

An Examination of Falling Real Wages, 2010 - 2013

Author Name(s): **Ciaren Taylor, Andrew Jowett and Michael Hardie. Office for National Statistics**

Abstract

Recent ONS publications have noted that households' real wages have been falling following the 2008-09 economic downturn. Nominal wage growth below the rate of price inflation has resulted in real wages falling for the longest sustained period since at least 1964. This trend is robust to several possible measures of the real wage. This article considers three influences on the behaviour of real wages during this period: changes in hours worked; the impact of productivity changes (taking account of the real wage 'wedges' between what an employer pays and what an employee receives); and changes in the composition of the workforce - although these are not the only relevant factors. Productivity and the 'product wage'⁽¹⁾ display similar behaviour, suggesting that falling productivity may be exerting downwards pressure on real wages. Falling working hours, changes in workforce composition, and increases in non-wage costs at the time of the economic downturn in 2008 and 2009 may also have acted to reduce real wage growth. Some of these factors do not appear to explain the continuing reduction in real earnings since 2010, which may therefore be driven by the continuing weakness in productivity. Note 1. The product wage is a measure of the wage paid to workers in terms of what they produce (e.g. for workers producing widgets, it is a measure of their wage in terms of widgets). Statistically, this measure is produced by deflating a measure of nominal wages by an output price index. In this article the nominal wage measure used is average weekly earnings (AWE), while the price index is the GDP deflator.

Acknowledgements

1. The authors would like to acknowledge input from Fred Foxtton, Sami Hamroush, David Howell and Andrew Banks. Comments from Phil Wales, Zuhaib Khan and Tanya Flower are also acknowledged.

Introduction

Economic activity in the UK fell considerably during the 2008-09 economic downturn. This put downward pressure on nominal wage rises at a time when price inflation picked up. Real wages have therefore fallen. For example, even if a person's nominal wage remains unchanged, the effect

of inflation implies that their income now buys fewer goods and services, resulting in a fall in their real wage.

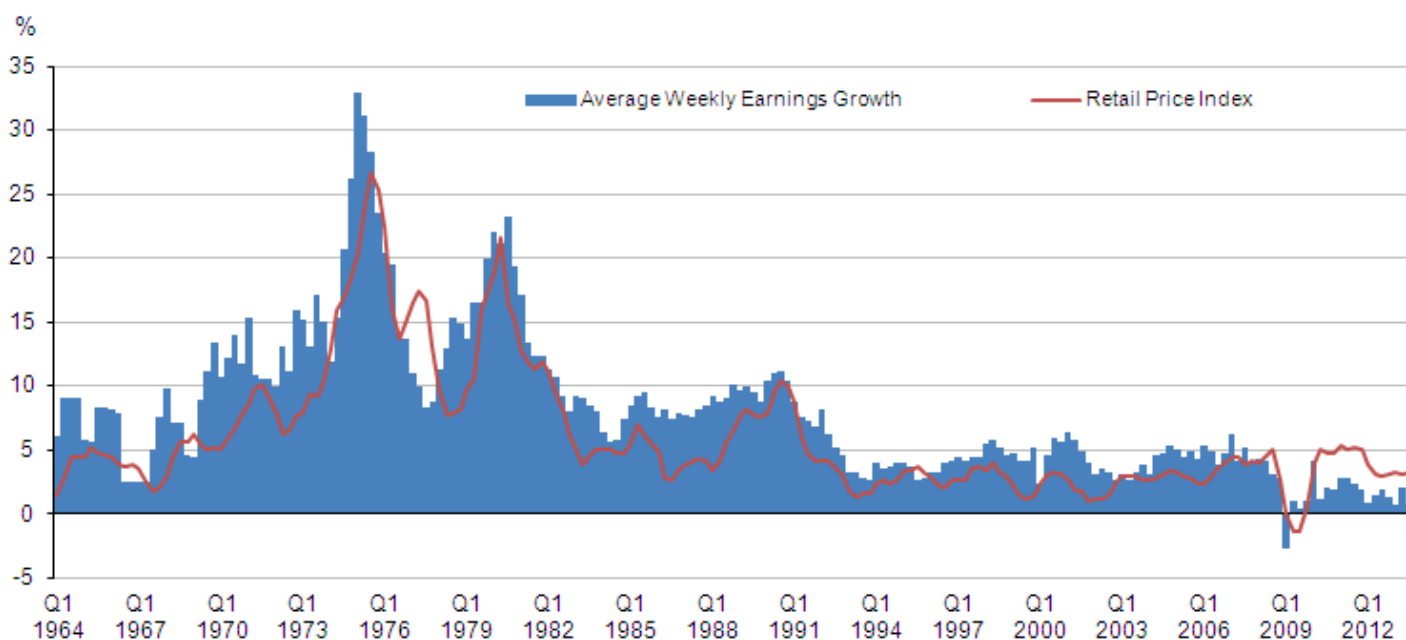
This article outlines the historical interaction between nominal wages, inflation, and the resulting trends in real wages. The robustness of the fall in real wages is demonstrated by examining a variety of ONS measures of real wages, which all show falls since 2010. The article then explores some of the factors that may have affected real wages over the last few years.

Long-run trends in real wage growth

The long-term relationship between inflation as measured by the retail prices index (RPI)¹ and nominal wage growth as measured by average weekly earnings² (AWE) can be seen in Figure 1. The annual RPI inflation rate fluctuated more widely prior to the 1990s, with occasionally large peaks in inflation. Nominal wage growth has broadly tracked inflation over this period, albeit with a slight lag.

Inflation has been lower and more stable since the early 1990s – annual inflation averaged 3.7% in that decade compared with 12.6% in the 1970s and 7.4% in the 1980s. Wage growth also moderated over this period in response to lower and more stable rates of price change.

Figure 1: Nominal wage growth and RPI inflation, Q1 1964 to Q3 2013, per cent change on the same quarter a year ago



