THE DECLINING WORK WEEK

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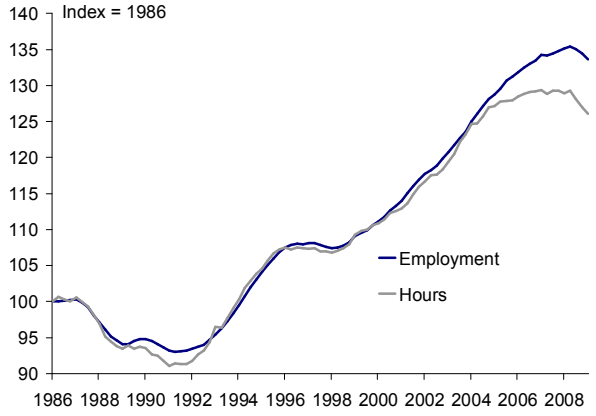
Abstract

Over the past five years average hours per worker, as recorded in the Household Labour Force Survey, have trended downwards. According to the frequently used measure of average hours per worker, total hours divided by total employment, people are now working 5% fewer hours than they were in 2004. This has contributed to weak growth in labour input over recent years. This paper uses data from the Household Labour Force Survey to examine what is behind the recent fall in hours worked per worker. It attempts to answer whether the fall has been due to compositional changes, such as population ageing and increased participation of women, or whether people are just working fewer hours than they used to. This paper estimates that up to 40% of the fall in average hours over the past five years is due to increased annual leave entitlements, while compositional changes are estimated to account for around 11%. The remainder of the fall in average hours appears to be due to a decline in hours worked within jobs. Fewer people working long hours and firms hoarding labour over the recent downturn are identified as two of the key explanations for this.

Introduction

The Household Labour Force Survey (HLFS) shows that the total number of people in employment usually follows changes in hours worked relatively closely. From 1986 to 2004 changes in employment were reflected by a corresponding change in hours worked. However, since 2004 this relationship has severely weakened (see Figure 1). Between 2004 and 2009, employment rose by 6.9% while hours worked rose by only 1.1%. This is the first time such a divergence between employment and hours has been seen in the HLFS, which began in 1986.

Figure 1: Employment and actual hours worked, 1986-2009



Source: HLFS, Statistics NZ.

As a result of employment growth outstripping growth in hours worked, the number of hours worked per worker has fallen dramatically. On average, those in employment are working 90 fewer hours per year than they were in 2004. This represents more than two weeks of full-time work and has important implications for assessing the performance of the labour market.

A characteristic of the most recent economic expansion was that of strong employment growth and large rises in labour force participation. At the end of the most recent period of growth, New Zealand had achieved the lowest unemployment rate and the highest labour force participation rate since the HLFS began. However, while much focus is given to employment when analysing labour market performance, far less is understood about the level and trends in hours worked.

Measurement of hours worked better reflects labour input than does a simple head count or job count as it accounts for changing work patterns over time. In this respect, when average hours are falling, trends in employment can mask the total amount of labour being used in the economy. Indeed, the rise in employment over the past five years appears to have overstated the strength of the labour market. While total employment increased by 140,000 between 2004 and 2009, the number of full-time equivalents increased by only 20,000. Similar trends have been seen in other countries such as Australia (Australian Bureau of Statistics 2010) and the United Kingdom (Stam and Coleman 2010) which have both experienced a fall in average hours over the past decade.

This paper aims to establish why there has been such a large fall in average hours over the past five years. In particular, it will focus on what groups have driven the fall in average hours and what impact changes in the labour market, such as increased leave entitlements and labour hoarding, have had on hours worked. Given

other studies show that there have been large compositional changes over this period (Hyslop and Maré 2008), this paper will also attempt to estimate how much of the fall in average hours per person has been due to changes in the structure of the workforce. A better understanding of the trends in average hours is important for understanding how the labour market is performing as well as for forecasting future labour supply and analysing trends in labour productivity.

Data description

This paper uses unit record data from the HLFS. The HLFS sample frame uses an eight-quarter panel, and samples approximately 15,000 households and 30,000 individuals aged 15 years and over each quarter. Data is available from 1986.

The measurement of hours

The HLFS provides information on both the number of hours people *usually* work and what they *actually* work. Actual hours worked therefore excludes hours paid for, but not worked, such as annual leave, public holidays, sick leave and other special leave. Alternatively, actual hours worked can include hours worked over and above what someone usually works (ie overtime).

For this reason, the actual hours measure is preferred over hours paid or usual hours worked. Actual hours worked better captures economic developments and more accurately reflects total labour input over a period. In addition, the OECD recommends using actual hours for productivity calculations (OECD 2001). Using actual hours will also better capture how workers have behaved during the recent downturn and should potentially capture any changes in leave entitlements[1].

