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The Squeeze On Real Wages - And What It Might Take To End It

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Abstract

The UK has been experiencing unprecedented falls in real wages and living standards. There are a number of alternative sources of earnings data and different measures of earnings that can be used to study this. Taking a balanced view of the available data suggests that since 2008 real weekly wages have fallen by around 8 percent, which amounts to a fall in annual earnings of £1850 for the typical (median) worker. The available evidence suggests that real wages have continued to fall through 2013 and are still falling according to the latest data. The fall for younger workers has been larger, so much so that for those aged under 25 real wages have fallen back to below levels last seen in 1988, 25 years ago, when their parents were typically entering the labour market. Most of the fall in real wages has been associated with nominal wage freezes whilst inflation erodes the real value. However, nearly 30 percent of the workforce in the same job between 2009 and 2012 experienced cuts in nominal wages. Three factors are important drivers of these unprecedented real wage falls. First, unemployment has been exerting a larger downward pressure on wages than in previous recessions. Second, the extremely poor productivity record through the recession and recovery has not created room for wage rises, though it has been good news for jobs. Third, and pre-dating the recession, wages of typical British workers are no longer keeping up with productivity gains made in the economy. This stems from a growing contribution of total compensation going toward supporting pensions, not just for current but also already retired workers, and that the highest paid (the top 1 or 2 percent) are taking a disproportionate share of the gains from productivity leaving little room for wage gains by ordinary workers.

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1. Introduction

Compared to earlier economic downturns, the deep recession and protracted period of economic stagnation that occurred in the aftermath of the financial crisis in 2008 has seen unusual responses in the UK labour market. Apart from those aged under 25, employment saw only minor falls – by about 2 percent – relative to the sizable 7 percent fall in GDP. Employment started to recover before output and now stands at pre-recession levels, whilst output still remains significantly below peak levels. Again the exception is those aged under 25 where the employment recovery has only just started. This poor output performance coupled with strong employment means that productivity remains well below peak levels and lies some 15 percent below levels seen at a similar stage after previous recessions. This is what has become to be widely been referred to as the "productivity puzzle".

At the same time as this pattern of relatively benign employment and poor productivity performance, the UK has experienced a significant fall in real wages. The scale of the real wage falls are historically unprecedented, certainly in the last fifty years where broadly comparable records exist (see Taylor et al, 2014). Both mean and median real weekly wages have fallen by nearly 8 percent since early 2008, when assessed over the range of measures available. This equates to an annual earnings loss of about £1850 in today's prices. The falls in hourly wages are slightly less marked owing to an increased extent of part-time working but overall impression is similar. The most recent data suggests the falls have continued through 2013 at a somewhat reduced rate.

Of course, these recent unusual patterns are linked. Falling real wages combined with difficulty accessing loans from banks for investment have combined to encourage firms to use extra workers rather than new investment in capital to meet demand. Hence, the extraordinarily poor period of flat productivity and the (relatively) benign picture for employment. In turn poor productivity performance offers no scope of rises in real wages, thereby completing the circle.

Despite these extraordinary patterns, academic research around this subject remains limited. In an earlier paper (Gregg et al, 2014) we undertook an initial analysis of whether there may have been a structural shift in the evolution of real wages by studying whether one can garner evidence of a changing role of unemployment in explaining falling real wages. This, alongside related contributions by Pessoa and Van Reenen (2014) and Blundell et al. (2014), who respectively explore productivity movements and cyclical shifts in the composition of the employed, formed a special session at the 2013 Royal Economic Society conference.

In this paper, we seek to make three new contributions in terms of what has happened to wages more recently compared to the previous part of the last twenty five years. We first offer a thorough, descriptive analysis exploring movements in real wages across various sources of wage information, concepts of pay and inflation measures. The aim is to ascertain how robust the evidence on falling real wages is and to better understand why the extent of measured falls might appear to vary in different settings. We look at different data sources, variations across major groups in the workforce and explore in more detail the evidence for nominal wage stickiness.

The second aim is to rehearse what we know about the reasons why real pay has been falling. Three factors are important drivers of these unprecedented real wage falls. First, unemployment has been exerting a larger downward pressure on wages than in previous recessions. Second, the extremely poor productivity record through the recession has meant no room has been created for real wage rises, though it has been good news for jobs. Third, and pre-dating the recession, wages of typical British workers have no longer kept up with productivity gains made in the economy. This stems from a growing contribution of total compensation going towards supporting pensions, not just for current but also already retired workers, and because it is the highest paid (the top 1 or 2 percent) who have taken a disproportionate share of the gains from productivity leaving little room for wage gains by

ordinary workers.

The third contribution is to offer a consideration of when or if the pattern of observed real wage falls could end. This entails a discussion of the extent to which economic recovery and whether policy change have scope to do to reverse the observed declines.

2. Documenting the Rise and Fall of Real Wages in the UK

To document what has happened to real wages over time, we analyse wage data from various sources over the twenty five year time period from 1988 to 2013. The start date is determined by the fact that 1988 is the first year where we have Consumer Price Inflation (CPI) data. The CPI has become the preferred measure of price inflation being used for the government's inflation target which the Bank of England Monetary Policy Committee is required to achieve (see ONS, 2012). So in this paper we principally use the CPI as the measure of consumer prices to compute the real consumer wage. We also look at real producer wages based on deflating wages with producer prices from the GDP deflator. But, where relevant, we do note any pertinent differences from considering other alternative price series.

What do different wage and inflation measures tell us?

Figure 1 shows real wage movements since 1988 at three points of the wage distribution, namely the 10^{th}, 50^{th} and 90^{th} percentiles. The Figure uses New Earnings Survey/Annual Survey of Hours and Earnings (NES/ASHE) data and indexes the three wage growth series to 0 in 1988. The ASHE series is derived from employer pay records and is widely seen as the most accurate wage data available. It is approximately a 1 percent sample of all workers and is thus based on a large sample of employees. It is also a panel, covering the same 1 percent of the population in every year, and we exploit this feature in some detail later.

The left hand panel of Figure 1 expresses the wage growth series in real terms using the CPI and is thus real consumer wages, whilst the right hand panel deflates by the GDP

deflator and represents real product wages (i.e. the real cost of employing workers given the prices firms charge for their output). Figure 2 shows movements over time in the CPI and the GDP deflator.[1] Looking over the full period shows that the choice of price deflator makes little difference to the overall patterns of real wage growth shown in Figure 1, although there are some subtleties that arise in different years. For example, between 2001 and 2008 the CPI rose slower than the GDP deflator and this has reversed since 2008. This means that real product wage, shown in the right hand panel of Figure 1, shows slower increases between 2001 and 2008 and smaller falls since when compared to real consumer wages.

However, the broad picture shown by Figure 1 is of real weekly wages of the typical (median) worker rising pretty consistently to around 2002, except for a brief period of stagnation through the recession of the early 1990s. This was followed by a period of far slower wage growth between 2002 and 2008, and very sharp declines after this.[2] By 2002 wages of the typical worker (at the median) reached over 30 percent above levels seen in the late 1980. After a period of near stagnation from then up to 2008, real wages then fell sharply, falling on this measure by 8 percent in just four years, before stabilizing in 2013.

The Figure also shows that the period from 1988 to 1999 was associated with faster growth for high earners (the 90th percentile) and lower for lower paid workers at the 10th percentile.[3] Real wages of the lowest paid did fall through the recession of the early 1990s, although not by as much in the recent period. From 1999 the pay of lower wage workers stopped falling further behind median wages, probably due the introduction of the UK's national minimum wage (NMW) even though this directly covered only around 5 percent of

[1] Appendix Table A1 shows annual price inflation for these two measures in the three time periods we focus upon, together with the retail price index (RPI), and two more recently available inflation indexes (the RPIJ, which covers the same basket of goods as the RPI using a methodology similar to that of the CPI, and CPIH, which adds owner occupiers' housing costs to the CPI).

