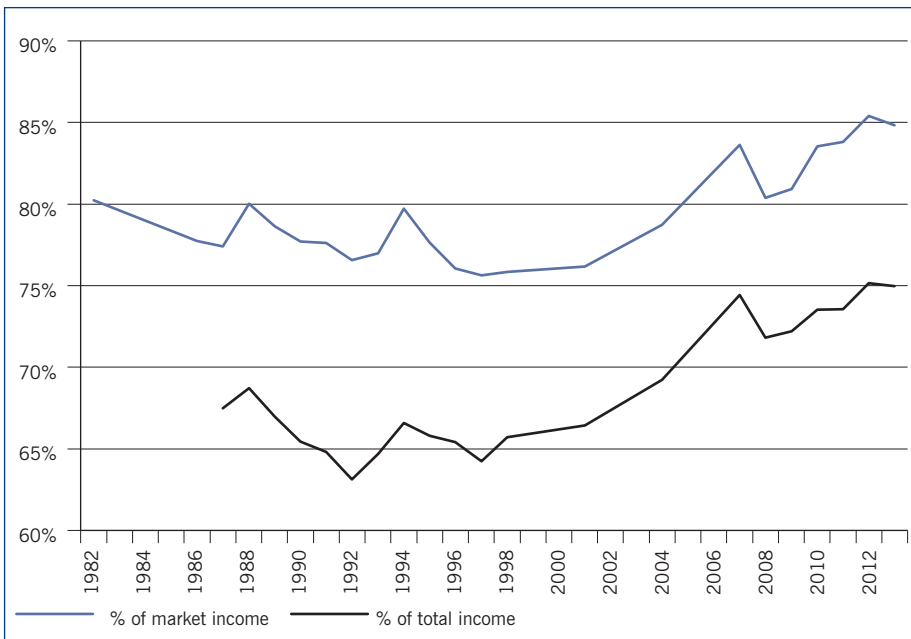Bill Rosenberg

Wages and Inequality

Wages and salaries are a vital part of the picture of income inequality in New Zealand because so many people depend on them as their principal or only source of income, although it is important to remember that the greatest extremes of inequality most frequently come from investment income

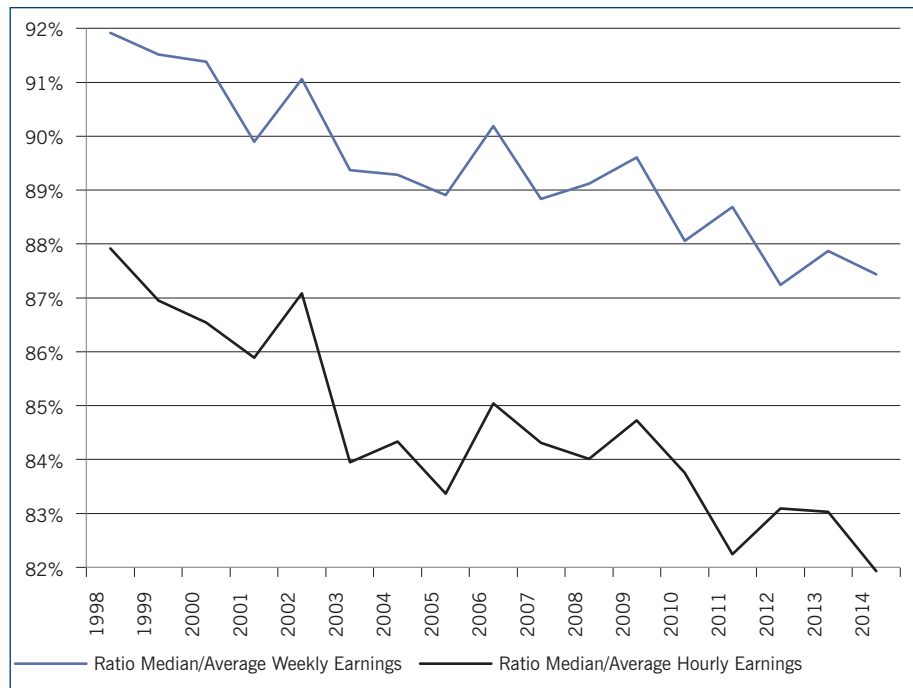**Figure 1: Wages and salaries as a proportion of household income**

Source: Household Economic Survey, SNZ

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(for very high incomes) and from social welfare benefits (for poverty). Wages and salaries are market incomes – that is, before taxes, tax credits like Working for Families, and other government assistance. 'Market' incomes include income from capital (real estate, investments, financial assets and other unearned income) as well as wages, but here we are looking only at wages and salaries (henceforth 'wages'). Market income is distributed much more unequally than even New Zealand's relatively high inequality of disposable incomes, let alone after also taking into account the provision of government services (or 'final income': see, for example, Aziz et al., 2012). It is, therefore,

Figure 2: Ratio of median to average earnings

Source: Household Economic Survey, SNZ

The distribution of wages

There is not as good publicly available data and analysis of the distribution of wages (or other market income) as there is for disposable household income. Easton (1983) provides some data for 1959–74; Dixon (1998) provided an analysis for the years 1984–97; and a 1999 Statistics New Zealand publication (Scott, 1999) provided further data for 1982–96. In somewhat more recent research, Stillman et al. (2012) analysed the incomes of families with at least one person aged 25–59 from 1983 to 2003. They found that 'real hourly wages declined 11–16% fairly evenly across the entire wage distribution between 1983 and 1993'. Between 1993 and 2003, real wages at and below the median grew only 3–6% while those above grew significantly faster: for example, 15% at the 9th decile. Changes in weekly earnings were less extreme, with no divergence from 1993 to 2003, because lower-paid workers worked more hours, confirming the observations above. However, there was a gradual increase in inequality in the top half of the wage distribution: the ratio between the 9th decile and the median increased by about 6% between 1983 and 2003 for both hourly and weekly wages, and gross and disposable household income (indicating the close relationship between wage and household inequality).

Since 2003 there have been some signs of an increase in wage inequality between lower and higher incomes. For example, as Figure 2 shows, the ratio of the median to the average hourly and weekly wage measured in the New Zealand Income Survey fell between 1998 and 2014, indicating that middle-income wage earners were receiving a declining proportion of the average wage and suggesting that higher wage and salary incomes were rising faster than low-wage incomes. Top salaries (such as those of chief executives and highly paid professionals) rose steeply during the 1990s, in relation both to lower wages and to each other. There is conflicting evidence as to their trend during the 2000s.