Source: Office for National Statistics

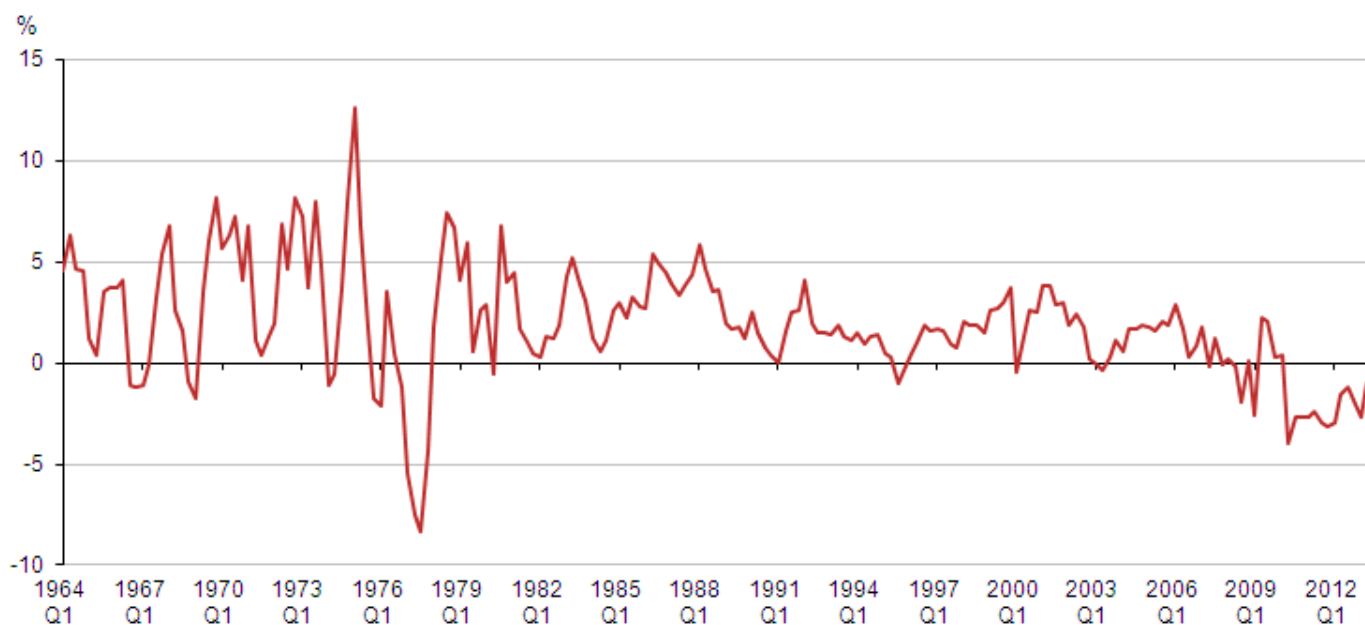
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Since the 2008-09 economic downturn, the RPI has grown faster than in the 1990s and 2000s, while economic conditions have slowed the rate of nominal wage growth, causing a break from the relationship previously experienced. The resulting movements in real wage growth are shown in Figure 2.

Figure 2: Real wage growth since Q1 1964, Average Weekly Earnings deflated by RPI, per cent change on the same quarter a year ago



Source: Office for National Statistics

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Real wages growth was volatile during the 1970s when inflation rates were high and variable. Since then growth has fluctuated less, but has been on a broadly downwards trend. There appear to have been small step changes down in real wages growth occurring around the end of each decade, perhaps in response to the UK or global recessions which occurred at those times. Annual real wage growth averaged 2.9% in the 1970s and 1980s, then roughly halved to 1.5% in the 1990s. The rate slowed again to an average of 1.2% in the 2000s, and real wages fell by 2.2% per annum between Q1 2010 and Q2 2013. The chart also shows that the recent episode is the longest sustained period of falling real wages in the UK on record.

Notes

1. It is necessary to use RPI as a consistent series is available over a long time period. ONS considers the consumer prices index (CPI) to be the preferred measure of inflation, but data are only available from 1989.
2. Unless otherwise stated, 'AWE' in this article refers to AWE total pay (including bonuses).

Recent trends in real wage growth

The conclusion that real wages have been falling following the economic downturn is robust to the choice of definition of real wages. Several different measures of the real wage can be compiled from ONS data, derived by using different combinations of prices and earnings.

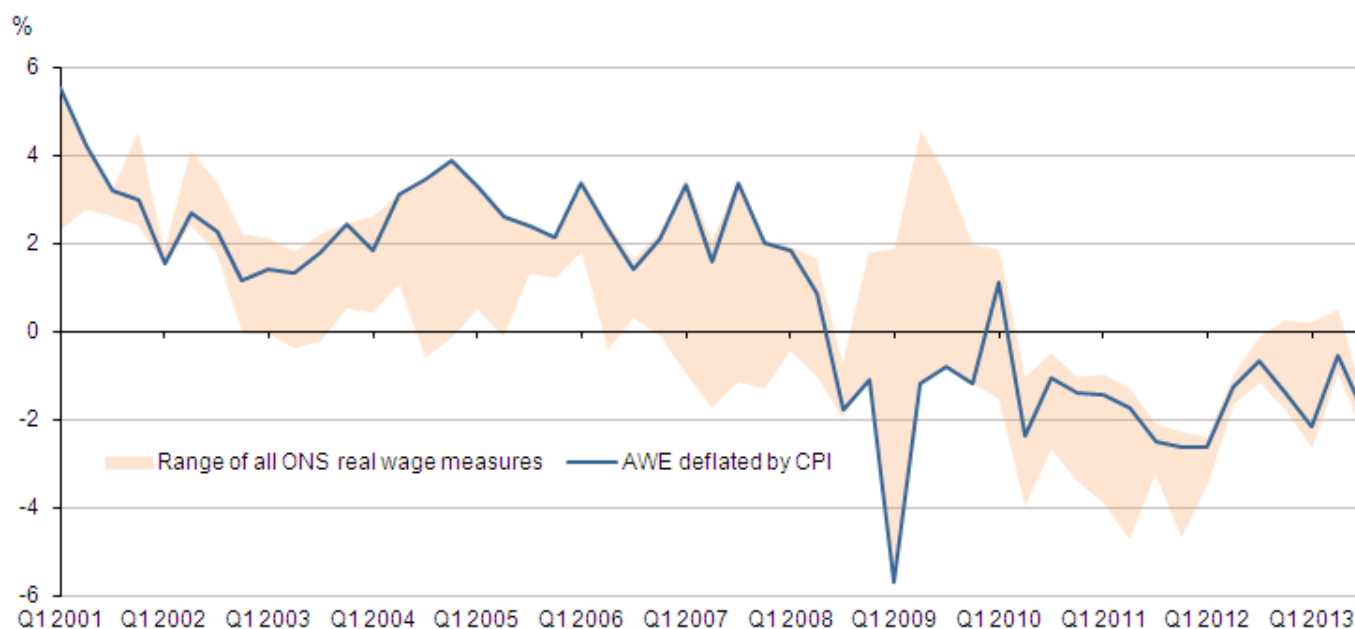
Information on wages is collected through separate surveys of households and businesses¹. The measures of wages are:

- Average Weekly Earnings (AWE)
- Annual Survey of Hours and Earnings (ASHE)
- Labour Force Survey (LFS) gross weekly earnings
- Average Earnings Index (AEI) (now discontinued)

ONS also produces a number of different measures of price inflation. Inflation usually refers to the change in a price index in one period compared with the same period a year ago to produce a figure for the annual rate of price inflation². The consumer prices index (CPI) is the commonly accepted headline measure of price inflation and is used for inflation targeting in the conduct of monetary policy by the Bank of England. However, the retail prices index (RPI) has a longer history as a measure of inflation than the CPI, which was introduced in 1997. But the outcome of a recent assessment against the Code of Practice for Official Statistics is that the RPI is no longer categorised as a National Statistic.

The measure of real wages employed in this article is AWE deflated by CPI inflation (AWE-CPI). Figure 3 compares the trends observed in annual real AWE growth since Q1 2001, with the swathe showing the range of other estimates.

