1. Introduction

Following recent work by the Office for National Statistics (ONS) and the Valuation Office Agency (VOA), this article describes improvements to private housing rents\(^1\) price indices used for the rental equivalence measure of owner occupiers' housing costs (OOH) in CPIH. The same private rent price indices are also used to calculate the Index of Private Housing Rental Prices (IPHRP) and from 2013 onwards they have been used to measure private rents prices in the suite of consumer price inflation statistics\(^2\).

The improvements to the OOH component in CPIH will be introduced as part of the 2015 annual update of consumer price indices published on 24 March 2015, with the historical series revised back to 2005. At the same time, improvements to the estimation of the private rents component in the suite of consumer price inflation statistics will also be made. However, the lower weighting applied to private rents means that the improvements do not have an appreciable impact on the overall CPIH index and consequently the back series will not be revised. This also keeps the treatment of private rents in CPIH in line with CPI.

The revised OOH index and annual growth rates are presented within this article to help users assess the impact of the improvements. The annual average growth rate of OOH (for the period from 2005 to 2014) has been revised upwards by 0.6 percentage points to 1.5 per cent. The experimental IPHRP and back series have been revised in the October to December 2014 results published today (30 January 2015)\(^3\), to coincide with the publication of this article. An assessment of the revisions to IPHRP is also included within this article.

The revision to the OOH component in CPIH also presents ONS with a one-time opportunity to revise the OOH weight in CPIH so that it is aligned with historical National Accounts estimates and so that it reflects planned changes to the methodology for measuring imputed rents that will be introduced in Blue Book 2016. The revised CPIH series, showing the impact of both revising the OOH series and updating the OOH weights historically (to reflect the Blue Book 2016 changes),

\(^1\) Throughout this article the use of ‘rents’ refers to private housing rents.
\(^2\) This includes the Consumer Prices Index (CPI), CPIH, the Retail Prices Index (RPI), RPIJ (an improved variant of the RPI which is calculated using formulae that meet international standards) and their derivatives.
will be made available in a separate article to be published on 17 March 2015. Once the March 2015 OOH weights revision has been implemented, the weights in CPIH will be left unchanged retrospectively, in accordance with the CPIH revisions policy.4

This article takes the following shape. The background to the improvements is provided in Section 2. Section 3 illustrates the impact the revision has had on the OOH and IPHRP indices. Methodology and data sources used in the calculation of these indices are presented as part of Sections 4 and Section 5. Section 6 compares the data and methodology used in ONS price indices to alternative sources of private rents. The section provides evidence to show that compositional and quality change in the private rented market can explain some of the differences seen in annual growth rates. Section 7 considers the impact of this revision to National Accounts and the resulting OOH weight. An event for users of private rental price indices is planned for 20 February 2015. Details of this event and next steps can be found in Section 8. Several annexes are also included in this article, providing additional metrics and supporting evidence.

2. Background

In early 2013, ONS launched CPIH, a measure of consumer price inflation including owner occupiers’ housing costs (OOH). CPIH uses an internationally recognised approach called rental equivalence to measure OOH. A detailed description of the rental equivalence approach to OOH and the development of CPIH can be found in Annex A. Importantly, owner occupiers’ housing costs are not a measure of house prices, instead they measure the costs of housing services associated with owning, maintaining, and living in one’s own home.

Rental data collected by the VOA for England, as well as comparable data collected by the Welsh Government and Scottish Government, are used in the calculation of OOH. These data are also used to calculate the experimental IPHRP and since 2013 have been used to measure price change in the private rents component in the suite of consumer price inflation statistics.

Following the adoption of these new data, a number of users questioned the different price evolution shown by the new ONS private rent price indices when compared to other sources of information on average private rent prices. Particular focus has been given to the difference in the change in the average rent prices published by VOA and the ONS figures – both of which are based on the same underlying data source. These queries resulted in some users questioning the validity of the data used to measure OOH in CPIH.

ONS subsequently initiated work with VOA to understand these differences and to determine whether any improvements were possible to the methods used in the ONS measures. The following four areas were identified for improvement:

- Improvements to the process for determining comparable replacement properties when a price update for a sampled property becomes unavailable, leading to more viable matches.
- Bringing the process for replacing properties for which there is no comparable replacement into line with that used for other goods and services in consumer price statistics.

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• Optimising the sample of properties used at the start of the year, to increase the pool of properties from which comparable replacements can be selected.

• Reassessing the length of time for which a rent price can be considered valid before a replacement property is found.

In addition to these areas for improvement, the opportunity has also been taken to review the stratum weights used for the private rents series, bringing them into line with the methods used for the IPHRP.

An exchange of letters between John Pullinger, the National Statistician, and Sir Andrew Dilnot, Chair of the UK Statistics Authority, on 14 August 2014, resulted in the suspension of the National Statistics designation of CPIH, returning the indicator to experimental status.

A second exchange followed, which asked ONS to commence the process of consulting with the Bank of England over whether proposed improvements to the measurement of private rental prices within the RPI would constitute a fundamental change in the index that would be materially detrimental to the interests of holders of relevant index-linked gilts, and hence trigger the redemption clause. A senior committee at the Bank considered this matter and on 10 January 2015 replied with the decision that the proposed change can proceed without triggering the redemption clause.

3. Impact of the improvements on the indices

As part of the development process, the impact of each improvement on the OOH index was separately quantified and is presented in this section to help users assess the impact of the improvements. Revisions to the OOH indices are then presented, followed by revisions to the IPHRP series for Great Britain and London. Section 4 details the methodology used and Annex B covers the impact of the methodological improvements on sample metrics.

3.1 Impact on OOH

The impact of each improvement on the OOH index has been assessed in a series of iterations as detailed in figure 3.1 below. Each improvement is implemented in the order shown and builds on the previous improvements listed (and is therefore cumulative). For example, series 3 – ‘50:50 sample split implemented’ includes the impact of both improving the matching process for comparable replacements and implementing the 50:50 sample to substitution pool split. Series 5 – ‘14 month contract length implemented’ represents the revised OOH series which includes all of the improvements. These iterations were produced as part of the development process and

9 Given the relationship between each of these iterations, calculating the impact of each change in a different order can produce a slightly different result.
therefore series 5 differs slightly to the revised OOH series presented in figure 3.5 in the next section.