[2] For the longer term evolution of real wages deflated by the retail price index (data on which goes back longer in time) see the Figures in Gregg et al (2014). The overall nature of change (of rising real wages, followed by a slowdown and then sharp falls is also shown there.

[3] The observed pattern of rising wage inequality in the UK over the last forty years has been well documented - see Machin (2011) for more detail.

the workforce (Machin, 2011). The wages of the highest paid continued to pull away though until 2008. Since then wages have fallen pretty much equally for all groups.

Table 1 shows the magnitudes of real wage growth in these three sub-periods for a range of alternative sources of earnings data and measures of earnings. From 1988 to 2002, real weekly wages rose at 1.8 percent per annum for the typical (median) worker according to the ASHE data used in Figure 1. This fell to just 0.7 percent per annum between 2002 and 2008 (using the Consumer Price Index, it is even lower at 0.4 percent using GDP deflator, as shown in Table A2 of the Appendix). After that, a sharp decline set in – of 2 percent a year (CPI) or 1.2 percent a year (GDP deflator). One important thing to note, and something we return to later, is that the 2003 to 2008 period of near stagnation occurred in a period of reasonable productivity growth and near full employment. The fall in median real wages on the CPI measure over the whole 2008-2013 period is around 10 percent since 2008, or around £2300 for a typical worker in today's prices in the ASHE data.

Whilst the ASHE database is widely thought of as the mostly reliable series for earnings, it is not the only data source available and is somewhat dated compared to other more up to date sources (for example, April 2013 being only just released at the time of writing). Table 1 therefore also shows growth for average and median hourly wage growth since 1988 based on the Labour Force Survey (LFS)[4] and the ONS Average Weekly Earnings (AWE). The LFS data is based on survey of households rather than employer records and thus may be subject to some reporting biases if people are giving a general sense of their earnings rather than referring to official records such as monthly pay slips. However, it also will capture very short-term jobs which might be missed by the annual ASHE series. The other main ONS weekly wage data series, Average Weekly Earnings, which is also employer based, but is reported monthly rather than annually and thus is more up to date but only average

[4] More precisely, it uses the General Household Survey before 1993 as the LFS did not include wages prior to then (see Machin, Murani and Van Reenen, 2014, for more details).

(mean) weekly earnings is available.

These alternative series suggest somewhat faster real wage growth between 2003 and 2008 (i.e. less stagnation) and slightly less marked falls since 2008 for median and mean weekly wages than for comparable series in ASHE. Compared to the 10 percent fall in ASHE, the falls in real mean and median weekly wages since 2008 are 5.5 to 7 percent in these alternative series. Hence, considering all the different sources, a balanced picture is of falls somewhere in the region of 8 percent over the 5 years since the onset of the financial crisis, or £1800 lower for the typical worker.

On the nuances resulting from considering different wage/earnings measures, Table 1 also shows that hourly wages on all measures showed slightly faster growth than weekly wages in the period 1988 to 2003. This is because average hours of work fell, partly because of increased part-time working in the workforce but mostly due to full-time workers cutting back of hours of work as living standards rose. The ASHE data also reports annual earnings for workers who stay in the same firm through the full year. Here the measured fall in real wages since 2008 is the largest among the available sources being down by 11 to 13 percent.

The final column of Table 1 shows the latest data available for the different real wage series. The ASHE data shows real wages to be broadly flat in the year to April 2013. The Labour Force Survey, which is released quarterly, suggests that real wages continued falling in the year to quarter 3 of 2013 (we average quarters 2 and 3 to improve reliability). The ONS Average Weekly Earnings series can be followed up until the 3 months to November 2013 also shows continued real wage falls. Thus the alternative series to ASHE suggest that real wages continued to fall in 2013, by something a little over 1 percent or £210 per year for median workers). The different series tend to show similar trends over extended periods but can differ over 1 year comparisons. Thus the latest data would suggest, on balance, that the fall in real wages has slowed in 2013 but has not yet stopped.

3. The Extent of Falling Real Wages Across Major Groups and Individuals

Figure 1 showed that the recent real wage falls have occurred across the pay distribution. This is in direct contrast to previous recessions where they were confined only to the lowest paid. Next we therefore turn to exploring variation in the extent of falls across major groups and also to explore movements for individual workers, exploiting the ASHE panel.

Differences Across Major Groups of Workers

The picture so far has explored average wage movements among those in employment in any period. Figures 3 and 4 therefore start to explore the data to look for variations across demographic groups. Figure 3 starts by show median real wage growth for men and women separately. Median wages for women grew somewhat faster than for men prior to 2008. Indeed male real wages showed a slight fall in 2008 ahead of women. Overall, though the fall from peak levels of real wages are similar for men and women.

This commonality in the pattern of real wage falls is not shared across age groups. Figure 4 shows real wage movements for 18 to 24 year olds, 25-29, 30-34, 35-49, 50-59 and those aged 60+. The older age groups have seen relatively more modest falls in real wages in the region of 5 to 6 percent from peak levels in 2009. The falls for the younger age groups more clearly start in 2008 and amount to real falls of 12 to 15 percent. For workers aged 18-25 the fall in real wages in the recent period has been so extreme that, in real terms, wages are back to levels not seen since 1988, the start period of our analysis.

Putting this another way, real wages for this group of younger workers have fallen so far back that they are actually below those seen twenty five years ago when their parents were typically entering the labour market. For the first time since WWII at least, real wages of the younger generation are below those enjoyed by their parents. For the slightly older group, those aged 25 to 29 real wage falls have taken wages back to the level last seen fifteen years ago in 1998. This is less extreme than for the 18-25s, but nonetheless is still a striking feature of real wage evolutions in the UK labour market.

Wage Changes at Individual Level

We next turn to look at wage movements at the level of the individual by exploiting the panel aspect of the ASHE data. Figure 5 shows the extent of variation in individual real wages over the period of the major earnings falls, 2009 to 2012, and for the prior four year period, 2005 to 2008.

Our earlier analysis of ASHE showed a 10 percent fall in median weekly wages for the workforce as a whole, but when looking at individual pay growth like we do in Figure 5, we need people to study the sample who are in employment in both periods. Thus, young workers who enter the labour market after 2009 are not included, making those in employment in both periods older in 2012 than the workforce as a whole. Likewise workers moving in or out of the workforce are not included and these are generally lower paid individuals. It is normal that as people age we see earnings grow, especially for those aged under 40 and those retiring at the end of their working lives earn far more than those just entering after leaving education. By looking at those in employment in both 2009 and 2012 we are thus focusing on those on the upward part of the wage trajectory and not the wages of those entering and exiting the workforce. Hence it comes as no surprise that the real wage falls for those in employment in both years are smaller than for the workforce as a whole, with the median wage falling by around 5 percent.

Despite this positive selection, Figure 5 shows that 30 percent of workers employed at the beginning and end of the period experienced real wage falls of more than 10 percent, and 15 percent of workers had falls in excess of 20 percent. There is a marked spike in the distribution of real wage growth where wages fall by just over 10 percent. This is the group who had three years of nominal wage freezes and it thus the fall reflects CPI based inflation over this window. Figure 5 does, however, show considerable heterogeneity in the nature of real wage growth. In terms of real increases, about 40 percent of workers had real wage gains and 25 percent experienced real wage gains in excess of 10 percent.

Looking at a similar time window from before the recession, 2005 to 2009, makes it clear how the 2009 to 2012 period is very different. Between 2005 and 2009, median real wage growth for those in employment in both years was just under 7 percent. But only 30 percent experienced real wage falls and for around 15 percent these falls were more than 10 percent. This picture is essentially the same if we focus on those who are employed with the same firm over the three year window.