Figure 3: AWE real wage growth and the range of real wage growth estimates using other ONS wages and price series[3] , Q1 2001 to Q3 2013, per cent change on the same quarter a year ago



Source: Office for National Statistics

Notes:

1. The wages measures include AWE, AEI, LFS wages, and ASHE. The price measures include CPI, RPI, and CPIH.

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Annual real wage growth was 2.6% on average between Q1 2001 and Q4 2006 according to the AWE-CPI measure. During this period most other real wage measures also showed stable, positive growth. However, there are points at which some measures briefly turn negative, mainly due to the divergence between RPI and CPI inflation - the RPI annual inflation rate was higher than its CPI counterpart for most of the period 2003-2008. When RPI is used to adjust for price changes over this period instead of CPI, annual real wage growth is 1.2 percentage points lower on average.

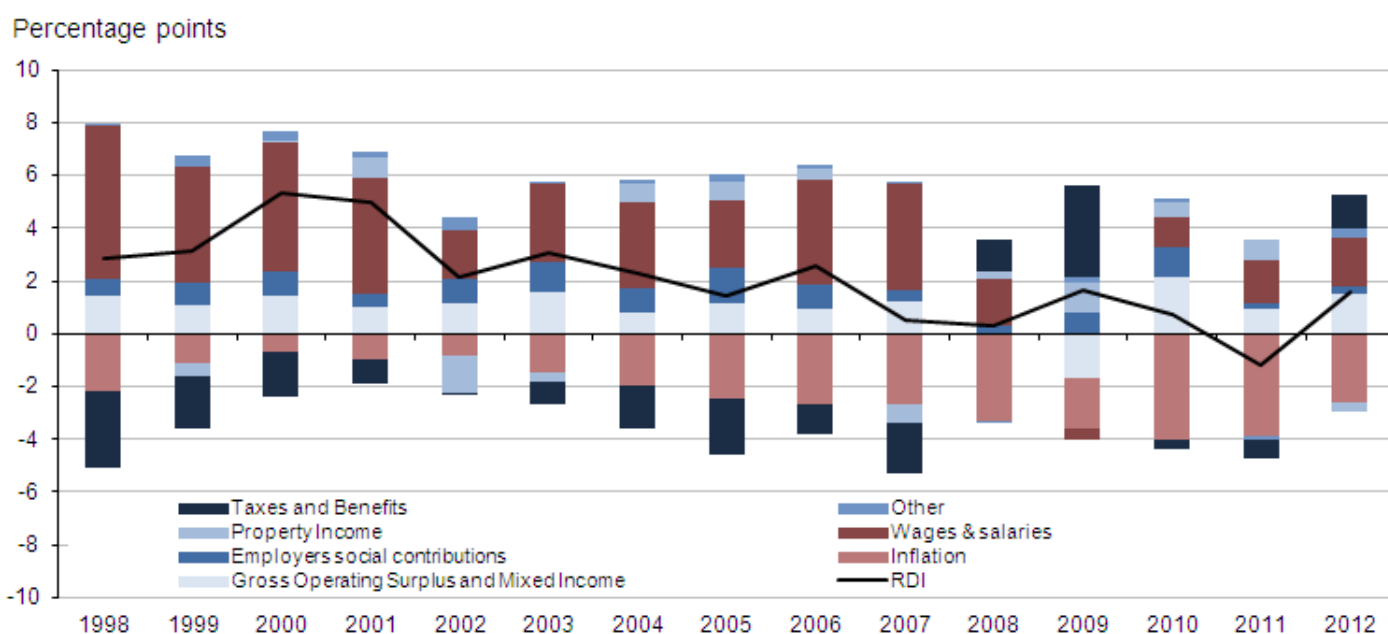
The range of estimates for real wage growth increased during the 2008-2009 economic downturn. This can mainly be attributed to two factors - unusual movements in bonuses, and a divergence between the CPI and RPI measures of inflation. In Q1 2009, for instance, nominal wages fell by 2.8% on a year earlier according to AWE when bonuses are included, but rose by 2.5% when bonuses are excluded. The inclusion of these bonus payments, in large part, explains the real wage measures at the lower end of the swathe during the downturn. In addition to this, between Q1 and Q3 2009, the RPI measure of inflation turned negative and therefore had a positive impact on real wage growth measures that use it to adjust for price change. This is largely accounted for by a fall in interest rates, which consequently reduced aggregate mortgage payments, and accounts for those measures showing higher real wage growth during the economic downturn.

Following the downturn, real wages fell by an average of 1.6% a year between Q2 2010 and Q2 2013 according to the AWE-CPI measure, with almost all other measures confirming the negative rates of growth over this period. Between Q4 2012 and Q2 2013, LFS wages data deflated by CPI and CPIH respectively displayed slightly positive growth (less than or equal to 0.5% annually), as did 2013 ASHE data. LFS is regarded as an inferior source for data on earnings growth because it is known to underestimate the level of earnings due to the inclusion of proxy responses³. The ASHE figures relate to Q2 2013 when wages growth was swollen by later than usual bonus payments.

All series which reported in Q3 2013 showed wages falling by more than 1.5% on the same quarter a year ago, making it difficult to conclude that there has yet been a break from the trend of falling real wage growth.

The discussion here of the behaviour of real wages is quite distinct from analysis of changes in living standards, as for instance measured by ONS data on real household disposable income (RHDI). While income from wages and salaries is an important component of household disposable income, there are several other factors that contribute to changes in living standards, as shown in Figure 4. In each year since 2008, the negative impact of real wages and salaries growth can be seen by comparing the size of the smaller (mostly upward) dark red bars in Figure 4 with that of the larger, downward, pink bars which represent the impact of inflation. During 2009, for example, changes to taxes & benefits, property income, and employers' social contributions contributed positively to household disposable income growth despite falling real wages.

Figure 4: Contributions to annual RHDI growth, 1998 to 2012



Source: Office for National Statistics

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Notes

1. Table A1 in the Annex provides details on these measures (along with others used in this article) and outlines the differences between them in terms of geographical coverage, frequency, measurement of earnings and sample size. The table also indicates some of the limitations of each series.
2. A comprehensive explanation of the different ONS price indices can be found in [“A Tale of Many Price Indices”](#).
3. The wages measures include AWE, AEI, LFS wages, and ASHE. The price measures include CPI, RPI, and CPIH.
4. i.e. As bonuses are not mentioned explicitly in survey questions, responses vary as to whether or not they are included.