Wage and salary taxable income data from Inland Revenue[2] unfortunately only goes back to 1994, after the biggest

important to consider inequality of disposable or final income, but there is a return to concern about the distribution of market incomes, sometimes referred to as 'predistribution', in part because high levels of market income inequality meet increasing political resistance to adequate redistribution through the tax and benefit system.

The importance of wage and salary income

The part played by wages and salaries in providing income to New Zealand's households seems sometimes to be forgotten or taken for granted. Statistics New Zealand's Household Economic Survey (HES) shows that wages make up around three-quarters of average regular and recurring household income: though it dipped during the 1980s and 1990s, the percentage has been rising since then, from 66% in 1998 to 72% in 2008 and 75% in 2013.[1] Wages were 85% of average market income in 2013. According to the HES, the majority of households receive incomes from no other source.

Between 1983 and 2003, among families with at least one person aged 25–59, Stillman et al. (2012) found that 'labour income is by far the largest component of income and made up between 84% and 90% of regular income during the sample period'. According to Perry (2014, p.90), 'The two factors

that impact the most on the incomes of two-parent-with-dependent-children households are average wage rates and the total hours worked by the two parents.' Easton (2013, p.3) reports that 'The majority of the poor are couples with jobs, with some – but not a lot of – children, living in their own home albeit with a mortgage.'

A Treasury study looking at incomes before and after taxes, transfers and public services found that the market incomes of the lowest income half of households had essentially remained static in real terms between 1988 and 2010, in spite of a marked increase in the number of earners per household (Aziz et al., 2012, figure 2). According to Perry (2014, p.15), 'Around two of every three two-parent families were dual-earner families from 2007 to 2013, up from one in two in the early 1980s.' Many families worked harder to stand still.

Nevertheless, it is difficult to draw clear lines between wages (and other market income) and household income inequality because of the effect of taxation, tax credits and the other forms of social assistance. But given the dominance of wages in household incomes, they must underpin any consideration of adequacy and fairness of household incomes – unless we are willing to move to much more universal income assistance.

growth in disposable income inequality occurred. Pareto coefficients calculated on the top incomes show that top salaries rose more quickly than others in the late 1990s, stretching the inequality between top executives and most workers. It possibly fell a little during the 2000s and more recently rose (though note that 2012 data is provisional). On this data, the average income in the top 0.1% (one in a thousand) of salaries was approximately $650,000 in 2012, and $285,000 for the top 1%. The figures had been $265,000 and $130,000 respectively in 1994. The average for the top 0.1% rose from 16.5 times the average for the bottom 90% in 1994 to 21 times in 2012, and for the top 1% from eight times the bottom 90% in 1994 to nine times in 2012.

However, the data does not include some forms of income that senior private sector executives frequently get as a significant part of their pay package, such as shares or share options. It is therefore likely to understate the total remuneration for this group.

Although the lack of share option information doesn't necessarily mean top income inequality is either under- or overstated, the apparent slight easing in inequality during the 2000s is not consistent with many media reports and analyses of accelerating inequality between the incomes of top executives and their workers over this period. From 1997 to 2002, however, it is reasonably consistent with research by Otago academic Helen Roberts (Roberts, 2005, p.21; see Figure 5, noting that it shows real rather than nominal incomes). This shows chief executive remuneration rising from 11 times the average income of all workers in 1997 to 13 times in 2002. More recently, Fairfax business journalist Tim Hunter (2013) compared chief executive incomes to those of the average for staff in the companies they head. He found, for example, that the ratio had increased from 22 times in 2010 to 26 times in 2012, which is consistent with the upturn showing from 2010 in top salary inequalities in Figures 3 and 4. His methodology is different from either Roberts' or the tax data analysis, so the research is not directly comparable, but it is consistent with strongly growing inequality between top incomes and those

Figure 3: Inequality in top salary incomes – Inverted Pareto coefficient
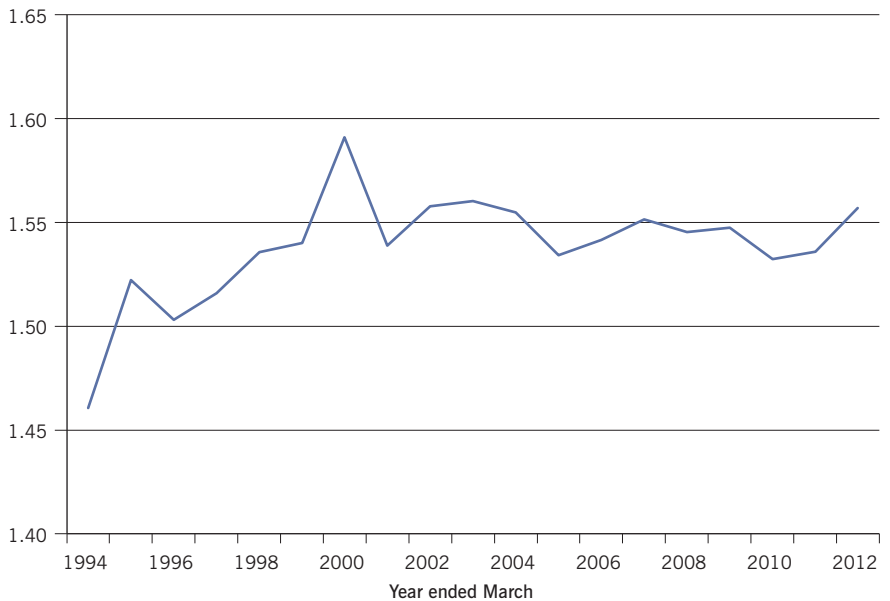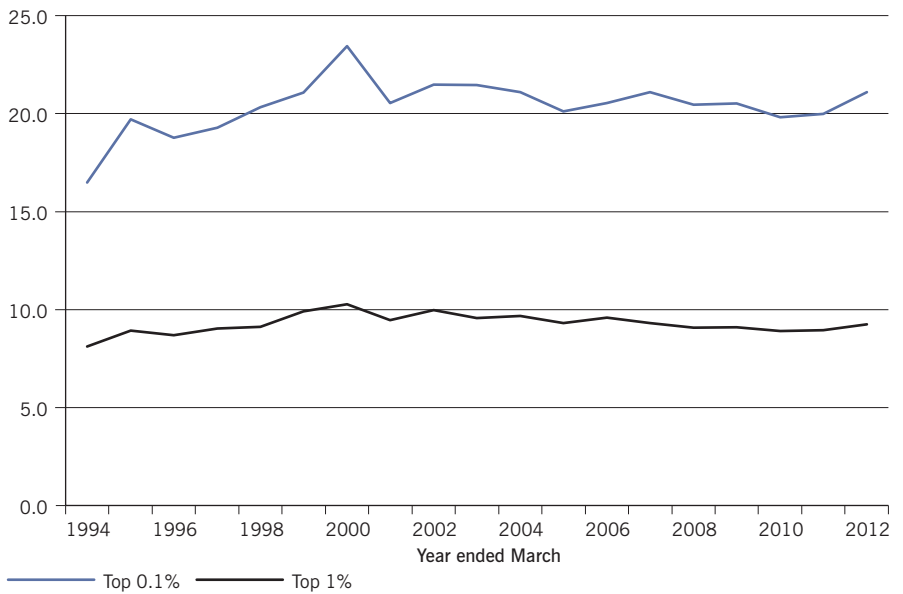
Figure 4: Ratios of average top salaries to average for bottom 90% of wage earners