**Figure 3.1: Series of iterations to assess the impact of each change on the OOH index**

<table>
<thead>
<tr>
<th>Series</th>
<th>Description</th>
<th>18 month validity period</th>
<th>14 month validity period</th>
<th>Improved matching</th>
<th>50:50 sample</th>
<th>Imputation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Previously published</td>
<td>✓</td>
<td>×</td>
<td>×</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>2</td>
<td>Improved matching implemented</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>×</td>
<td>×</td>
</tr>
<tr>
<td>3</td>
<td>50:50 sample split implemented</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>×</td>
</tr>
<tr>
<td>4</td>
<td>Non-comparable replacements and imputation</td>
<td>✓</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>implemented</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>14 month validity period implemented (revised</td>
<td>×</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td></td>
<td>series)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

The resulting indices are presented in figure 3.2 and the cumulative impact in figure 3.3 below. Each improvement has resulted in an upward revision in the index over the period shown (January 2005 to August 2014). In total, the difference between the previously published OOH index and the revised OOH index (series 5) is 6.3 index points in August 2014. The 50:50 sample to substitution pool split had the greatest impact on the index (2.5 index points) as it provided a bigger substitution pool, allowing more comparable matches. Introducing non-comparable replacements and imputation had the second largest impact (2.1 index points). Improving the matching process and reducing the assumed validity period to 14 months had slightly smaller impacts at 0.8 and 0.9 index points respectively.
The impact of each improvement on the annual OOH growth rate is shown is figure 3.4 below. Shortening the validity period from 18 months to 14 months (series 4 versus series 5) has made the index more responsive to turning points in the market as comparable replacements are made sooner. In particular, the index with the 14 month validity period responds faster to the recession in 2009 and then recovers a few months earlier than the series with an 18 month validity period. In periods of stability, the annual growth rates for the 14 and 18 month validity periods appear to converge.
Figures 3.5 and 3.6 below present the index and 12-month growth rate for the previously published OOH series against the revised OOH series from January 2005 to December 2014. Over this period, the revised OOH index has increased by 16.8 per cent, compared to an increase of 9.7 per cent in the previously published series. Looking at the 12-month growth rate, since January 2012 (the post recession period), the average annual growth rate of the revised OOH series is 1.5 per cent, an increase of 0.5 percentage points on the previously published series.
3.2 Impact of improvements on IPHRP

The revised IPHRP index for Great Britain (see figure 3.7) shows that rental prices have increased by over 8 per cent from January 2011 to December 2014, compared to the previously published series which grew by less than 5 per cent over the same time period. The revisions to the 12-month growth rates (figure 3.8) show that IPHRP was under estimating rental price inflation by an average of 0.9 percentage points across the period.
At the regional level, over the same period, the improvements led to an upward revision (on average) in the 12-month growth rates for all regions. From an average upward revision of 0.1 percentage points in the North West, to London which saw the biggest upward revision of 1.8 percentage points on average. Growth rates in London are now much more responsive to market
conditions as shown in figure 3.9. The full time series for each region, and an assessment of the revisions, can be found in the latest IPHRP publication\(^\text{10}\) which has been published alongside this article.

Figure 3.9: Revisions to IPHRP growth rates, London

![Graph showing revisions to IPHRP growth rates](image)

3.3 Relationship between private rental prices and house prices
Annex C of this article reviews the literature on the relationship between private rental prices and house prices, before comparing the revised IPHRP and House Prices Index (HPI) to provide an initial assessment of the relationship between the two.

4. Methodology to calculate private rent price indices
This section presents the methodology used to calculate private housing rents price indices which are used to measure OOH in CPIH, IPHRP, and since 2013, to measure the private rents component in the suite of consumer price inflation statistics. The section begins by providing a high level summary using illustrative diagrams and is then followed by a detailed description.

Private housing rents data are from the VOA for all the regions of England, and the Scottish Government and Welsh Governments for Scotland and Wales respectively. Legislation governing the VOA\(^\text{11}\) means that ONS does not have access to VOA microdata. Therefore, ONS has worked with VOA staff to implement the methodology in their systems. ONS has agreements with the


\(^{11}\) Commissioners of Revenue and Customs Act 2005
Welsh and Scottish governments to have access to their microdata which means that the methodology is applied in-house by ONS.

### 4.1 High level summary

#### Step 1

In January each year, a sample of rental properties is randomly selected from the private housing rental dataset using half of the rents collected in the previous 14 months; the other half form the substitution pool. Duplicate rents are removed, keeping the most recent record. For example, the January 2014 sample and substitution pool cover the 14 month period from December 2012 to January 2014. The sample of rents selected is monitored for price change until January of the following year.

#### Step 2

The length of time that prices for selected properties remain in both the sample and substitution pool is monitored. They are valid for a maximum of 14 months from their entry date into the system.

#### Step 3

Data collected in the following month, for example February 2014, are matched by address to records within the sample. Unmatched properties are moved to the substitution pool.
Step 4

The date range is moved on for properties in both the sample and substitution pool.

Step 5

Properties outside of the validity period (> 14 months) are removed from the substitution pool. For records outside the validity period in the sample, a comparable replacement (a property with similar characteristics) is found in the substitution pool. If a comparable replacement is not available, then a non-comparable replacement is made and a price movement, since the January (base) period, is imputed using the average movement of comparable replacements within the same stratum. The replacement process (for both comparable and non-comparable replacements) is ordered from newer to older, so newer price updates are used in preference to properties which have been in the substitution pool for longer. A property used as a replacement maintains its entry date into the system when it moves into the sample. For example, if a record has an entry date in August 2013, but does not enter the sample until May 2014, it will still be replaced in October 2014, 14 months after its entry date.
Step 6
The data in the sample are used to calculate price relatives, using January as the base period, which are aggregated into strata and weighted together to form a private rent price index. The process then repeats for the next month and so on until January of the following year when the sample is re-selected.

4.2 Detailed description

4.2.1 Data sources
Private housing rental data are collected by Rent Officers from the VOA for all the regions of England, and comparable data are collected by the Scottish Government and Welsh Government. Annually over 450,000 private rents prices are collected in England, and 30,000 and 25,000 in Wales and Scotland respectively. Data for England and Wales are based on confirmed rents, whereas data for Scotland are mainly based on advertised rents. Detailed information on these data sources is available in Section 5.

