 49). Obviously this may not necessarily be true (Smeeding, et al., 1993, p. 237). For instance, some households may not value the health or education services members receive, while there are positive externalities for society in having a healthy and well-educated population (Paulus, et al., 2009, p. 245; Wolff and Zacharias, 2006, pp. 18-19). Providers, such as health and education sector workers, also benefit from government expenditure on these services and may be able to capture the benefits of expenditure increases.

We attributed education and health expenditure using an *average* cost of service approach. This was because insufficient information is available to determine the actual cost of providing services to individuals. This average cost approach means that the same amount of education expenditure was attributed to each school-age child of a particular age, even though we know that the actual cost varies between children. For instance, larger schools have lower per student staffing entitlements because they benefit from economies of scale. Similarly, a number of variables affect operational

funding for schools, with schools in lower income areas and in more remote areas receiving higher per student funding. However, schools in higher income areas tend to attract more experienced teachers and more experienced teachers receive higher average salaries from the government. Similarly, our model attributes average government health expenditure to all people with given demographic characteristics.

For New Zealand Superannuation and for the six main income-related benefits people who report receiving payments are modelled as receiving the amount they would qualify for based on their family circumstances. This is because people are often unable to accurately remember their level of benefit payments. However, for some complex benefits, such as orphans, disability and miscellaneous benefits, self-reported answers are more accurate than attempting to model entitlements.

3.3 Households and equivalisation scales

Households are either a person living alone or a group of people who share a dwelling and either share consumption of food or contribute towards shared expenses. Household members will not necessarily be related (Statistics New Zealand, [2007]). HES excludes family members who are living away from a household, such as children at university.

We used an equivalisation scale to control for the tendency for household expenses to grow with household size, but also for households to benefit from economies of scale. Because we are comparing our results to previously published results, we are restricted to the square root equivalency scale Crawford and Johnston used (Crawford and Johnston, 2004, p. 12). The formula for the square root equivalency scale is:

$$ES = \sqrt{A + C}$$

In the above equation, the equivalency scale (ES) is the square root of the number of people in the household. This scale assumes adults (A) and children (C) have the same needs. The *equivalised household income* is defined as the household income divided by the square root of the number of individuals in the household.

As Table 3 indicates, average household sizes have been gradually declining. This will have a slight effect on the results because household incomes are being spread between fewer people.

Study years	Number of private households	Average number of people in households
1987/88	1,122,155	2.8
1997/98	1,314,653	2.7
2006/07	1,565,006	2.5

Source: (Crawford and Johnston, 2004, pp. 3, 36); Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

Changes in household composition and in the circumstances of people in different deciles also affect the results. For instance, there has been a gradual increase in the proportion of single person, couple with no children, solo parent, and multi-family

household types (Table 3). In contrast, the proportion of households with children has fallen. Table 4 indicates that multi-family households, such as flatmates, remain relatively uncommon. Nevertheless, changes in household structure have, over time, affected New Zealand's income distribution (Hyslop and Mare, 2005; Martin, 2000, pp. 82, 87).

Household type	1987/88	1997/98	2006/07
Single	20.6%	21.9%	22.6%
Couple no children	24.4%	25.8%	25.9%
Couple with children	36.1%	31.4%	27.9%
Solo parents	7.8%	8.1%	9.5%
Other family types*	6%	8.4%	7.3%
Multi-family households**	5.2%	4.2%	6.9%
*Other family types include one-family households where 'other' related and unrelated people are present. **Multi-family households include two or three family households and any other multi-person households (e.g. flatmates).			

Source: (Crawford and Johnston, 2004, pp. 3, 36); Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