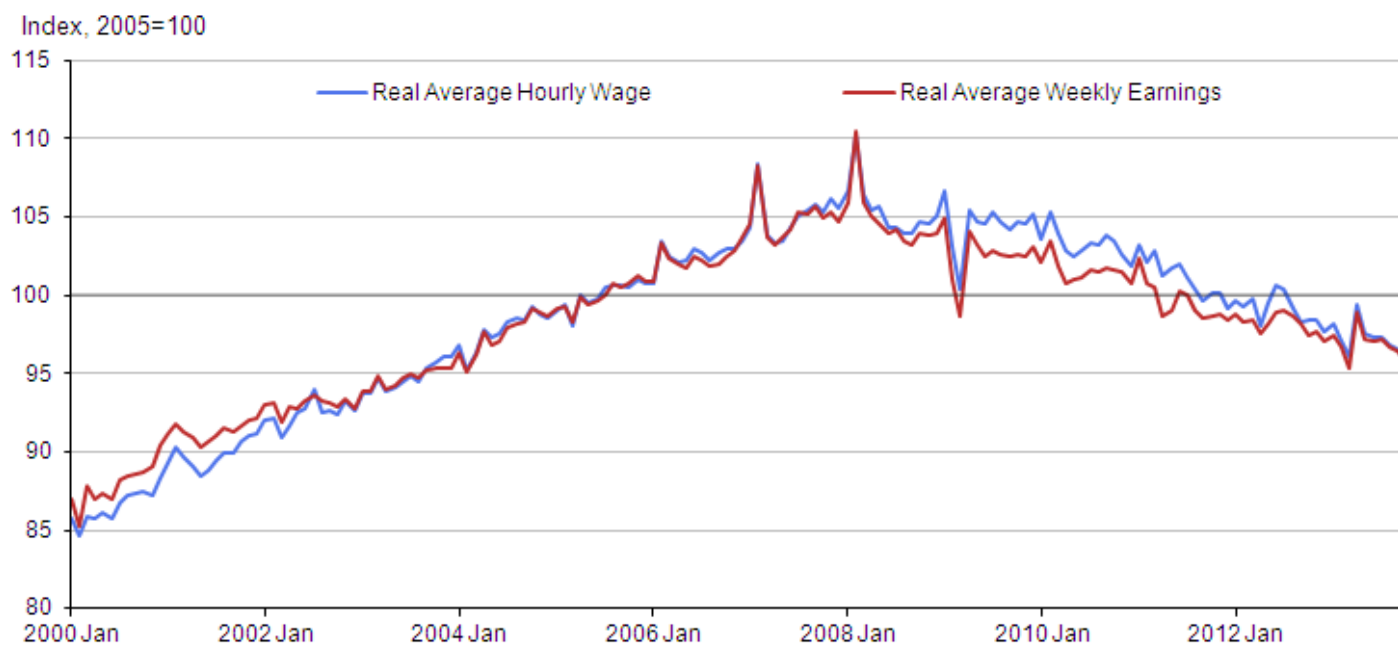
Possible explanations behind real wage trends in the UK

There are a number of factors which are influencing the recent trend of falling real wages. This article focuses on three of those factors: changes in hours worked; the impact of productivity changes (after taking account of the real wage ‘wedges’ between what an employer pays and what an employee receives); and changes in the composition of the workforce.

Hours worked

Changing working patterns, particularly the number of hours worked, since 2008 have had an impact on real average weekly earnings. Falling weekly hours worked have reduced weekly earnings during the downturn itself, but have put upward pressure on earnings growth in some later years.

Real hourly and weekly earnings increased at a similar rate between 2000 and 2007, as shown in Figure 5, suggesting that there was little overall impact from changes in hours worked. Since 2008 both series have been on a downward trend. Weekly earnings fell faster than hourly pay between 2008 and mid-2010, reflecting the drop in average weekly hours, with the gap being reversed subsequently as average hours recovered.

Figure 5: Real Average Weekly Earnings and Real Average Hourly Wage, index 2005=100

Source: Office for National Statistics

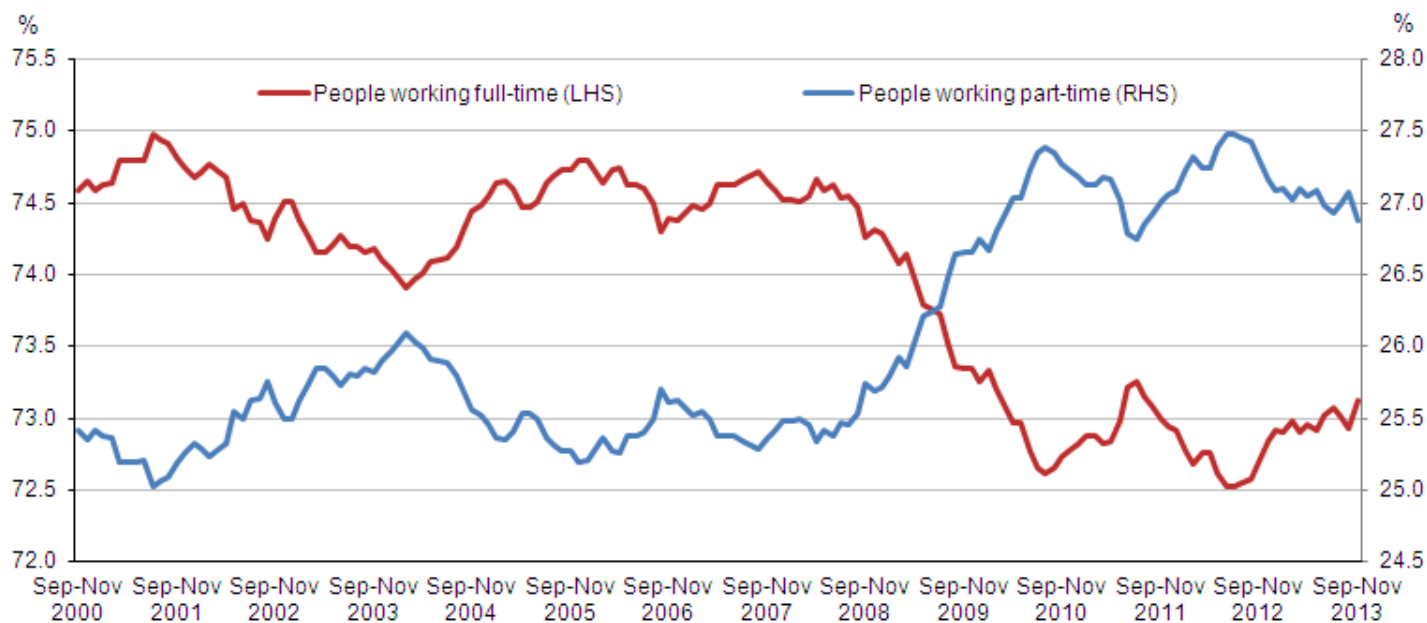
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One reason for the reduction in the average number of hours worked each week is the distribution between full and part time work, as shown in Figure 6. The percentage of people employed in full-time work fell from an average of 74.5% of the total number in employment between January 2000 and December 2008, to 73.0% during the period between January 2009 and November 2013.