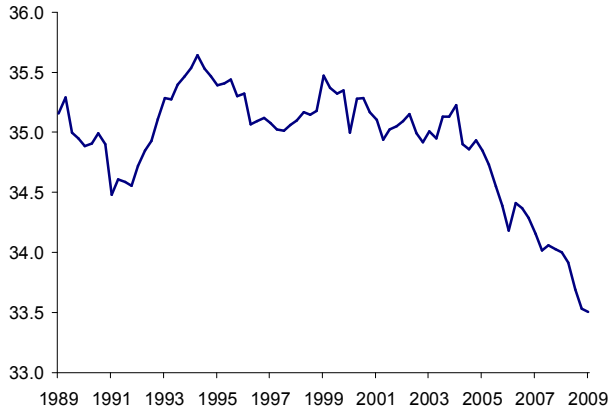
As noted above, the data on average hours worked used in this paper has been calculated from unit record data. Statistics New Zealand does not explicitly publish an average hours per worker measure in its quarterly release of HLFS data. Data is only provided on total hours worked by all people in employment. Labour market analysts and economists therefore usually calculate average hours per worker themselves[2]. This is calculated by dividing total actual hours by total employment. Over recent years however, there has been a rise in the number of people not stating their actual hours. In 2009, around 12,000 people in employment were not stating their actual hours, up from almost zero in 2004.

As a result of the rise in the number of respondents not reporting their hours, the crude measure of calculating average hours per worker has been marginally overstating the fall in average hours. The crude measure shows average hours fell by 5.4% between 2004 and 2009. In this paper, only those who have stated their hours are included in the analysis, which lowers the fall in average hours to 4.9%[3].

The fall in average hours

Using annual average data (to reduce data volatility and seasonal variation) people in employment were working only 33.5 hours per week at the end of 2009, down from 35.2 in 2004 (see Figure 2). This translates into a 4.9% decline in hours worked per week. On an annual basis, this represents a decline of 90 hours per worker.

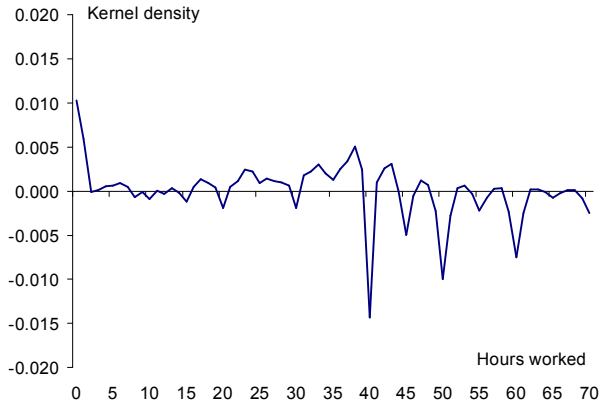
Figure 2: Average hours worked per worker per week, 1989-2009



Source: HLFS, Statistics NZ.

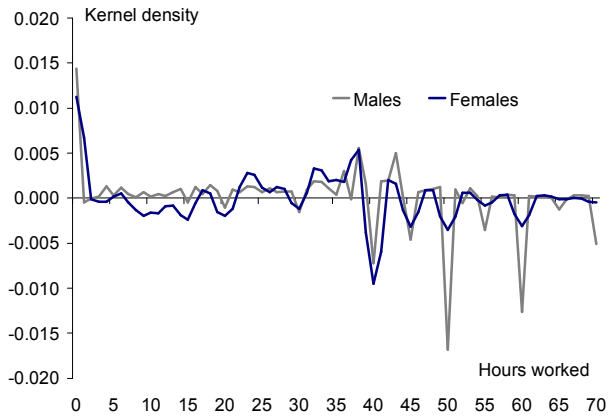
To get a better understanding of why average hours have fallen, it is necessary to look at where the changes have occurred in the hours distribution. Figure 3 uses kernel density estimation methods to examine how the hours worked distribution has changed between 2004 and 2009. Figure 4 does this separately for both males and females.

Figure 3: Change in the distribution of hours worked for all persons between 2004 and 2009



Source: HLFS, Statistics NZ.

Figure 4: Changes in the distribution of hours worked for males and females between 2004 and 2009



Source: HLFS, Statistics NZ.

The first notable change is that there has been a large increase in the number of people working zero hours in the reference week. Indeed, when people who work zero hours are excluded, the decline in average hours worked over the five years to 2009 is only 2.8% instead of 4.9%. There are a number of possible reasons for the rise in the number of people stating zero hours. The first is that there has been an increase in annual leave entitlements. As required by the Holidays Act 2003, annual leave entitlements were increased from three to four weeks, as at April 1 2007. This is likely to have seen total average hours fall by up to 2% (although this is most likely an overestimate as many people were already receiving four week's annual leave when the legislation was enacted). However, the increase in leave entitlements does not fully explain the rise in people working zero hours as a number of people would have spread the extra leave across a number of weeks. Other reasons for the rise in people working zero hours include the possibility that sick leave has increased over recent years or that there has been changes in paid parental leave patterns. An increase in the number of casual workers over this period may also have led to a rise in the number of people who are in employment but stated they worked zero hours in the reference week.