Suitable comparable data are not currently available for Northern Ireland. Where a UK measure of rents is required, the existing CPI private rents data collected in Northern Ireland by ONS’s contracted field force is used.
4.2.2 Monthly periods
A cut-off date of the 27th of the month, based on the entry date into the system, is applied to the private housing rental dataset to enable monthly processing. Therefore, each month the dataset covers the period from the 28th of the previous month to the 27th of the current month. Due to current data collection practices, data will be lagged by around one month as it can take Rent Officers up to six weeks to input prices into the collection database.

4.2.3 Sample selection and stratification
A stratified random sample is selected each January using half of all records entered into the system over the previous 14 months. For example, the January 2014 sample includes prices for properties entered into the system from December 2012 to January 2014. Within this process, duplicate records for the same property are removed so that the most recent record entered into the system is used. Prices to rent a single room in a House in Multiple Occupancy (HMO) are also removed. The sample count for England is over 200,000 properties, 18,000 properties for Wales and 14,000 properties for Scotland. The remaining records form what is referred to as the ‘substitution pool’.

The data are stratified by Wales, Scotland and the nine regions of England, as well as by property type, and whether the property is furnished or unfurnished. The property types used for stratification have been chosen to reflect the characteristics a consumer would consider when purchasing or renting a dwelling and are as follows:

- Detached House
- Semi-detached House
- Terraced House
- Flat/Maisonette

For the purposes of calculating owner occupiers’ housing costs, only unfurnished properties are used. Unfurnished properties account for nearly 90 per cent of the sample.

4.2.4 Validity period
To calculate a rent price index, the sample of properties is monitored for price change throughout the year. This is done by matching the records collected each month by Rent Officers to the existing sample. There is no formal procedure in place that requires Rent Officers to follow up the sampled properties, although approximately 40 per cent of sampled properties are followed up around a year later. Therefore, when a rental price is collected, it is assumed to be valid for 14 months from its entry date into the system, or until an update is received. The rationale for using a 14 month validity period is described in Annex D.

4.2.5 Property price updates
The price of an existing property in the sample is updated when a match is identified in the data collected each month (referred to as the input dataset), and the price change is within the acceptable tolerance level (see box 4.1). If an update is made, then the record entry date is amended and the rent for that record becomes valid again for up to 14 months.
Properties in the input dataset that do not match any records in the sample are added to the substitution pool to be used later in the processing. If an update fails the tolerance check then the property is deleted and not included in the sample or returned to the substitution pool.

4.2.6 Comparable property replacements

If a property in the sample has reached the end of its 14 month validity period and no price update has been made, a replacement property of comparable quality is sought from the substitution pool. A replacement is defined as comparable if it has the same:

- property type
- postcode sector\(^{12}\)
- number of bedrooms
- furnished status (furnished/unfurnished)

and has a price quote which meets the same tolerance checks applied to price updates (see box 4.1 above).

If there is more than one potential replacement property, then the property collected most recently is chosen. When a comparable replacement is found, and it passes the tolerance test, then the property is used to replace the outgoing property in the sample. This replacement property maintains its original entry date into the system. By replacing the property that has expired with a comparable replacement, it is assumed that the replacement property is similar enough to the one that it is replacing that any difference in rent is due to price change, and not a difference in quality. If a replacement is found, but it fails the tolerance check, then the property is returned to the substitution pool and another replacement is sought.

4.2.7 Non-comparable property replacements and imputation

If a property in the sample has reached the end of its 14 month validity period, and a comparable replacement cannot be found, then the property is replaced by a non-comparable property in the substitution pool from within the same stratum. Although the replacement is non-comparable, an effort is still made to make the replacement property as comparable as possible to the property it is

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\(^{12}\) UK postcodes consist of an outward and inward code. The outward code comes before the single space in the middle, and the inward code come after the space. Postcode sectors are made up of the outward code and the first character of the inward code. For example, NP10 8 is the postcode sector for NP10 8XG. On average there are approximately 2,300 properties in a postcode sector.
replacing. Therefore, the following priority order is applied to identify a non-comparable replacement:

1) Match on stratum, number of rooms, and Local Authority
2) Match on stratum and number of rooms
3) Match on stratum and postcode sector
4) Match on stratum and Local Authority
5) Match on stratum only

As the name suggests, the replacement property is deemed to be a different quality to the one it is replacing, and therefore the price of the new and replaced property cannot be directly compared. No explicit information is available to quantify the difference in quality; therefore an implicit approach is taken. A new January (base) price is calculated for the new property based on the movement of comparable replacements made within the same stratum in the same month; this movement is henceforth referred to as the imputation ratio.

Comparable replacements made within a stratum (opposed to using all properties in a stratum) are used to form the imputation ratio for non-comparable replacements as they are an appropriate estimate of the price change that would have been observed if a comparable replacement had been made.

For each comparable replacement within the month in question, for example March, a price relative is calculated as:

**Equation 1**

\[ PR = \frac{RC_{Mar}}{RC_{Jan}} \]

Where

- \( RC_{Mar} \) is the rent for a comparable match in March
- \( RC_{Jan} \) is the rent in January for the original property that was subsequently replaced.

Within each stratum, an average of these price relatives is calculated to form the imputation ratio. If there are fewer than 3 comparable replacements within a stratum, then the movement at a higher level is used\(^{13}\).

The new January (base) price for each non-comparable record is then calculated as follows:

\(^{13}\) Using the movement at a higher level, if the stratum level cannot be used, is consistent with CPI methodology. For the purposes of rents, those at the furnished or unfurnished level are used.
Equation 2

\[ RNC_{Jan} = \frac{RNC_{Mar}}{IR_{Mar/Jan}} \]

Where

RNC\textsubscript{Jan} is the derived January (base) rent for the non-comparable record

RNC\textsubscript{Mar} is the rent for a non-comparable record in March

IR\textsubscript{Mar/Jan} is the imputation ratio calculated from the movement of comparable records between March and January within a stratum.

Properties that have been used as non-comparable replacements are removed from the substitution pool and replace the expired property in the sample. The non-comparable replacement maintains its entry date into the system. If there is no non-comparable match available then the property is removed from the sample\textsuperscript{14}.

4.2.8 Historical data availability

The availability of data to calculate historical private rents indices differs by country. Private rental data from VOA are available from 2005 onwards. Private rental data from the Welsh Government and Scottish Government are available from 2009 and 2011 onwards respectively.

As detailed in figure 4.1 below, to enable the calculation of the OOH index from 2005 onwards at the UK level, data from the CPI private rents series (unfurnished rents only) for Wales and Scotland are used prior to the availability of the new data source, and the CPI private rents series for Northern Ireland (unfurnished rents only) is used in all years.