There has long been discussion of nominal rigidities in pay adjustment. It is commonly believed that real wages can fall due to high price inflation, but it is widely thought that nominal wages do not fall (see, inter alia, Bewley, 1999). Given the recent unprecedented real wage falls of this magnitude over a short window we have documented (even for workers staying in the same job), it looks to be quite plausible that this stylized fact of the operation of labour markets is being put to the test in the recent UK experience. Indeed, looking at individual changes in weekly wages each year from 2009 to 2012 we see that around 20 percent of the workforce had nominal wage freezes (i.e. their weekly earnings are exactly the same one year on, before factoring in inflation). Furthermore a broadly constant fraction – of around 20 percent of workers - had nominal wage falls in excess of 1 percent (i.e. they earn less one year on than they started with before taking inflation into account). Of course this may reflect a number of changes in pay, such as overtime working, bonuses and shorter hours of work. If we focus on weekly basic pay, excluding overtime and bonuses, the fraction seeing nominal wage falls is around 17 percent in each year.

Taking this further, Figure 6 shows the distribution of wage growth for each of the three years for hourly basic pay, thus excluding overtime and bonuses, for workers employed in the same job at the beginning and end of each annual period. This is the tightest measure of earnings available as it excludes variations in pay due to more volatile components of earnings (e.g. overtime and bonuses), hours of work or job changes. Falls in this measure really do represent nominal wage cuts. Again a sizable group, amounting to somewhat over

20 percent of the workforce, experienced nominal wage freezes (defined as wage growth of between -0.5 and +0.5 percent). The size of this group actually increases in each year from 2010 to 2012, almost reaches 30 percent in the year to April 2012. A further 14 percent see nominal hourly basic wage falls of more than 0.5 percent. This is slightly larger in 2009 to 2010 than in the other years, but they are broadly similar. Around 5 percent in each year experience nominal wage cuts of 10 percent or more.

If we consider workers who are employed in the same job in all three years (about 80 percent of the sample employed in any one of the three years) we find that 30 percent have had a nominal wage cut in at least one of the three years. Note this is for a measure of pay that strips out changes in hours, overtime and bonus payments etc. A smaller group experience nominal wage cuts more than once. Further, some 20 percent had a nominal wage cut of at least 5 percent in one of the three years. Hence, there is clear evidence that whilst wage freezes are by far the most common story explaining real wage falls, nearly one third of workers employed in same job for three years saw a nominal wage cut in basic hourly pay. Thus it appears that nominal downward wage rigidities are breaking down in this period of unprecedented cuts in real wages.

4. Why Have Real Wages Fallen so Much?

As we have already stated, the recent falls in real wages experienced are highly unusual for the UK, even through periods of economic crisis. Hence the next obvious question is what we can say about why these falls have occurred. Since as far back as Victorian times real wage growth has been broadly in line with productivity growth. As we make goods and services of higher value in every hour we work, the more pay levels can rise. Rising wages allow for greater consumption of goods produced, thus boosting demand and supply. Further, rising wages encourage firms to boost productivity by investing in labour saving technology, creating a virtuous circle.

In addition to wage-productivity links, it has long been established that the rise and fall of unemployment across the economic cycle also influences pay movements. Hence to understand the recent real wage falls we might naturally explore how sensitive wages are to movements in unemployment, around underlying trend wage growth and the relationship between productivity and this underlying level of trend wage growth.

We consider three (not necessarily mutually exclusive) explanations of what have been important drivers of the unprecedented real wage falls. These are:

i) downward pressure on wages from unemployment;

ii) the poor productivity record through the recession and recovery;

iii) the distribution across major groups of workers of the productivity gains made in the economy.

Real Wages and Unemployment

Table 2 builds on earlier research we undertook exploring how wages have become more sensitive to unemployment in the last decade or so (see Gregg et al, 2014). It presents 'wage curves' based on the ASHE data discussed earlier and is regional panel of real median wages (CPI deflated) and unemployment levels.[5] Panel A estimates the sensitivity of wages to unemployment around an underlying trend rate of growth in real wages. The unemployment effect here is thus driven by the aggregate economic cycle, through the rise and fall in unemployment, and regional movements around the UK wide average. Panel B introduces year dummies instead of a trend in wage growth. This nets out the aggregate cycle and the estimates are just derived from regional variation in wages and unemployment movements not the aggregate economic cycle.

We estimated the model over two periods - before 2003 and from 2003 onwards - to explore the extent of underlying wage growth given by the time trend in Panel A and the sensitivity of wages to movements in unemployment. The estimation over separate periods

[5] See Blanchflower and Oswald (1994, 1995) and Bell et al (2002) on wage curves.

allows us to explore whether both underlying wage trends and the sensitivity to unemployment have been operating differently over the last decade than previously. Column 1 of Panel A suggests that prior to 2003 underlying median real wage growth was 0.7 percent per annum, and that this fell to 0.3 percent per annum in the second time period (see column 2). In addition to this slowdown in real wage growth, unemployment applies a larger downward pressure on wages in the second period (the coefficient on the lagged unemployment rate going from -0.077 in the first period, to -0.124 in the second, or a statistically significant drop of -0.047). According to this estimate, the magnitude is such that a doubling of unemployment from say 4.5 to 9 percent, slightly more than actually occurred in the downturn, will lowered real wages by 12.4 percent in the recent period (or around £2,700 a year for a typical worker in today's terms), compared to a little under 8 percent (or £1,800) before 2003.[6]

Such estimates being based on a short period with just one cycle and thus may just reflect the correlation in timing between the recent downturn and the unusual fall in wages rather than a deeper shift in the sensitivity of wages to unemployment. Thus the lower panel includes time dummies for each year rather than trend terms. These will pick up the economy wide shift in unemployment and wages in any year and the unemployment terms now only reflect deviations in unemployment and wages at the regional level. Thus the estimates are based on regional variations net of the macroeconomy depending on whether regions with larger or smaller shifts in unemployment within any year experience smaller or larger movements in real wages in the following year. As the results rest only on regional deviations in unemployment and some regions are quite small there will be some noise in the data induced by variation in sampling that occurs in any survey. Hence the magnitudes of the unemployment effects are smaller, but the key point is that we see the same increase in the

[6] Table A3 of the Appendix shows the trend specification for real wages deflated by the GDP deflator rather than the CPI. Of course, the more general year dummies specification is identical to that in Panel 2 of the Table as it nets out common macroeconomic differences through inclusion of the year dummies.

sensitivity of wages on unemployment (the elasticity changing by a statistically significant -0.036 between the two time periods). Such a model is asking quite a lot of the data and that it is robust to being based on regional variations is very reassuring. Thus we can be confident that through the recent recession real wages have fallen because of an underlying slowdown in real wage growth combined couple with an increased sensitivity to unemployment movements that have applied greater downward pressure than seen the past.

Wages and Productivity

Next we turn to what drives the underlying trend growth in wages seen above. The relationship between wages and productivity growth has been long established. Figure 7 shows the trends in productivity per hour worked and total compensation per hour. The latter is a broad measure of total labour costs to firms and includes employer NI and pension contributions. This Figure is an updated version of that presented in Pessoa and van Reenen (2013) whose analysis this discussion is based on. This Figure is expressed in real terms using the GDP deflator and thus reflects real product wages, as this is the most appropriate representation for productivity (though, as Figure 2 showed though, this difference between producer and consumer prices over this period is small). It shows that total labour costs have continued to grow in line with productivity. It is thus clear that a part of the pattern of the slowdown in underlying real wage growth connects to the poor productivity performance of the UK economy during the downturn.

The Distribution of Productivity Gains

Figure 7 shows no sign of a decoupling of productivity and wage costs measured as total compensation, which would be the case if labour's share were falling. However, Figure 8 shows two additional measures of labour costs based on wages and not on total compensation. The first is average (mean) wages per hour. This differs from total compensation in that it does not include employer non-wage labour costs, such as pension contributions, but just wages received by workers. The second is median instead of mean wages per hour.

The point that very clearly emerges is that, over the last decade, from around 2002, average wages started to grow more slowly that productivity. The gap between average wages and total compensation per hour suggests that non-wage labour costs, mostly pensions, took a growing share of the productivity growth achieved.