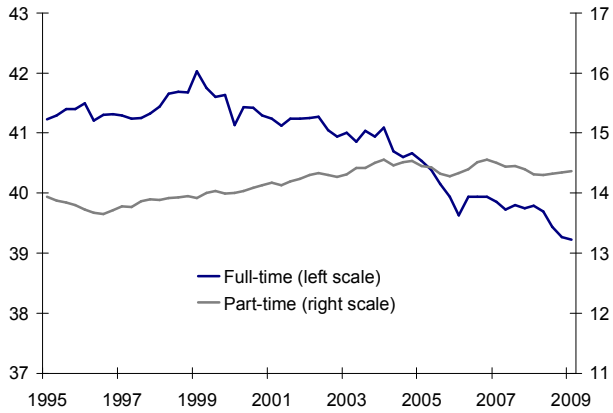
The second notable change is that there has been a decrease in the share of people, particularly males, working long hours. It has previously been shown that a high proportion of New Zealanders work long hours compared to other countries (Callister 2003, 2004). However, the share of people in employment working 50 hours or more fell from 18% in 2004 to 14% in 2009. While some of this fall may be due to people working shorter hours during the recent downturn, the percentage of people working long hours has generally trended downwards since 2000. This is likely to be partly due to changes in the composition of the workforce, which is investigated later in the paper.

It is possible, however, that part of the decline is because people are increasingly engaged in work activities away from the office. While these hours should technically still be counted by the HLFS, technological developments have blurred the boundaries between work and non-work time and some people may not be stating these hours. For example, with the rise in the number of people with access to the internet, many people are more easily able to work from home, particularly business owners. In 2009, 75% of households had access to the internet at home, up from 65% in 2006 (Statistics New Zealand 2009). Furthermore, one-quarter of people in employment in 2009 used the internet to work from home, up from 20% in 2006. The decline in the number of people working in manual jobs and the rise in the number of people working in managerial and professional jobs may also have seen people more likely to work from home[4].

The change in the female distribution is slightly different from that of males. For females, there appears to have been a fall in the share working low hours (ie 1-15 hours) and a rise in the share working 'high' part-time hours (ie around 25 hours) and 'low' full-time hours (ie 31-39 hours)[5]. The rise in those working 31-39 hours also seems to be present for males, although to a lesser degree than for females. Finally, there has also been a fall in the share of people working exactly 40 hours over the past five years.

This goes some way to explain the differing trends in average hours for those in full-time and part-time employment. Figure 5 below shows that average part-time hours have been relatively stable since 2004 while average hours for full-time workers have fallen quite strongly over the past five years. In 2004, the average full-time worker was working 41.1 hours per week. By 2009, this had fallen to 39.2 hours per week – a decline of 4.5%.

Figure 5: Average hours per worker by full-time/part-time



Source: HLFS, Statistics NZ.

Another factor worth considering is that during the recent downturn many employers reduced the hours of their staff, with many full-time workers likely to have had their hours reduced from above the 30 hour part-time/full-time cut-off point to just below the cut off point which, would have seen part-time hours increase.

In general, labour hoarding is likely to have contributed to the fall in average hours, although it is difficult to estimate the effect accurately. However, given that average hours began falling in 2004 and New Zealand

did not enter recession until early 2008, it can only explain some of the very recent fall.

During the downturn over 2008 and 2009, many employers reduced the hours of their staff rather than laying them off. Between the December 2007 and September 2009 quarters, total hours worked fell by 3.7% compared to a fall in employment of only 1.5%. While labour hoarding is common during downturns, previous work suggests that it happened to a greater extent during the recent recession compared to previous ones (Department of Labour 2010a). It was hypothesised that this was due to increased specialisation in the workforce (making it more costly to let workers go) and that the current downturn followed a period of significant skill and labour shortages which made employers more willing to hold on to staff, especially highly productive workers. Indeed, the greater extent of labour hoarding during this downturn compared to previous recessions was recently cited by the OECD (OECD 2010). It noted that, as was the case in a number of other countries, the contribution of hours reductions to labour input adjustment during the downturn in New Zealand has been higher than seen in previous recessions.

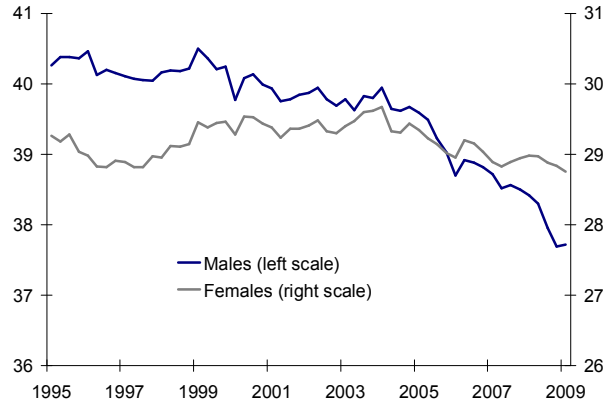
Cross sectional analysis

This section examines which groups have experienced the largest fall in average hours. This will help explain what has driven the fall in aggregate average hours.