**Figure 4.1: Historical availability of data for OOH (unfurnished rents only)**

<table>
<thead>
<tr>
<th>Year</th>
<th>England</th>
<th>Scotland</th>
<th>Wales</th>
<th>Northern Ireland</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>VOA</td>
<td>CPI</td>
<td>CPI</td>
<td>CPI</td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2007</td>
<td></td>
<td>CPI</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2008</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td></td>
<td></td>
<td>Scottish Government</td>
<td>CPI</td>
</tr>
<tr>
<td>2010</td>
<td></td>
<td></td>
<td>Welsh Government</td>
<td></td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>2012</td>
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<td>2013</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

IPHRP is based entirely on the new data sources and covers England from 2005 onwards, Wales from 2009 onwards and Scotland from 2011 onwards (see figure 4.2 below). An index for Great

\textsuperscript{14} In practice this is very rare. For example, between January 2012 and December 2014 this only occurred in one month.
Britain is also available from 2011 onwards (the first year data for England, Scotland, and Wales are all available).

**Figure 4.2: Historical availability of data for IPHRP**

<table>
<thead>
<tr>
<th>Year</th>
<th>England</th>
<th>Scotland</th>
<th>Wales</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>VOA</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2006</td>
<td></td>
<td></td>
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<tr>
<td>2010</td>
<td></td>
<td></td>
<td>Welsh Government</td>
</tr>
<tr>
<td>2011</td>
<td></td>
<td>Scottish Government</td>
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<tr>
<td>2012</td>
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<td>2013</td>
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<td></td>
</tr>
<tr>
<td>2014</td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

### 4.2.9 Elementary Aggregates

The Jevons (also known as the geometric mean of price relatives) formula is used to aggregate private rent prices below the stratum level for OOH, IPHRP, and the private rents component in CPIH, CPI, and RPIJ.

Using exactly the same underlying data, private rents for the RPI are aggregated below the stratum level using the Carli (also known as the arithmetic mean of price relatives) formula.

Elementary aggregates for Wales and Scotland are calculated by ONS using the microdata delivered on a monthly basis while elementary aggregates for England are provided by VOA. All use the same methodology as described above.

### 4.2.10 Strata weights

Strata weights for OOH and IPHRP are updated annually. These weights are used to combine elementary aggregates (calculated for each stratum) so that regions and dwelling types contribute to aggregate indices in proportion to their relative expenditures. For the OOH index, weights are designed to represent the owner occupied market. For IPHRP, the weights are designed to represent the private rental market. Starting with the publication of the February 2015 index in March, the stratum weights for the private rents component in the suite of consumer price inflation statistics will align with those used for IPHRP. Stratum weights for earlier periods will be unrevised. Expenditure weights are calculated by multiplying dwelling stock counts (in the owner occupied market for OOH, and in the private rental market for IPHRP) by average rental prices, the data sources for these calculations are described below.

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15 The main difference being that IPHRP uses dwelling type splits at a regional level, while the private rent components used dwelling type split at a national level. From March 2015 both use dwelling type splits at a regional level.
4.2.11 Dwelling stock data

Dwelling stock data for the private rented sector and owner occupied sector comes from the Department for Communities and Local Government (DCLG) for England and its regions. Similar dwelling stock data are also available from the Scottish Government for Scotland and the Welsh Government for Wales. In addition, for the private rented sector only, dwelling stock estimates are also split by the proportion of property types rented privately in Wales, Scotland, and the nine regions of England. For the owner occupied sector, a split by property type is only available at a national level so the same property type split is applied across all regions\textsuperscript{16}.

4.2.12 Average rental prices

Average rental prices, split by the nine English regions, property type, and whether the property is furnished or unfurnished, are provided annually by VOA. These averages are calculated using all of the rents data collected by VOA Rent Officers in the relevant year, and are therefore not directly comparable to the sample of rents followed for the private rents price indices.

The average rental prices for Wales and Scotland are calculated by ONS using the microdata delivered on a monthly basis. Again, all the data collected in the relevant year are used to calculate these averages and therefore it does not compare directly to the sample of rents followed for the private rents price indices.

The averages for a given year cover the period from February of the previous year to January of the current year. For example, the average price used for the 2014 weights is based on data from the period February 2013 to January 2014.

4.2.13 Weight construction

To calculate timely expenditure weights, the most recently available data are used. For a given index year \( y \), the expenditure shares are based on the time periods set out in figure 4.3 below.

\begin{table}[h]
\centering
\begin{tabular}{|c|c|}
\hline
\textbf{Dwelling stock data} & \textbf{y-3 years} \\
\hline
\textbf{Average prices data} & \textbf{y-1 years} \\
\hline
\end{tabular}
\end{table}

Total expenditure is calculated by multiplying dwelling stock counts by average rental prices for each combination of region or country, property type, and furnished/unfurnished status. The relative expenditure weight for each stratum is then calculated using the aggregate level expenditure. The formula for this is as follows:

\begin{equation}
W_{i,j,y} = \frac{p_{i,j,y} \times q_{i,j,y}}{\sum_{i=1}^{11} \sum_{j=1}^{4} p_{i,j,y} \times q_{i,j,y}}
\end{equation}

\textsuperscript{16} A detailed description of the surveys and methods used to derive dwelling stock estimates for the privately rented sector can be found here: \url{http://www.ons.gov.uk/ons/rel/hpi/index-of-private-housing-rental-prices/historical-series/iphrp-article.html#tab-Methodology-of-IPHRP}
Where

\[ w_{i,j,y} = \text{expenditure for property type } j \text{ in region } i \text{ for year } y \]

\[ p_{i,j,y} = \text{average price for property type } j \text{ in region } i \text{ for year } y-1 \]

\[ q_{i,j,y} = \text{estimated stock of property type } j \text{ in region } i \text{ for year } y-3 \]

This weighting procedure gives 88 different expenditure weights for IPHRP, one for each of the nine English regions plus Wales and Scotland, four property types, and furnished/unfurnished status. The OOH index has 48 different expenditure weights. As the index only uses unfurnished rents there is no furnished/unfurnished split, but it does include weights for Northern Ireland.

5. Overview of private rents collection practices

Private rents are collected in England, Scotland, and Wales by Rent Officers as part of responsibilities to administer functions relating to Housing Benefit. This includes the Local Housing Allowance (LHA) and Local Reference Rent (LRR) schemes.