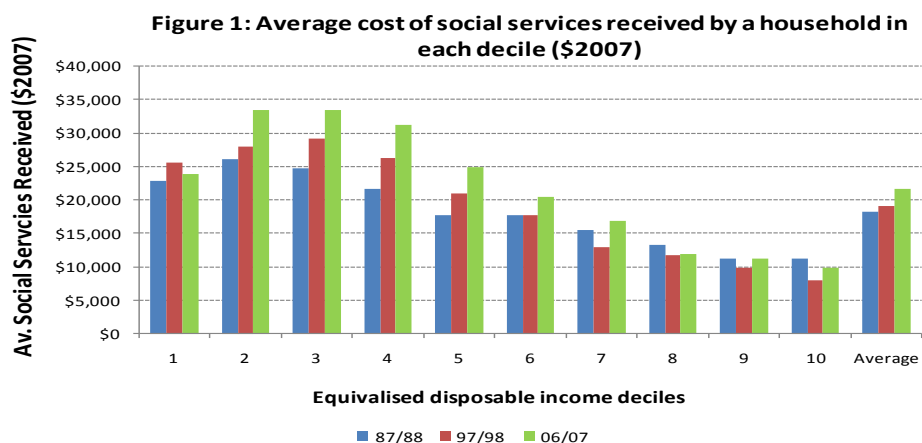
4. Results

This section begins by discussing the summary results for social services and taxation. The detailed results for different types of social service and taxation are then covered. The focus then switches in section five to household market, disposable and final incomes.

4.1 Summary results for social services and taxation

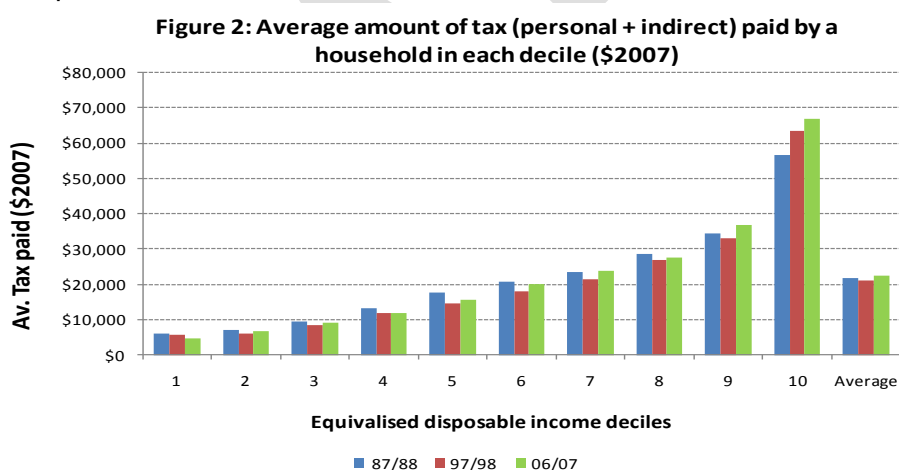
Between 1987/88 and 1997/98 social services expenditure (income support benefits, health and education) increased by about \$1.1 billion, after taking into account growth in the number of households. However, Figure 1 shows that expenditure became more concentrated on deciles one to five.³ In contrast, between 1997/98 and 2006/07, deciles two to seven benefitted most from considerable growth in real expenditure on social services. There were smaller increases for most other deciles, but a \$4.2 billion increase in real social services expenditure beyond the increase caused by growth in the number of households. Indeed, between 1997/98 and 2006/07 average per household social services expenditure grew from about \$19,000 per year to approximately \$21,700 per year in 2007 values.

³ Households are ranked by *equivalised disposable income* - Decile 1 households have the lowest equivalised disposable incomes while decile 10 households, the highest.



Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

Figure 2 shows the average amount of tax (personal and indirect) paid by a household in each income decile. In contrast to the social services results, the higher income deciles pay the most taxation. Indeed, in 2006/07 the top decile paid 30.2% of the total tax take. The average per household tax take of \$21,700 in 1987/88 had grown to \$22,300 in 2006/07, with most of the increase occurring between 1997/98 and 2006/07. Between 1997/98 and 2006/07, average per household tax paid increased for all deciles except decile one.



Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

Table 5 shows the share of social services consumed by the five highest income deciles has declined since 1987/88 to 32.4% of the total in 2006/07, whereas the share of tax they pay has grown slightly to 78.6% of the total. Table 6 shows that in contrast the share of social services consumed by the bottom five income deciles has grown since 1987/88, while their share of tax has fallen.

In other words, the share of social services consumed by lower income deciles has grown, while the share of tax they pay has fallen. The results are the opposite for the highest income deciles. Most of the change occurred between 1987/88 and 1997/98 when New Zealand's welfare state became more tightly targeted.

