RECOMMENDED READING

Supply Stocktake (7/10)

Note title: **Stocktake On Average Hours**

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RECOMMENDED READING

From

STOCKTAKE ON AVERAGE HOURS

Main message: The key judgement for trend average hours remains the degree to which involuntary part-time workers find full-time work. The current estimate of trend average hours appears broadly consistent with this analysis, although we propose some minor tweaks to the profile.

Key points:

- The 2008/09 recession led to an increase in involuntary part-time employment, which has so far persisted. The manner in, and extent to, which this will unwind is the key judgement underlying any view of trend hours.
- There is little evidence of a strong cyclical impact on average hours beyond this compositional shift.
- Based on the latest data, we are proposing to revise up the average hours gap slightly from 0.1% to 0.3% in 2015Q1.
- Demographic change is likely to lead to a small decline in average hours over the next few years, though not to the same degree as on the participation rate.
- This is likely to be offset to some extent by a falling share of public sector employment.

Introduction

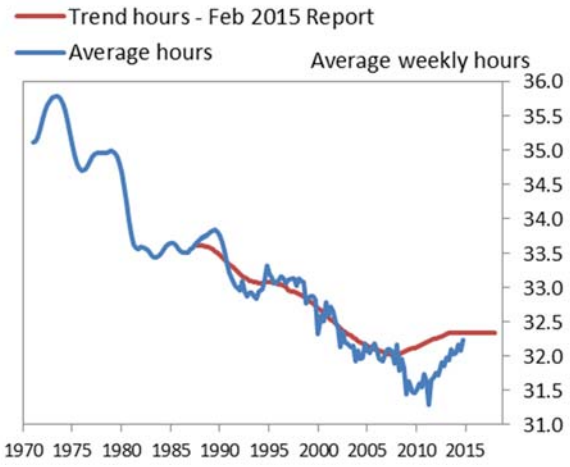
The judgement on trend average hours is important as it forms part of estimates of spare capacity in the labour market, and consequently estimates of potential supply. Therefore, as part of the wider stocktake on supply, this note revisits this judgement, assessing whether the current judgement still seems reasonable in the light of all the evidence. In particular, whether we can learn anything new from the drivers behind past changes in average hours, quantifying the cyclical component of changes in average hours, and examining the risks to average hours including from likely demographic developments.

Developments in average hours

Prior to the recession, there had been a steady downward trend in average hours since at least the 1970s, and probably longer (**Chart 1**).[1] Since 2010, however, average hours have increased, reversing some of this decline. In the February 2015 *Inflation Report* forecast, the profile of the 'trend' level of average follows this decline in actual average hours until the 2008/09 recession, before rising slightly between 2008 and 2014. This profile of trend average hours implies that a gap opened up between trend hours and actual hours over the recession, although it has subsequently narrowed substantially over the past couple of years.

[1] Some long-run estimates of average hours have a downward trend since at least the 1850s (see 'Three centuries of macroeconomic data'. This long-standing downward trend is not a United Kingdom-specific phenomenon: working hours have been falling across many industrial countries for many decades. See BIS (2014).

Chart 1: Actual and trend average hours



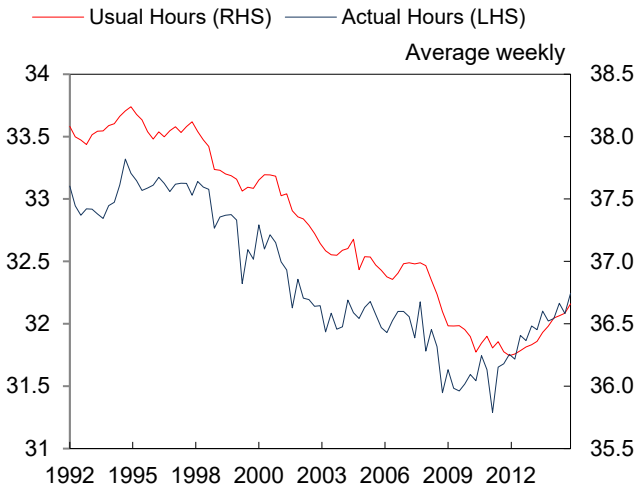
Actual vs. Usual hours

Part of the turnaround in average hours worked since 2010 is due to a change in the number of people working fewer hours than usual.[2] In any particular week, around 12% of those in employment do not work any hours, and a further 25% work fewer hours than usual; for many it is because their hours or overtime tends to vary, but it can also be because of holidays, sickness or parental leave among other reasons.[3] As a consequence, average actual hours worked tend to be a lot lower, and a lot more volatile, than average usual hours worked.

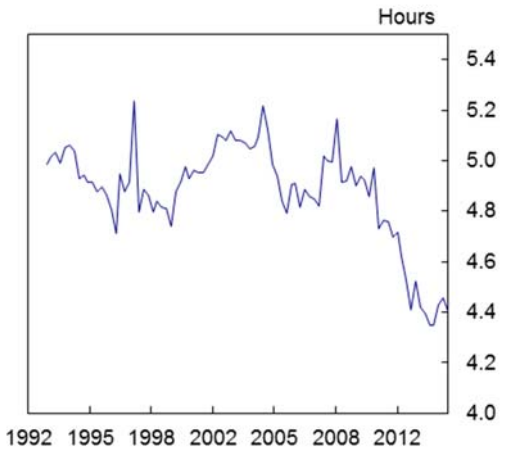
Over the past, these two measures of hours – actual and usual – have moved together and so, while usual hours had the advantage of being less volatile, both measures tended to follow the same trend. The increase in average hours between 2010 and 2014, however, was much more marked in *actual* hours than in *usual* hours (**Chart 2 (a)**); in fact, the wedge between actual and usual hours is at is narrowest since the quarterly LFS began in 1992 (**Chart 2 (b)**).

Chart 2: Actual and usual hours

(a) Average weekly hours



(b) Wedge between actual and usual hours



Actual hours can increase more than usual hours in two ways, either (a) the hours worked by those working more hours than usual can increase, or (b) those working fewer hours than usual can decrease. The recent increase in average hours has been driven by the latter – there has been a marked decline in the wedge between actual and usual hours, driven by a fall in the number of people surveyed for the LFS taking leave or holiday during the reference week (**Chart 3** and **Chart 4**).

[2] The LFS asks about both the actual hours worked in the reference week, as well as the respondent's usual hours.

[3] If average usual hours are 38 hours/week, then it takes +/- 0.3% of employment to be away from work in any given week to move average actual hours by 0.1pp relative to average usual hours.

While the cause is unclear, the magnitude is observable: this added around 0.4 to actual average hours worked per week between 2010 and 2014. More recently, there has been some pickup in usual hours as well, which will be examined further below.