Age and sex

On average, males work about 10 hours more per week than females. This is due both to the nature of the industries that males work in and because they are less likely to work part-time. This gap remained at around 10 hours from the beginning of the HLFS in 1986 up until the middle of the 2000s. Since then, male hours have fallen strongly while average hours for females have remained relatively steady (see Figure 6).

Figure 6: Average hours per worker by sex



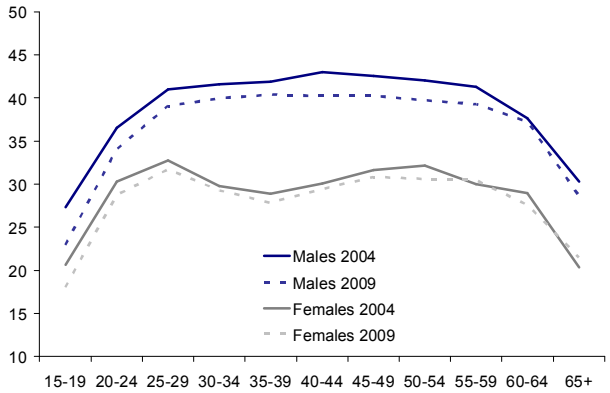
Source: HLFS, Statistics NZ.

In 2004, males were working on average 39.9 hours per week. By 2009, this had fallen by nearly 6% to 37.7 hours per week. In contrast, average hours for females had fallen by less than an hour, from 29.7 in 2004 to 28.8 in 2009. So while overall male employment was 5% higher in 2009 compared to 2004, total hours worked by males had actually fallen by 2%.

Of note is also the trend for hours during the downturn. The number of hours worked by females has remained relatively flat since the recession hit in early 2008, while average hours for males has continued to decline – from 38.7 hours in 2007 to 37.7 in 2009. This suggests that the labour hoarding that occurred during the recession mainly had an effect on males. This is likely to be due to the industries that were most affected during the downturn. The largest falls in economic activity during the recession were in the male-dominated industries of manufacturing, construction and wholesale trade.

Figure 7 presents average hours broken down by both sex and age. Between 2004 and 2009 average hours have fallen for every age group except females aged 55-59 and 65+. The largest fall in average hours worked, for both males and females, has been for young people. Average hours worked for people aged 15-19 years have fallen from 24.1 in 2004 to 20.6 in 2009, a 14.4% drop. The fall appears to have occurred over the past three years, with the recession a major driver of the fall. Youth have been particularly affected during the downturn, largely because of their low levels of experience and skills, but also because they are heavily employed in industries that have been particularly affected in the recession such as hospitality, retail and construction (Department of Labour 2010b). However, it also appears that more youth are working part-time, possibly due to increased participation in study, which is likely to have contributed to the fall in average hours.

Figure 7: Average hours per worker by sex and age



Source: HLFS, Statistics NZ.

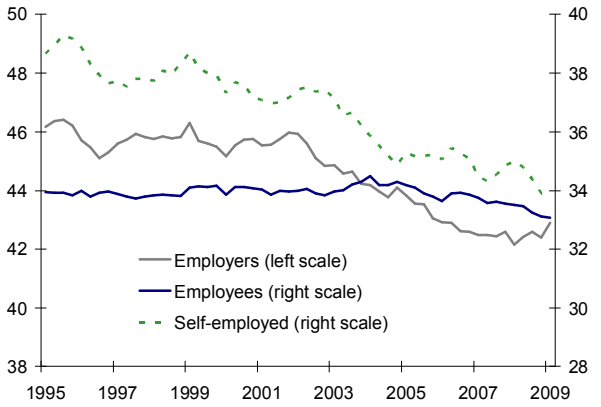
Employment status

After adjusting for the fact that employers work much longer hours than the self-employed and employees, *Figure 8* shows average hours for the self-employed and employers have been trending downwards for some time, while average hours for employees have been relatively stable.

Looking at the five years to 2009, average hours for all employment statuses have fallen. Average hours for employees decreased from 34.5 per week in 2004 to 33.1 in 2009, a 4.1% fall. The self-employed experienced a larger decline in average hours, falling by 5.5% from 35.9 in 2004 to 33.9 in 2009. Employers have experienced a fall of only 2.9%, although in absolute terms, the fall in average hours is similar to that for employees.

Interestingly, average hours for employers fell strongly between 2004 and 2007, but then increased by 1.0% during the two years to 2009 when the New Zealand economy was in recession. While the rise is likely to be due to compositional changes, it is possible that in response to declining profitability, business owners cut costs by laying off staff and working harder themselves.

Figure 8: Average hours per worker by employment status



Source: HLFS, Statistics NZ.

