

Compendium

# Regional distribution of earnings in the UK: 2017

Regional analysis of the distribution of earnings using Annual Survey of Hours and Earnings (ASHE) provisional 2017 data and previous ASHE datasets, with a focus on earnings growth for those in employment between two consecutive years.

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# 1 . Main points

- In 2017, the largest difference in the proportion of employees earning around the National Living Wage (NLW) was between London (5.9%) and Northern Ireland (13.1%).
- Wage stickiness (0.0% nominal growth) was experienced by 14.2% of employees in London, 13.4% of employees in the North East, North West, and Yorkshire and The Humber, 13.8% of employees in the East and West Midlands and 13.4% of employees in the South East, South West and East of England in 2017.

## 2 . Introduction

The headline earnings distribution in Chapter 1 of the compendium shows some important characteristics of the experience of the UK as a whole, but there are notable differences across regions. This article uses the [Annual Survey of Hours and Earnings \(ASHE\)](#) to analyse the variation in earnings levels, earnings growth and distributional outcomes across regions and countries in the UK.

## 3 . Regional earnings

### Distribution

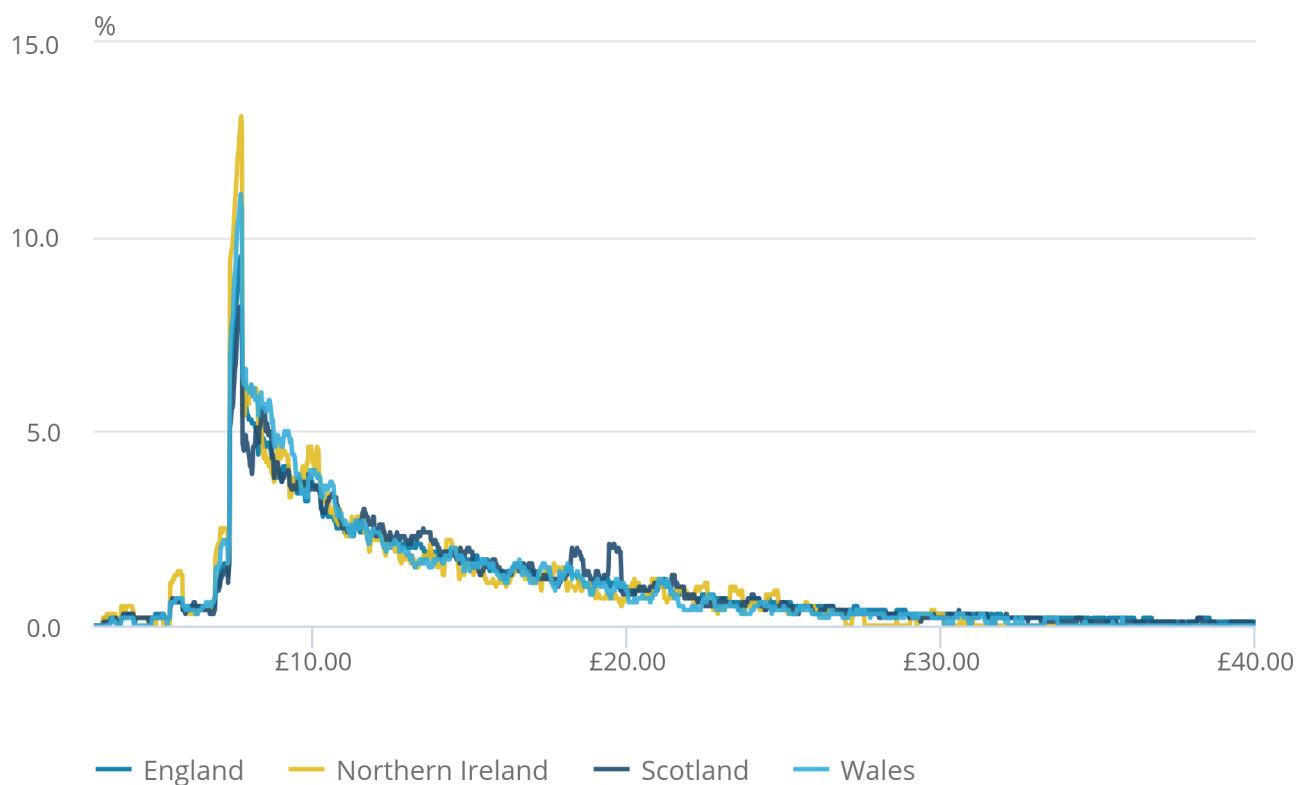
The regional distributions of earnings are explored in Figures 1 to 4. For comparison purposes, London is included in each of the English regional charts as London diverges from the trend experienced by most regions.

**Figure 1: Distribution of hourly earnings for England, Northern Ireland, Scotland and Wales, 2017**

Plus or minus 20 pence

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Plus or minus 20 pence



Source: Office for National Statistics, Annual Survey of Hours and Earnings

**Notes:**

1. 2017 data are provisional.
2. Each point on the x-axis represents a rolling sum of the density of jobs receiving greater than or equal to 20 pence below, and strictly less than 20 pence above, the stated hourly earnings.
3. As the density records the rolling sum of jobs paid within 20 pence of the stated amount at each point on the x-axis, jobs paid the April 2017 adult National Living Wage (£7.50) will appear between the x-axis values of £7.30 and £7.70.
4. The 2017 NLW refers to the April 2017 Adult National Living Wage of £7.50.