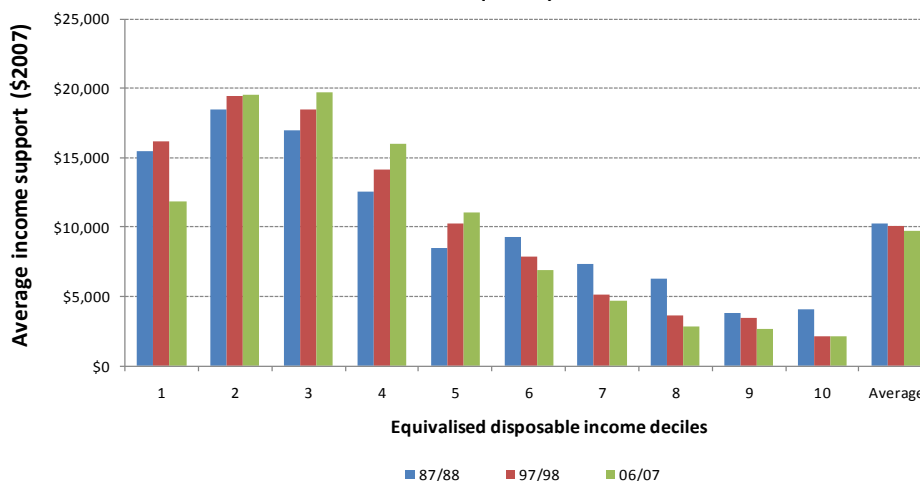
Table 5: Share of social services consumed and tax paid by the five highest income deciles (deciles 6-10) in 2006/07			
	1987/88	1997/98	2006/07
Share of social services consumed	37.9%	31.6%	32.4%
Share of tax paid	75.6%	77.7%	78.6%

Table 6: Share of social services consumed and tax paid by the five lowest income deciles (deciles 1-5) in 2006/07			
	1987/88	1997/98	2006/07
Share of social services consumed	62.1%	68.4%	67.6%
Share of tax paid	24.4%	22.3%	21.4%

4.2 Income support results

Cash benefits, tax credits and rent subsidies together constitute income support payments. Average per household income support expenditure remained virtually static between 1987/88 and 2006/07. Most income support expenditure has benefitted people in lower income deciles. Although the lowest income decile has consistently received lower income support payments than deciles two and three, the unusual employment histories and other characteristics of this decile are discussed in section four. Because of increases in the real value of New Zealand Superannuation, no superannuitant couples or superannuitants living alone should normally be in decile one.

Figure 3: Average cost of income support received by a household in each decile (\$2007)



Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

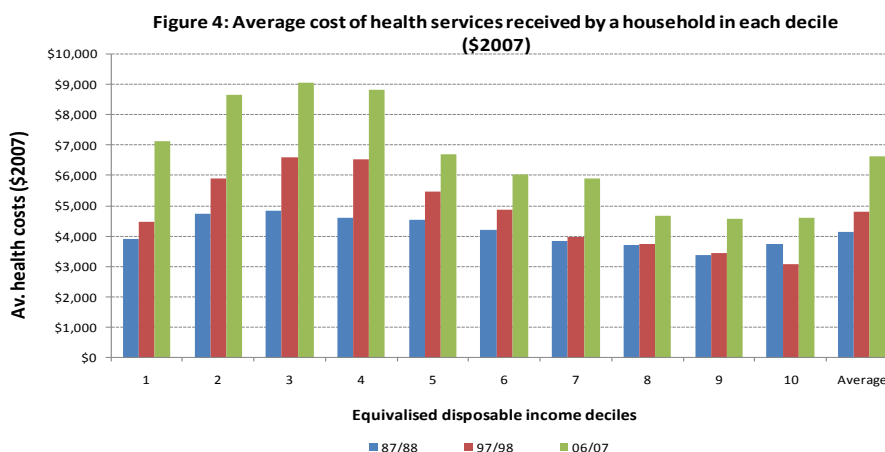
The level of income support payments fell sharply for decile one between 1997/98 and 2006/07, but increased for deciles two to five. Deciles six to ten were receiving considerably lower average income support payments in 2006/07 than in 1987/88. This partly reflects the abolition of the universal Family Benefit (Crawford and Johnston, 2004, p. 16). In addition, in 1987/88 some housing expenditure was attributed to high income decile households who were receiving mortgage subsidies or were living in state houses (Department of Statistics, 1990, p. 48). By 1997/98, the Housing

Corporation was no longer providing subsidised mortgages or state house rentals and eligibility for the Accommodation Supplement was contingent on current income (Crawford and Johnston, 2004, p. 8; Housing Corporation of New Zealand, 1998, p. 5). In 2006/07 state housing rentals were again subsidised, but only for those on low incomes.