Chart 3: Decomposition of change in actual hours worked since 2008q3[4]

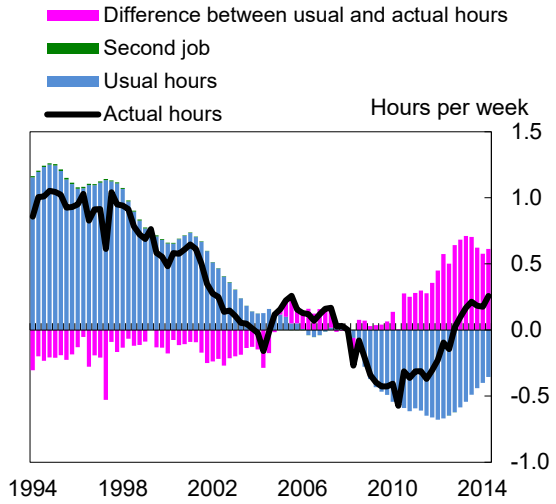
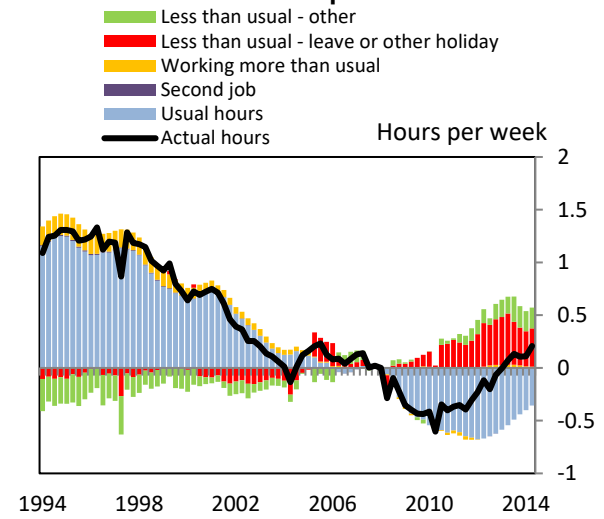


Chart 4: Decomposition of change in actual hours worked since 2008q3



The outlook for average hours and trend average hours will in part depend on whether this narrowing in the wedge between actual and usual hours persists, or narrows even further, versus being temporary and reversing. Given that the wedge appears to have stabilised over the past few quarters, a reasonable assumption in the absence of more information might be that the wedge will remain at around its current level, though there is a risk that it unwinds.

Composition versus 'within' group effects

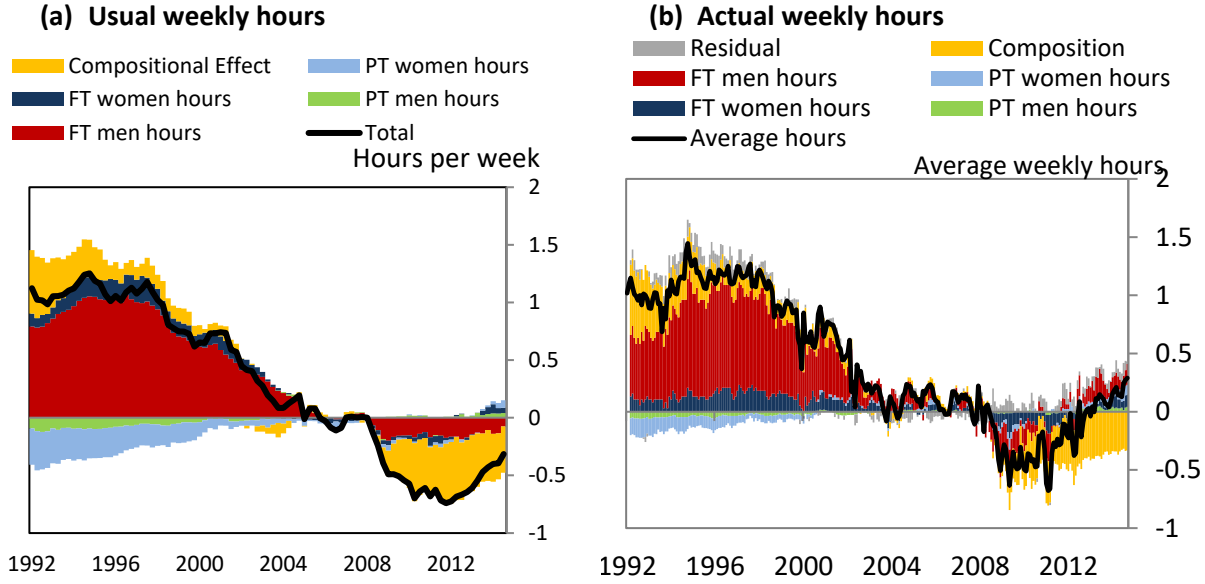
Chart 5 breaks the change in average hours into the contributions from within group effects[5] and compositional effects. The secular decline in average hours between 1992 and the early 2000s was predominantly driven by a fall in the hours worked by men in full-time employment. In turn this was largely driven by falls in hours at the top of the distribution (**Chart 6**), probably due to changes in working cultures, industry composition and legislation such as the Working Time Directive[6]. Around half of the decline can be attributed to the fall in paid overtime (**Chart 7**). The downward trend in male full-time hours appears to have stabilised around the early- to mid-2000s, however, and did not appear to have been affected markedly by the crisis.

[4] NB: measures of hours use in this note which have been derived from the ONS LFS microdata are shown as 4-quarter moving averages. This is because the microdata are non-seasonally adjusted, and to fully seasonally adjust data on hours worked, one would need to take into account holiday effects.

[5] The groups here are defined by sex and by whether the respondent classifies themselves as working full- or part-time. Note that the full-time/part-time classification in the LFS is self-reported, unless reported hours are less than 16 hours for full-time and more than 40 hours for part-time.

[6] See BIS (2014) for a detailed analysis of the effects of the Working Time Directive on the UK.

Chart 5: Contributions to change in average hours since 2008q3



The decline in the immediate aftermath of the 2008/09 recession looks to have been predominately due to compositional effects; in particular a shift away from full-time work and towards part-time work. There was also a small fall in the contribution from usual hours worked by men in full-time employment – driven by a fall in paid overtime – which could be interpreted as the cyclical impact on hours, over and above the compositional effects. These developments have so far persisted and, as a consequence, usual weekly hours remain below their level immediately pre-crisis (**Chart 5 (a)**).

In contrast, actual hours worked are slightly above their pre-crisis level, predominately due to the narrowing in the actual-usual wedge discussed above (**Chart 5 (b)**).