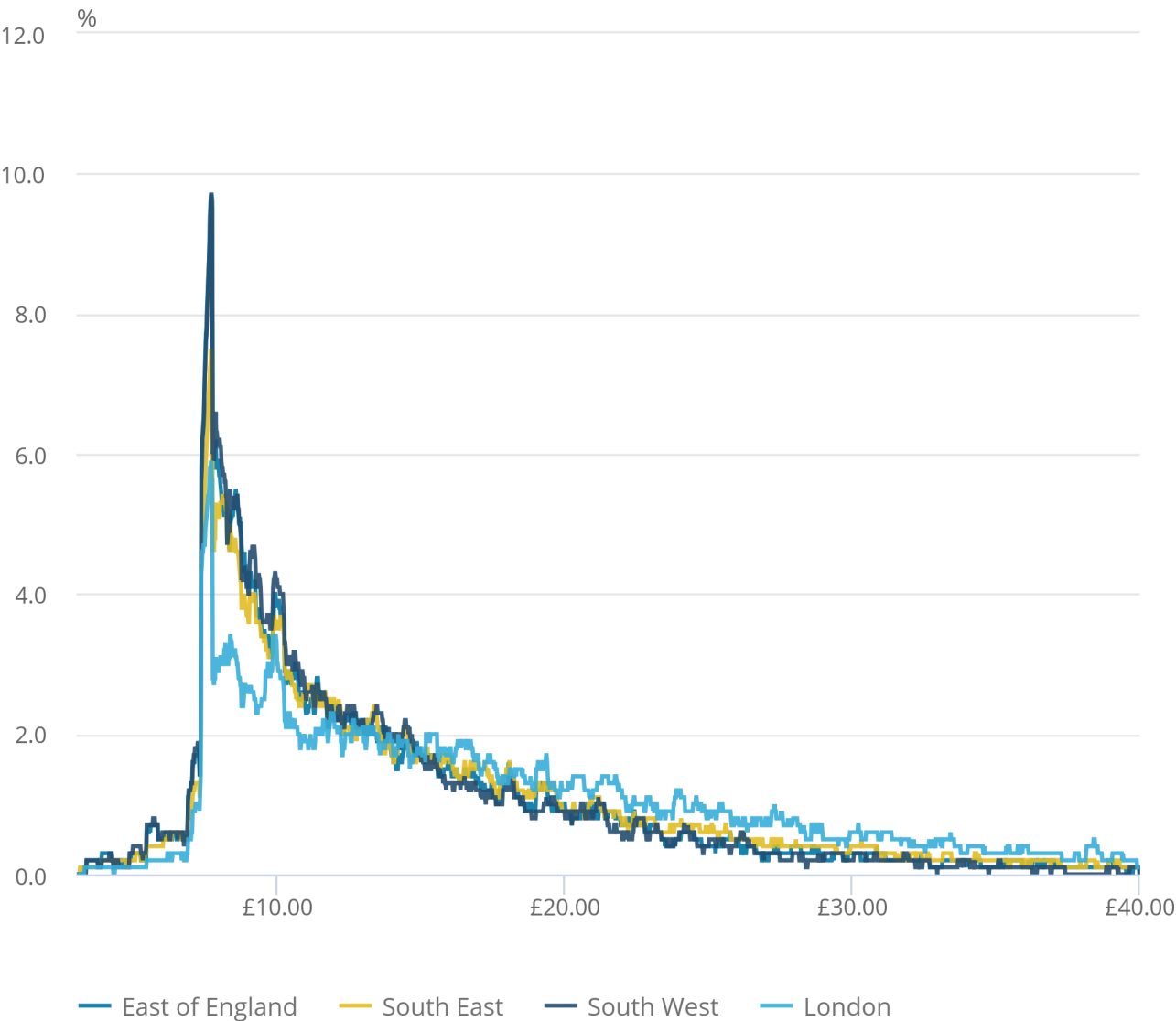
Figure 1 provides insight into the earnings distributions for the constituent countries of the UK. Northern Ireland had a large spike of 13.1% of employees earning £7.70 (within plus or minus 20 pence of the National Living Wage (NLW)), higher than any other country or region of the UK in 2017. Scotland has the lowest density (8.2%) of employees that earn near the NLW compared with the other countries, but the density is not as low as that of London.

**Figure 2: Distribution of hourly earnings for the East of England, South East, South West and London, 2017**

Plus or minus 20 pence

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Plus or minus 20 pence



Notes:

1. 2017 data are provisional.
2. Each point on the x-axis represents a rolling sum of the density of jobs receiving greater than or equal to 20 pence below, and strictly less than 20 pence above, the stated hourly earnings.
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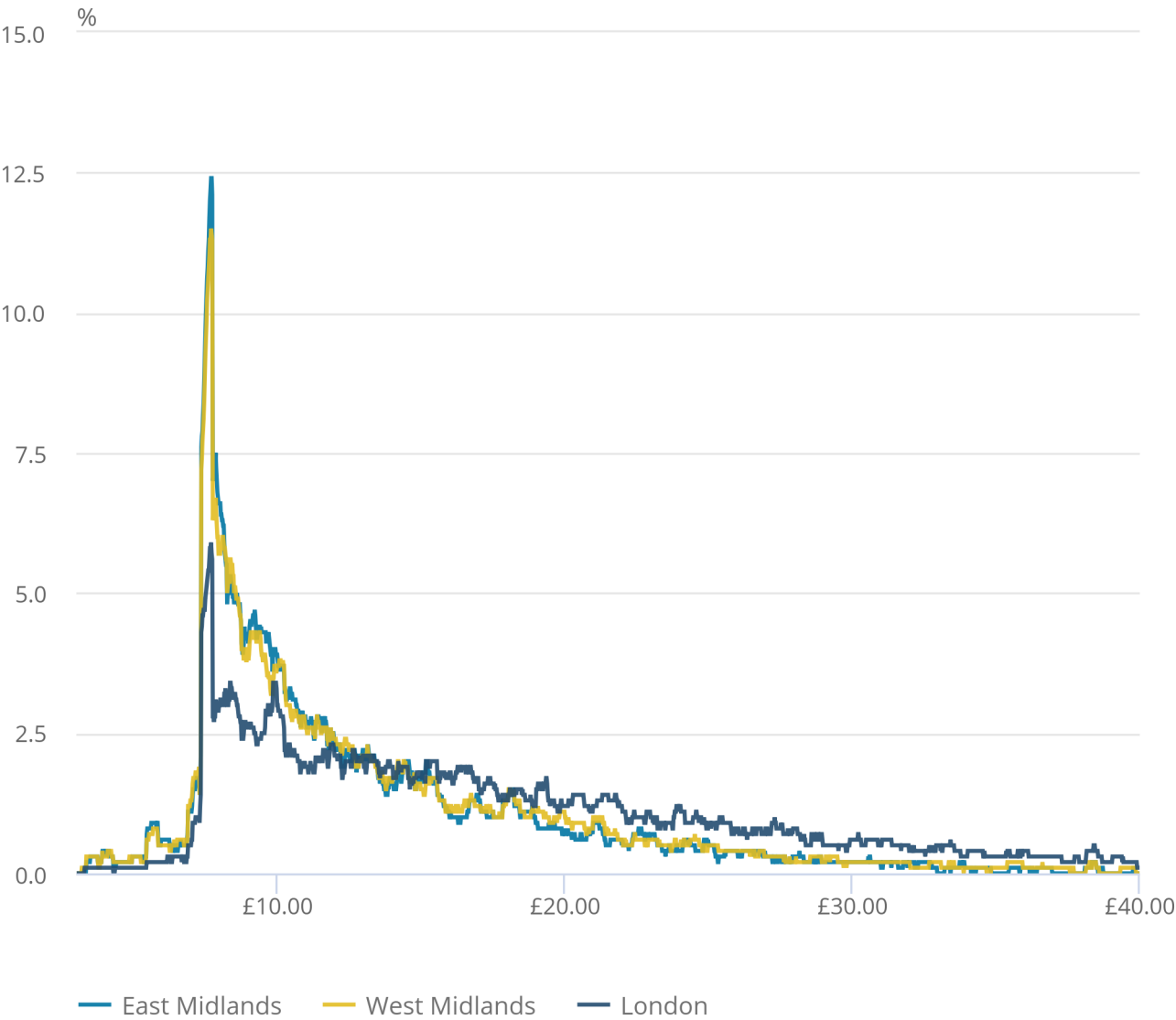
Figure 2 shows the differences in the distributions of real hourly earnings between the selected regions of the UK. All distributions are clustered around the NLW in 2017, with a higher share of employees concentrated within 20 pence plus or minus NLW at £7.68 in the South West (9.7%) and East (9.7%) compared with the South East (7.5%) and London (5.9%). Generally, a lower proportion of employees earned higher wages (above £15.12 an hour) in the South West and the East of England than in London and the South East in 2017.

**Figure 3: Distribution of hourly earnings for the East Midlands, West Midlands and London, 2017**

Plus or minus 20 pence

Figure 3: Distribution of hourly earnings for the East Midlands, West Midlands and London, 2017

Plus or minus 20 pence



Source: Office for National Statistics, Annual Survey of Hours and Earnings

Notes:

1. 2017 data are provisional.
2. Each point on the x-axis represents a rolling sum of the density of jobs receiving greater than or equal to 20 pence below, and strictly less than 20 pence above, the stated hourly earnings.
3. As the density records the rolling sum of jobs paid within 20 pence of the stated amount at each point on the x-axis, jobs paid the April 2017 adult National Living Wage (£7.50) will appear between the x-axis values of £7.30 and £7.70.
4. The 2017 NLW refers to the April 2017 Adult National Living Wage of £7.50.

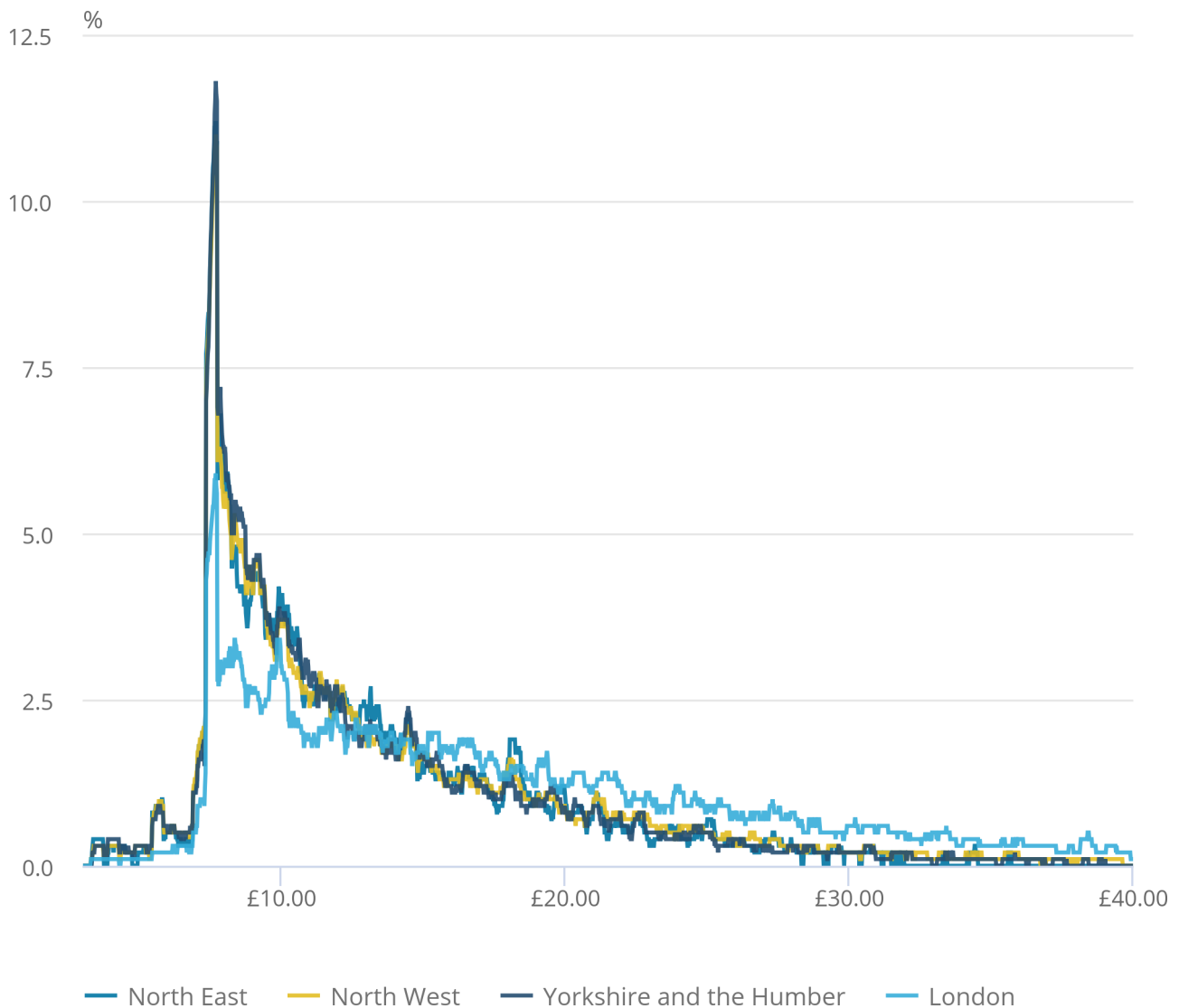
Figure 3 shows a clear difference in the hourly earnings distributions of the Midlands and London in 2017. The proportion of employees earning the 2017 NLW of £7.50 differs with 5.9% of employees in London earning around the NLW (£7.68), compared with 12.4% of the employees in the East Midlands, and 11.5% of the employees in the West Midlands. The share of employees earning wages greater than the NLW declined rapidly in the Midlands, but remained steadier in London.