Two further points need to be made here. First, these pension costs are not just those for current workers but all contributions to pension funds to meet the costs of defined benefit (DB) pension schemes run by firms. So a portion of the non-wage labour costs are meeting pensions of already retired workers. Indeed many such DB schemes are now closed to new workers (Pension Protection Fund, 2013) so current workers will not see such good deals in the future. Greater longevity and poor stock market performance, compared to that expected when such schemes were set up in the 1950s to 1970s, means these funds required higher employer contributions to avoid building up considerable deficits. The other is that low waged workers often do not receive the same generosity of pension deals as higher paid workers, inequalities here are larger than in wages as a whole. Minhat (2008) suggests that pension contributions made by firms on behalf of senior executives in the UK represent around 15 percent of their total compensation, a figure supported by a recent consultancy firm (Lane, Clarke and Peacock Consulting, 2014). This is far higher than for typical workers, for instance, the new auto-enrollment system for uncovered workers, NEST, being introduced in the UK has employer contributions of just 3 percent, and even less before the scheme is fully functioning in 2018.

Importantly, Figure 8 shows that median wages per hour fell behind productivity growth far earlier, beginning from around the mid-1990s. Moreover, the gap opened up much faster soon after the turn of the millennium. The opening of the gap between mean and median wages is because of rising wage inequality. As top earners had faster wage growth that pulled the average (mean) wages up at a faster rate then the median wages (of the middle or typical worker). Rising wage inequality started before 2000 of course (see Machin, 2011).

Prior to then higher wage growth for high paid workers was matched by stagnation for the lower paid and so from 1979 to the mid to late 1990s, median workers saw pay grow broadly in line with productivity. Since then the lower paid have matched the middle, perhaps due to the National Minimum Wage, but higher pay for top earners has pulled the average up. Hence it seems that median wages have become de-coupled from productivity growth, because of rising inequality meaning a growing share of the value from productivity growth being absorbed by pensions and higher salaries for top earners.

5. What Might Reverse the Trend?

Pulling the different pieces of evidence together, we can start a discussion of what it may take for broad based real wage growth to re-emerge. The evidence of Table 2 shows that falling unemployment will lead to higher wage growth for a period. The evidence presented suggests that a fall from 8.5 percent unemployment - the peak in this cycle - to say percent 5 percent - the typical level from 1998 to 2008 - will result in wages rising by about 9 percent.

The estimated wage curve uses a very simple dynamic structure[7], but suggests that wages respond to falling unemployment with a lag of a year or so. So unemployment peaked right at the end of 2011 (see Figure 9) and then edged down until the Summer of 2013, which would suggest real wages stablising in 2013. But according to the lag structure, real wages will not respond to the strong falls in unemployment since the summer of 2013 till the middle or latter half of 2014. So we might expect to see real wages rising again within the next year, which will be good news for the government. However, the model suggests though once unemployment has stopped falling for a year or so then the rise in real wages will return to the underlying growth rate of just above zero. So the wage recovery will only last till a year or so after unemployment has stopped falling. Introducing more complex dynamics would suggest that half the effect of falling unemployment is felt in the second year after the fall occurs with

[7] For more variations, see Gregg et al (2014).

the rest of the effect coming in a diminishing rate in the following 3 years. Thus if unemployment is on a sustained downward trend the biggest effects on wages will be felt in years 3 and 4 after unemployment starts a period of steady decline, so from the Summer of 2016 if the current downward trend in unemployment continues. Hence we should expect real wages to start rising in the second half of 2014 and for growth to get stronger until a year or two after the fall in unemployment slows significantly.

The second ingredient for a broad based wage recovery and the essential part of a sustained wage recovery is productivity growth. The weak output performance and strong employment picture means that productivity is still 4.5 percent below that seen at the beginning of the crash. Such a prolonged period of declining productivity (with the trough in quarter 4 of 2012) has never been seen before in modern UK history. Whilst growth has returned, productivity in the last year has remained very sluggish at just 0.5 percent (quarter 4 2013).

It is essential that we see a return to the levels of 1.5 to 2 percent annual productivity growth seen in the decade before the crash, if real wage growth is to return on a sustained basis. Part of the extremely poor productivity record reflects low wages, as firms have weak incentives to invest in labour saving technology when workers are easy to hire and cheap. So falling unemployment should kick start investment, as labour becomes scarcer and real wages stop falling investment should return and with it productivity. If this does not occur, there can be little hope of a sustained wage recovery.

Moreover, this is a necessary but not a sufficient condition for a broad and sustained wage recovery. Figure 8 shows worrying trends in thus regard. If some of the patterns documented there continue, then the combination of rising total employer pension contributions and growing wage inequality seen over the last decade before the crash could continue to extract all the growth in the size of the pie, leaving little or nothing extra for typical workers. Therefore, policy aiming to boost wages (outside of the lowest paid where

minimum wages have an effect) needs to focus on boosting productivity, producing sustained increases in revenues of company pension schemes (e.g. through stock market returns and real interest rates of company and government bonds) and addressing the distribution of wage growth not only towards the top 1 percent of employees (see Bell and van Reenen, 2014, for a good discussion of this issue). Generous employer pension contributions for top executives running at around 15 percent of salary represent a nexus of the issues of pay inequality and pensions absorbing the bulk of the gains from productivity .

6. Conclusions

The UK has been experiencing unprecedented falls in real wages and living standards. In this paper we document the nature of these falls, discuss reasons why real wages ahave fallen, and offer a discussion of what might bring back a return to real wage growth.

In terms of documenting the scale of real wage falls, there are a number of alternative measures of wages available and indeed measures of inflation. Taking a broad view of this evidence suggests that since 2008 real wages have fallen by ariound 8 percent (with different measures and sources showing falls in the range of 5.5 to 13 percent). This equates to a fall of around £1850 for the typical (median) British worker. Real wages falls have been widespread and have occurred right across the wage distribution. Moreover, the broad picture from the available data suggests that real wages have continued to fall right through 2013 and are still falling on the latest data.

The real wages of some groups have been particularly hard hit, most notably the young. Those aged 25 to 29 have seen real falls of 12 percent and those aged 18 to 24 of over 15 percent. Indeed, the fall for those under 25 is so large it has taken real wages back to below levels last seen in 1988, twenty five years ago, when their parents were typically entering the labour market. For the first time since at least as far back as WWII, a generation is starting out poorer than their parents were at the same age. In part this may reflect greater part-time

working whilst extending educational studies, but even among those aged 25 to 29 (i.e. those past normal age for finishing education) real wages have fallen back to levels seen in 1998.

At the individual level there is considerable variation in size of wage falls. Indeed among those who worked through the recession, in work in both 2009 and 2012, who are a rather select group, some 40 percent experienced no fall in real wages. However, at the same time, a third saw real wage falls in excess of 10 percent and one in six experienced falls in excess of 20 percent. Moreover, there is also considerable evidence of nominal wage cuts. Whilst the bulk of the observed real wage falls stem from wage freezes combined with erosion by inflation, around one third of workers who were employed by the same firm between 2009 and 2012 experienced a cut in nominal hourly basic pay (thus excluding overtime and bonuses) in at least one year of the downturn and for one in five workers this cut exceeded 5 percent of basic hourly pay.

The available evidence suggests these unprecedented real wage falls are being driven by three factors. First, unemployment is exerting a far larger downward pressure on wages than in previous recessions. This can be seen even at the regional level when netting out the economy waide rise in unemployment and fall in wages, which strongly suggests it is not just a coincidence of timing. Second, the extremely poor productivity record through the recession and recovery is not creating room for wage rises, though it is good news for jobs. Third, and this pre-dates the recession, wages of typical British workers are no longer keeping up with productivity gains made in the economy. This stems from a growing contribution of total compensation going toward supporting pensions, not just for current but also already retired workers, and that the highest paid (top 1 or 2 percent) are taking a disproportionate share of the gains from productivity leaving room for few gains by ordinary workers.