Chart 6: The distribution of usual hours worked each week by those in employment

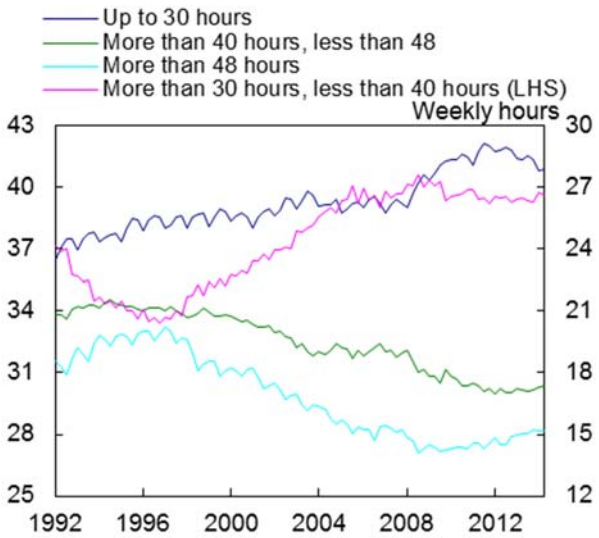
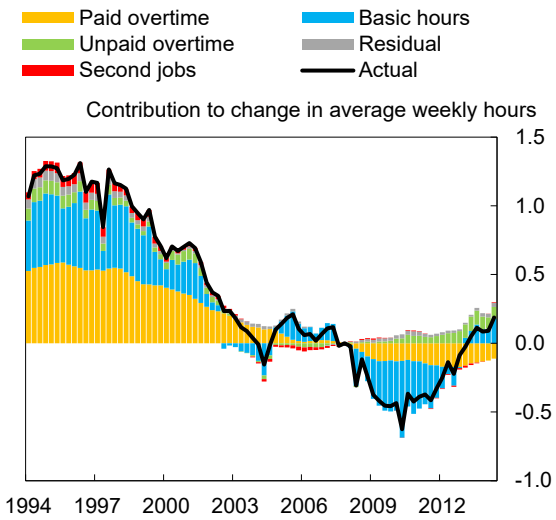


Chart 7: Decomposition of the change in average hours since 2008q3 into basic pay, overtime and second jobs



The outlook for average hours will, in large part, depend on how these compositional effects evolve. The large pick-up in the part-time share in the immediate response to the recession can be largely accounted for by the pickup in those that are part-time because they could not find a full-time job (**Chart 8**). In fact, as shown in **Chart 9**, the proportion of employment either in full-time employment, or part-time because they could not find a full-time job has risen slightly: all else equal, this might

suggest an increase in trend average hours. So a key question (discussed in more detail below) is whether these people are likely to find full-time jobs with more hours, and add net hours to the aggregate.

Chart 8: Part-time because could not find a full-time job

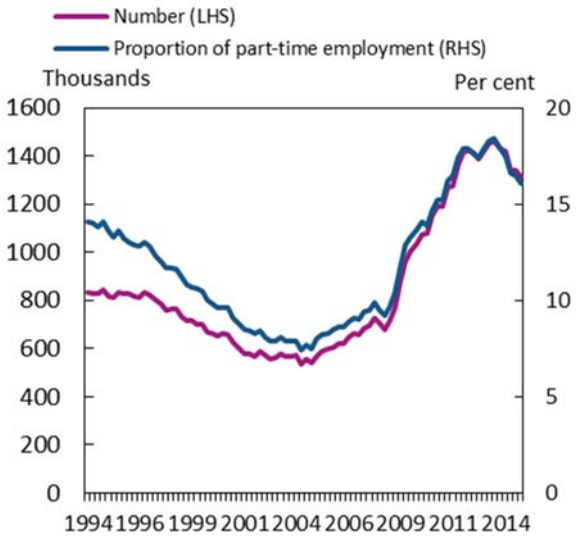
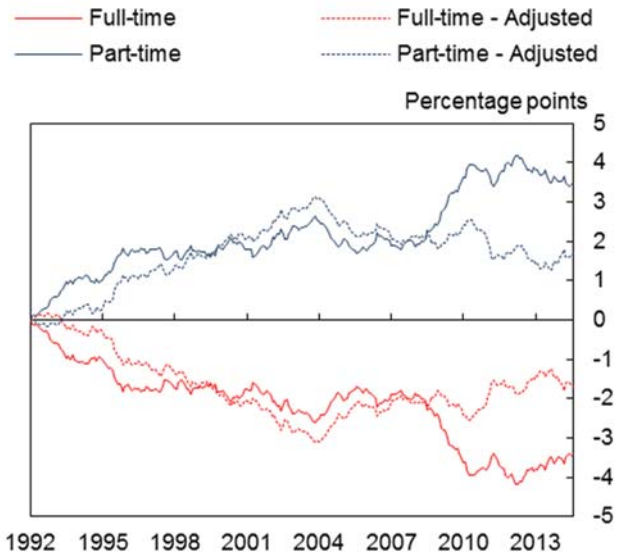


Chart 9: Full-time and part-time shares of employment*



**Adjusted full- and part-time shares reallocate to full-time employment those that report being part-time because they could not find a full-time job.*

Another compositional effect that might be important is the split between public and private employment: those working in the public sector work slightly fewer hours per week on average than those in the private sector. This difference is, however, relatively small (worth around 3 hours per week), and so has played a limited role in the change in average hours so far; adding a little under 0.1 hours since 2010 (**Chart 10**). Given the ongoing fiscal consolidation, this shift is expected to add another 0.1 to weekly hours by the end of 2017 (**Chart 11**).

Chart 10: Contribution of public-private shift to aggregate average hours

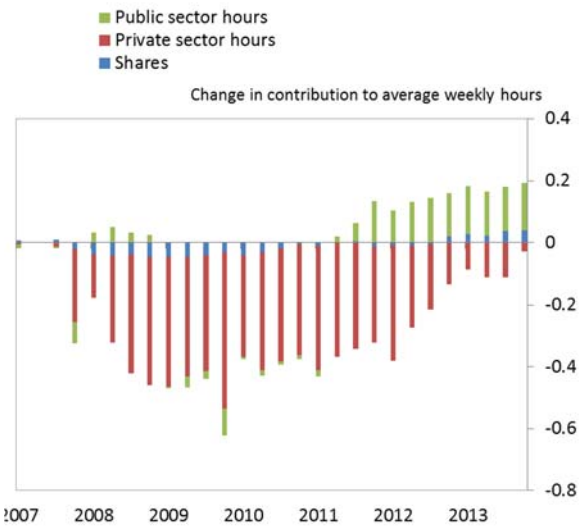
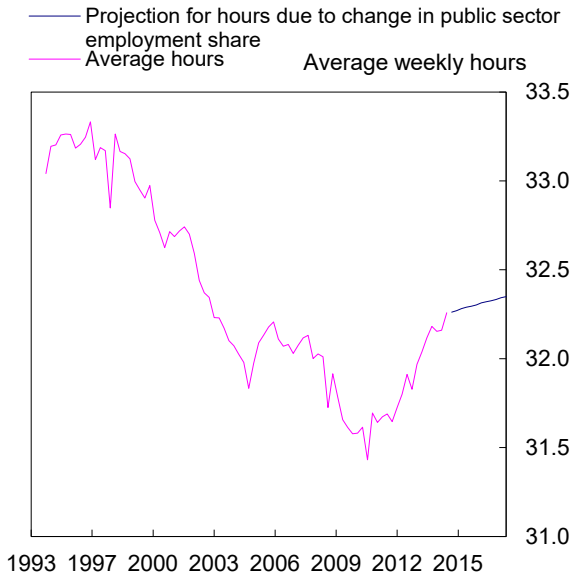