Despite tighter targeting between the mid 1980s and early 1990s, in 2006/07 the top income decile received the same level of income support payments as in 1997/98. There continues to be high expenditure on New Zealand Superannuation, which is universal for those aged over 65 who meet residency requirements.

4.3 Health and education results

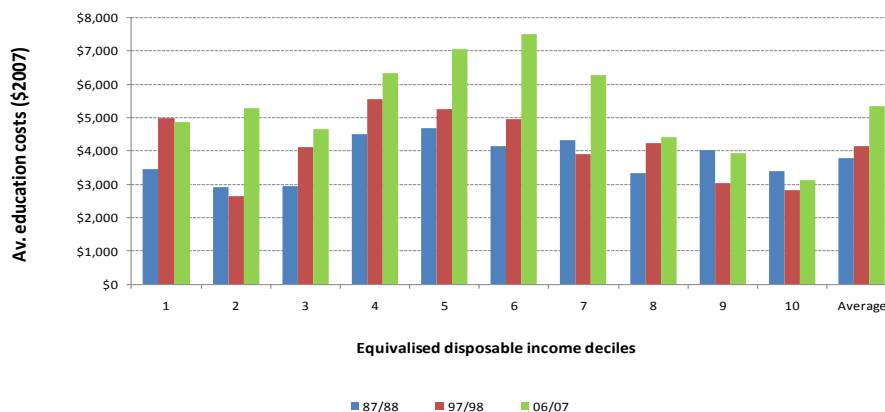
Average receipt of government funded health services has considerably increased from \$4,100 per household in 1987/88, to \$4,800 in 1997/98, and to \$6,600 in 2006/07. Average receipt of health services fell only for decile ten between 1987/88 and 1997/98, and increased for every decile between 1997/98 and 2006/07. Nevertheless, health expenditure has become more concentrated on lower and middle income deciles. There is less targeting of state health expenditure than of income support transfers.



Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

Average receipt of education services increased only modestly between 1987/88 and 1997/98. However, there was a much higher growth in government expenditure on education between 1997/98 and 2006/07, with average per household expenditure increasing from \$4,100 to \$5,300. Indeed, over these nine years the average cost of government provided and subsidised education services increased for all income deciles except decile one. The share of education expenditure received by households in deciles five to seven has sharply increased. This probably reflects the cumulative effects of changes such as smaller class sizes in early childhood and compulsory education, higher funding for early childhood education, higher tertiary education participation rates, and interest free student loans. Most education expenditure is not targeted to particular income groups in New Zealand. Over their life-time most people also benefit from compulsory education (Gillespie, 1965, p. 146).

Figure 5: Average cost of education services received by a household in each income decile (\$2007)