Introduced in April 2008, the LHA is a flat rate allowance paid to housing benefit claimants living in private sector accommodation. LHA rates depend on the number of bedrooms and the Broad Rental Market Area (BRMA\(^{17}\)) the rented property falls in. Prior to this the LRR was used and still applies to those who have claimed Housing Benefit without a break from the same home since before the introduction of the LHA. The LRR is the mid-point between what, in the Rent Officers’ opinion, are the highest and lowest non-exceptional rents in a BRMA. Previously increased by the lower of CPI inflation or to the 30th percentile of market rents, in the Autumn Statement 2012, the Government announced that in 2014/15 and 2015/16, LHA rates would be up-rated by 1 per cent rather than by CPI\(^{18}\).

5.1. England

The collection of private rents in England is administered by the Valuation Office Agency (VOA), using evidence of rents paid in the private rented sector. In order to meet this responsibility, landlords and letting agents provide VOA Rent Officers with data pertaining to the properties they let. This information is captured electronically in the VOA’s lettings information database. Checks are carried out at the point of entry to ensure that any Housing Benefit funded tenancies are excluded from this database. All the lettings information is provided on a goodwill basis.

Rent Officers are instructed to ensure that the letting information that they collect is representative of the full range of local market rents in each BMRA. Prices are collected from landlords, letting agents and tenants, with the aim to collect approximately 15% of data from sources other than letting agents. Rent Officers are expected to maintain a high standard of knowledge of the private rental market in their area. To help Rent Officers select a representative sample across each BRMA, they are given targets based on the 2011 Census. The current target is set at 20% of dwellings privately rented in the 2011 Census, which is estimated to currently represent 10% of the

\(^{17}\) A BRMA is an area within which a person could reasonably be expected to live having regard to facilities and services for the purposes of health, education, recreation, personal banking, and shopping, taking account of the distance of travel, by public and private transport, to and from those facilities and services

private rents market (based on estimates of the size of the private rents market from the 2011 English Housing Report).

Rent Officers are alerted, via a monthly report, of properties that are about to reach a 12 month anniversary since their last update. However, there is no formal procedure for VOA Rent Officers to revisit previous properties and this process does not guarantee that properties are followed up.

VOA rents data are available from 2005 onwards. However, the introduction of the LHA in 2008 resulted in changes to collection practices. The LHA is much more transparent and open to scrutiny compared to LRR and therefore Rent Officers needed to compile and maintain a robust and representative sample of the private rented sector. In response, dedicated teams of Rent Officers were formed to specialise in data collection, and at the peak there were around 100 Letting Research Rent Officers. Guidance, training, and collection and monitoring methods were reviewed, this included introducing more effective and consistent approaches to following up data. Finally, there was also an effort made to improve the awareness of the Rent Officers role which helped create a more receptive environment to data collection. As a result of these changes, the sample used to construct private housing rents price indices grew from around 115,000 in 2008 to around 230,000 in 2010. More detailed information is available in Annex E.

5.2. Scotland

Rental data for Scotland are currently provided by Rent Service Scotland, part of the Community Analytical Services Division (formally known as the Rent Registration Service) of the Scottish Government. It is responsible for gathering rental prices and analysing local rental markets to provide Local Authorities with LHA figures. This information on the rental market is collected by market rental evidence teams, which are in regular contact with landlords and letting agents. As well as setting the LHA figures, it provides advice to Local Authorities in assessing claims for Housing Benefit made before 7th April 2008 under the LRR scheme. Rent Service Scotland also undertakes Fair Rent valuations for regulated tenancies which began in Scotland prior to 2 January 1989. The service operates from three Offices in Edinburgh, Glasgow, and Dundee and employs 12 Scottish Government staff.

Rent Officers use their knowledge and experience to ensure that data collected reflect the mix of properties in the area as far as possible. Rents are gathered from a diverse range of sources but are mainly based on advertised, rather than achieved, rents. All information collected is from open market sources, never from landlords who advertise to people on housing benefits and/or halls of residence. Data for Scotland are available from 2011.

5.3. Wales

Rent Officers Wales, part of the Housing Policy Division of the Welsh Government, provide rental data that are used to construct the Wales estimate. Residential accommodations in the private rented sector in Wales are valued by Rent Officers who provide an independent and impartial valuation service of residential properties. The market rental evidence team of Rent Officers Wales are in regular contact with landlords and letting agents who provide them with the latest up-to-date information, on a voluntary basis, to ensure all valuations are based on current open market rents.

Rent Officers Wales came in to existence in 2003 when it was amalgamated from eight separate regions in Wales and brought under the Welsh Government. Rent Officers were first appointed in
1967 to administer Fair Rents but in 1989, when rents were de-regularised, additional functions were added whereby Rent Officers assessed rents for which housing benefit was being claimed. Evidence of market rents has been collected since then. Systems and methodology were radically updated in 2008 to take account of the commencement of LHA meaning that data for Wales are available from 2009 onwards.

5.4. Northern Ireland

Suitable, comparable data are not currently available for Northern Ireland so the existing CPI private rental data collected in Northern Ireland are used when a UK aggregate is needed. In 2012, when the rental indices were first developed, the Northern Ireland administrative data were deemed unsuitable because they are were neither frequent nor timely enough for inclusion within a measure of consumer price inflation, and the coverage of the data only included the Belfast Metropolitan area, rather than the whole of Northern Ireland. The Northern Ireland Housing Executive (NIHE), responsible for collecting private rental data, is currently undertaking a programme of development to improve the timeliness and extend the coverage to the whole of Northern Ireland. Recent work by NIHE has looked at combining data from PropertyNews.com with NIHE rent data gathered by staff in order to calculate the LHA received for the administration of private sector housing benefit. ONS will continue to work with NIHE in their development programme and look to include comparable administrative private rental indices in OOH and IPHRP in the future.

6. Private rents growth and quality change

Some users have questioned the different price evolution shown by the ONS private rents price indices compared with alternative sources of information on private rents, as noted during a user feedback exercise\(^{19}\). This section considers these alternative sources and provides analyses to demonstrate that at least some of the differences can be explained by compositional changes in survey data and quality changes in the stock of rental properties. Both compositional change and quality change are specifically excluded from the ONS private rent price indices to ensure only pure price change is captured. Put another way, the aim is to compare like with like.