Chart 11: Projected change in average hours due to change in public sector employment share



Involuntary part-time employment and underemployment

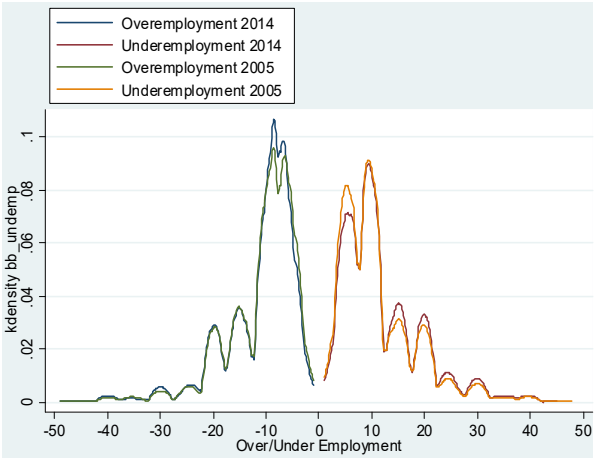
In the past we have used involuntary part-time employment as a way to cross-check our view on trend average hours, on the assumption that the involuntary part-time would, on average, like to work the same hours as someone in full-time employment.

We also, however, have a way of quantifying how many additional hours these individuals would like to work. Specifically, we have a measure of the number of net additional hours those in employment report they would like to work.[7] In some sense, this is a broader measure than involuntary part-time employment, and it is a measure of the quantity of extra hours desired, in contrast to the number of involuntary part-time workers.[8]

In practice, however, these two measures appear to be largely capturing the same phenomenon in relation to the increase since the recession. The change in the distribution of those wanting a change in hours is most marked for those wanting an additional 10 hours or more (**Chart 12**). The increase in net desired hours is primarily due to an increase in underemployment in part-time employment (**Chart 13**), and most of this can be explained by those who could not find a full-time job (**Chart 14**).[9] While there has been an increase in net additional desired hours for full-time and, to a lesser extent the voluntary part-time, these are much smaller by comparison.[10]

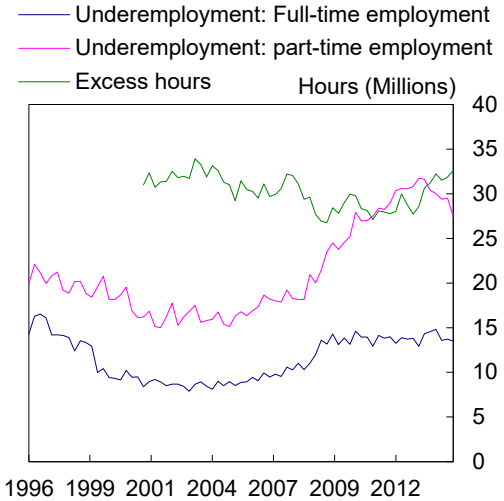
As a result, estimates of trend average hours based on the increase in involuntary part-time work and the increase in underemployment are of a similar magnitude (**Chart 15**).

Chart 12: Distribution of desired extra hours*



*Negative hours implies overemployment. Excludes those not reporting wanting more/fewer hours.

Chart 13: Over and Under-employment by full- and part-time employment



[7] Bell and Blanchflower (2013) proposed this measure of underemployment in the UK. Essentially they calculate the net desired additional hours across all those who want to work more or fewer hours.

[8] A subset of those asked about whether they would work more hours – those who are looking for another job because they would like different hours – are not asked if they would do so at the same wage rate. Therefore the additional hours of this group has not been conditioned on whether they would be willing to do so at the going wage rate. They are, however, a relatively small proportion of those reporting they would like different hours.

[9] Around half of those flowing into 'involuntary part-time' status have had a reduction in hours from full-time employment, the other half were part-time to begin with and experience a small change in hours, suggesting that for these people other causes – perhaps family circumstances – are important.

[10] It is also worth noting that the increase in desired hours is largely an employee, rather than a self-employment, story.

Chart 14: Change in part-time desired hours since 2004q2

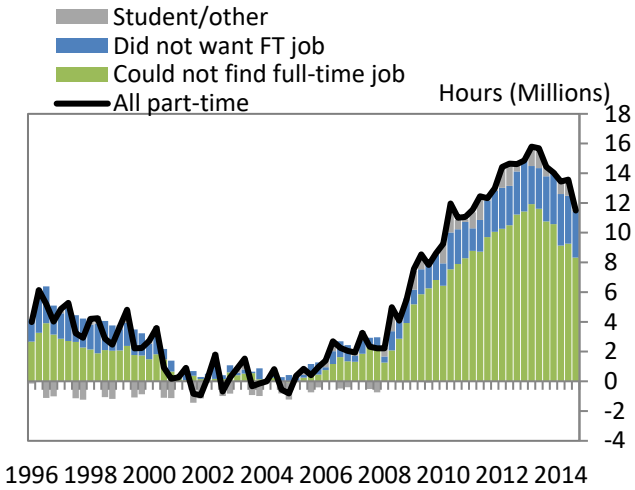
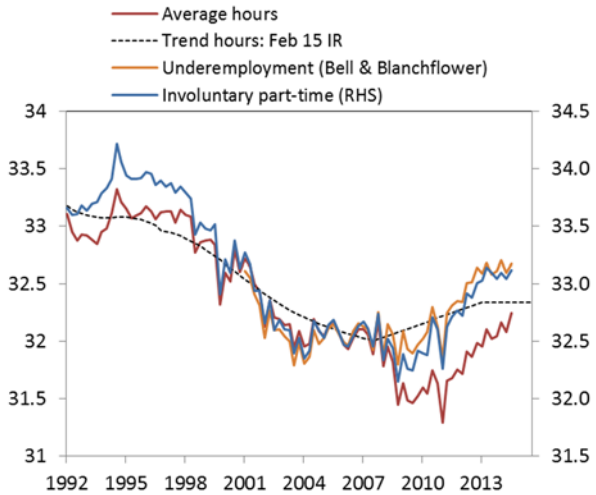


Chart 15: Average hours, underemployment and involuntary part-time employment

Average weekly hours



There are two key questions for the impact on aggregate average hours. First, whether this group of people are more likely than others to see an increase in their hours and therefore push up on aggregate hours. Second, if they are, how long this adjustment is likely to take.