Ethnicity

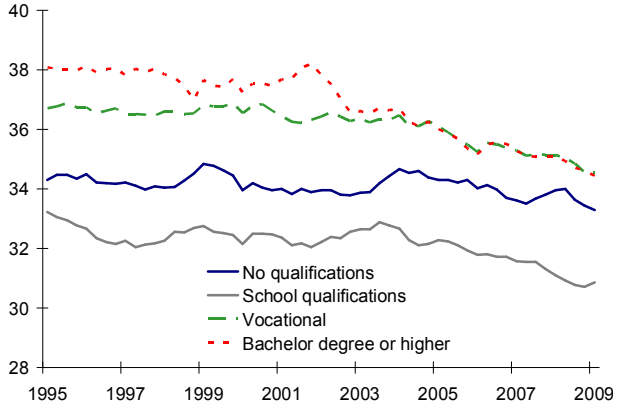
The average number of hours worked does not differ significantly by ethnicity[7]. Furthermore, the small differences in hours worked between ethnic groups are likely to reflect other factors such as age, industry and employment status. Over the five years to 2009, Māori and Europeans experienced the largest fall in average hours, down by 6.3% and 5.0% respectively. Average hours for Pacific people on the other hand held up well and declined by only 1.3% between 2004 and 2009.

Qualifications

Figure 9 shows that those with post-school qualifications, either vocational or Bachelor's degrees or higher, tend to work more hours than those with no post-school qualifications. However, over the past fifteen years, it appears the gap between the two groups has decreased, with average hours for those with Bachelor's degrees or higher falling by more than those without.

Over the 2004 to 2009 period there seems to be no significant differences in the trends of average hours worked across qualification, although average hours have continued to fall faster for those with Bachelor's degrees or higher. Nevertheless, all four qualification groups have experienced a fall in average hours between 2004 and 2009 ranging from a 4.0% fall for those with no qualifications to a 6.2% fall for those with a Bachelor's degree or higher.

Figure 9: Average hours per worker by highest qualification

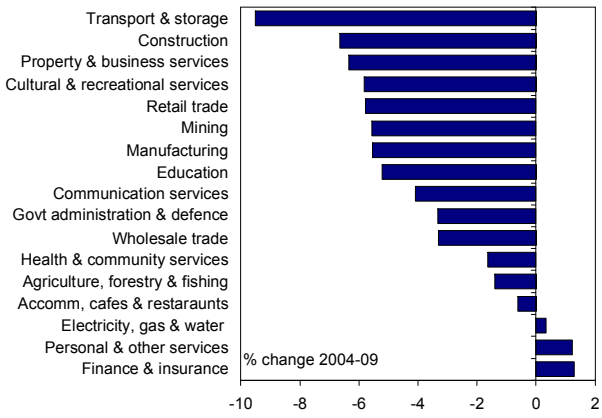


Source: HLFS, Statistics NZ.

Industry

Figure 10 shows there have been large differences in how average hours have changed by industry over the five years to 2009. Fourteen out of the seventeen industries recorded a fall in average hours, with electricity, gas & water supply; personal & other services; and finance & insurance the only exceptions. Transport & storage recorded the largest fall in average hours, down 9.5% from 41.5 hours in 2004 to 37.5 in 2009. Construction (down 6.6%) and property & business services (down 6.3%) also recorded large falls. It is worth noting that the two industries that experienced the largest falls in average hours are heavily male-dominated. This partly explains why average hours have fallen more strongly for males than females. In contrast, female-dominated industries such as health & community services and hospitality seemed to be less affected.

Figure 10: Change in average hours per worker by industry between 2004 and 2009 (ANZSIC 1996)

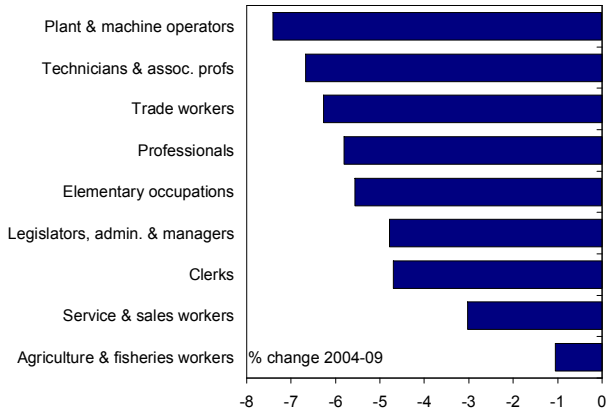


Source: HLFS, Statistics NZ.

Occupation

Figure 11 shows that over the 2004 to 2009 period, plant & machine operators experienced the largest decline in average hours worked, falling by 7.4%. Plant & machine operators are mainly focussed in manufacturing, construction and transport & storage – three industries which have experienced above average falls in hours worked per person. Plant & machine operators were also hit hard by the recession. Technicians & associate professionals experienced a 6.7% decline while trades workers reported a 6.3% fall, much of this over the past two years as the construction industry weakened. Agriculture & fisheries workers experienced the smallest decline in average hours worked, down only 1.0% over the five year period. This mirrored the small fall in hours worked for the agriculture, forestry & fishing industry. The differences between the occupational groups do not appear to be linked to skill level, with both highly skilled and lower skilled occupations experiencing large falls in average hours. Most of the differences appear to reflect the industry in which people worked.

Figure 11: Change in average hours per worker by occupation between 2004 and 2009 (NZSCO 1999)



Source: HLFS, Statistics NZ.