Top 0.1% ——— Top 1%

Source: Analysis of IRD data for wage and salary taxable incomes. Top 0.1% and Top 1% incomes are estimated assuming a Pareto distribution
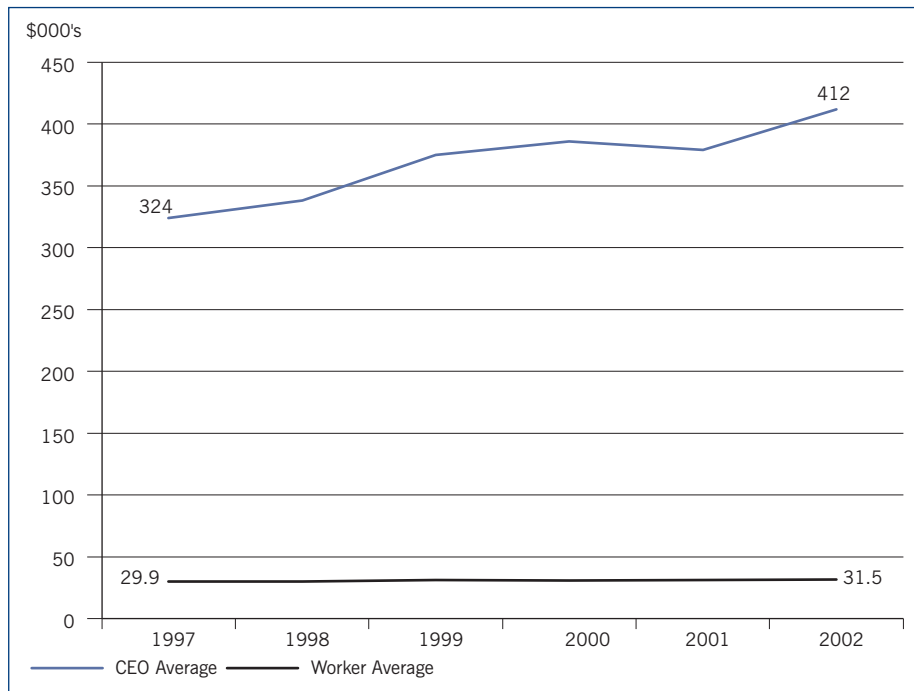
of the great majority of employees. These kinds of studies are largely limited to the chief executives of sharemarket-listed companies and top public sector managers because of lack of other data, but it seems unlikely that other executives would have had significantly different trends, given their close attention to relativities.

At the other end of the income scale, a recent Treasury report estimated that in the year to March 2014 about 30% of households with dependants earned wages below the then living wage of $18.40 an hour. It estimated that 45% of wage earners earned less than $18.40,

of whom 56% earned between the then minimum wage of $13.75 an hour and $15.00 an hour, and that included 60% of Māori and Pasifika workers:
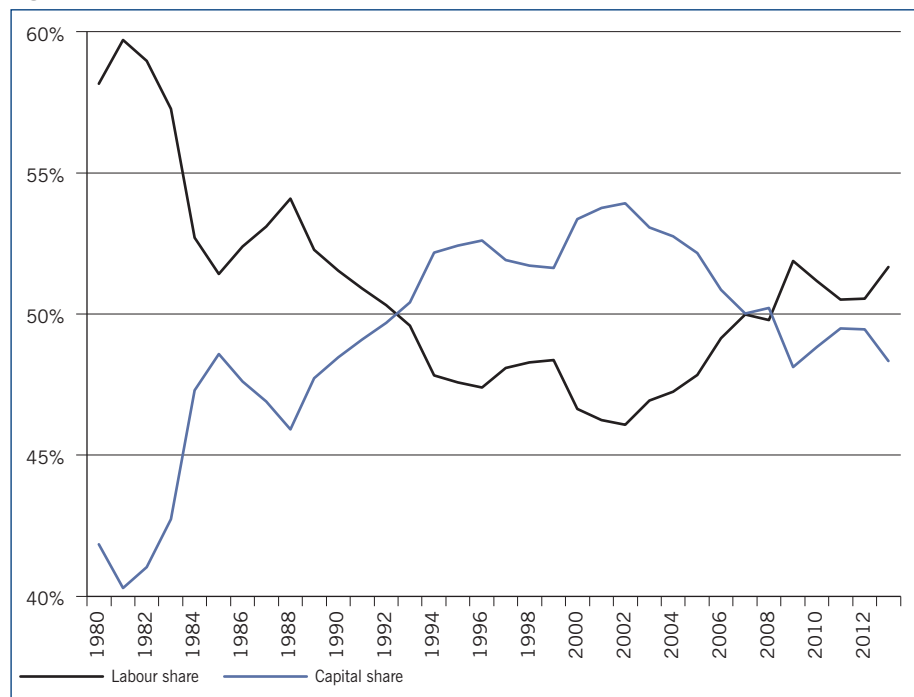
> Over half of the sole parents with dependants who are working have wage rates below the Living Wage, and most of these earn less than $15 per hour. In 25% of households with two adults and dependants, the principal earner of the household is on a wage rate below the Living Wage. This earner may also have income from other sources, but

Figure 5: Chief executive and worker real incomes 1997-2002

Source: Roberts (2005)

Figure 6: How the nation's income is shared

Source: National Accounts, series SND031AA, SNZ

generally the partner and dependants will have an even lower wage rate if they are earning wages or a salary. (Galt and Palmer, 2013, pp.2, 7, 8

How much of New Zealand's income goes to wage and salary earners?