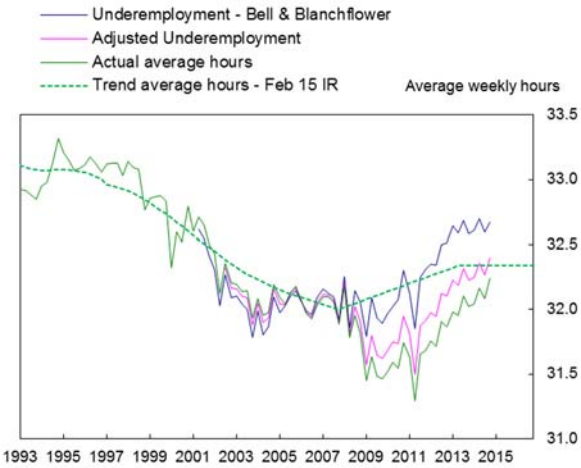
On the first issue, it seems plausible that the increase in the stock of involuntary part-time as a consequence of the recession would eventually unwind, pushing up on aggregate average hours. However, analysis in Weale (2014) found that it takes a significantly smaller change in hours to move people from underemployment to full employment than they report.[11] **Table 1** depicts the results from a similar analysis, with an extended time period and a focus on usual hours. It also splits out the involuntary part-time to see whether the result is different for this group. The overall conclusion is very similar: reported desired hours seem to be a relatively poor predictor of the changes in actual hours required to satisfy them in subsequent quarters. The involuntary part-time, however, do appear to have a slightly smaller gap between desired and achieved changes in hours than the rest of the underemployed.

[11] However that analysis also finds that this is the case to a greater extent for the over-employed – leading to the conclusion that the degree of slack is, if anything, greater than suggested by using the sum of net underemployment hours.

Table 1: Desired and observed changes in usual hours worked, 2013-2014

Current status		Status four quarters ago: All			Status four quarters ago: Involuntarily part-time		
		Under-employed	Fully-employed	Over-employed	Under-employed	Fully-employed	Over-employed
Under-employed							
	Desired change	13.5		-11.1	17.4		NA
	Actual change	1.1	-1.8	-9.3	2.5	1.0	NA
Fully-employed							
	Desired change	11.8		-11.7	16.6		NA
	Actual change	4.8	-0.1	-3.9	10.6	3.6	NA
Over-employed							
	Desired change	10.7		-11.6	14.8		NA
	Actual change	5.9	1.2	-1.1	11.4	4.2	NA

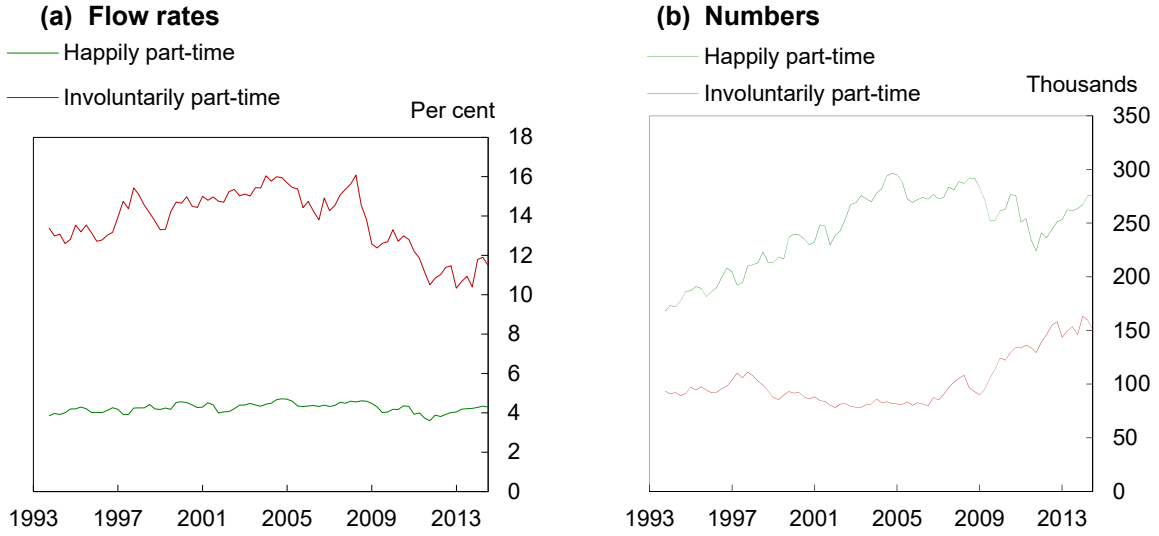
Chart 16: Adjusted underemployment measure



Extending this analysis over time allows us to adjust the underemployment measure for the difference between reported desired hours and the actual change when people move from underemployment to full employment. **Chart 16** illustrates how weighting each hour of under-employment by this ratio (on average about 0.4) would suggest a measure of trend hours a little under halfway between observed hours and the Bell and Blanchflower measure of underemployment. This weighted underemployment line lies below the estimate of trend average hours at the time of the February 2015 *Report* for most of the post-recession period, although they converge by the end of 2014.

Further, **Chart 17** shows that although the rate of transition of involuntarily part-time workers to full-time work is around 3-4 times higher than for other part-time workers, the absolute numbers remain much lower (since there are many more voluntary part-time workers). These greater numbers more than offset a larger increase in their hours when they do move into full-time employment as well, implying that net flows of all part-time workers to full-time work may be more important for aggregate hours.

Chart 17: Transitions to full-time employment



The evidence also implies that desired hours may only affect actual hours with a lag. Regression estimates of actual changes in hours worked on additional desired hours at an individual level suggest that there is a positive relationship, but a relatively weak one. In particular, each additional hour of under- or over-employment is estimated to raise average weekly hours in a year's time by around 0.2 hours (**Table 2**).

Table 2: Regression results

Effect of each additional desired hour on change in actual hours:		
	1 quarter ahead	**4 quarters ahead**
Under-employment only	0.10	0.24
Over-employment only	0.15	0.32
Both	0.09	0.21

Note: Rounded to 2 dp. Control variables include: age, occupation, housing tenure, industry, region, whether individual is full-time or part-time and the number of dependent children under 19.