Figure 6: Three month average for the percentage of people working full- and part-time, respectively, September-November 2000 to September-November 2013



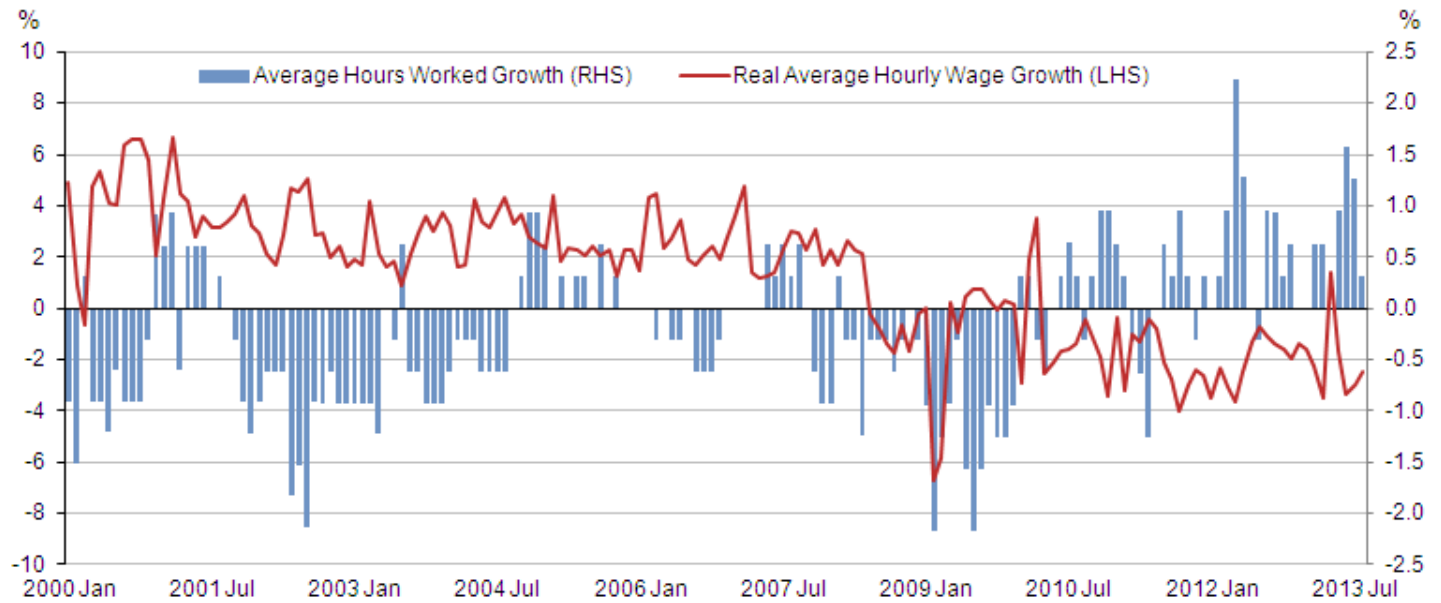
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Figure 7 shows annual growth in real average hourly wages compared with annual growth of average hours worked. Average hours worked fell year-on-year for much of the period between 2001 and 2004, but the impact on real weekly earnings was more than offset by increases by hourly wages over this period. The fall in average weekly hours worked over the period of the 2008-2009 downturn was accompanied by falling real hourly wages, producing a more pronounced fall in real weekly earnings. Since 2010, average hours worked has been increasing while the real hourly wage has been falling. The first of these put upward pressure on average weekly earnings, which consequently fell by less than hourly pay. Further analysis of the contributions to growth in hours worked can be found in the January edition of ONS's monthly [Economic Review](#).

Figure 7: Growth of average hours worked and real average hourly wages, per cent change on the same month a year ago, January 2000 to September 2013



Source: Office for National Statistics

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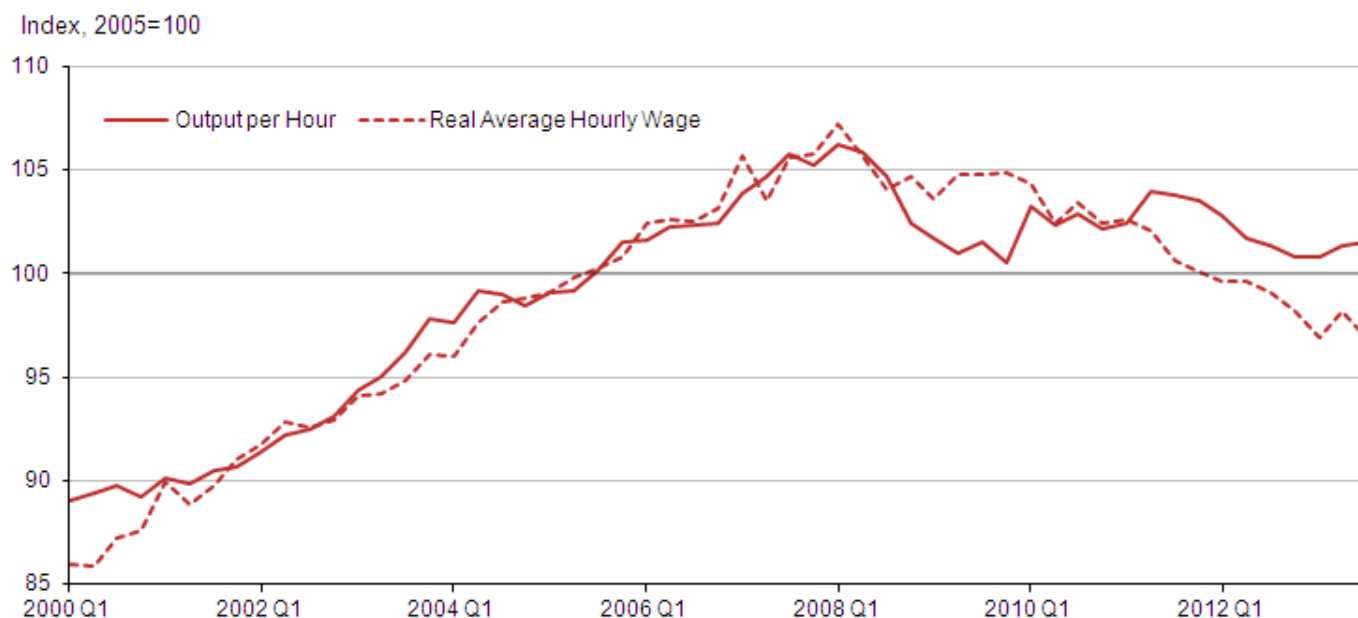
Productivity and “wedges”

Productivity, the product wage and the consumption wage

Economic theory indicates that the wage an employer pays an employee will be based on the productivity of the employee. So if a firm’s output falls, it will respond by reducing either the level of wages or the number of people employed in order to maintain its viability.

There is a clear relationship between productivity and real earnings in the period before 2008, but the picture is less clear in more recent years. Output per hour fell faster than real earnings during the economic downturn, and this was reversed since the end of 2009.