In addition there are methodological differences in the way rental prices can be measured. Broadly speaking there are two approaches. The first approach is to measure the stock of rents that is aiming to capture the price of all properties in the rental market. The second approach is to measure the flow of rents, in other words, to capture the price of new lettings made in the reference period. A useful analogy is comparing the stock of rental properties to a bath of water, and the flow of rental properties to the temperature of the water coming into the bath. If the hot tap is on, it will still take time for the temperature of the water in the bath to warm up, and vice versa\(^{20}\).

ONS rents price indices, in line with current best practice (as described in the ILO CPI Manual), and consistent with methodology used by other National Statistics Institutes, are stock measures. However, it is worth noting that Johnson (2015) suggests that ONS should consider using a flow


\(^{20}\) Thank you to Simon Hayter at Countywide for providing this analogy.
approach to measuring rental prices for owner occupiers’ housing costs. This will be investigated by ONS in due course.

Some of the data and arguments presented in this section are also covered within Johnson (2015) from which much of sections 6.2, 6.3 and 6.4 have been taken.

6.1 Alternative sources of private rents data

Several alternative sources of private rents data are available and they can broadly be grouped into two categories; those produced by government sources and those produced by private companies with an interest in the private rented housing sector.

6.1.1 Private rents – government sources

The English Housing Survey (EHS), Living Costs and Food Survey (LCF) and Family Resource Survey (FRS) are all continuous annual surveys produced by UK government departments. Each of the publications associated with these surveys has been assessed as a National Statistic by the UK Statistics Authority. Although the purpose of each survey is different (see box 6.1 for details), each collects information on housing costs, including rent paid by respondents living in the private rented sector.

Box 6.1

English Housing Survey
Produced by the Department for Communities and Local Government (DCLG), the EHS collects information about people’s housing circumstances and the condition and energy efficiency of housing in England, including the average weekly rent paid by households in the private rented sector.

Living Costs and Food Survey
Commissioned by the ONS, the LCF collects information on spending patterns and the cost of living in Great Britain that reflect household budgets, which includes average weekly rents paid by private households.

Family Resource Survey
Sponsored by the Department for Work and Pensions (DWP) the FRS provides information about the living conditions of people in the UK and the resources available to them. Median weekly rents are published as part of the FRS and DWP has provided ONS with mean weekly rents.

Using EHS, LCF and FRS survey data, a monthly average rent can be produced for each survey for the relevant year. The surveys capture rent levels of the stock of private rented housing and the sample for each is refreshed annually using a multi-stage sampling design. The total survey sample size, and sample in the private rented sector, for the three surveys are presented in figure 6.1 below.
Figure 6.1: EHS, LCF and FRS sample counts, 2013

<table>
<thead>
<tr>
<th>Survey</th>
<th>Total sample size</th>
<th>Private Rentals sample size</th>
</tr>
</thead>
<tbody>
<tr>
<td>EHS</td>
<td>13,600</td>
<td>2,100(^{21})</td>
</tr>
<tr>
<td>LCF</td>
<td>6,000</td>
<td>780</td>
</tr>
<tr>
<td>FRS</td>
<td>20,000</td>
<td>3,000</td>
</tr>
</tbody>
</table>

Responses for the EHS, LCF and FRS are weighted (or grossed) using similar methods; predominantly so that totals match the population distribution by region, age group and sex in the relevant year. The EHS and FRS also use information on the number of households split by tenure type for weighting.

The grossing methodologies for each of these surveys are designed to provide the user with a point in time estimate for the variable of interest. Over time, there will be compositional changes in the population and the grossing factors will change to reflect this. However, this introduces a difference between these surveys and ONS’s rent price indices because changes in the average rent will also include these compositional changes, while the price index does not. An example in figure 6.2 is used to illustrate how this can happen. In the example there are two regions, region 1 has monthly rent of £500, and the monthly rent in region 2 is double at £1000. The monthly rent is the same in both year 1 and year 2 for the two regions. However, the relative weights between the two years change, with region 2 accounting for 50 per cent of the total market in year one but 60 per cent in year 2. The average rent has increased from £750 in year 1 to £800 in year 2 (a 6.7 per cent increase), all due to a compositional change in the population. But there has been no increase in rent prices; which means that a rent price index would show no increase in price between periods 1 and 2.

Figure 6.2: Example showing how compositional change can impact on average rents

<table>
<thead>
<tr>
<th></th>
<th>Region 1</th>
<th>Region 2</th>
<th>Average rent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rent</td>
<td>Weight</td>
<td>Rent</td>
<td>Weight</td>
</tr>
<tr>
<td>Year 1</td>
<td>£500</td>
<td>50</td>
<td>£1,000</td>
</tr>
<tr>
<td>Year 2</td>
<td>£500</td>
<td>40</td>
<td>£1,000</td>
</tr>
</tbody>
</table>

For each of these surveys, average monthly rents for the private rented sector from 2005 to 2013 have been converted into an index and 12-month growth rates calculated. The results are presented in figures 6.3 and 6.4 below.

---

\(^{21}\) Households (as opposed to dwellings, which are the basis of some EHS statistics)
Figure 6.3 Private Rents – Government sources, index

Index (Jan 05 = 100)

- FRS
- EHS
- LCF
- IPHRP - England

Jan-05 Jan-06 Jan-07 Jan-08 Jan-09 Jan-10 Jan-11 Jan-12 Jan-13

Figure 6.4 Private Rents – official government sources, 12-month growth rates

Per cent

- FRS
- EHS
- LCF
- IPHRP - England

Jan-06 Jan-07 Jan-08 Jan-09 Jan-10 Jan-11 Jan-12 Jan-13
Over the nine year period shown, all three indices grew by 30 per cent or more, giving a minimum average annual growth rate of 3.4 per cent. The IPHRP for England on the other hand grew by 18.6 per cent over the same period, an annual average growth rate of 2.1 per cent. The annual growth rates for all of the surveys are volatile, and can differ significantly from each other, however the largest growth rate for the EHS and FRS, and second largest for the LCF is recorded in the same year, 2008. Some of the volatility will be due to the relatively small survey sample sizes which are refreshed annually (see 6.1 above).