These findings set the scene for a discussion of what conditions could bring back real wage growth. The recent recent rapid fall in unemployment, since the Summer of 2013, should be sufficient to generate real wage rises in the second half of 2014, as there is a lag of

around a year before wages respond to changing labour market conditions. Continued falls should lead to a continued wage recovery, but alone such gains will stop around two to three years after unemployment stops falling. For a sustained wage recovery the economy also needs to generate a return to the levels of productivity growth normally seen, but have been notably absent over the last six years. As labour gets scarce and more expensive we should expect firms to increase investment generating productivity improvements. But even this will not be enough for sustained real wage gains to come about unless the distribution of the returns from productivity growth can get channelled back to ordinary workers. This was the historical norm, but it stopped in the early 2000s – importantly before the downturn - with a disproportionate share of productivity gains going to support pension commitments and rapidly rising salaries of very highly paid workers.

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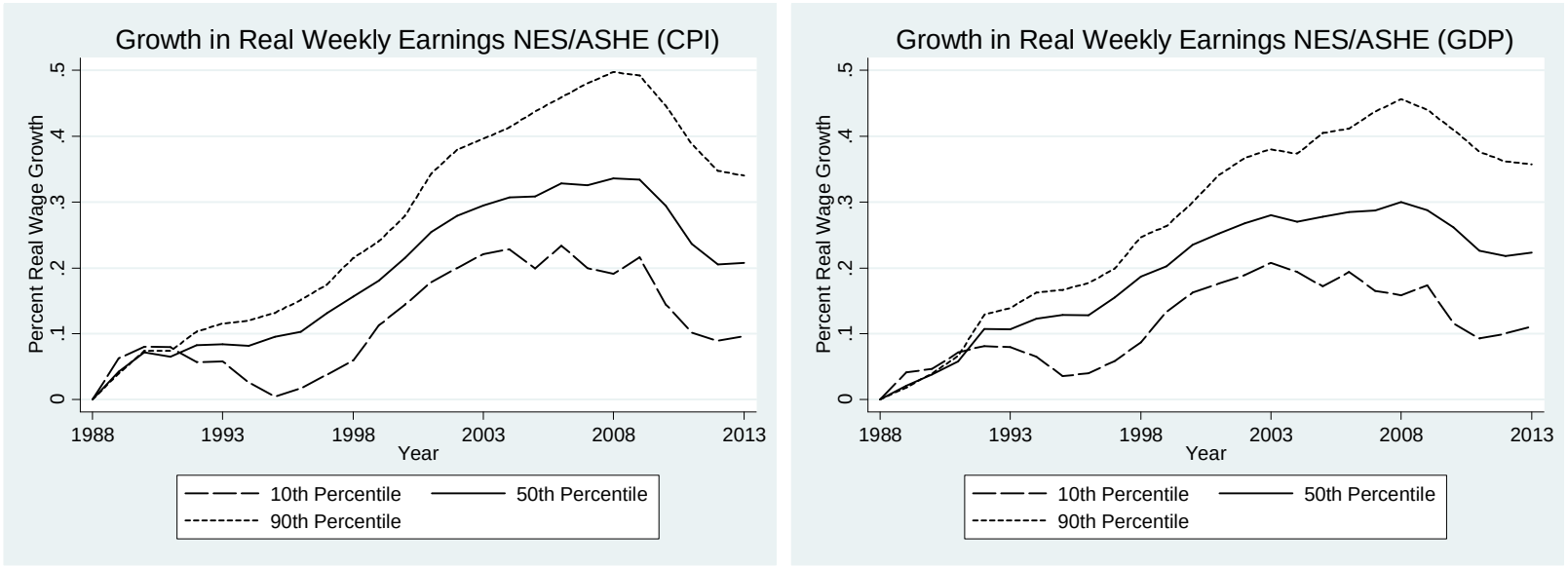
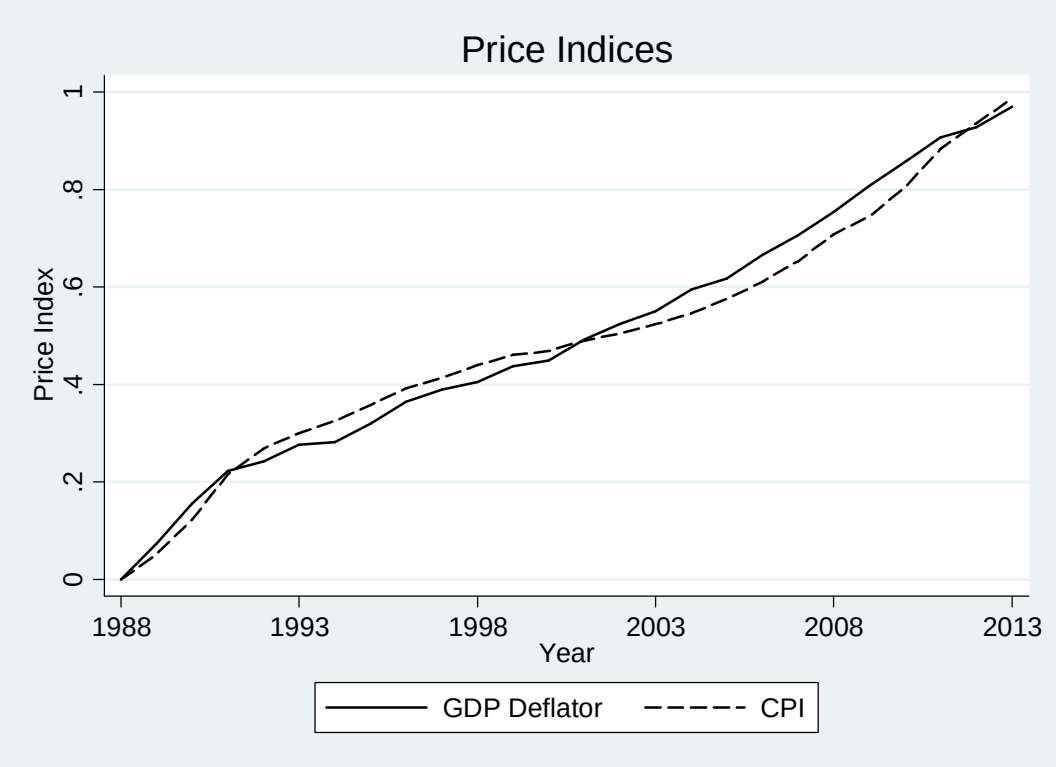
Figure 1:
Real Wage Growth at the 10th, 50th and 90th Percentiles, Weekly Wages, 1988-2013



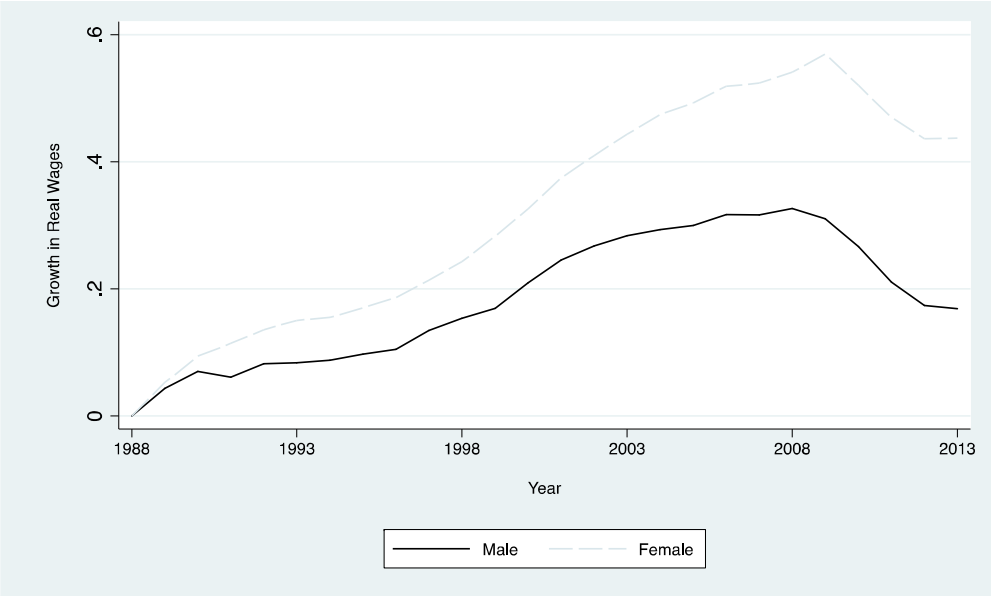
Notes: From New Earnings Survey/Annual Survey of Hours and Earnings. Weekly earnings, CPI deflator (left Figure) and GDP deflator (right Figure).