However, individual or household income inequality is not the only concern as to how income is distributed. 'Factor shares' describe how the income of the economy is shared between the factors of production, labour and capital. Like inequality in general, this is a rising international concern because of the fall of the labour income share in most OECD countries. The International Labour Organization and economist Thomas Piketty are among those who have analysed it in depth.

In the national accounts, the income generated by the economy is divided into 'compensation of employees' and 'gross operating surplus'. Compensation of employees includes wages and non-wage benefits such as employer superannuation contributions, Accident Compensation Corporation employer levies and medical insurance paid by the employer. Gross operating surplus includes interest, dividends and self-employed income (called mixed income because it includes income from both labour and capital). The labour share is compensation of employees as a proportion of the total income generated by the economy (which is notionally equal to GDP). The 'capital share' is gross operating surplus as a proportion of total income, and the two shares add up to 100% by definition.[3]
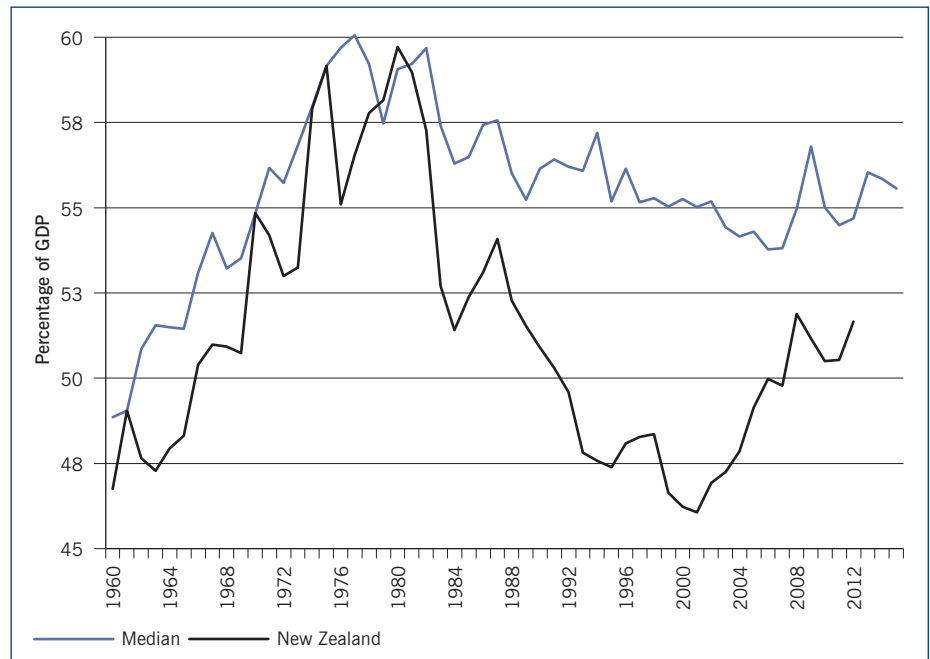
Sometimes the labour share is adjusted to include labour income of the self-employed, which has to be imputed because they do not necessarily pay themselves identifiable wages. There are various approaches to estimating the labour income of the self-employed, all of which have weaknesses.[4] While our focus here is on wages, we do need to recognise moves by employers to pressure or force employees into nominally self-employed dependent contractor ('outworking') situations in order to shed their responsibility for employment standards. However, adding in imputed self-employed labour income does not appear to make a significant difference to the picture of a substantial fall in the labour share (this is discussed further below). Changes in the labour share are closely related to whether real wage rises keep up with labour productivity increases, also discussed below.

As Figure 6 shows, the labour share of income fell from approximately 60% of income in the early 1980s to 46% in 2002 – a loss to wage earners of about a quarter of aggregate income. It then recovered to a little above 50%, but would need to be a sixth higher to return to its share in the early 1980s. In current dollar terms, that is a loss of about $19bn per year, or $10,000 per wage earner per year. The present value of the loss over that period is estimated at between $660bn (at a discount rate equivalent to investment in term deposits) and $1,200bn (at a discount rate equivalent to paying off a mortgage) or three to five times GDP.

New Zealand's labour share is relatively low by developed country standards. There are various sources of data for international comparisons: the United Nations, the OECD, Penn World Tables, and the European Commission's AMECO (annual macro-economic) database, which includes most OECD countries, including New Zealand. All international comparisons are problematic, but AMECO appears to provide the most consistent comparisons. It includes estimates back to 1960, which must be regarded as even more problematic than recent dates because of lack of international System of National Accounts (SNA) standards, adopted in New Zealand from the year ended March 1972 (1971 in figures 7a and 7b). But the general picture appears to be that New Zealand's labour share was broadly comparable to the OECD median until the 1980s and then fell well behind, before partially recovering from the early 2000s. For the adjusted labour income share, data is available only since 1986 for New Zealand (1985 in Figure 7b).[5]
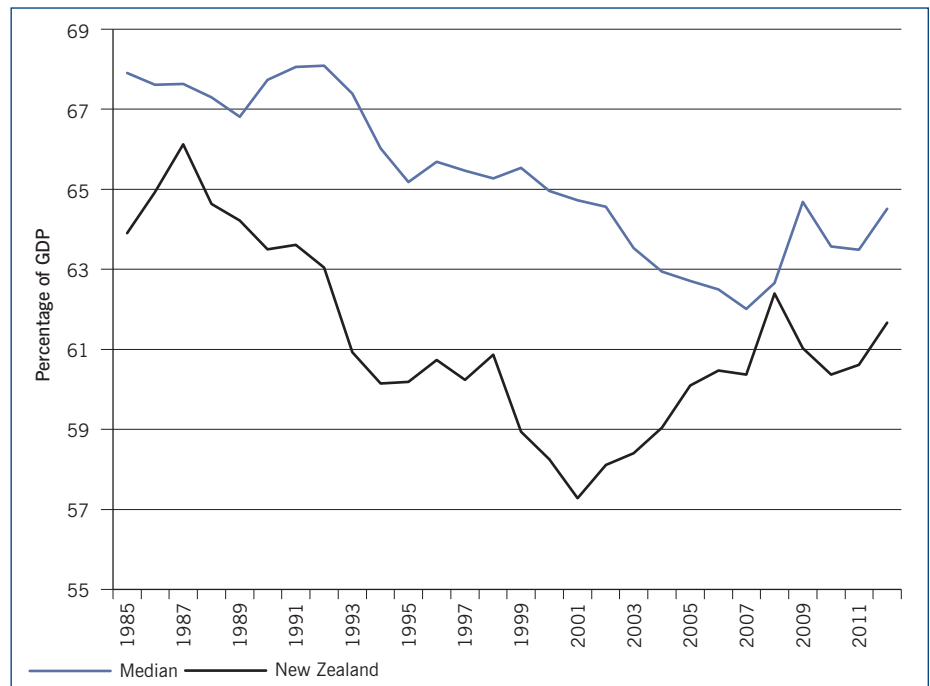
The distribution across types of income also can be seen in Figure 8, which shows household disposable income by main income source. The blue bars show estimates of the income from the Household Economic Survey, which is used for most income analyses. The dark grey result from work in progress by Statistics New Zealand analysing the distribution of the national accounts (Cope, 2013). They add income that can be observed in the economy as a whole and must be benefiting some households but is not reported in the HES. While values should be taken as approximate given the status of this work, the largest change is for households whose main income is from property, which includes financial wealth as well as shares, real estate and other forms of wealth. Their income approximately doubles when this 'hidden' income is recognised, and they are by far the highest-income households on average, followed by self-employed (presumably dominated by high-income professionals, farmers and successful small business owners), with wage and salary earners ahead only of those relying mainly on welfare benefits ('Transfers and others').