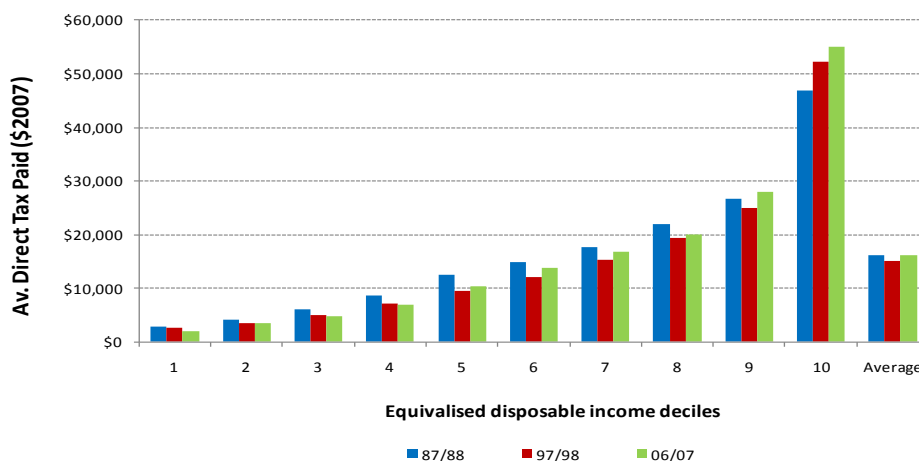


Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

4.4 Income and indirect taxation results

Our attention now turns to the funding of government expenditure through taxation, and the incidence of taxes on different income deciles. Figure 6 shows that the average income tax take per household was slightly higher in 2006/07 than in 1997/98, and was fractionally lower than in 1987/88. In all three time-periods, the highest income decile paid the most income taxation. Deciles nine and ten were also the only deciles paying more income tax and a higher proportion of income tax in 2006/07 than in 1987/88. In both 1997/98 and 2006/07, the top decile paid slightly over 34% of total income taxation. The top income decile also paid approximately twice as much income tax as the second highest income decile, and three times as much as the average for all disposable income deciles.

Figure 6: Average direct (personal) tax paid by a household in each income decile (\$2007)



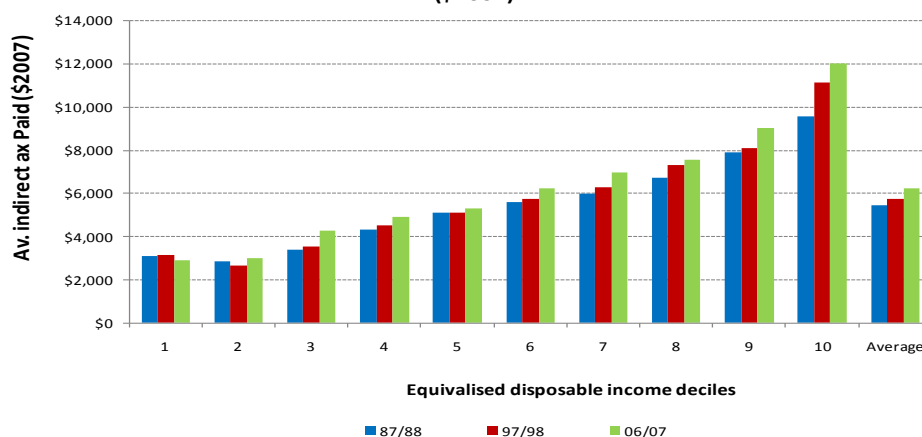
Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

With the exception of decile one, the average amount of indirect tax paid by every decile in 2006/07 was higher than in 1997/98. Most indirect tax in New Zealand is collected through GST, which is a flat-rate value-added tax with few exemptions. GST increased from 10% to 12.5% in July 1989, although consumption levels also affect the

amount collected. Excise duties on alcohol, tobacco and petrol also collect some indirect tax.

Higher income deciles usually pay both more indirect taxation and a higher proportion of indirect taxation than lower income households. Indeed, except for deciles one and two in 1987/88 and 1997/98, the amount and proportion of average indirect tax paid increases continuously with average income. The results imply that decile one has had similar consumption levels to decile two, despite having lower self-reported income levels. This probably reflects a combination of under-reporting of income and people with temporarily low incomes consuming their savings.

Figure 7: Average indirect tax paid by a household in each income decile (\$2007)



Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

5. Household income results

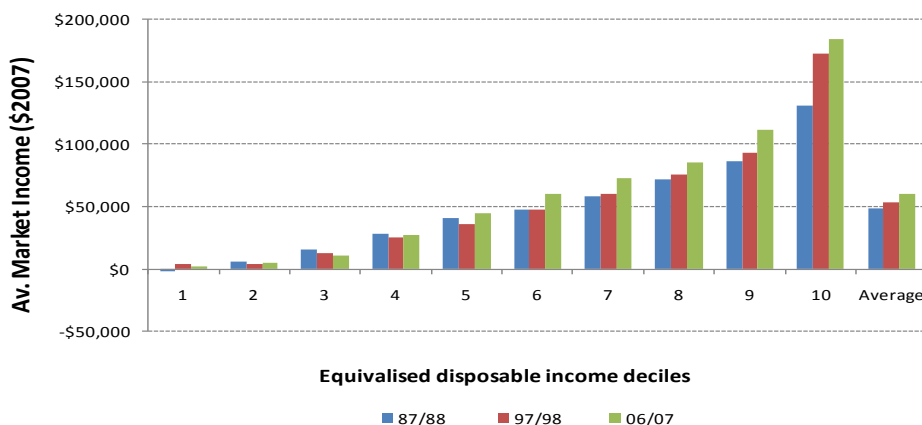
We will now examine the results for market, disposable and final income. Definitions of these income categories were shown in Table 1.