Figure 8: Real average hourly wages and output per hour, Q1 2001 to Q3 2013, indexed to 2005=100



Source: Office for National Statistics

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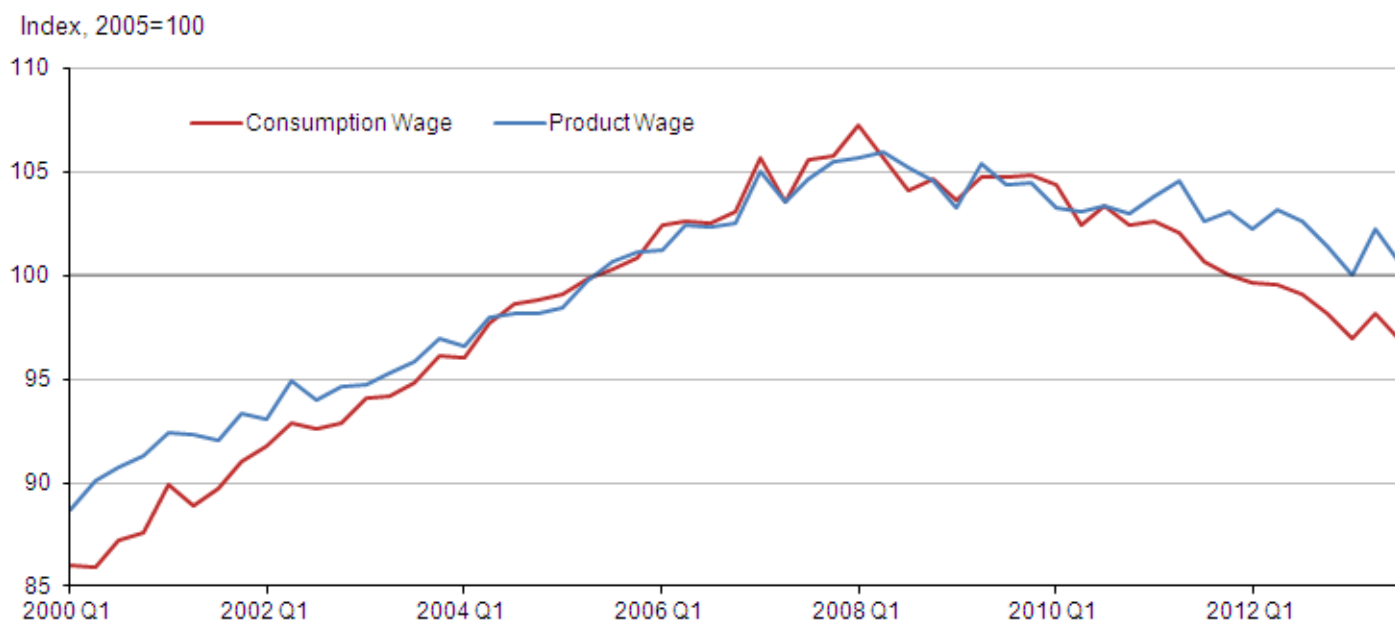
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The apparent partial breakdown in this relationship may in part be due to the divergence between growth in the 'consumption wage' and the 'product wage', shown in Figure 9.

- The consumption wage is an estimate of the real wage deflated using consumer prices. It therefore represents the real value of wages seen from an employee's perspective¹ in terms of the quantity of goods and services that their earnings will purchase.
- The product wage is a measure of the real wage paid to a worker expressed in terms of what that worker produces² (e.g. for a worker producing widgets, it is a measure of their wage in terms of widgets). The wage is therefore measured in relation to the price that the firm can obtain from selling its output.

The product wage has held up more strongly than the consumption wage since 2010, falling by 1% and 5.5% respectively between Q1 2010 and Q3 2013. This divergence, or 'wedge', between the two measures reflects differences between the rates of inflation captured by the GDP deflator and the CPI. The GDP deflator is a measure of domestically-generated inflation that excludes the direct impact of rising import prices. It has therefore grown more slowly than consumer price inflation since 2010, resulting in a smaller fall in the product wage. In other words, the cost of wages to the employer is perceived to have fallen by less than the value of those same wages to the employee.

Figure 9: Hourly product wages and hourly consumption wages, Q1 2001 to Q3 2013, Index 2005=100



Source: Office for National Statistics

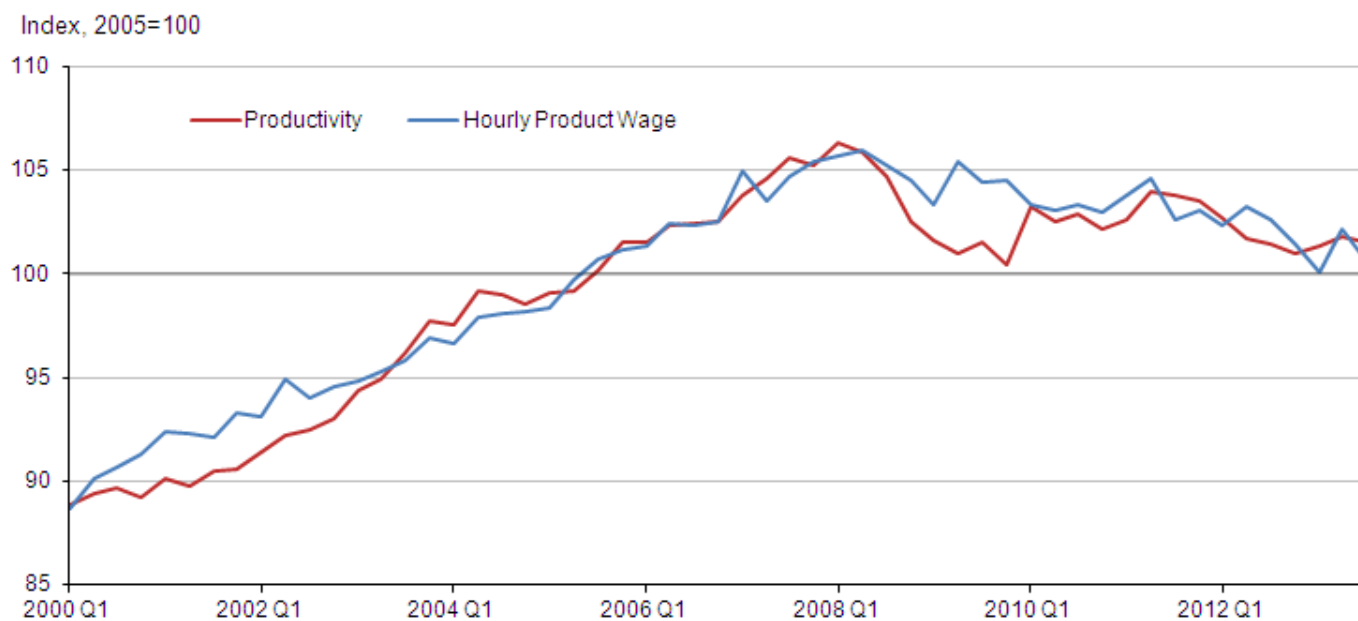
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As the product wage more accurately reflects the level of real wages from an employer's perspective, this measure of the wage should more appropriately display the relationship with productivity predicted by economic theory. Figure 10 suggests that the relationship holds over time, although there was a lag as real wages took time to catch up with the fall in productivity in 2008 and 2009.