It is important to note that during the time period analysed, there have been changes to the surveys underpinning two of the series. The first relates to the EHS series. In April 2008 the English House Conditions Survey (EHCS) was integrated with the Survey of English Housing (SEH) to form the EHS. Mean weekly private rents in the 2008-09 EHS were 18 per cent higher than the published 2007-08 SEH rents. Analysis conducted by DCLG\textsuperscript{22} has shown that 4-5 percentage points of this difference is due to the change from collecting tenancy rents in the SEH to collecting household rents\textsuperscript{23} in the EHS. As a result, the EHS series prior to 2008 in figure 6.3 and 6.3 below has been adjusted to account for this discontinuity. However, this still leaves the mean household rent in the 2008-09 EHS approximately 14 per cent higher than the mean 2007-08 household rent from the SEH. Notwithstanding the earlier quantification, it is possible that not all of the discontinuity has been fully accounted for. The second survey change relates to the LCF which, also in 2008, became a module of the Integrated Household Survey (IHS). In anticipation of this change, the LCF moved onto a calendar year basis in 2006\textsuperscript{24}. It is unclear if this had any effect on the average rental price collected in 2008.

Of the three surveys, the FRS has the biggest sample size, and importantly does not include any known discontinuities in the series. In 2008 the average rent in the FRS increased by about 12 per cent, a significant increase, and over the whole time period (2005-2014) private rents increased by about 30 per cent. The increase is more than 10 percentage points higher than the growth in IPHRP over the same period. As described earlier, compositional changes are captured within the average rents calculated using FRS data and could be impacting on the results (compositional changes in the private rental market, in particular the growth in London relative to the rest of England and Wales, are explored further using census data in section 6.5). In addition, the quality of the underlying stock of rental prices could also be changing over the same period (driven by an increase in the number of rental properties, explored in section 6.3). Compositional change and quality change could, at least in part, explain some of the difference in growth rate between the FRS and IPHRP.

**6.1.2 Private rents – other sources**

In addition to official government sources, there are a number of private companies who produce statistics on the rental market, see box 6.2 for details.


\textsuperscript{23} One household can potentially include several individual tenancies

Figure 6.5 presents the average rent levels produced by the three companies. Although the levels themselves are different, a seasonal pattern can be seen, with all three peaking around September each year. Autumn is usually the peak period for letting agencies in terms of volume of contracts signed and this could be driving the peaks seen due to demand. The trough around January might be because of low demand at this time of the year and landlords accepting a lower rent as a result. The HomeLet series has the strongest seasonal pattern which might be because the series is calculated using simple averages, with no weighting to control for the mix of properties rented throughout the year. Figure 6.6 presents the same three series as 12-month growth rates, alongside the IPHRP (England). During 2012 HomeLet and LSL Property Services both show similar growth rates of around 3 - 3.5 per cent, however in other periods the annual growth of all three series can vary substantially. Growth for IPHRP (England) is lower than the series for the three private companies but there are some similarities with the LSL Property Services series.

Box 6.2

Countrywide PLC
Countrywide has over 1,300 offices nationwide operating under locally recognised brands. Countrywide regularly publishes a monthly new lets average rental price which is based on 4,000-5,000 properties let in the reference month by letting agencies under the Countrywide umbrella. The data are weighted and stratified by regions and number of bedrooms. The regional weights are derived from EHS and the number of bedroom weights are calculated using Countrywide data. Countrywide also manages a portfolio of 75,000 properties and has recently started publishing an occupied lets and a renewal average rental price based on this portfolio of properties.

HomeLet
HomeLet is a private company that provides tenant referencing and insurance for letting agents, landlords and tenants. Since January 2009 it has published a UK new lets monthly index called the HomeLet Rental Index, which is based on achieved private rental prices collected from its tenant referencing services (around 29,000 per month). The index is constructed using a simple average with no weighting applied.

LSL Property Services
LSL Property Services is a provider of residential property services, including residential lettings. Its estate agency arm trades under a number of brands. LSL has commissioned a monthly private housing rental index since January 2011 called the Buy-to-Let Index, which is based on around 7,000 new lets in a month, collected from the mix of rental services that it provides across England and Wales. The sample is stratified and weighted by government office regions (GORs) and by property type. The weights for regions are derived from the EHS, whereas property type weights are derived from LSL’s database of privately rented properties spanning a number of years.

Figure 6.5 presents the average rent levels produced by the three companies. Although the levels themselves are different, a seasonal pattern can be seen, with all three peaking around September each year. Autumn is usually the peak period for letting agencies in terms of volume of contracts signed and this could be driving the peaks seen due to demand. The trough around January might be because of low demand at this time of the year and landlords accepting a lower rent as a result. The HomeLet series has the strongest seasonal pattern which might be because the series is calculated using simple averages, with no weighting to control for the mix of properties rented throughout the year. Figure 6.6 presents the same three series as 12-month growth rates, alongside the IPHRP (England). During 2012 HomeLet and LSL Property Services both show similar growth rates of around 3 - 3.5 per cent, however in other periods the annual growth of all three series can vary substantially. Growth for IPHRP (England) is lower than the series for the three private companies but there are some similarities with the LSL Property Services series.

The three series presented above are all calculated using new rents from the reference month, and are therefore flow measures of private rents. In addition, similar to the government sources, the quality of the underlying stock of rental properties could be changing over time which would be
captured within the price changes shown. However, the Countrywide and LSL Property Services series do control for some compositional changes\textsuperscript{26} with their weighing schemes.

Evidence from the EHS, shown in figure 6.7 below, shows that rents paid differ by length of residence. Those who have been in their property for less than one year pay the most, and in general the longer the length of residence, the lower the rent paid. This can have important implications when considering the difference between stock and flow measures of private rents as a new lets series will tend to focus on the more expensive dynamic end of the market.

**Figure 6.7: Mean weekly private rents by length of residence, 2012-13**

<table>
<thead>
<tr>
<th>Years</th>
<th>All private renters paying rent (£)</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 1 year</td>
<td>175</td>
</tr>
<tr>
<td>1-2 years</td>
<td>163</td>
</tr>
<tr>
<td>2-3 years</td>
<td>161</td>
</tr>
<tr>
<td>3-4 years</td>
<td>164</td>
</tr>
<tr>
<td>5-9 years</td>
<td>154</td>
</tr>
<tr>
<td>10-19 years</td>
<td>134</td>
</tr>
<tr>
<td>20+ years</td>
<td>106</td>
</tr>
<tr>
<td>All</td>
<td>163</td>
</tr>
</tbody>
</table>

Source: English Housing Survey, full household sample

More recently Countrywide has started publishing an occupied lets (a stock measure and hence more comparable with IPHRP) and a renewals average price alongside its existing new lets average price. The average price and annual growth rates for Great Britain are shown in figure 6.8 and 6.9 below. The difference in average price between the three series is striking, with the new lets average price £45 - £50 higher (or 5-6 per cent) compared with the occupied lets and renewal average. This could give some indication of the expected increase in rental price achieved when properties are re-let on the open market (Annex D provides some information on why this gap might exist).