5.1 Market income

The results show that average household market incomes for the lowest decile have always been lower than \$4,000 in 2006/07 values, and in 1987/88 were slightly negative for the lowest income decile. As noted in sections 3 and 6, there is considerable evidence that many people in this decile either under-report their income or only temporarily have a low income. In 2006/07, the top income decile had an average market income of over \$184,000, up from \$131,000 in 1996/97.

Our results suggest that the distribution of market income has become more skewed between New Zealand households. In absolute and proportionate terms, the top decile enjoyed the biggest gains between 1987/88 and 1997/98. In 2006/07, the top income decile received about 31% of market income, which was similar to the proportion received in 1997/98. Deciles one and five to ten had higher market incomes in 2006/07 than in 1987/88. Decile ten received the biggest proportional increase in market income during this period.

Figure 8: Average household market income by decile (\$2007)



Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

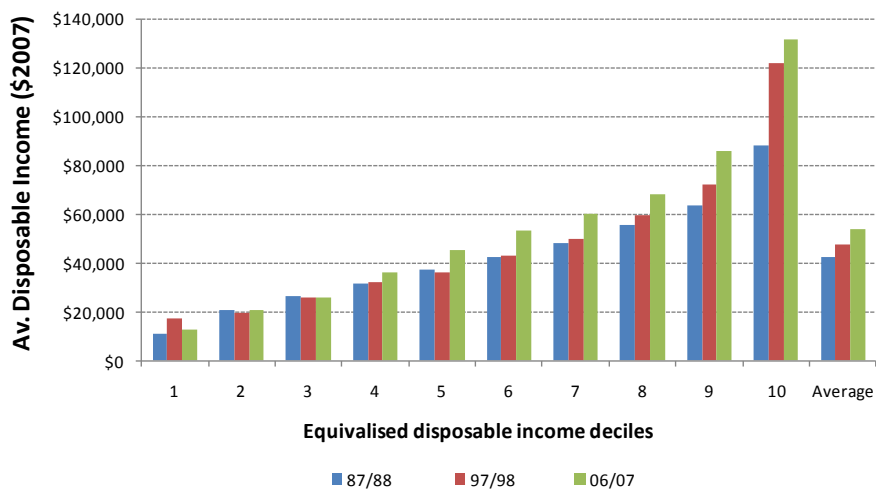
The market income distribution results are broadly similar to those found by researchers who have used HES data and census data (Hyslop and Yahanpath, 2006; Podder and Chatterjee, 2002). There was an increase in income inequality in New Zealand between 1987/88 and 1997/98 (Gould, 2008, p. 255; Podder and Chatterjee, 2002, pp. 13-14). Since then, however, inequality in pre-tax incomes for working-age individuals has been relatively stable, while there have been “broad gains in income to working-age individuals” (Hyslop and Yahanpath, 2006, p. 308).

An obvious limitation of our results is our emphasis on household incomes. On some other measures of equality, such as differences in wage and salary earnings between men and women, the distribution of income has become more equal over time (Papps, 2010, p. 228).

5.2 Disposable income results

Average disposable household income in New Zealand has increased over time. Although the biggest increases have been for the top decile, all deciles except one and three were also enjoying higher disposable incomes in 2006/07 than in both 1987/88 and 1997/98. Deciles one and three had lower disposable incomes than in both 1987/88 and 1997/98. The share of disposable income received by the top two income deciles has also grown.

Figure 9: Average household disposable income by decile (\$2007)