Figure 10: Productivity (Output per hour) and product wages, Q1 2000 to Q3 2013, all measures indexed to 2005=100



Source: Office for National Statistics

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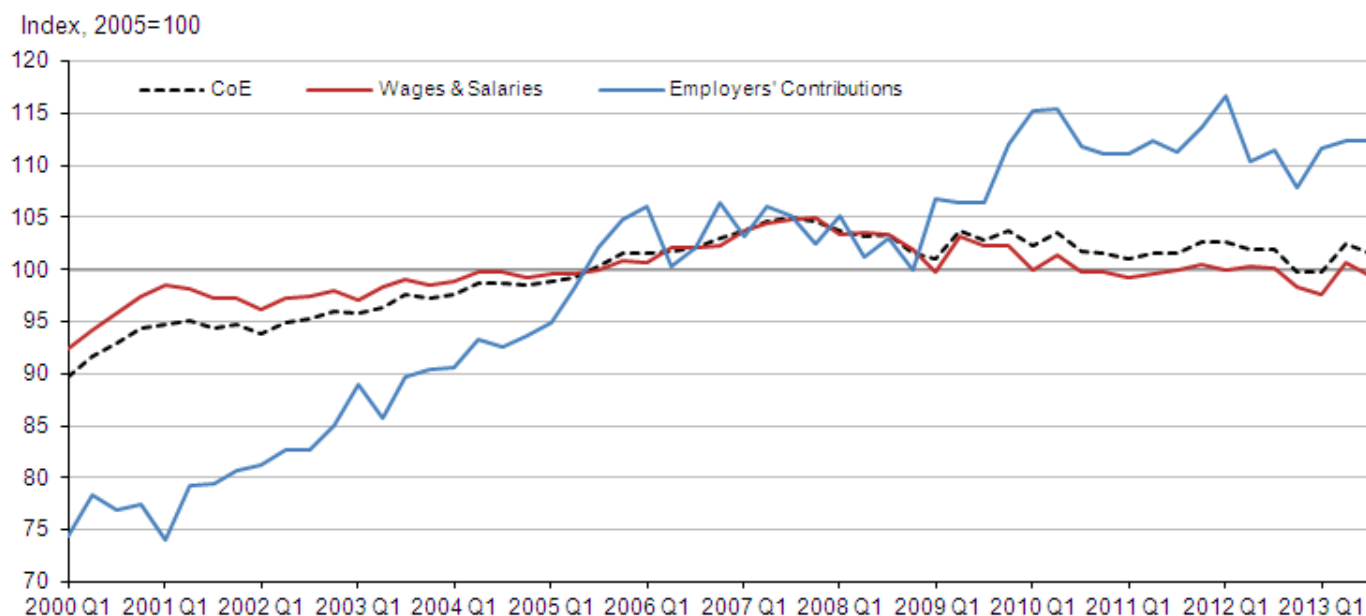
Non-wage costs

A further explanation for the deviation of real wages from productivity arises from another 'wedge', between the cost that a firm incurs for employing people and the amount that the employee receives in wages. This takes the form of additional non-wage costs over and above the wage and salary bill, and includes national insurance and pension contributions that are made by employers on behalf of their employees. If non-wage costs increase, then in the absence of a rise in productivity, firms will seek to reduce wage costs.

Non-wage costs have risen in real terms throughout much of the period since around 2001, although they stabilised between 2006 and 2009. The upward trend may reflect growing employer payments necessary to tackle pension fund deficits. Non-wage costs jumped sharply between 2009 and 2010, in part due to a rise in employers' national insurance contributions, and this may have contributed to the weakness in real wages during this period.

Figure 11 shows recent trends in real compensation of employees (CoE), which comprises both wages & salaries and employers' contributions.

Figure 11: Compensation of Employees, decomposed into wages and salaries and employers' contributions, deflated by the GDP deflator, Index 2005=100, Q1 2000 to Q3 2013



Source: Office for National Statistics

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Notes

1. Unless otherwise stated, the consumption wage is taken, in this article, as being synonymous with the term 'real wage'.
2. Statistically, this measure is produced by deflating a measure of nominal wages by an output price index. In this article the nominal wage measure is AWE, and the output price index is the GDP deflator.

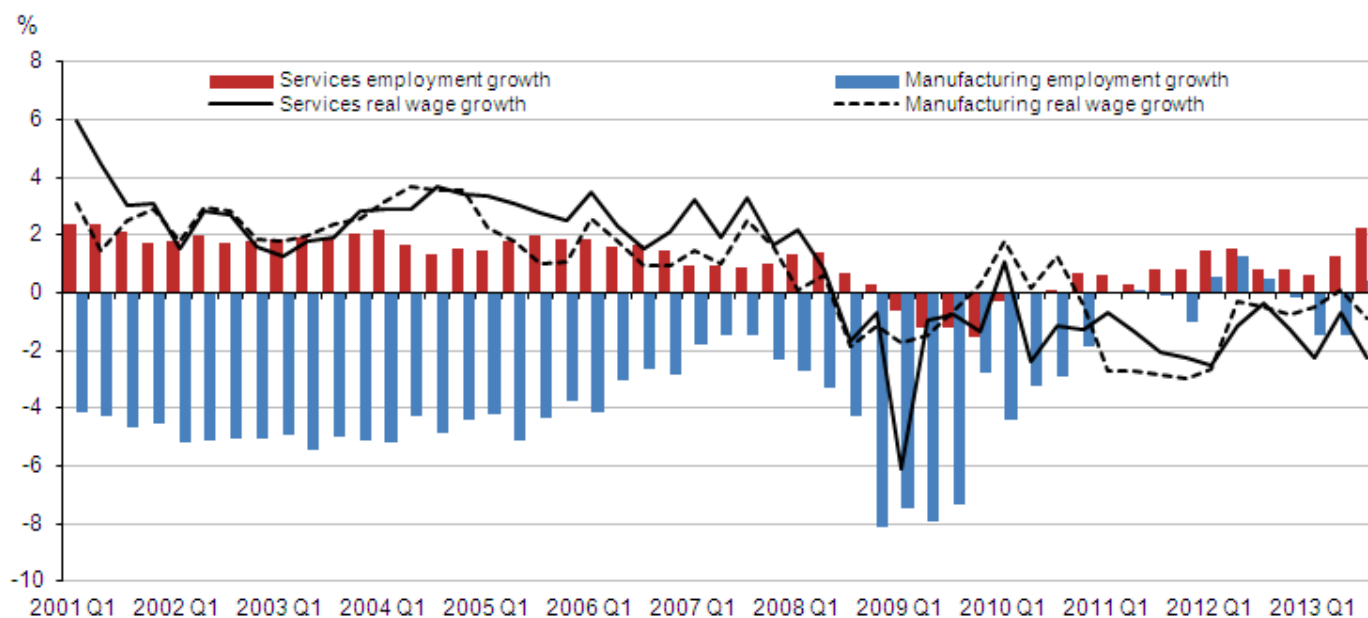
Changes in labour force composition by industry

ONS data also suggests that the changing composition of the UK workforce may have had an impact on real wages, particularly the shift from higher paid workers in the manufacturing sector towards lower paid services industries.

The average weekly nominal wage for a services worker was £437 in 2010, compared with £524 for a manufacturing worker. Therefore the transition of employment from manufacturing towards services between 2001 and 2010, shown in Figure 12, implies a downward effect on average weekly

earnings for the UK as a whole. Note that the broad trends in real wage growth for both sectors have been broadly similar.