Figure 2: Alternative Price Measures, 1988-2013



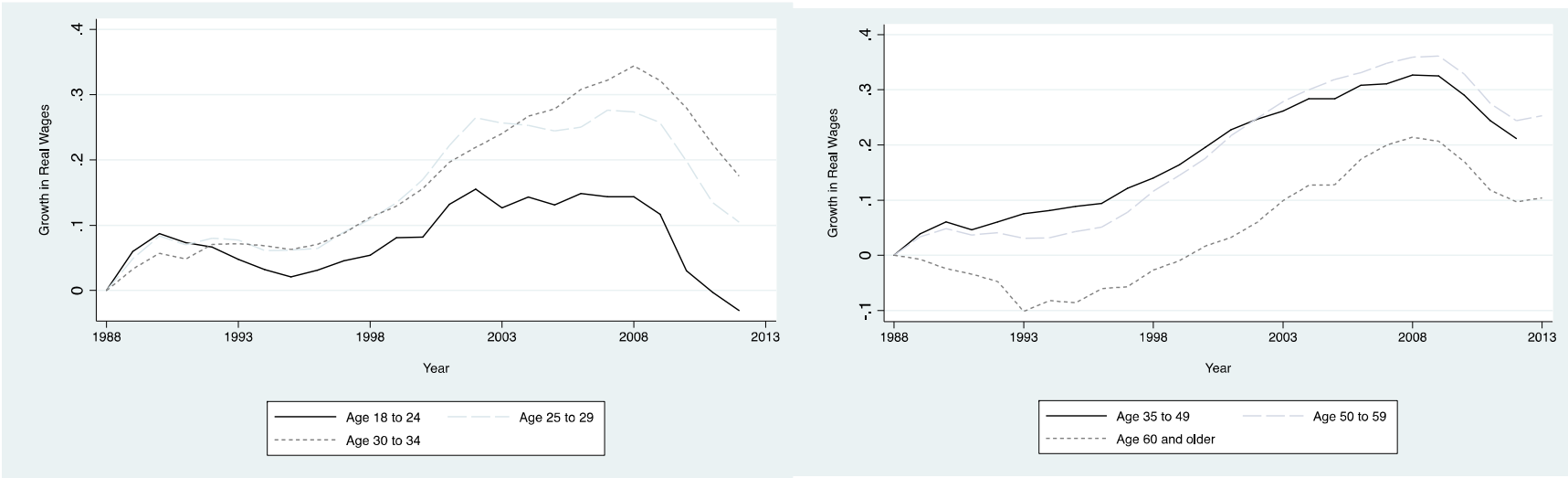
Notes: From ONS.

Figure 3: Median Real Weekly Wages for Men and Women, 1988-2013



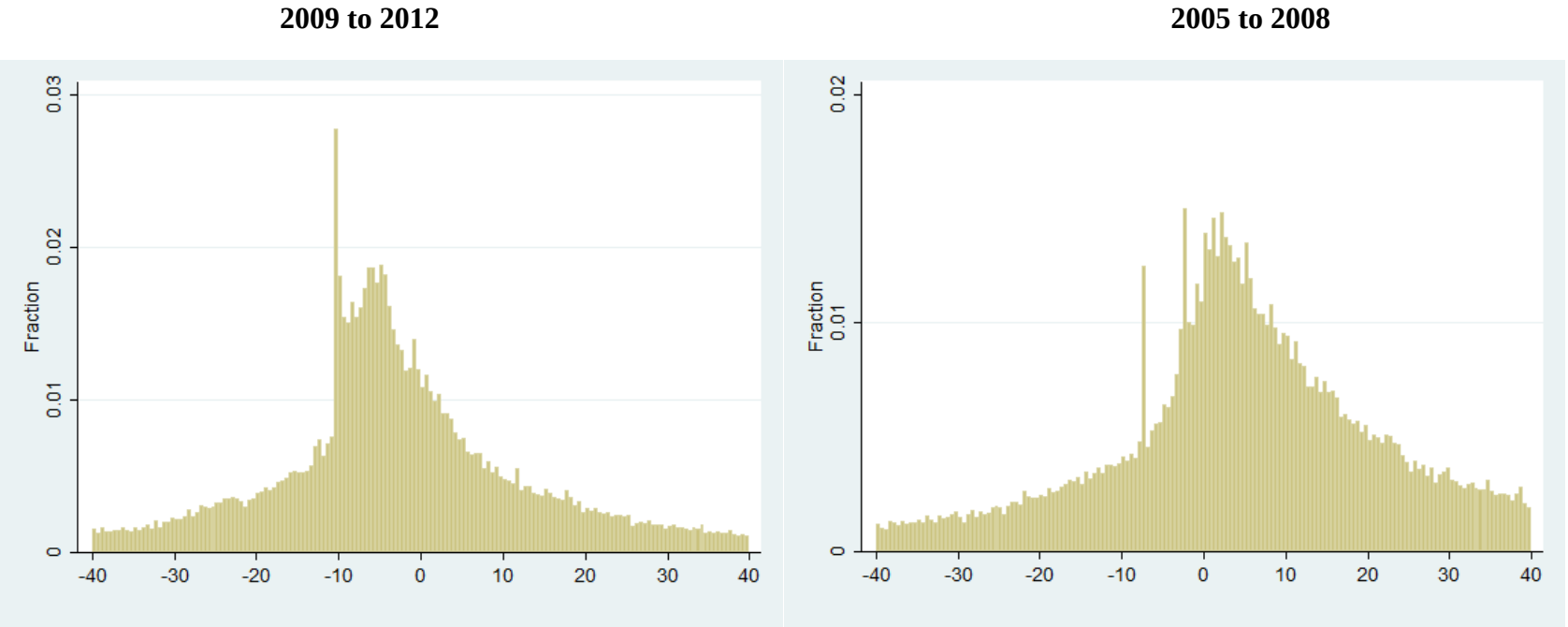
Notes: From New Earnings Survey/Annual Survey of Hours and Earnings. Weekly earnings, CPI deflator.

Figure 4: Median Real Weekly Wages by Age Group, 1988-2013



Notes: From New Earnings Survey/Annual Survey of Hours and Earnings. Weekly earnings, CPI deflator.

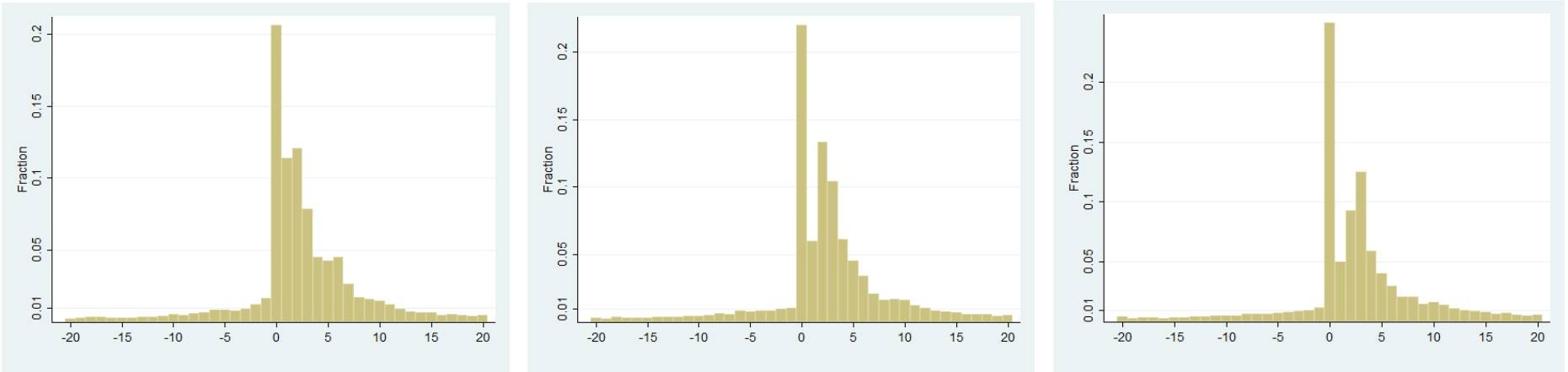
Figure 5: Change in Individual Real Weekly Pay, ASHE 2005 to 2012



Notes: From New Earnings Survey/Annual Survey of Hours and Earnings. Weekly earnings, CPI deflator, for those in continuously in employment.