Compositional changes

The previous section examined trends in the hours worked for a number of different groups. This section looks at the effect of several changes in the composition of the workforce on total average hours worked per person. For example, even if hours remained the same within an age group or industry, a rise in the employment share of this group may have an effect on total average hours worked. Doing this analysis will determine how much of the fall in average hours has been due to compositional changes and how much has been due to a fall in hours within jobs. Other studies have found there were substantial compositional changes over the most recent expansion. Hyslop and Maré (2008) used LEED data to show compositional changes in employment had a substantial downwards effect on measured average earnings over the 1999 to 2007 period. Much of the difference was found to be associated with new workers entering employment as labour force participation rose strongly.

To examine the effect of compositional change on average hours, this paper uses the decomposition method popularised by Blinder (1973) and Oaxaca (1975). This technique is widely used to study mean outcome differences between groups. For example, the technique is often used to analyse wage gaps by gender or race (Dixon 2000). However, this technique can also be used to decompose changes which are attributable to differences in observable characteristics across two time periods (Myles et al 2008).

The first step is to estimate separate regression models for each time period. Given the significant differences in hours worked by gender, separate hours regressions are estimated for all persons, males, and females. The hours regressions take the form of

$$\overline{H}_i = \alpha + \beta\ X_i + \varepsilon_i$$

where H_i is an individual's average hours worked per week and X_i is a vector of explanatory variables. The explanatory variables are age, ethnicity, employment status, education, industry, occupation, and in the regression for all persons, gender. Appendix 1 displays the results of the regression equations on which the Blinder-Oaxaca decompositions are based.

Drawing on the ideas of Blinder and Oaxaca, the change in average hours between 2004 and 2009 can be written as

$$\overline{H}_1 - \overline{H}_0 = (\alpha_1 - \alpha_0) + \beta_0 \left(\overline{X}_1 - \overline{X}_0\right) + \overline{X}_1(\beta_1 - \beta_0)$$

where the subscript 1 denotes the 2009 year, 0 denotes the 2004 year, $\overline{H}$ denotes the average hours for the sample, $\overline{X}$ the average vector of the explanatory variables in the sample, and β the corresponding coefficient estimates obtained from the two separate regressions.

The second term on the right-hand side captures the effects of changes in the means of the explanatory variables, weighted by the starting period (2004) coefficients – this is the 'explained' component. The third term captures the effects which are attributable to changes in the coefficients – this is the 'unexplained' component and captures the effects of all unmeasured variables that are not part of the model including, but not limited to, behavioural changes. This paper focuses on the second term, as this is the part that allows us to explain how much of the fall has been due to changes in the measured characteristics.

The proportion of the total change in average hours that can be explained by the change in the means of the explanatory variables is then calculated as

$$\frac{\sum \beta_o \left(\overline{X}_1 - \overline{X}_0\right)}{\left(\overline{H}_1 - \overline{H}_0\right)}$$

Results of the Blinder-Oaxaca decompositions

The results of the decompositions are presented in Table 1. It shows the effect of changes in each of the measured characteristics on total average hours worked between 2004 and 2009.

Table 1: Contribution of changes in the measured characteristics of the workforce to the fall in average hours worked between 2004 and 2009

	All persons	Males	Females
Gender	-5%	-	-
Age	-7%	-8%	-3%
Employment status	-4%	-6%	1%
Ethnicity	-2%	-4%	6%
Education	4%	1%	21%
Industry	-7%	-6%	-11%
Occupation	9%	1%	42%
Total	**-11%**	**-22%**	**56%**

Source: HLFS and own estimates.

Average hours per worker fell by 1.7 hours between 2004 and 2009 – from 35.2 hours per week to 33.5. Of the 1.7 hour difference, only 11% can be attributed to changes in observable characteristics. In other words, if the composition of the workforce had remained the same as it had been in 2004, the fall in average hours over the five years to 2009 would have been 4.4% rather than 4.9%.

Table 1 shows that there were four main compositional changes over the five years to 2009 that contributed to the fall in average hours. The first was changes in the age structure of the workforce. Since 2004, there has been strong growth in the number of older workers in employment, who generally work below average hours. Changes in the industries in which people work in have also caused total average hours to fall. Compared to 2004, fewer people work in 'long hours' industries such as agriculture, forestry & fishing, manufacturing and wholesale trade. Both of these changes are estimated to have each accounted for 7% of the total fall in average hours over the past five years.

An increasing share of females participating in the workforce has also caused total average hours to fall. Since 2004, female employment has risen by 9.4% compared to a 4.8% rise for males. Females are much more likely to be employed part-time and work fewer hours than males. The increasing share of female workers is estimated to have accounted for 5% of the total fall in average hours.

The final notable change was a fall in the number of people who were classified as employers or self-employed. The number of employers (who work around 25% more hours than average) fell by one-quarter over the five years to 2009 while the number of self-employed, who generally work slightly above average hours, fell by 4%. These changes are estimated to have accounted for 4% of the total fall in average hours over the reference period.

Offsetting these changes was strong growth in employment in highly skilled occupational groups such as legislators, administrators & managers and for people with Bachelor's degrees or higher. Both these groups tend to work longer hours than average.