The past may not, of course, be a reliable guide to the future. There is a risk that those that are currently part-time because they could not find a full-time job are different in some way to those in the past, and that they end up having a greater impact on average hours in aggregate.

Other cyclical effects

Aside from the composition effect discussed above, there may be other cyclical effects that affect average hours. One approach to determining the degree to which recent changes in average hours are cyclical is to examine how cyclical average hours have been in the past. An update of an exercise carried out in previous Bank work[12] suggests that, in general, average hours are not very responsive to the economic cycle (**Chart 18**). Paid overtime is the most cyclical element of average hours, but even the correlation between paid overtime and economic indicators is relatively weak, and paid overtime constitutes only 2.5% of total hours worked in any given week. This is however consistent with the evidence above that the fall in usual hours worked by those in full-time employment can largely be accounted for by lower hours of paid overtime.

[12] Analysis is based on correlations between detrended measures of hours and economic variables. For details see Shortall (2002).

Chart 18: Cyclicality of the components of average hours

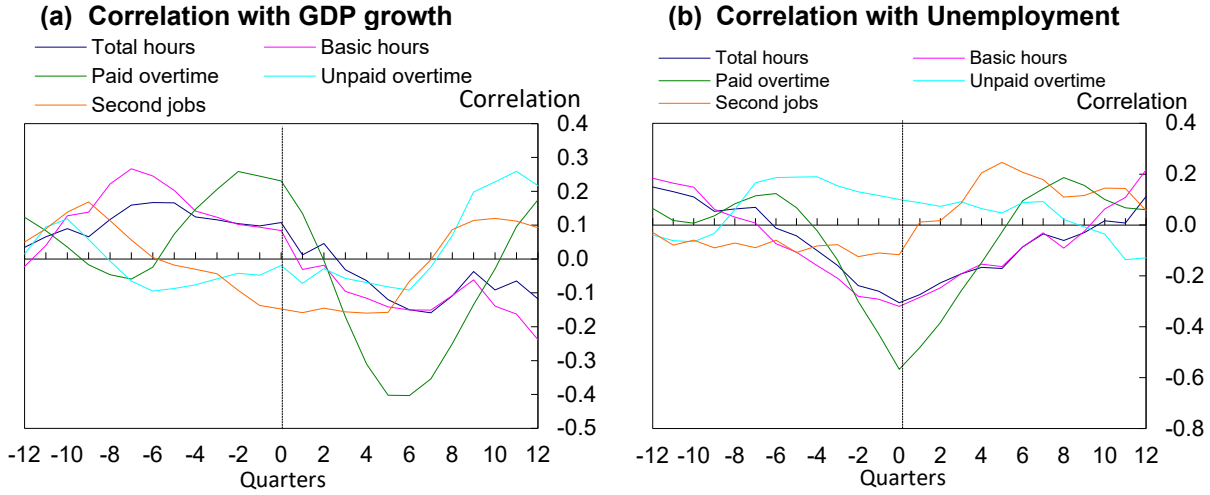
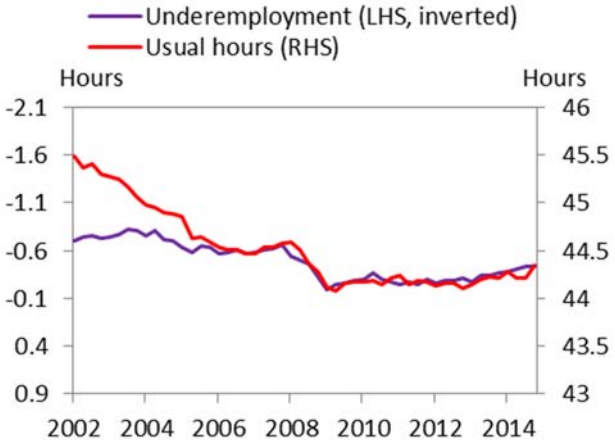


Chart 5 (a) and **Chart 7** above suggest that there was some fall in the usual hours of full-time men after the crisis, which looks to largely have been due to paid overtime, and which has persisted. The analysis above suggests that some of this could be cyclical. The increase in underemployment in full-time men broadly matches the fall in their usual hours (**Chart 19**), which may suggest that the underemployment measure is already capturing this effect.

Chart 19: Underemployment and usual hours of full-time men



While this suggests that some of the observed fall may be cyclical, it doesn't rule out an increase in latent or desired hours that is in addition to any changes in actual hours worked (for example a real income shock that induces a greater supply of labour).

The role of demographic change

Demographic changes – in particular an ageing population – are likely to have some impact on average hours, but probably not to the same degree as on participation rates. This if for two key reasons:

(1) Average hours vary less over the life-cycle than participation rates (**Chart 20**)
(2) What matters for average hours is the employment share by age, since average hours are calculated as hours worked per person in employment.[13] The share of older people in employment drops off much more sharply than in the population (**Chart 21**) – so they will tend to drop out of the calculation entirely, rather than dragging it down.

[13] This is in contrast to the participation rate, which is calculated as a proportion of the population.

Chart 20: Participation rate and average hours by age

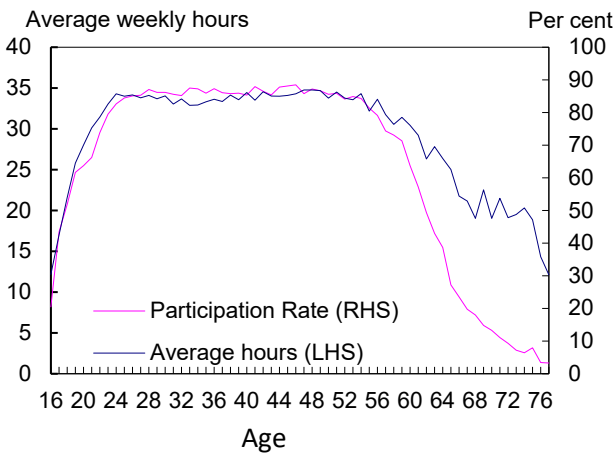
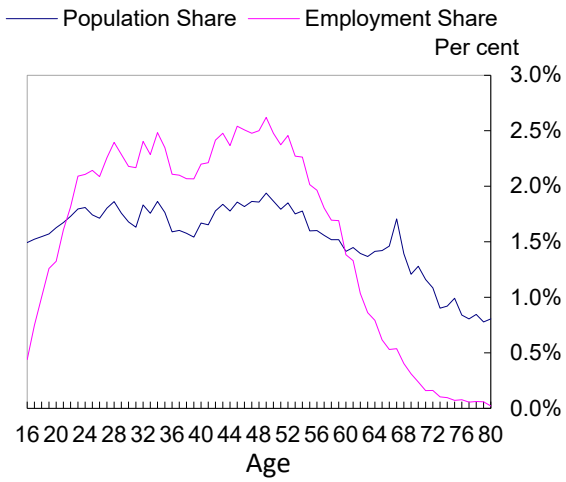