Figure 7a: Labour income share compared to OECD median

Sources: OECD: AMECO series UWCD, UOGD; New Zealand: SNZ, author's calculations

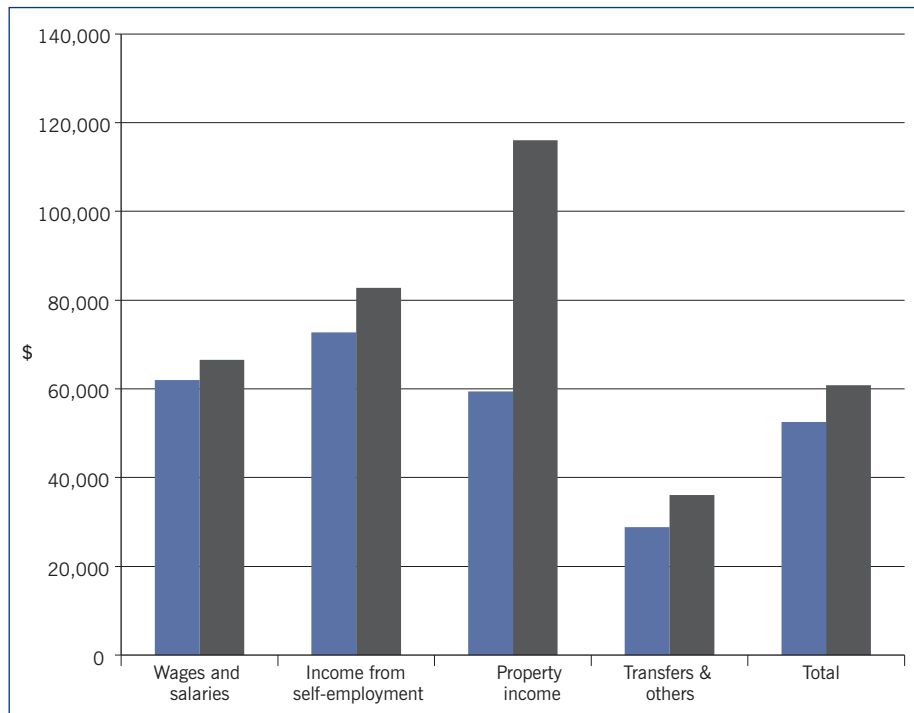**Figure 7b: Adjusted labour income share compared to OECD median**

Sources: OECD: AMECO, series ALCD2 New Zealand; SNZ, author's calculations

The big loss of income share to labour could have been due to the radical shift in New Zealand's industry structure, particularly during the 1980s and 1990s, which destroyed many relatively high-paying, high-value-add industries but replaced them largely with low-paid service industries. However, a shift-share analysis which breaks down the changes in labour share into those due to shifts in industrial structure and those due to changes within an industry indicates that the big structural changes largely cancelled each other out and the fall was overwhelmingly due to within-industry effects, especially during the 1990s.
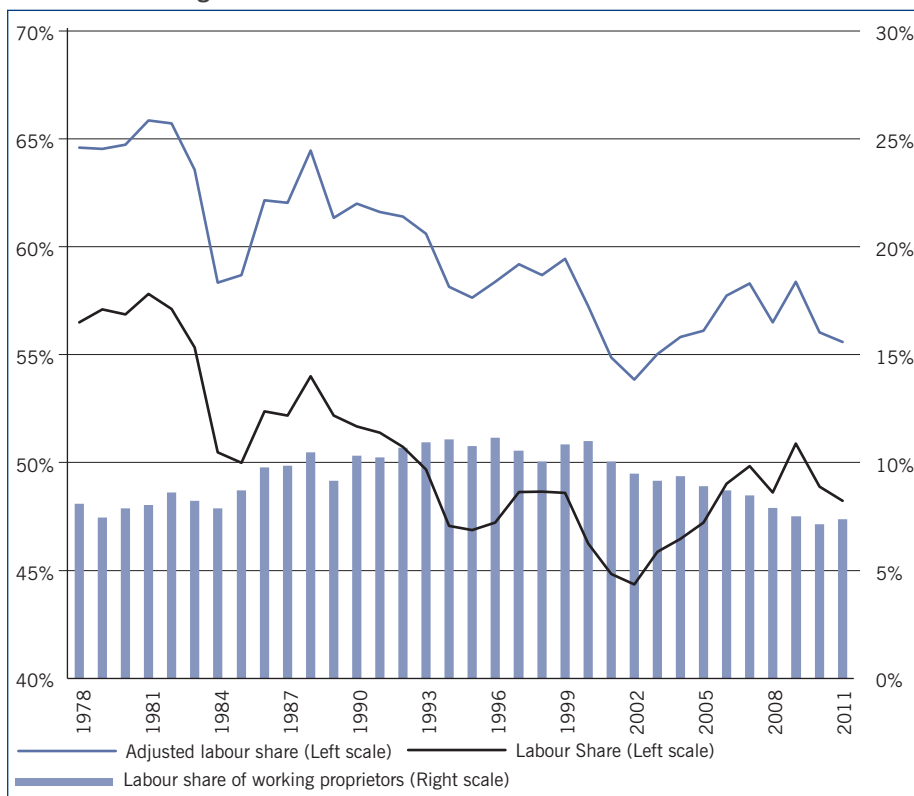
However, one significant structural change that would not necessarily show up in this analysis is the increased international financial integration that occurred over the period. The financial sector was growing relative to the rest of the economy, increasingly reliant on overseas funding and itself increasingly