To test whether these changes were just the result of the recession, the decomposition was also run on the 2004 to 2007 period. Similar results were found, with 8% of the fall in average hours over this period estimated to be due to compositional changes.

Results by gender

The decomposition analysis was also performed separately on males and females, with notable differences found. Of the 2.2 hour fall in average hours for men, 0.5 hours or 22% could be explained by compositional changes. In contrast, changes in the composition of the female workforce have been associated with longer hours. In other words, if we control for compositional changes, the predicted fall in average hours for females would have been 4.9% instead of 3.1%. There appears to be two main causes of these changes, both likely to have been the result of continued strong increases in participation for females over the past five years.

Between 2004 and 2009, there has been a strong rise in the number of females in employment who have Bachelor's degrees or higher and a fall in the number of females with no qualifications. In fact, the entire net rise in employment for females over the past five years has been driven by those with Bachelor's degrees or higher. In general, higher qualifications are associated with longer working hours.

There has also been strong growth in the number of females employed in highly skilled occupational groups, such as in the legislators, administrators & managers occupational group. In general, this group works substantially more hours than average. This has coincided with a declining share of females employed in clerical occupations, service & sales jobs, and elementary occupations. In general, these three groups work below average hours.

Discussion

The purpose of this paper was to gain a greater understanding of why average hours worked per person

has fallen since 2004. Using data from the HLFS, this paper has established a number of factors that have contributed to the fall in average hours.

The increase in annual leave entitlements from three to four weeks in 2007 can explain some of the fall. A rough estimate is that it has accounted for up to 40% of the decline in average hours worked. Changes in the composition of the labour force have also driven some of the fall in hours worked. Using the Blinder-Oaxaca decomposition technique, this paper estimates about 11% of the fall in average hours between 2004 and 2009 can be attributed to changes in the composition of the workforce.

However, even when adjusting for the composition of the labour force and the increase in annual leave, average hours have fallen over the past five years. These two factors can explain only around half of the fall in average hours. This suggests that there has also been a fall in hours within jobs. Some of this may be due to increased work/life balance, with more people valuing their leisure time. Indeed, the fall in the number of people working very long hours is somewhat consistent with this. There is also a possibility that technology improvements and increased access to the internet has resulted in a blurring of the boundary between work and non-work. More people may be working from home but not stating these hours in the HLFS. The large rise in the number of people working zero hours has also been a feature and it is possible that factors such as increased sick leave have contributed to the fall.

The recession that hit in early 2008 has also likely had an effect on average hours. The rise in the number of people working part-time but wanting to work more hours is evidence of this. As is common during a downturn, a number of firms adjusted the hours of their staff by more than actual staffing numbers. Firms entered into the downturn following a period of significant skill and labour shortages during which recruiting staff was difficult. This experience looks to have made employers more willing to hold on to staff for when the economy recovered.

So given there are a number of reasons why average hours per worker has trended down over the past five years, what does this mean for average hours in the future?

Part of the fall in average hours appears to have been due to cyclical factors such as labour hoarding, and therefore we should see some rebound in hours worked. As the recovery gathers momentum, businesses will be able to increase production by getting more hours out of existing workers rather than needing to hire new staff. Indeed, hours have increased faster than employment since employment reached a low point in late 2009. Over the year to September 2010, total hours worked has risen by 3.0% while employment has increased by 1.8%.

Some of the compositional changes have also been cyclical. Certainly the large falls in employment in manufacturing and construction, two industries which work above average hours, will reverse to some extent. Even if they do not return to their pre-recession levels, employment is still expected to rebound in these industries. However, while this will see hours worked per worker recover to some extent, average hours are not expected to return to their 2004 levels. The increase in annual leave has seen a permanent shift downwards in average hours per worker, while increased work/life balance and more people working from home are other longer term trends.

There are a number of permanent compositional changes that appear to be occurring too. The increase in the number of females participating into the labour force is expected to continue, as is the increase in part-time work. As the population ages, there is also expected to be continued strong growth by older workers, who in general work fewer hours than average. These changes will continue to put downward pressure on average hours worked.

With labour force participation rates already high and unemployment relatively low, this has significant implications for future labour supply. It also highlights the fact that while we might see further increases in employment and participation from females and older workers, this can overstate total labour supply if average hours are also falling.

Future research

This paper has mainly focussed on what has driven changes in average hours. Further work is needed to understand what has driven changes across the entire hours distribution. For example, it would be useful to establish what compositional changes have contributed to the fall in the number of people working long hours. A variety of methods have been developed, such as the decomposition method introduced by DiNardo et al (1996), which would allow us to decompose changes in the full distribution of hours. This would provide a much more transparent analysis of changes in hours than the method of decomposing average hours used in this paper.