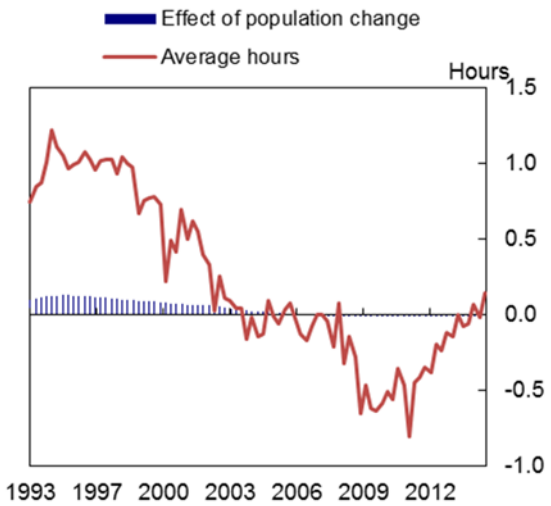
Chart 21: Share of employment and population by age



Because hours don't vary much across most age groups and employment rates drop off sharply around the same time as average hours, the effect of an ageing population has so far been small: **Chart 22** shows the results of a simple exercise whereby average hours and employment rates are fixed within each age while the age structure of the population varies. It illustrates that the effect of the change in the population structure to date has been very small relative to the changes in average hours.

All else equal, demographic change is, however, likely to lead to a small decline in average hours over the next few years. **Chart 23** illustrates the result of a simple simulation exercise to quantify the impact of demographic change on average hours over the forecast. The average hours worked by each single-year age group have been held constant at their 2014 levels, and then employment rates are projected forward using the ONS mid-year 2012 population estimates.[14] The results do suggest that demographics may pull-down on average hours to some extent over the next few years; equivalent to around 0.3 hours per week by the end of 2020.

Chart 22:The impact of demographics on average hours



Further, there could be important interaction effects between average hours worked and the rising participation rates of older people. In particular, if the share in employment of older people increases by disproportionately more than their share in the population – i.e. their participation rates increase – while average hours remain lower than those of 'prime-age', then this will bring down the average hours by more than suggested in this simple exercise. A continued increase in participation rates of older workers is implicit in the central view of participation at the time of the

[14] For average hours, unlike for participation rates where the population is the denominator, this exercise requires a projection for employment rates. For simplicity the assumption used is that employment shares evolve in line with population shares – i.e. relative participation rates do not change much. This is not fully consistent with an assumption that the participation rates of older people continue to rise.

February 2015 *Report*. And, as **Chart 24** illustrates, there has so far been little sign of a marked increase in the average hours worked by older workers or of any significant cohort effects.

Chart 23: Illustrative impact of an ageing workforce on average hours in future years

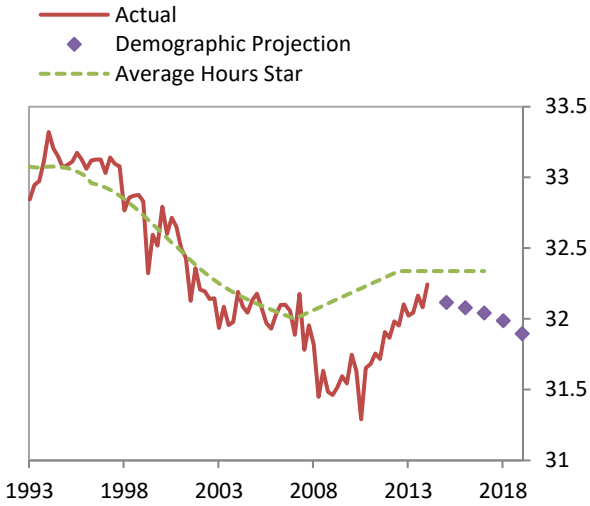
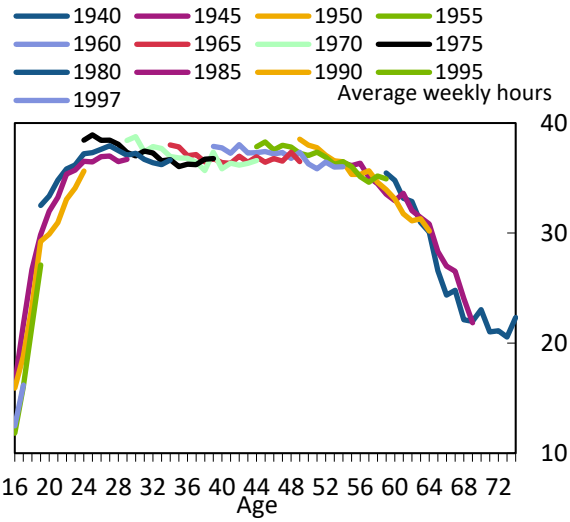


Chart 24: Average hours over the life-cycle, by birth cohort



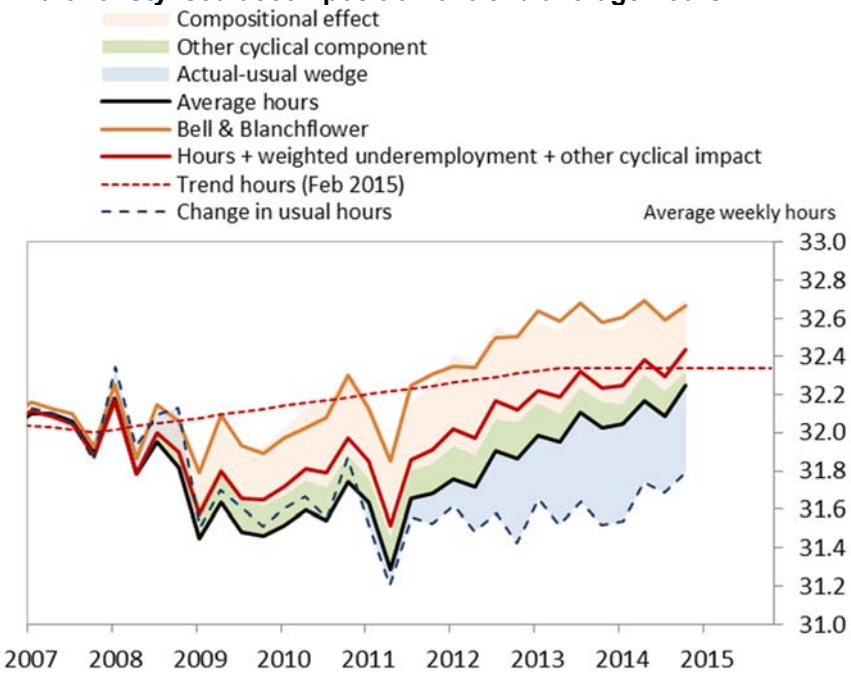
Implications for trend average hours

Chart 25 brings all of this together. Average usual hours have been fairly flat since the recession (the blue dotted line), and most of the increase in actual hours can be explained by the fall in the wedge between actual and usual hours (the light blue swathe). The cause of this is unclear, and while it seems reasonable to assume this will be persistent, there is a risk that it unwinds.