Figure 8: Average household disposable income by main income source, 2006-07

Research in progress, SNZ

Figure 9: Adjusted and unadjusted labour share "former measured sector" excluding arts and recreation

Source: SNZ – National Accounts and Productivity statistics

overseas-owned. There was increasing financially-driven company takeover activity through debt-loaded leveraged buyouts, often by overseas-owned private equity investors, offshoring by New Zealand manufacturers, greatly reduced regulation of international capital movements, and a freely floating, heavily-traded dollar. The International Labour Organization (2013), while also finding that within-industry effects dominate, finds global financialisation to be the strongest factor in a falling labour share, and IMF researchers Jaumotte, Lall and Papageorgiou (2013) and Furceri and Loungani (2013) find that it contributes more generally to income inequality.

Could the low and falling labour income share be because of unusually high and rising capital intensity? This is unlikely, because New Zealand is known to have low capital intensity relative to Australia and other OECD countries (Conway and Meehan, 2013; Mason, 2013). There was strong growth in capital intensity for about six years between the late 1980s and early 1990s, when the labour share was falling. However, the share continued to fall even when this growth fell away, and capital intensity growth was also reasonably strong in the 2000s when the labour share was growing. Capital intensity growth was low to moderate by OECD standards over the whole period (Conway and Meehan, 2013, p.26). Indeed, in 2005 Hall and Scobie concluded:

> We find that the capital intensity in New Zealand has not been increasing as fast as in Australia for nearly 25 years. Between 1995 and 2002, lower capital intensity explains 70% of the difference in output per hour worked. Whereas the cost of labour relative to capital has been rising in Australia, it has fallen by 20% in New Zealand between 1987 and 2002. The relative price of labour to capital in New Zealand fell to 60% of the Australian value in 2002 after being comparable in the late 1980s. It is to be expected that New Zealand enterprises would therefore tend to adopt less capital intensive production methods.

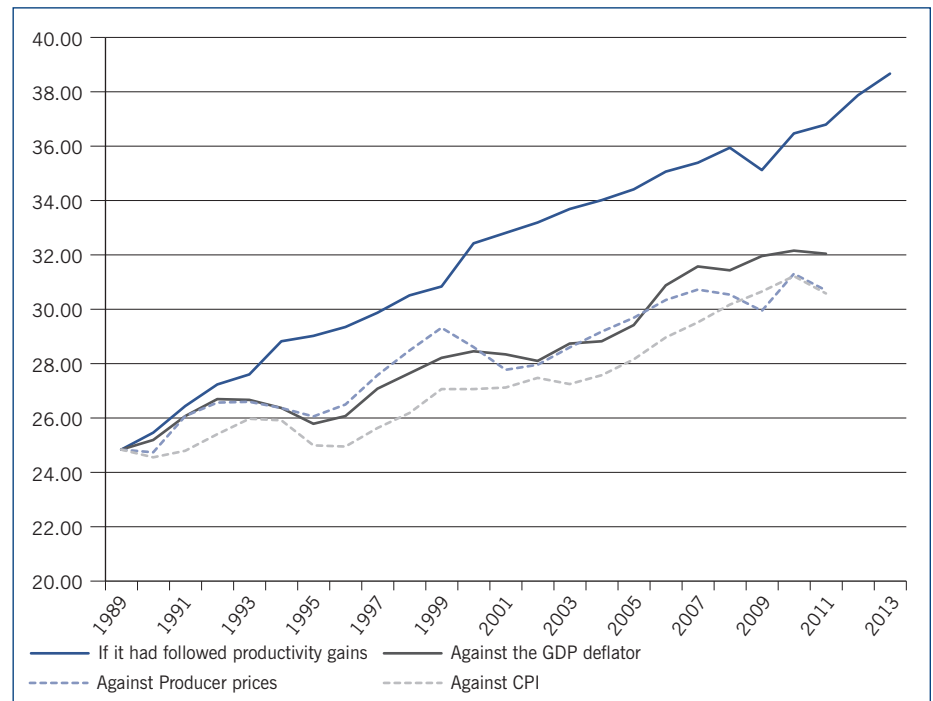The International Labour Organization (2013) and Stockhammer (2009) find that technology made only a small contribution to the fall in the labour share in developed countries.

Another possibility is that there was a move from wage work to self-employment. There has long been concern that employees have been forced into much less secure employment relationships as dependent contractors. As far as the

available data allows us to say, there is some effect of growth in self-employment income, but not enough to substantially change the picture of falling labour share. Figure 9 shows the comparison for a substantial part of the market sector of the economy.[6] Self-employment peaked around 2000 and then returned to levels similar to the 1980s, whether looking at number of workers or hours paid. As with industry restructuring, this hides big changes. Data provided by Statistics New Zealand shows that there was a fall in the proportion of paid hours worked by the self-employed in agriculture, forestry and fishing, the sector with most intensive self-employment, from 60–65% in the 1980s and 1990s to around 45% this decade. This was counterbalanced by a big increase in the large and rapidly growing professional, scientific and technical services sector, plus smaller contributions from elsewhere (for more details see Rosenberg, 2014). However, it is not clear how much of this increase is due to increases in traditionally self-employed occupations and how much has been forced by dependent contracting.