Figure 12: Employment and real wage growth in the services and manufacturing industries, Q1 2001 to Q2 2013



Source: Office for National Statistics

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Manufacturing employment fell by an annual average of 4.5%, while services employment grew by 1.8%, between Q1 2001 and Q4 2006. Following this period, both manufacturing and services employment fell during and immediately after the 2008-2009 economic downturn, before a further shift in trend around the start of 2012. Both sectors have seen increased employment on average since 2012.

There have also been changes in the composition of the workforce within the services sector. As an example, the financial and insurances activities industry – which has relatively high levels of earnings – fell as a share of the workforce, while the real estate activities and administrative support service activities sector – which is on average lower paid – rose. See Table 1.

Table 1: Changing (%) composition of the workforce, comparing January 2001 to December 2008 with January 2009 to June 2010

	(£)	%	
		Average proportion of the workforce between:	
Industry	Average Nominal Wage in 2010	January 2001 and December 2008	January 2009 and June 2010
Financial & Insurance Activities	971	4.5	4.2
Real Estate Activities	471	1.2	1.6
Administrative & Support Service Activities	337	7.1	8.0

Table source: Office for National Statistics

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The aggregate effect of all such compositional changes can be quantified using AWE datasets available from ONS. These give average wage and employment weights for each individual industry (using a 24 sector breakdown of the economy) which can be used to decompose nominal AWE growth into the contributions from each industry's nominal wage levels, together with a 'compositional effect'. This aggregate compositional effect is shown in Figure 13.

Figure 13: Aggregate compositional effect on nominal wage growth between January 2001 and October 2013



Source: Office for National Statistics

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On the whole, the compositional effect has been relatively small. However since 2007, there has been a period where the impact was more substantial - a negative effect of up to 1.2 percentage points between January 2009 to June 2010 as employment shifted from higher-paid industries to lower-paid industries.

Conclusions

Real wages have been falling consistently since 2010, the longest such period since at least 1964. This observation is robust across a range of estimates of real earnings. The recent period appears to be the latest stage in a series of step-changes in annual real wage growth, usually taking place in response to an economic downturn - from an average of 2.9% the 1970s and 1980s, 1.5% in the 1990s, 1.2% in the 2000s, to -2.2% since Q1 2010. A number of factors may have contributed to this, although it seems likely that a key driver is the response to the fall in productivity in 2008 and 2009, and its subsequent weakness:

- Hours worked exerted downwards pressure on real wages growth during the downturn, but upwards pressure for much of the most recent period.

- A divergence between productivity and real wage growth since 2010 may be explained by different trends in the product and consumption wage causing a 'wedge'. Rising non-wage costs in 2010 may also have played a role.
- The composition of the workforce may account for a small negative effect on real wage growth between January 2009 and June 2010, but this was offset by the reverse effect in the following year.

Annex

Table A1: ONS wage and wage-related measures

Method	Frequency	Coverage	Included	Exclusions	Limitations	Survey Size
AWE (One measure of wages)	Monthly	GB	<ul style="list-style-type: none"> - Regular Pay - Overtime Pay - One-off bonus or commission payments are collected separately in the questionnaire 	<ul style="list-style-type: none"> - Self Employed - HM armed forces - Government-supported trainees - Employers' National Insurance Contributions - Contributions to pension schemes - Benefits in kind - Expenses - Redundancy payments - Signing-on fees - Stock options not paid through the payroll - Pay award arrears 	<ul style="list-style-type: none"> - Not a measure of the rates of pay - Can be affected by changes in the composition of the work force - Enterprises with employment under 20 are estimated and not directly collected in the Monthly Wages and Salaries Survey 	9,000 businesses per month, covering 13.8 million employees
ASHE (Several measures of wages)	Annual	UK	<ul style="list-style-type: none"> - Gross weekly pay - Weekly pay excluding overtime - Basic pay including other pay - Overtime pay - Gross hourly pay - Gross annual pay - Hourly pay 	<ul style="list-style-type: none"> - Self employed - Those not paid during the reference period. 	<ul style="list-style-type: none"> - Changes to methodology cause discontinuities in the series - By only using those paying NI, it excludes the majority of people who are below the NI threshold. 	1% random sample of jobs on the HMRC PAYE register (approximately 281,000 employees)

Method	Frequency	Coverage	Included	Exclusions	Limitations	Survey Size
			excluding overtime - Annual incentive pay - Total paid hours - Basic paid hours - Paid overtime hours			
LFS (Gross Weekly Earnings, by industry and region)	Quarterly	UK	- Regular Pay - Overtime Pay - Bonuses - NI contributions - Pension contributions - Full-time workers - Those with a workplace outside the UK	- Self-employed workers - Part-time workers - HM forces stationed abroad - Redundancy payments - Expenses - Benefits in kind - Excludes those whose pay is over £100 an hour	- Known to be an underestimate, principally due to proxy responses (Bonuses are not mentioned explicitly when collecting data).	41,000 households per quarter
AEI (Discontinued - one measure of wages)	Monthly	GB	- Regular Pay - Overtime Pay - One-off bonus or commission payments are collected separately in the questionnaire	- Self employed - HM armed forces - Government supported Trainees - Employers' National Insurance Contributions - Contributions to pension schemes - Stock options not paid through	- Can be unaffected by changes in the workforce that raise the average wage.	9,000 businesses per month, covering 13.8 million employees

Method	Frequency	Coverage	Included	Exclusions	Limitations	Survey Size
				the payroll - Benefits in kind - Expenses - Redundancy payments - Signing-on fees		
ABS (Total labour costs)	Annual	UK	- Trading businesses registered for VAT and/or PAYE	- Very small businesses - The self-employed - Some non-profit organisations		Approximately 62,000 businesses
Unit Labour Cost	Quarterly	UK	- Compensation of employees - Social security - Employers' pension contributions - Costs of self-employed labour		- Labour costs of the self-employed assumed to be the same as employees	Partly based on LFS (41,000 households), and partly on the Quarterly National Accounts
Unit Wage Costs	Quarterly	UK	- Compensation of employees	- Social security - Employers' pension contributions - Costs of self-employed labour		Partly based on LFS (41,000 households), and partly on the Quarterly National Accounts
Sectional Unit Labour Costs, by sector	Quarterly	UK	- Social security - Employers' pension contributions - Costs of self-			Data from Supply-Use Tables and the LFS are used.

Method	Frequency	Coverage	Included	Exclusions	Limitations	Survey Size
ILCH (Experimental statistics)	Quarterly	UK	employed labour - Total labour costs per hour worked - Wage costs per hour worked - Other labour costs per hour worked, primarily NI contributions and occupational pensions, as well as sickness, maternity and paternity pay - Total labour costs, excluding bonuses and arrears, per hour worked	- Self employed	- Not seasonally adjusted - Still experimental, with data from Q1 2000	Drawn from a range of surveys.

Table source: Office for National Statistics

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Statistical Contacts

Statistical Contact: Michael Hardie, Office for National Statistics,

Contact Details: macro@ons.gsi.gov.uk, +44 (0)1633 455923

Background notes

1. Details of the policy governing the release of new data are available by visiting www.statisticsauthority.gov.uk/assessment/code-of-practice/index.html or from the Media Relations Office email: media.relations@ons.gsi.gov.uk

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