**Figure 4: Distribution of hourly earnings for the North East, the North West, Yorkshire and the Humber and London, 2017**

Plus or minus 20 pence

Figure 4: Distribution of hourly earnings for the North East, the North West, Yorkshire and the Humber and London, 2017

Plus or minus 20 pence



Source: Office for National Statistics, Annual Survey of Hours and Earnings

Notes:

1. 2017 data are provisional.
2. Each point on the x-axis represents a rolling sum of the density of jobs receiving greater than or equal to 20 pence below, and strictly less than 20 pence above, the stated hourly earnings.
3. As the density records the rolling sum of jobs paid within 20 pence of the stated amount at each point on the x-axis, jobs paid the April 2017 adult National Living Wage (£7.50) will appear between the x-axis values of £7.30 and £7.70.
4. The 2017 NLW refers to the April 2017 Adult National Living Wage of £7.50.

Figure 4 shows that the North followed a similar earnings distribution to other regions in the UK in 2017. The distribution of earnings in the North were concentrated around the NLW (within plus or minus 20 pence): 11.0% of the employees in the North West, 11.2% of the employees in the North East and 11.8% of the employees in Yorkshire and The Humber. Generally, a greater share of the employees in London earn approximately £14.82 and above when compared with northern regions.

The earnings distribution for each of the regions shown in Figures 1 to 4 follow the characteristic trend introduced in Chapter 1 of the compendium: positively skewed and centred around the 2017 NLW rate of £7.50 an hour. The modal distribution for every region in 2017 was around the 2017 NLW of £7.50. However, the main difference between regions was the proportion of employees earning the modal wage. London is used in the English regional graphs for comparison purposes. It has a consistently higher proportion of employees earning higher wages and a lower proportion of employees earning around the NLW than other regions. The steadily falling share of employees earning higher wages is indicated by the long, thinning right-hand tail of each distribution. Relatively few jobs were paid less than the NLW (including employees aged under 25 years earning alternative minimum wages) as suggested by the left-hand tail.

## **Growth**

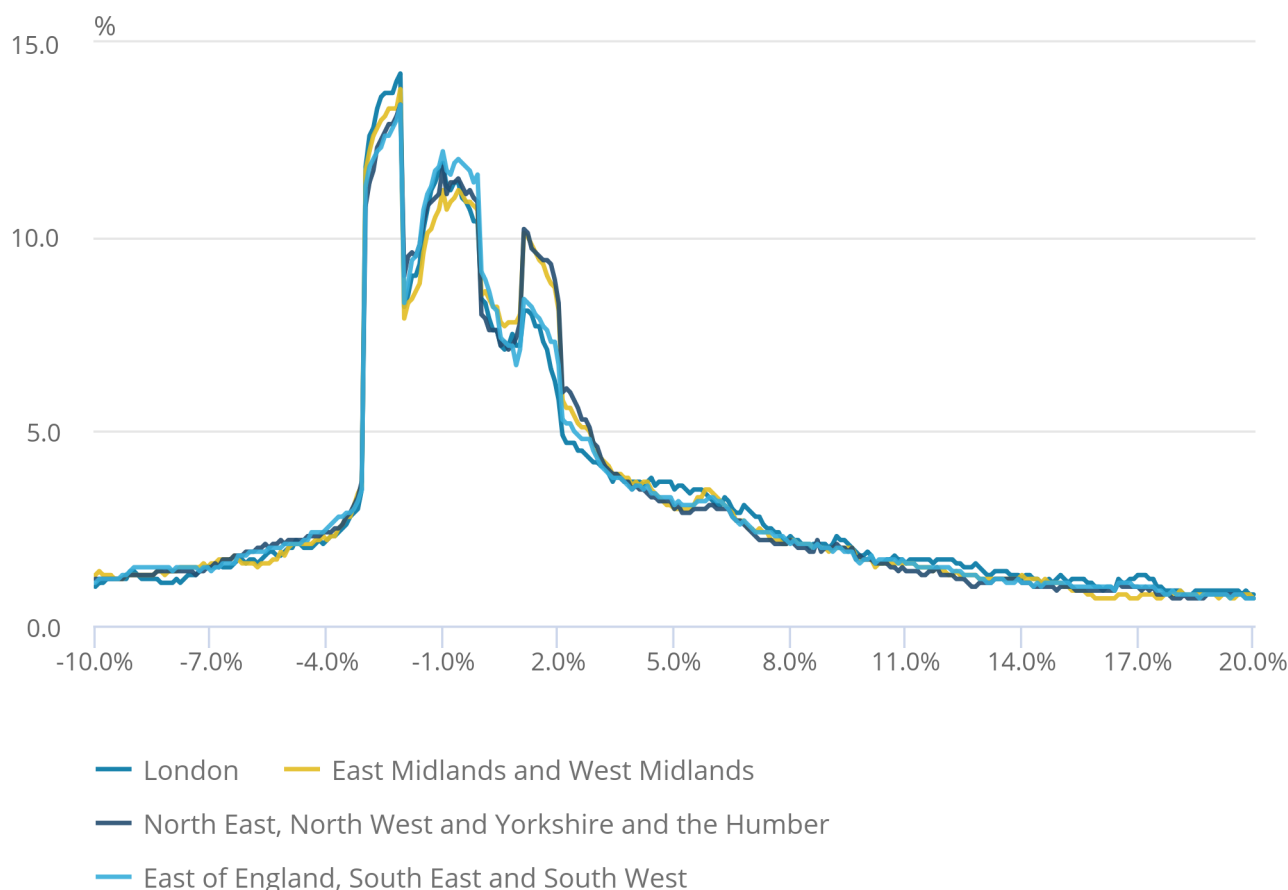
Analysis of the growth of earnings across regions provides further insight into the distributional outcomes for employees. Figures 5 and 6 show the distributions of growth in real hourly earnings in 2017, grouping the areas presented in Figures 1 to 4 into larger regions.