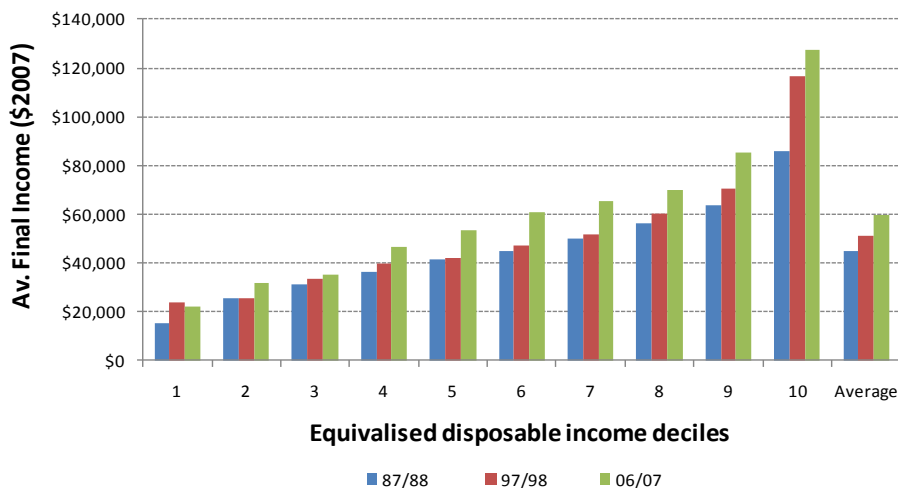


Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

5.3 Final income results

The range of incomes for final income (Figure 10) is less dispersed than in the previous two graphs. For instance, whereas average market income for decile ten in 2006/07 was over \$184,000, the average final income for this decile was about \$127,000. In contrast, whereas decile four had an average market income of about \$27,000 in 2006/07, the average final income of decile four was almost \$20,000 higher.

Figure 10: Average household final income by decile (\$2007)



Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

The results suggest that every decile had higher average final income levels in 2006/07 than in 1987/88. With the exception of deciles one, all deciles had higher average final income levels in 2006/07 than in 1997/98.

5.4 Changes in Gini coefficient across income measures

A higher Gini coefficient indicates higher inequality. The increase in income inequality in New Zealand since the late 1980s (Easton, 1995; Podder and Chatterjee, 2002) has been more modest using final income than using other measures of income. This could indicate that government spending on in-kind health and education services has continued to reduce inequality compared to market and post-income tax and welfare benefit payments. However, because of our 'cost of service' approach, increases in social services expenditure may not have always resulted in commensurate improvements in people's well-being. Similarly, a reduction in social services expenditure could affect the final income Gini coefficient, but would not decrease people's well-being if service levels were maintained.

	1987/88	1997/98	2006/07
Market income	.42*	.49	.48
Disposable income	.28	.32	.34
Final income	.24	.26	.26

Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

*Crawford and Johnston's (2004) calculations

Table 8 quantifies the extent to which disposable and final income have reduced inequality compared to market income outcomes.

	1987/88	1997/98	2006/07
Market to disposable	-34%	-34%	-30%
Market to final	-44%	-46%	-46%
Disposable to final	-15%	-19%	-22%

Source: Statistics New Zealand Household Expenditure Survey and administrative data. Calculations by the Treasury.

6. Examining the decile one results in further detail

The decrease in government expenditure on decile one between 1997/98 and 2006/07 probably reflects the high proportion of working age adults in this decile who reported low or no income, rather than changes in targeting. Only 28.3% of those aged 15+ in decile one in 2006/07 reported being in work when surveyed. Instead decile one was dominated by households dependent on core benefits.

Of those aged between 15 and 64 who reported earnings from wages, salaries and self-employment, a high proportion of those in the bottom decile reported earnings from self-employment. These people were probably only temporarily on low incomes.

Because of increases in the real value of superannuation, superannuitants are now not normally in decile one. The proportion of children in decile one has also fallen since 1997/98, which has reduced education expenditure on this decile. Compared to deciles two and three, decile one has a high proportion of people aged between 15 and 59 who potentially could be part of the work-force. As a result, government expenditure on this decile is relatively low. Although comparisons are not possible over time, in 2006/07

decile one, however, had a high proportion of tertiary students. Tertiary students are also only temporarily on low incomes.

Because of these factors, we would not place too much weight on the decile one results. The Ministry of Social Development (MSD) has also noted that reported disposable income for the bottom decile is a “very unreliable indicator” of their material living standards. This is because some households have implausibly low incomes, others have reported expenditure well above their income, and some meet both criteria (Perry, 2010a, p. 19). In other countries, such as Australia, there are also problems with under-reporting of income by the people who appear to be at the bottom of the income distribution (Siminski, Saunders, Waseem and Bradbury, 2003, pp. 2, 29).