The fall in average hours in immediate response to the crisis can be largely explained by an increase in part-time employment at the expense of full-time employment (the compositional effect in the chart). This may well unwind, although this is far from certain and, even if it does, it may do so only very slowly. The extent of this unwind is where most uncertainty lies, and therefore remains the key judgement underlying any estimate of trend average hours. Evidence for sizeable cyclical effects in average hours beyond this compositional change is relatively limited, though the contribution to usual hours from men in full-time work did fall slightly after the crisis before starting to recover over the last couple of years; this could be interpreted as the cyclical response of hours, over and above the compositional effect (the green swathe).

Assuming the change in the actual-usual wedge will be persistent, while 40% of the compositional effect and the other cyclical impacts will unwind, gives an estimate of trend hours given by the solid red line. This suggests that the estimate of trend hours in the February 2015 *Report* (the dotted red line) looks broadly plausible in 2014, but perhaps too high between 2009 and 2013. If, however, one puts more weight on the possibility that the compositional effects will unwind then the current trend may look too weak over the past couple of years. Putting 40% weight on the underemployed, and taking into account the latest data implies a small increase in the average hours gap from 0.1% to 0.3% in 2015Q1.

Chart 25: Stylised decomposition of trend average hours



- The **compositional effect** is a consequence of the shift from full-time to part-time work, and is equivalent to the orange bars in **Chart 5**
- The **actual-usual** wedge is the change in the gap between actual and usual hours reported in the LFS, and equivalent to the pink bars in **Chart 3**
- The other cyclical components is an estimate of the cyclical impact beyond the compositional effects, and is equivalent to the red bars in **Chart 5 (b)**

Over the forecast horizon, the main upside risks to the February 2015 *Report* trend are: (i) that those who report wanting to work more hours manage to increase their hours by more than they appear to have done in the past; and (ii) that the wedge between usual and actual hours continues to narrow. The downside risks are: (i) the secular trend in the hours of full-time men resumes, (ii) the wedge between actual and usual hours reverts to its past (higher) level, and (iii) demographics, and the interaction with changing participation rates, pull down on average hours over the next few years. On balance, the last of these downside risks is probably the most significant risk so we have incorporated some of this into the proposed trend. Although it is worth noting that this effect will be partially offset (by around 0.1 hour per week by the end of 2017) by the fall in the public sector employment share driven by continued fiscal consolidation. The proposed trend is illustrated in **Chart 26**, and the main conclusions and risks are summarised in Table 3 below.

Chart 26: Proposed average hours trend

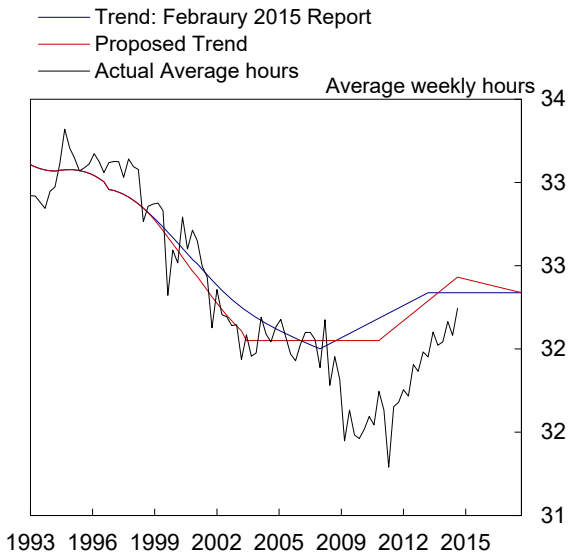


Table 3: Summary table

Component	Evidence	Implication for trend	Key risks
Observed average hours	Secular decline stabilised in the 2000s Fall after recession was largely compositional, driven by an increase in 'involuntary' part-time work Fall in usual hours of those in full-time employment, particularly in paid overtime. Likely to be cyclical. Some of the increase is due to a smaller wedge between actual and usual hours, which may persist Change in public/private split has added around 0.1 hours since 2010q2, and is set to add another 0.1 hours by 2017q4	Suggests that a flat to slightly rising profile for average hours over the past few years is reasonable	Secular downward trend restarts Wedge narrows further, or reverses Paid overtime does not recover (this risk is relatively small in magnitude)
Latent/cyclical component of hours	The pick-up in involuntary part-time work looks like it may be cyclical Evidence for strong cyclical effect beyond this is limited	Suggests that there was a gap between trend average hours and observed average hours over the last few years	Those reporting underemployment represent a greater degree of latent hours, and this leads to an increase in actual hours to a greater degree than in the past
Demographics	Role of demographic change in the past appears limited Demographics are likely to drag on average hours as population ages, particularly if participation rates continue to increase for older workers, as is implicit in judgement on participation	Suggests argument for pushing down on trend average hours over the forecast period	Participation rates and average hours interact in such a way that average hours decrease more significantly

References

Bell & Blanchflower (2013) *'Underemployment in the UK revisited'*

BIS (2014) *'The Impact of the Working Time Regulations on the UK labour market: A review of evidence'*

Shortall (2002) *'Working Time in the United Kingdom: Evidence from the Labour Force Survey'*

Weale (2014) *'Slack and the labour market'*

Annex

Headline average hours reported by the ONS (and which feeds into the Bank measure of hours and hours gap) is the mean of all hours (main + second job), including those that work no hours in the reference week (ONS code, YBUV: LFS microdata code SUMHRS). This is made-up of a number of different components. Table 4 sets out how the components of average hours relate to each other.

Table 4: Components of average hours (and LFS code)

	Actual	**Usual**
Basic hours, main job	BACTHR	BUSHR
+ Paid overtime, main job	ACTPOT	POTHR
+ Unpaid overtime, main job	ACTUOT	UOTHR
= All hours, main job	**TTACHR**	**TTUSHR**
+ All hours, second job	ACTHR2	N/A
= All hours, main + second job	**SUMHRS**	**N/A**

Note: the components in the table are not used to derive the variables, but instead provide a way of decomposing average hours into its constituent parts.