**Figure 5: Distribution of growth in real hourly earnings by grouped region, 2017**

Plus or minus 0.5 percentage points

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Plus or minus 0.5 percentage points



**Source: Office for National Statistics, Annual Survey of Hours and Earnings**

### Notes:

1. 2017 data are provisional.
2. For each growth rate on the horizontal axis, the area under the curve indicates a portion of employees who experienced earnings growth within 0.5 percentage points of that rate.
3. This figure uses individual level data from the Annual Survey of Hours and Earnings (ASHE) to calculate the growth of nominal weekly earnings for employees observed in pairs of years in 2016 and 2017. Note that the ASHE methodology is not specifically designed to model earnings growth for employees over time.
4. Note that the proportion of employees experiencing a pay growth of 4.2% may not reflect the proportion of employees on the National Living Wage in the earnings distribution in April 2017. This is because the growth analysis is focusing on employed employees in two consecutive periods and not just in April 2017.

Figure 5 shows that most regions of England had a similar trend in the growth distribution with the modal real wage growth rate at around negative 2.5% (0.0% nominal growth) in 2017. Wage stickiness was experienced by 14.2% of employees in London, 13.4% of employees in the North East, North West, and Yorkshire and The Humber, 13.8% of employees in the East and West Midlands and 13.4% of employees in the South East, South West and East of England in 2017, as wages had a delayed response to macroeconomic changes such as the inflation rate.

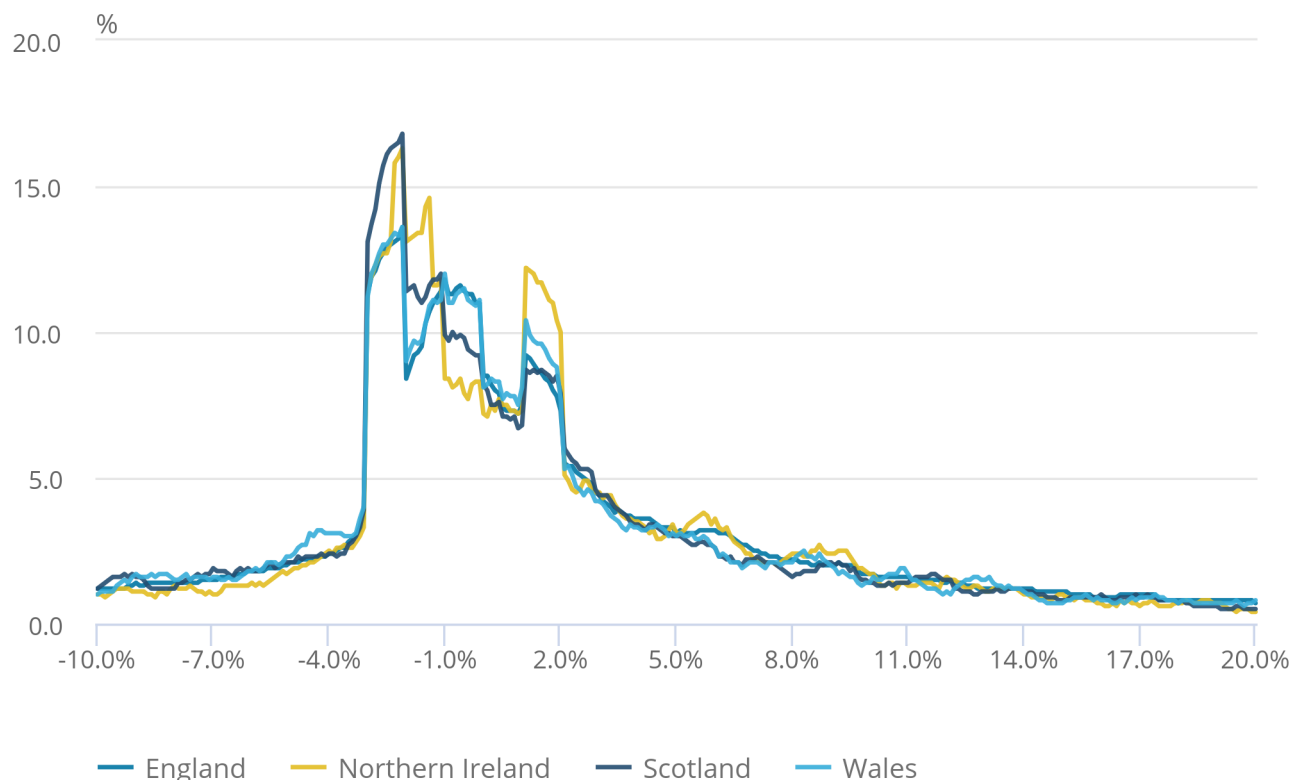
Figure 5 also shows the proportion of employees who received increases in their earnings in line with the 2017 NLW change of 1.5% in real terms. The proportion of employees who experienced the rate of increase was highest in the North East, North West, and Yorkshire and The Humber and the East and West Midlands, and lowest in London and the South East, South West and East of England. This is expected, given Figures 1 to 4 showed a higher proportion of employees earning the NLW were located in the the North East, North West, Yorkshire and The Humber, and the East and West Midlands and a lower proportion of the employees in the other regions.