Finally, there is the possibility that the fall in labour share results from a significant fall in employees' bargaining power compared to their employers. There have been structural and institutional changes that make this credible, and it is consistent with Piketty's analysis of the international fall in the labour share, perhaps summed up in his statement that 'in every country the history of inequality is political – and chaotic' (Piketty, 2014, p.286). In other words, institutions and policies are all-important. The wage freeze of 1982–84, for example, coincides with a sharp but largely temporary fall in the labour share. The OECD in its major study on wage inequality, *Divided We Stand: why inequality keeps rising* (2011), found that the strongest single driver was institutions and policies, particularly labour market institutions and policies reducing inequality (including union coverage, product market regulation, employment protection legislation and tax wedges). Further, while trade integration as such showed no significant effect on inequality, imports from low- or medium-income developing countries

Figure 10: Real compensation of employees per hour compared to labour productivity March 2014 dollars (for CPI), measured sector
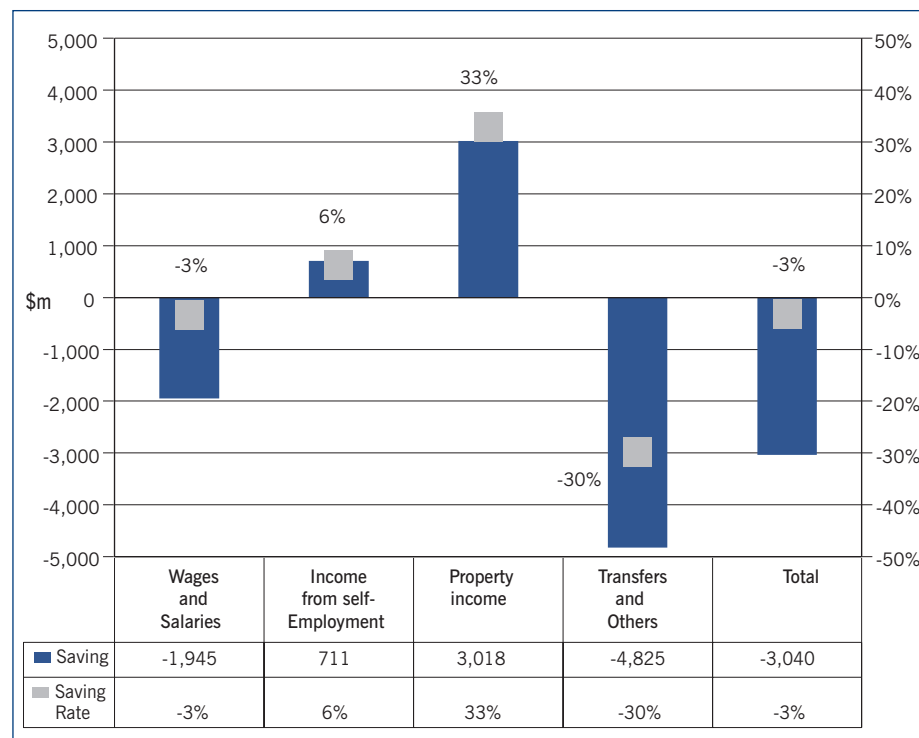

Source: SNZ, author's calculations

had a significant negative effect when the importing country had weak employment protection legislation (as with New Zealand), and particularly when the source country was low-income (such as China). Similarly, the International Labour Organization (2013) finds that government consumption and union density are major contributors to the fall in the labour share.

While this is not the place for a full narrative of the policy and institutional changes over this period, some examples are obvious and are consistent with the drivers described by the researchers above. The period was one of rapid opening of the economy which substantially reduced employee bargaining power through lower-cost imports, outsourcing and shifts of production overseas. Around the same time there was radical deregulation of the labour market (through the Employment Contracts Act 1991), which removed the award system and national collective bargaining. Together with changes in the late 1980s, this contributed to a steep decline in union density and collective bargaining. Union density fell from 69% in the early 1980s to its present level of around 20%, most of the fall being by the mid-1990s, one of the steepest falls in the OECD. The sharp and permanent

fall in welfare benefits in the 1991 Budget relative to the average wage reduced reservation wages. The minimum wage fell between 1990 and 1999 from 43% to 40% of the average wage. Over this period the labour share was on a falling trend. It bottomed out in 2002 and rose until 2009, but to a level below the 1980s. A new employment law in 2000 (the Employment Relations Act) mildly strengthened collective bargaining, and was amended in 2004 to strengthen it further; this was followed by a national campaign for wage rises by unions ('5% in 05'). However, collective bargaining coverage is now not only low, but has the lowest extension beyond union members of 21 OECD countries surveyed by the International Trade Union Confederation (2013, pp.28-9). There were strong rises in the minimum wage (from 40% to 49% of the average wage between 1999 and 2009, most of which was between 2003 and 2008). There was a local recession in 2008, followed by the global financial crisis and the drawn-out international recession, combined with further changes to employment law and welfare benefits.

The loss of bargaining power and employment protection provides a stronger explanation for the loss in labour share, is consistent with the

Figure 11: Gross saving and saving rate by main income source, 2006-07

	Wages and Salaries	Income from self-Employment	Property income	Transfers and Others	Total
■ Saving	-1,945	711	3,018	-4,825	-3,040
▢ Saving Rate	-3%	6%	33%	-30%	-3%

Research in progress, Statistics NZ

description by Hall and Scobie (2005), and is recognised as a significant factor in similar trends in other OECD countries by the research quoted above, and in other studies (e.g. Blanchard, Jaumotte and Loungani, 2013; Card, Lemieux and Riddell, 2003; DiNardo, Fortin and Lemieux, 1995; Fournier and Koske, 2012; International Monetary Fund and International Labour Organization, 2010; Kumhof and Rancière, 2010; OECD, 2012; Western and Rosenfeld, 2011) .

Wages and productivity

As mentioned, a falling labour share can indicate real wages falling behind productivity growth. That has indeed been the case. Wage increases have fallen well behind labour productivity increases in the sector of the economy over which productivity is measured by Statistics New Zealand.[7] Between 1989 and 2011 the consumer wage, measured by compensation of employees per hour paid[8] deflated by the consumer price index, rose 23%; the producer wage – compensation of employees per hour deflated by the GDP deflator – rose 29%, or 24% deflated by the producer price index for outputs; while labour productivity rose 48% (see Figure 10). Between the trough of the recent recession in 2009 and 2013, labour productivity rose 10.1%, the

consumer average wage rose 1.5% and the producer average wage (using the GDP deflator) rose 3.3%.