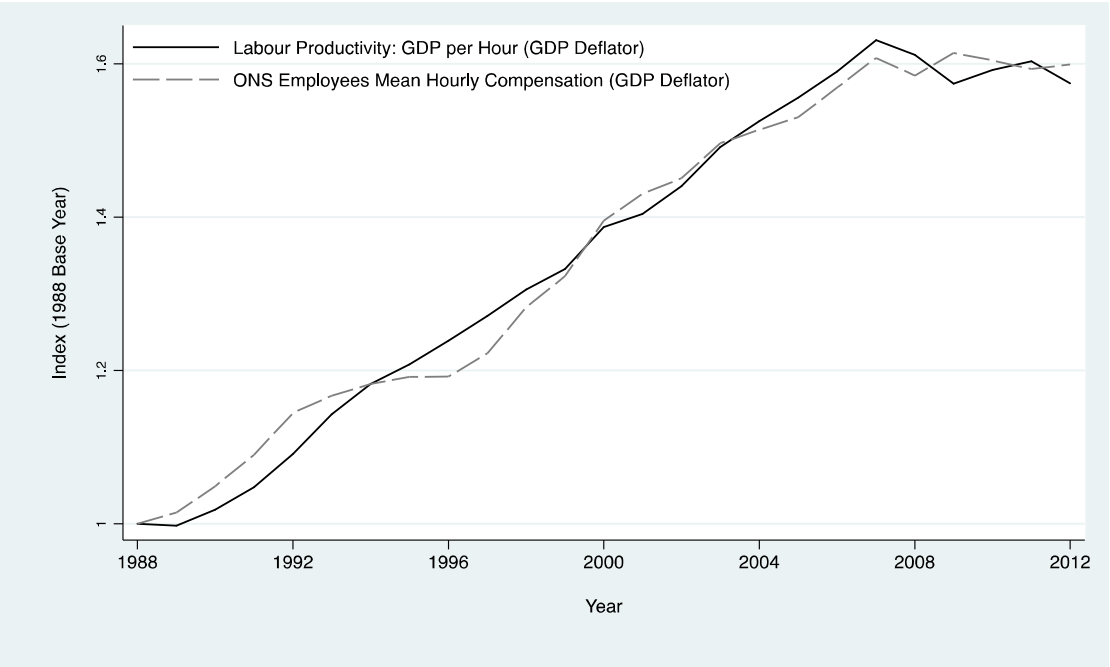
Figure 6: Yearly Changes in Nominal Basic Hourly Earnings for Workers in the Same Job, ASHE

2009 to 2010 **2010 to 2011** **2011 to 2012**



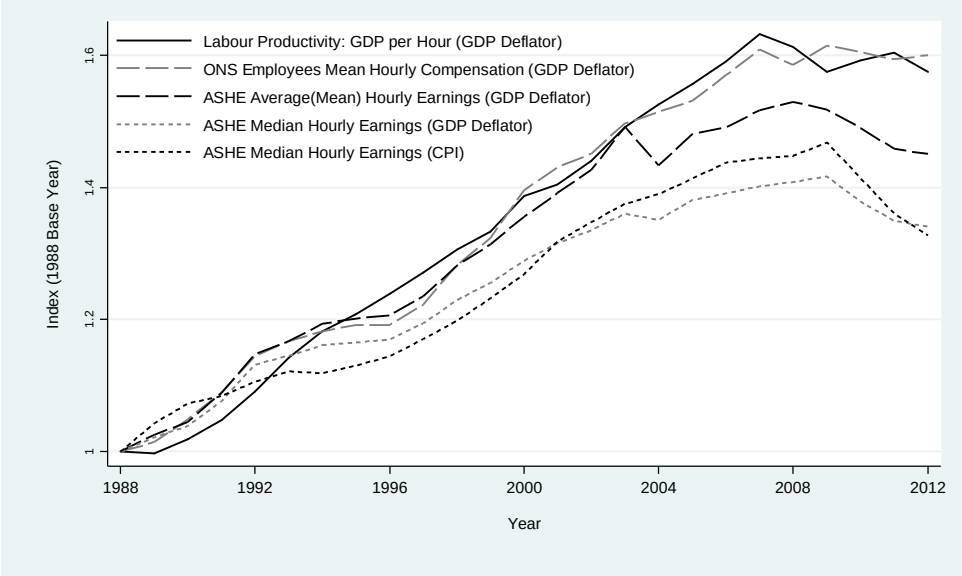
Notes: From New Earnings Survey/Annual Survey of Hours and Earnings. Weekly earnings, CPI deflator, for those in continuously in employment.

Figure 7: Labour Productivity and Annual Compensation, 1988 to 2012



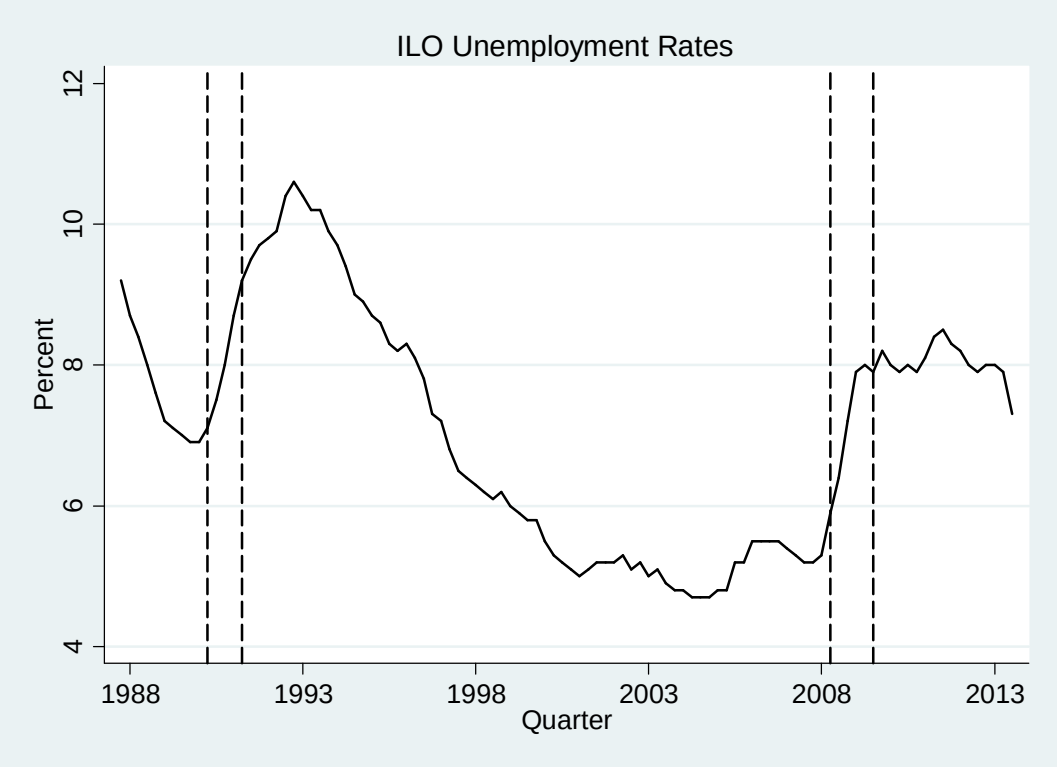
Notes: From ONS.