**Figure 6: Distribution of growth in real hourly earnings for England, Northern Ireland, Scotland and Wales, 2017**

Plus or minus 0.5 percentage points

**Figure 6: Distribution of growth in real hourly earnings for England, Northern Ireland, Scotland and Wales, 2017**

Plus or minus 0.5 percentage points



**Source: Office for National Statistics, Annual Survey of Hours and Earnings**

**Notes:**

1. 2017 data are provisional.
2. For each growth rate on the horizontal axis, the area under the curve indicates a portion of employees who experienced earnings growth within 0.5 percentage points of that rate.
3. This figure uses individual level data from the Annual Survey of Hours and Earnings (ASHE) to calculate the growth of nominal weekly earnings for employees observed in pairs of years in 2016 and 2017. Note that the ASHE methodology is not specifically designed to model earnings growth for employees over time.
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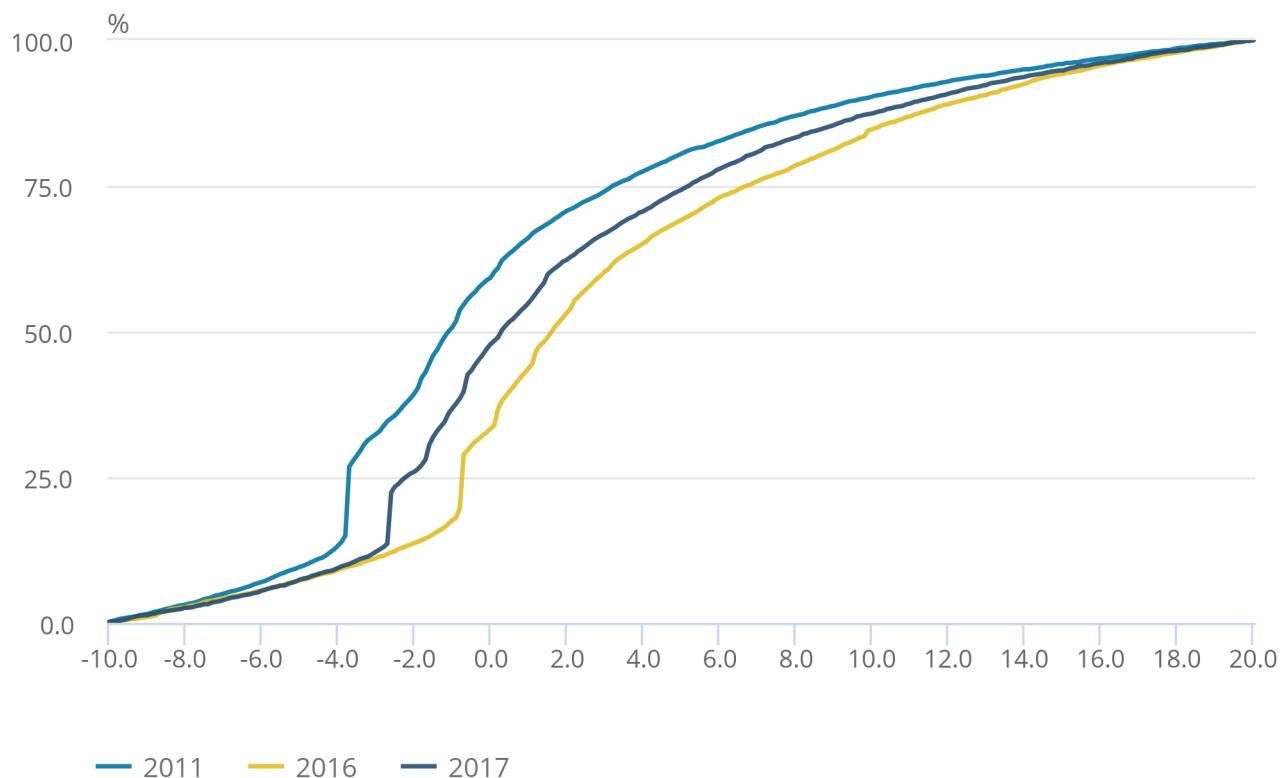
Figure 6 shows variations in the distributions of earnings growth among the countries. Wage stickiness and the delayed response to macroeconomic changes are shown by the proportion of employees experiencing 0.0% nominal wage growth and negative 2.5% real growth. Around 13.0% of employees in Wales, 12.9% of employees in England, 16.1% of employees in Scotland and 12.7% of employees in Northern Ireland experienced stagnant wages in 2017.

Figure 6 also shows peaks in the proportions of those experiencing earnings growth in line with the 2017 NLW increase of 1.5%. Northern Ireland had the highest proportion of employees experiencing growth in line with the NLW increase at 11.7%, followed by Wales (9.6%), Scotland (8.7%) and England (8.6%). Given Figure 1 showed the region with the highest proportion of employees earning the NLW in 2017 to be Northern Ireland, it is expected that Northern Ireland would be the region with the highest proportion of employees experiencing growth in line with the NLW.

An alternative visualisation of the distribution of real earnings growth can be shown using cumulative percentage frequency charts. Figures 7a and 7b show the cumulative distributions of growth in real hourly earnings for employees in London and Northern Ireland in 2011, 2016 and 2017. These regions have been selected as they have the least and most employees earning the NLW respectively.