Implications

Increased wage inequality, or a fall in the wages share in the economy, has consequences. Low labour incomes weaken aggregate demand and the domestic sales of local firms (Onaran and Galanis, 2012; Stockhammer, 2011; Stockhammer, Onaran and Ederer, 2007; Storm and Naastepad, 2011). High inequality creates pressures on governments to compensate people for their loss. Working for Families is an example. Effectively a wage subsidy, it is falling in real terms as a result of frozen thresholds, but even at $2.5bn is small compared to the $19bn annual loss in labour share. Even then, it has set up dynamics that maintain the low-wage structure, and consequently in the long run increase the pressure to subsidise wages.

Low wages also have implications for savings. Figure 11 also comes from the work by Statistics New Zealand (Cope, 2013). It shows negative savings on average in households whose main source of income is from wages and salaries or from benefits. Only households whose main source of income is from property

(wealth) saved significantly. Household saving as a proportion of disposable income across all households shows a very similar pattern to the labour share since the late 1980s. Saving became negative in 1995, continued to fall until 2003, then recovered as the labour share increased.

To recap, the International Labour Organization research quoted above attributes falling labour share in developed economies to increased financialisation (46%), globalisation (19%) and technology (10%), and loss of employee bargaining power, de-unionisation and falling government spending (25%). Increases in unemployment also contribute. Other research finds the factors affecting wage inequality overlap with these.

We can conclude that when major changes are made to the economy, such as those in the 1980s and 1990s, unless countervailing measures are maintained or put in place, inequality will rise and the share of wages in the nation's income will fall, at the expense of the welfare of many wage and salary earners. Such changes include globalisation – especially intensified international financialisation – and more intensive use of technology, though this has less effect on the labour share of income. In other words, the lack of such coordination results in winners and losers rather than equitable sharing of any benefits. The winners will be owners of capital, and employees or self-employed in advantageous bargaining positions. Governments during the 1980s and particularly the 1990s signally and often deliberately weakened or removed the countervailing measures. Effective countervailing measures include employment protections, support for collective bargaining and unionisation, a strong public welfare system and progressive taxation.

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1   The share may in fact be somewhat lower because of income, mainly from self-employment and investment, which appears to be under-reported in the HES. The national accounts for the household sector show compensation of employees, which is a wider measure of cost to employers than wages, as 73.5% of primary income in 2012 (it was 75.7% in 1987 and fell to around 70% in the early 2000s) after deduction of the non-cash items of imputed income from home ownership and earnings attributed to insurance and pension policy holders, which is approximately equivalent to 'market income' (depending upon the definition of the latter). It was 59.5% of total income after deduction of non-cash and non-recurring items that could be identified as such. However, the trend, as in the HES, is for the share to be increasing, at least since 2000. The household sector accounts for 2012 showed entrepreneurial income as 12.9%

of this measure of total income, whereas the HES showed self-employed income as 4.4%, and the household sector accounts showed property income as 8.6% compared to 4.4% in the HES, and these discrepancies occur throughout the years where data is available.

2 Available at http://www.ird.govt.nz/aboutir/external-stats/revenue-refunds/wage-salary-dist-for-ind/.

3 Before taxes on production less subsidies.

4 The most common is to assume the self-employed pay themselves at the average wage rate for employees in the same industry, sometimes capped by mixed income (if the data is available, unlike in New Zealand). A second is to share mixed income between labour and capital income in the same proportion as between compensation of employees and remaining gross operating surplus. A third is to assume their capital receives the same return as the industry as a whole and allocate the remainder to labour, but this is often difficult to calculate. For a more thorough discussion see Inklaar and Timmer (2013, p.16 ff) or Piketty (2014, p.204), both of whom prefer the second method.

5 See UN data, http://data.un.org, Table 4.1, Total Economy (S.1); direct link: http://tinyurl.com/og3o3tf. OECD Labour Income Share can be found at http://stats.oecd.org/Index.aspx?DataSetCode=ULC_ANN; Penn World Tables (PWT) are at http://www.rug.nl/research/ggdc/data/penn-world-table. The AMECO database is at http://ec.europa.eu/economy_finance/db_indicators/ameco/. The problems with

the various data sets are briefly as follows. The UN data has partial coverage by years, and no calculation for adjusted labour share. The OECD data, which is adjusted for labour share, has been discontinued, and uses inappropriate data for New Zealand, underestimating the New Zealand adjusted labour share. Replacing that with a consistent estimate makes the data set very similar to AMECO, but it is not as well documented and does not have the breadth of different series. PWT appears to have gaps in its series for New Zealand which are interpolated, and it uses five different methods for estimating adjusted labour share (Inklaar and Timmer, 2013). While this improves validity for individual countries, it reduces comparability between countries. Like the OECD, AMECO has incorrect data for New Zealand for self-employment, which has been replaced for the comparison here, and the national accounts series have been updated to the latest available at time of writing OECD, AMECO and PWT all adjust the labour share for New Zealand, and for all countries in the case of OECD and AMECO, by multiplying the labour share by total employment divided by wage and salary (employee) employment. While considerably less than ideal, this has the merit of using widely-available data and being consistent between countries. It implicitly assumes the self-employed receive the same annual labour income as employees. Whole-economy New Zealand data for self-employment is available only from 1986, from the Household Labour Force Survey. Consistent

with the data set, years ended March are attributed to the previous year in AMECO.

6 The adjusted labour share is from a Statistics New Zealand estimate for 11 sectors of the economy in its productivity series (Infoshare series PRD018AA). Although Statistics New Zealand does not use the preferred method described in note 4, it adjusts using hours worked capped by mixed income, which is better than using persons employed.

7 Measured sector productivity is available only from 1996, but is extrapolated back from 1996 to 1989 using the published productivity series for a subset of industries, the former measured sector, which constituted over 80% of it during this period. The year 1989 is chosen as approximately when the divergence of wages and productivity appears to have begun and also is the first year of the Quarterly Employment Survey average wage series. The GDP deflator was calculated at basic prices (i.e. excluding producer taxes less subsidies) for the measured sector to 2011 and extrapolated to 2012 using the GDP expenditure deflator, which it closely matches.

8 The wage measure is calculated by dividing compensation of employees for the measured sector by the number of paid hours worked by employees in the sector (provided by Statistics New Zealand). The GDP deflator is calculated for the measured sector at basic prices (i.e. excluding producer taxes less subsidies).

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