Figure 8: Labour Productivity, Annual Compensation, Mean and Median Wages, 1988-2012



Notes: From ONS and New Earnings Survey/Annual Survey of Hours and Earnings..

Figure 9: ILO Unemployment Rates, 1988-2013



Notes: Quarterly data from ONS. ILO Unemployment Rates for 16+ (seasonally adjusted). Vertical dashed lines show recession quarters.

Table 1: The Rise and Fall of Real Wages, 1988 to 2013

	Level April (or Q2) 2013	Real Per Annum Growth 1988-2002 (CPI)	Real Per Annum Growth 2002- 2008 (CPI)	Real Per Annum Growth 2008- 2013 (CPI)	Latest Annual Growth (CPI)
Average Weekly Earnings					
ONS Average (Mean)* Weekly Earnings	484	2.40	1.88	-1.34	-1.2 (3 months to Nov)
ASHE Average (Mean) Weekly Earnings	486.1	2.20	1.01	-2.21	-0.22 (April)
LFS Average (Mean) Weekly Earnings**	479.1	2.36	1.87	-1.40	-1.90 (Q2 & Q3)
ASHE Average (Mean) Weekly Basic Earnings	459.99	2.51	1.39	-2.02	-0.24 (April)
Median Weekly Earnings					
ASHE Median Weekly Earnings	402.14	1.78	0.73	-1.99	0.19 (April)
LFS Median Weekly Earnings	393	1.87	1.65	-1.12	-1.39 (Q2 & Q3)
ASHE Median Weekly Basic Earnings***	375.42	2.25	1.09	-1.85	0.16 (April)
Average Hourly Earnings					
ASHE Average (Mean) Hourly Earnings	14.26	2.64	1.51	-1.86	-0.34 (April)
LFS Average (Mean) Hourly Earnings	13.68	2.18	1.98	-1.06	-1.78 (Q2 & Q3)
Median Hourly Earnings					
ASHE Median Hourly Earnings	11.12	2.16	1.21	-1.6	0.56 (April)
LFS Median Hourly Earnings	11	1.93	1.65	-0.78	-0.02 (Q2 & Q3)
Annual Earnings					
ASHE Average (Mean) Annual Earnings****	26683.65		1.62	-2.77	-0.82
ASHE Median Annual Earnings	21571.45		0.87	-2.29	-0.53

Notes:

* The figures on ONS Average Weekly Earnings (AWE) from year 1988 to 1999 are ONS estimates using information on the Average Earnings Index (AEI) as the ONS Average Weekly Earnings series is only available from January 2000. The estimated series is considered to be comparable to the published AWE.

**The level for LFS refers to the 2nd Quarter of 2013 (April to June). LFS wages are yearly averages constructed using all LFS quarters (waves 1 and 5) for columns 2 and 3. From 2009 to 2013 growth for LFS excludes the fourth quarter, as there is no information available for the last quarter of 2013. The latest Annual growth refers to wages for the 2nd and 3rd Quarter of 2012 to 2nd and 3rd Quarter of 2013.

*** ASHE Basic Earnings includes other payments. Table 3 refers to "Real Per Annum Growth from 2005 to 2008" due to a change in definition in 2005.

****Annual Earnings are only available in ASHE from 1996 and just represent employees in the same job for more than a year.

Table 2:
Regional Median Real Weekly Wages and Unemployment (CPI), 1988-2012

	1988-2002	2003-2012	Change Between 1988-2002 and 2003-2012
A. Trend Specification			
ΔLog(Unemployment Rate[t])	0.005	-0.012	-0.018
	(0.011)	(0.018)	(0.021)
Log(Unemployment Rate[t-1])	-0.077	-0.124	-0.047
	(0.010)	(0.019)	(0.021)
Trend	0.007	0.003	-0.005
	(0.002)	(0.002)	(0.003)
Region Dummies	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes
R-Squared	0.985	0.970	0.984
Sample Size	165	110	275
B. Year Dummies Specification			
ΔLog(Unemployment Rate[t])	-0.014	-0.015	-0.001
	(0.011)	(0.013)	(0.016)
Log(Unemployment Rate[t-1])	-0.017	-0.054	-0.036
	(0.009)	(0.013)	(0.016)
Region Dummies	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes
R-Squared	0.994	0.993	0.995
Sample Size	165	110	275

Notes: Robust standard errors in parentheses. The time varying regional controls are from the Labour Force Survey and are the proportion with a degree, female, young and white in the regional workforce.

Appendix

Table A1: Price Indices

	Per Annum Growth 1988-2002	Per Annum Growth 2002-2008	Per Annum Growth 2008- 2013
CPI	2.99	2.14	3.08
RPI	3.70	3.42	2.96
GDP Deflator	3.08	2.37	2.36
RPIJ		3.05	2.48
CPIH		2.30	3.04

Notes: Source ONS published figures. The Consumer Price Index (CPI) and the Retail Price Index (RPI) are the two main measures of consumer prices produced by ONS. The RPI and CPI measures differ in the methodology used for their calculation and also the CPI does not include housing costs for owner occupiers. The CPIH and the RPIJ measures aim at overcoming these two differences between CPI and RPI: the CPIH includes owner occupiers' housing costs and is available from 2005; and the RPIJ covers the same basket of goods as the RPI using a methodology similar to that of the CPI and is available from 1997. The GDP Deflator is the deflator for the Gross Domestic Product.

Table A2: The Rise and Fall of Real Wages 1988-2013 (GDP Deflator)

	Level April 2013	Real Per Annum Growth 1988-2002 (GDP deflator)	Real Per Annum Growth 2002- 2008 (GDP Deflator)	Real Per Annum Growth 2008- 2013 (GDP Deflator)	Latest Annual Growth (GDP Deflator)
Average Weekly earnings					
ONS Average (Mean) Weekly Earnings	484	2.32	1.56	-0.53	-1.76 (3 months to Sep)
ASHE Average (Mean) Weekly Earnings	486.1	2.13	0.7	-1.42	0.02 (April)
LFS Average (Mean) Weekly Earnings	479.1	2.19	1.52	-0.68	-1.59 (Q2 & Q3)
ASHE Average (Mean) Weekly Basic Earnings	459.03	2.45	1.24	-1.23	0 (April)
Median Weekly Earnings					
ASHE Median Weekly Earnings	402.14	1.72	0.41	-1.20	0.43 (April)
LFS Median Weekly Earnings	393	1.71	1.30	-0.40	-1.08 (Q2 & Q3)
ASHE Median Weekly Basic Earnings	375.42	2.18	0.94	-1.06	0.39 (April)
Average Hourly Earnings					
ASHE Average (Mean) Hourly Earnings	14.26	2.58	1.20	-1.07	-0.11
LFS Average (Mean) Hourly Earnings*	13.68	2.01	1.62	-0.34	-1.46 (Q2 & Q3)
Median Hourly Earnings					
ASHE Median Hourly Earnings	11.12	2.09	0.9	-0.81	0.80
LFS Median Hourly Earnings	11	1.78	1.51	-0.06	0.30 (Q2 & Q3)
Annual Earnings					
ASHE Average (Mean) Annual Earnings	26683.65		1.30	-1.98	-0.59
ASHE Median Annual Earnings	21571.45		0.56	-1.05	-0.3

Notes: As for Table 1.

Table A3: Regional Median Real Weekly Wages and Unemployment (GDP Deflator), 1988-2012

	1988-2002	2003-2012	Change Between 1988-2002 and 2003-2012
Trend Specification			
ΔLog(Unemployment Rate[t])	-0.011	0.004	0.015
	(0.008)	(0.012)	(0.014)
Log(Unemployment Rate[t-1])	-0.021	-0.079	-0.058
	(0.007)	(0.013)	(0.014)
Trend	0.010	0.002	-0.008
	(0.001)	(0.001)	(0.002)
Region Dummies	Yes	Yes	Yes
Regional Controls	Yes	Yes	Yes
R-Squared	0.993	0.986	0.992
Sample Size	165	110	275

Notes: As for Table 2.