**Figure 7a: Cumulative distribution of growth in real hourly earnings for London, 2011, 2016, 2017**

Figure 7a: Cumulative distribution of growth in real hourly earnings for London, 2011, 2016, 2017



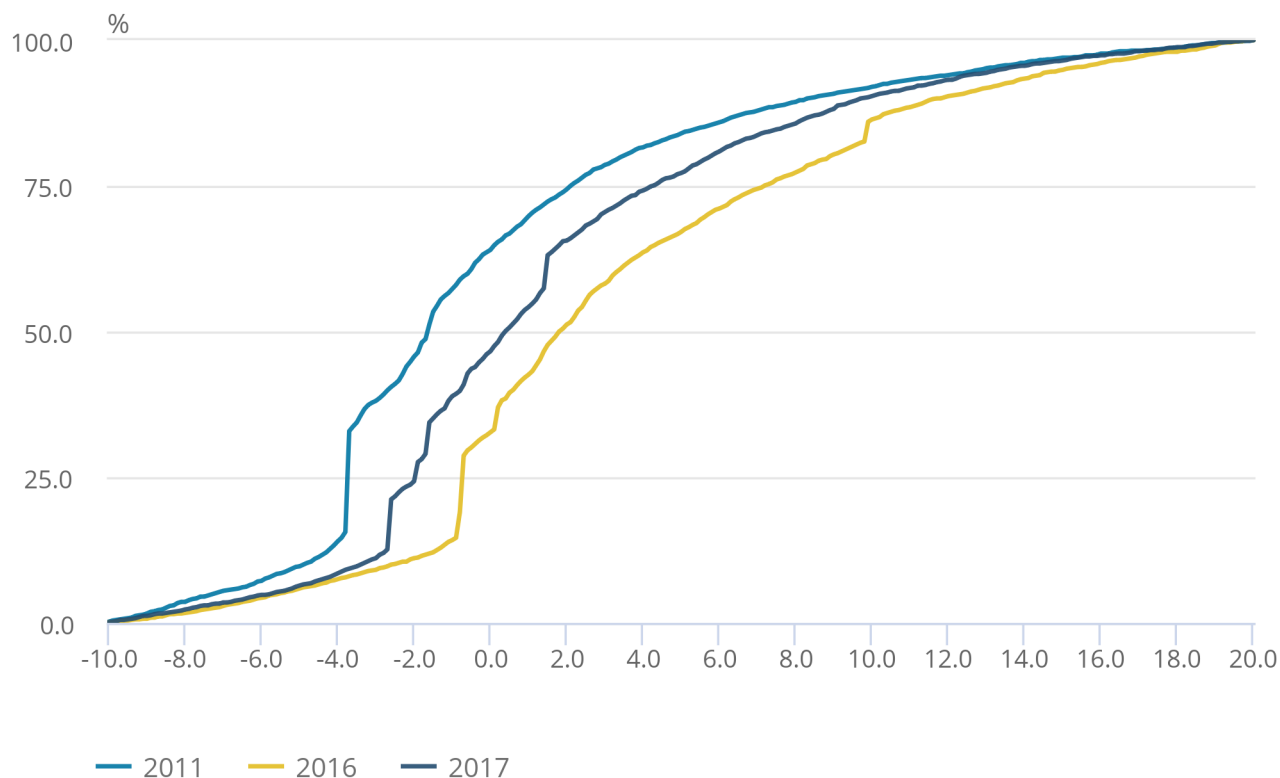
**Source:** Office for National Statistics, Annual Survey of Hours and Earnings

**Notes:**

1. 2017 data are provisional.
2. For each growth rate on the horizontal axis, the curve indicates the proportion of employees who experienced earnings growth at that rate.
3. This figure uses individual level data from the Annual Survey of Hours and Earnings (ASHE) to calculate the growth of nominal weekly earnings for employees observed in pairs of years in 2010 and 2011, 2015 and 2016, and 2016 and 2017. Note that the ASHE methodology is not specifically designed to model earnings growth for employees over time.
4. This figure only looks at employees whose pay growth between 2016 and 2017 fell between negative 10% and positive 20%. As such, the proportion of employees on the y-axis should not be interpreted as the entire population of employees.

**Figure 7b: Cumulative distribution of growth in real hourly earnings for Northern Ireland, 2011, 2016, 2017**

Figure 7b: Cumulative distribution of growth in real hourly earnings for Northern Ireland, 2011, 2016, 2017



**Source:** Office for National Statistics, Annual Survey of Hours and Earnings

**Notes:**

1. 2017 data are provisional.
2. For each growth rate on the horizontal axis, the curve indicates the proportion of employees who experienced earnings growth at that rate.
3. This figure uses individual level data from the Annual Survey of Hours and Earnings (ASHE) to calculate the growth of nominal weekly earnings for employees observed in pairs of years in 2010 and 2011, 2015 and 2016, and 2016 and 2017. Note that the ASHE methodology is not specifically designed to model earnings growth for employees over time.
4. This figure only looks at employees whose pay growth between 2016 and 2017 fell between negative 10% and positive 20%. As such, the proportion of employees on the y-axis should not be interpreted as the entire population of employees.