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Notes

1. Another reason for the decision to use actual hours is that there has been a large rise in non response for usual hours over the past five years. In 2009, no information on usual hours worked was available for approximately 50,000 people in employment.
2. For example, see the Reserve Bank of New Zealand's March 2009 Quarter Monetary Policy Statement or ANZ's March 2010 Household Labour Force Survey review.
3. In an attempt to reduce the number of people not specifying hours, this paper uses usual hours worked if a respondent has not stated their actual hours worked. It is also worth noting that Statistics New Zealand adjusts total hours by doing a calendar re-alignment adjustment. This accounts for the different number of normal and official holiday days. The analysis in this paper makes use of unit record data where the calendar re-alignment adjustment can not be performed and is another reason why the data differs slightly.
4. Between 2004 and 2009 there was a 20% increase in people employed in managerial and professional jobs, while the number of people employed as labourers or machinery operators & drivers decreased by 11%.
5. Part-time workers are those who work fewer than 30 hours per week.
6. In the September 2008 quarter, the HLFS started publishing ethnicity data using the single/ combination output method, which created a break in the ethnicity series. To construct a suitable time series, all ethnic data used in this report has been classified using the old prioritised classification process. Prioritisation is a classification which assigns the ethnicity of a person who has given multiple responses to just one ethnicity. The prioritisation is in the following order: Māori; Pacific peoples; Other ethnic groups; and European.

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Appendix 1

HLFS hours regressions for 2004

	Parameter estimates					
	All persons		Males		Females	
	Coefficients	SE	Coefficients	SE	Coefficients	SE
Female	-7.665*	0.142	-	-	-	-
Age	1.084*	0.026	1.427*	0.036	0.664*	0.039
Age-squared	-0.013*	0.000	-0.017*	0.000	-0.008*	0.000
Employer	4.311*	0.257	5.581*	0.315	1.614*	0.452
Self-employed	-2.029*	0.209	-0.816*	0.264	-4.617*	0.341
Māori	1.177*	0.200	-0.385	0.276	3.084*	0.285
Pacific	1.364*	0.307	-1.164*	0.424	4.436*	0.439
Other ethnic groups	-0.811*	0.237	-2.147*	0.327	1.176*	0.340
No qualification	-1.033*	0.182	-1.209*	0.246	-0.569*	0.268
School qualification	-1.676*	0.164	-1.551*	0.232	-1.513*	0.228
Bachelor's degree or higher	0.450*	0.201	-0.370	0.288	1.94*	0.278
Primary industries	3.278*	0.437	6.030*	0.549	-3.062*	0.759
Manufacturing	1.030*	0.264	0.650	0.348	2.663*	0.421
Construction (incl. utilities)	0.849*	0.310	1.104*	0.374	-2.617*	0.677
Wholesale trade	1.269*	0.330	1.302*	0.428	1.275*	0.525
Accommodation, cafes and restaurants	-1.320*	0.334	-2.209*	0.551	-0.872*	0.412
Transport & storage	3.854*	0.367	3.935*	0.461	2.922*	0.645
Communication services	0.971	0.509	1.040	0.700	0.876	0.732
Finance & insurance services	-0.667	0.417	-2.796*	0.640	0.663	0.540
Property & business services	-0.611*	0.283	-0.718	0.401	-0.413	0.396
Government administration & defence	0.657	0.385	-1.633*	0.572	2.073*	0.512
Education	-5.168*	0.320	-6.385*	0.537	-5.266*	0.402
Health & community services	-3.018*	0.287	-3.750*	0.569	-2.981*	0.346
Cultural & recreational services	-2.931*	0.441	-2.250*	0.652	-3.781*	0.586
Personal & other services	-2.661*	0.347	-2.372*	0.527	-2.446*	0.452
Legislators, administrators & managers	7.610*	0.263	6.095*	0.390	10.003*	0.371
Professionals	4.734*	0.280	3.242*	0.441	6.286*	0.361
Technicians & associate professionals	2.734*	0.270	2.295*	0.426	3.4*	0.347
Clerks	1.803*	0.262	0.285	0.501	2.703*	0.311
Agriculture & fishery workers	4.890*	0.437	3.999*	0.565	6.175*	0.759
Trades workers	3.927*	0.309	2.843*	0.403	4.533*	0.893
Plant & machine operators	5.242*	0.306	4.914*	0.417	3.42*	0.549
Elementary occupations	-1.330*	0.300	-0.179	0.432	-3.502*	0.441
Adj R-squared	0.166		0.120		0.090	
F	424.2		157.0		101.9	
N	70175		37070		33105	

*denotes significant at the 5 percent error level

Ethnicity is entered into the hours regressions via three dummy variables that identify individuals who are Māori, Pacific peoples, or any other non-European ethnicity. Two dummy variables are added for employers and the self-employed. The education variable is a dummy variable indicating the individual's highest qualification, classified into the following groups: no qualifications; school qualifications; vocational qualifications; and Bachelor's degrees or higher. 'Vocational qualifications' is the omitted category. Industry dummies are added to the regressions at the 1-digit level although mining has been added to agriculture, forestry & fishing to create a 'primary' industry, while electricity, gas, & water supply has been added to construction. Occupational dummies were also added at the 1-digit level. Both age and an age-squared term were added to regression to adjust for the non-linear relationship between age and average hours.