6.1 Income dynamics and the disadvantages of a static income-based approach

Income dynamics are also often more important than snapshots of income, with lifetime earnings equality being higher than equality measured at a point in time (Barker, 1996, pp. 5, 18). Many people in lower income deciles, such as beneficiaries, the self-employed and students, are only temporarily on a low income. However, there is also considerable persistence in the incomes of many people over time (Hyslop, 2000; Ward, 2008, pp. i, 23). For example, many working age New Zealanders (and for some age groups the majority) have been dependent on a benefit at some stage. For most people benefit receipt occurs only for a short period, although a minority of beneficiaries account for most time spent on a benefit (Welch and Wilson, 2010, pp. 4, 18-19). Persistently low incomes are more common among the less-skilled (Hyslop, 2000; Ward, 2008, pp. i, 23).

Similarly, self-employed people temporarily drawing a low income are often building up a business. The self-reported expenditure on consumption by the self-employed often exceeds their income (Davis, Jenkin and Coope, 2003, pp. 16-17). There has also been considerable growth in upper secondary education and in tertiary education participation rates in recent decades. While further education temporarily depresses a person's income, people have been choosing to continue their education in order to improve their long term employment and income prospects. Today's high income households may also have received substantial benefits from government in earlier years that our methodology does not capture.

Deciles two and three contain a high proportion of superannuitants. Although this group tends to have stable incomes, they often own substantial housing assets. There are relatively few elderly in New Zealand living in hardship according to consumption-based measures of living standards (Perry, 2010b).

7. Other limitations

'Second round' effects of taxes on wages, incomes, prices and interest are likely to be important. For instance, high taxes can discourage productive effort (Culyer, 1983 [1991], p. 131; Leventi, Levy, et al., 2010, p. 7; Piggott and Whalley, 1987). Similarly, benefits have second round effects. The payment of New Zealand Superannuation to retired people, for example, means that there is less or no need for some people to save for retirement. The existence of benefits also clearly affects people's participation in the workforce, and their savings for contingencies such as sickness and illness (Crawford and Johnston, 2004, p. 28). In addition, many of the apparent transfers between income deciles could be considered transfers across the life-cycle.

We do not feel these and other limitations negate the value of our research, which provides an in-depth picture of final incomes at a point in time. Using consumption and wealth data to better determine people's standard of living could also be a topic for future research.

8. Conclusion

This paper has cautiously compared the fiscal incidence of government expenditure and taxation in 1987/88, 1997/98 and 2006/07. Only the 2006/07 analysis is new: for the two earlier time-periods published results were adjusted to ensure comparability. We acknowledge that we are only gaining partial insights into complex changes in income and expenditure distribution and that there are disadvantages in our static approach. Currently we are also limited to three snapshots of income and expenditure distribution. We have also not attempted to distinguish between the effects of economic factors, demographic factors and policy changes on government expenditure and on income distribution.

Nevertheless, we consider our results valuable for understanding the distribution of economic resources in New Zealand. As well as showing the distribution of three types of income, our results have shown how taxes and government spending are distributed across household income deciles. By considering the distribution of final income, we have generated a richer and more accurate picture than studies that are restricted to disposable income. Results from fiscal incidence studies can also reveal how the distribution of income distribution has changed over time, and the Gini coefficient results can be useful for this.

Our results show there was a small increase in real social services expenditure between 1987/88 and 1997/98. However, between 1997/98 and 2006/07 there was considerable growth in real government social services expenditure on deciles two to seven, and smaller increases in expenditure on most other income deciles. The average tax burden has also increased since 1987/88, with the biggest increases occurring for deciles nine and ten. Average levels of per household income support were similar in 2006/07 to 1987/88 and 1997/98, although expenditure has generally become more targeted to lower income deciles. In contrast, there has been considerable growth in government health and education expenditure, particularly between 1997/98 and 2006/07. The biggest increases in health expenditure have occurred for deciles one to four. Much of the increase in education expenditure has benefitted households in disposable income deciles five, six and seven.

During the period covered, the real value of market incomes increased for most income deciles. Disposable incomes, which are after income tax and include income support payments, have increased for all but decile three since 1987/88. In other words, the results show that taxation and benefit payments have equalised outcomes compared to market outcomes. Final income, which also includes the cost of government provided funded health and education services received, was higher for all deciles in 2006/07 than in 1987/88. The impact of net social spending and taxation in reducing inequality in household income distribution, as measured by the Gini coefficient, was approximately the same in 2006/07 as in 1997/98.

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