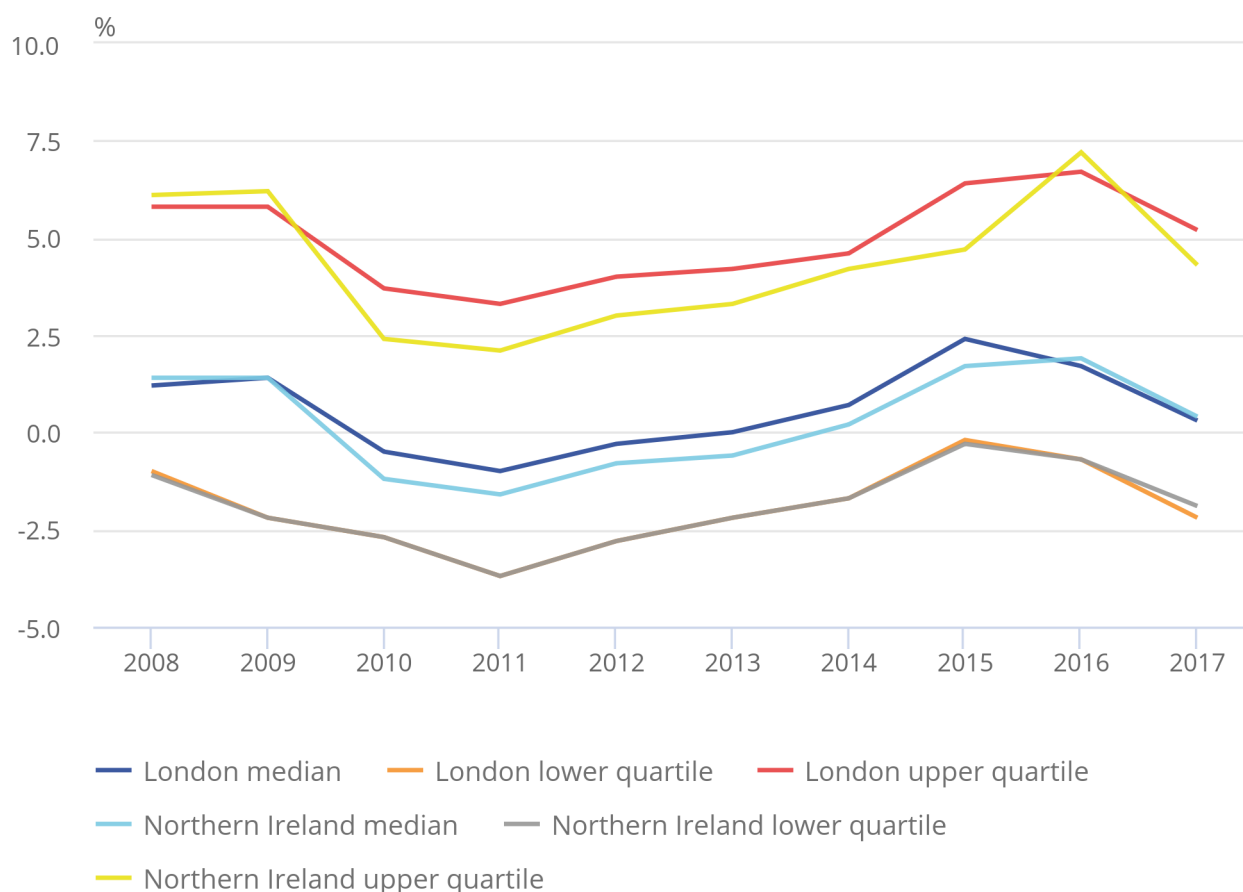
Figures 7a and 7b show the characteristic trend introduced in Chapter 1 of the compendium, with fewer employees in both London and Northern Ireland experiencing a pay decrease or freeze in real terms in the year to April 2016, compared with the years 2011 and 2017. The year 2011 saw the fewest number of employees in either region experience positive pay growth in real terms. Figures 7a and 7b show that the growth in earnings improved to 2016 (as represented by the curve shifting rightwards), and worsened to 2017 (represented by the leftward shift of the curve).

The figures highlight wage stickiness as shown by the spikes in the proportions of those experiencing real wage growth of around negative 3.7% in 2011, negative 0.7% in 2016 and negative 2.5% in 2017. Wage stickiness in 2011 may be partially attributed to the pay freeze for public sector employees that was announced in the 2010 Budget. Figures 5 and 6 further illustrated the 2017 wage stickiness.

In 2011, the median real wage growth rate (note that this is a different concept to the growth in the median) for employees in London was negative 1.1%, which was 0.5 percentage points higher than the median real wage growth rate in Northern Ireland. Over time, the median real wage growth rates appear to converge. In 2016, the median real wage growth rates were 1.7% in London and 1.8% in Northern Ireland and in 2017, they were 0.4% in Northern Ireland and 0.3% in London.

**Figure 8: Distribution of growth in real hourly earnings: median and quartiles for London and Northern Ireland, 2008 to 2017**

Figure 8: Distribution of growth in real hourly earnings: median and quartiles for London and Northern Ireland, 2008 to 2017



**Source:** Office for National Statistics, Annual Survey of Hours and Earnings

**Notes:**

1. 2017 data are provisional.
2. Each line on the figure indicates the lower quartile, median and upper quartile growth rates over time.
3. This figure uses individual level data from ASHE to calculate the growth of nominal weekly earnings for employees observed in pairs of years. For example, in 2010 and 2011, 2011 and 2012, 2016 and 2017. Note that the ASHE methodology is not specifically designed to model earnings growth for employees over time.

Figure 8 shows that the lower and upper quartiles real wage growth rates followed a similar trend to the median real wage growth rate for the selected regions. As shown in Chapter 1 of the compendium, throughout the economic downturn and until 2011, real wage growth rates followed a decreasing trend, before increasing until 2015 (both lower quartiles and London median) and 2016 (both upper quartiles and Northern Ireland median). More recently the real wage growth rates have followed a decreasing trend again.

For both regions, the lower quartiles real wage growth rates are very similar and are negative each year as wages have been decreasing on the year prior. For both regions, the lower quartile real wage growth rate was lowest in 2011 during wage stagnation in the economic downturn and highest in 2015 post recovery.

The median real wage growth rate tracks the lower quartile real wage growth rate closely from 2010 onwards, and fluctuates between negative 2.0% and positive 2.4%.

The upper quartile shows the greatest divergence between real wage growth rates. For both regions, growth in the upper quartile was highest in 2016.

## **4 . Background information**

Further analysis on the distribution of earnings by employment and employee characteristics using Annual Survey of Hours and Earnings (ASHE) data is contained in [the compendium](#).

Survey details and basic quality information can be found in Chapter 1 of [the compendium](#).