The 12-month growth rate for the new lets average (figure 6.9) is relatively volatile, with an average growth rate of around 4 per cent in 2014. Even though the occupied index is only available for a short period of time, it is clearly much smoother and growing at slower rate, on average 1.7 per cent in 2014, compared with the new lets series. A regional breakdown of the Countrywide charts is presented in Annex F.

\textsuperscript{26} For example by using region, number of bed rooms and/or property type weights which are held constant across the time period shown, see box 6.4 for further details.
Figure 6.8: Countrywide new lets, occupied lets and renewals average price, Great Britain

Figure 6.9: Countrywide new lets, occupied lets and renewals 12-month growth rate, Great Britain
A comparison of average 12-month growth rates in 2014 for Countrywide occupied rents and revised IPHRP is provided in figure 6.10 below. For Great Britain, the average 12-month growth rates are almost identical at 1.6 per cent for IPHRP and 1.7 per cent for Countrywide. At the regional level, the average 12-month growth rates are reasonably similar, with the exception of London which has an annual average growth rate of 2.3 per cent for IPHRP. This compares with the London breakdown Countrywide produces, Central London27 which grew by 0.9 per cent on average and Greater London (excluding Central London) which grew by 3.7 per cent. In the Countrywide weighting scheme, Central London has a weight of 3.3 per cent and Greater London has a weight of 17.25 per cent, giving a weighted London growth of 3.3 per cent, 1 per cent higher than the IPHRP average 12-month growth rate for 2014. However, there are some key differences in the underlying datasets used to produce the two series. Countrywide includes data from its own letting agencies, and therefore does not capture data from all letting agencies and, possibly more importantly, data from private landlords. In addition, the Countrywide weighting scheme is based on dwelling counts, and not expenditure weights. Expenditure weights would give a higher weight to Central London (as properties in Central London have higher average prices) which grew at a slower rate in 2014. Finally, Countrywide does not adjust for changes in the underlying quality of the rental properties it manages.

Figure 6.10: Revised IPHRP versus Countrywide occupied rents, average 12-month growth rate in 2014

<table>
<thead>
<tr>
<th>Regions</th>
<th>IPHRP</th>
<th>Countywide (occupied rents)</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East</td>
<td>0.3</td>
<td>0.6</td>
</tr>
<tr>
<td>North West</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Yorkshire and The Humber</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>East Midlands</td>
<td>1.2</td>
<td>0.7</td>
</tr>
<tr>
<td>West Midlands</td>
<td>1.2</td>
<td></td>
</tr>
<tr>
<td>East</td>
<td>1.1</td>
<td>1.9</td>
</tr>
<tr>
<td>Greater London</td>
<td>2.3</td>
<td>3.7</td>
</tr>
<tr>
<td>Central London</td>
<td></td>
<td>0.9</td>
</tr>
<tr>
<td>South East</td>
<td>1.8</td>
<td>1.8</td>
</tr>
<tr>
<td>South West</td>
<td>1.4</td>
<td>0.6</td>
</tr>
<tr>
<td>Wales</td>
<td>0.4</td>
<td>1.9</td>
</tr>
<tr>
<td>Scotland</td>
<td>1.8</td>
<td>1.3</td>
</tr>
<tr>
<td>Great Britain</td>
<td>1.6</td>
<td>1.7</td>
</tr>
</tbody>
</table>

6.2 VOA private rents data

In evaluating measures of rental price, some users have in particular focused on the difference between the average rental prices published by VOA28 and the ONS private rents price index, both of which are based on the same underlying private rents data collected by VOA Rent Officers. The ONS series is a price index, in that it seeks to make pure price comparisons and strip out the impact of quality change in rents. Average rents published by VOA, in contrast are not mix

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27 Countrywide broadly defines Central London as properties rented within the Circle line on the London Underground.
adjusted and do not attempt to control for differences in the quality of properties between years. This means that the differences between them are due to compositional change, quality change and methodology. The 12-month growth rates for the two series are presented in figure 6.11 below. The diagram in figure 6.12 below details the process flow for calculating ONS private rent indices and how the data relates to published VOA averages.

**Figure 6.11: VOA published average rental price and IPHRP, 12-month growth**
Using the VOA rents data, figure 6.13 presents the average rent recorded by VOA each month, as well as the average rent in the samples drawn from VOA’s data set to inform ONS’s statistics on private rents. OOH weights have been applied to both series and a 12 month moving average applied to the monthly input series to reduce the volatility in the series.
The sample average series in figure 6.13 shows the impact of re-selecting the sample of rents each January to monitor for price change. Between certain years, for example 2007 and 2008, there are large increases in the average rent of the sample. In total, rents rose from around £780 per month at the start of 2005 to around £1130 per month by August 2014. Over £200 of the £350 per month increase in rent can be attributed to changes between the samples, rather than growth within years.

Figure 6.14 below focuses on the 12-month growth rate rather than rent levels. Given both are derived from the same data source using the same weighting, the difference in the 12-month growth rate of the OOH index\(^\text{29}\) and the VOA monthly input data can be thought of as the residual difference due to changes in the quality of the stock of rental properties. This residual quality difference includes within sample year quality changes and across year quality changes due to changes in the properties included in the sample.

\(^{29}\) This series was produced as part of the development process and there are some minor difference between this and the final OOH series presented in figure 3.5.
Figure 6.14: VOA average rents and revised OOH index, England, 12-month growth rate

Figure 6.14 shows a large difference in growth rates between the monthly input and the OOH index during 2008 and 2009. This might be partly explained by changes in VOA’s collection practices during this period as a result of the introduction of the LHA in April 2008 (as discussed in section 5.1). As a direct result, the size of the sample used to construct the private rent indices grew from around 115,000 in 2008 to around 230,000 in 2010. The change in collection practices could have resulted in a change in the composition and underlying quality of the VOA dataset. However, it is worth noting that the growth in 2008 does coincide with the large increases in average rental prices recorded in the government sources of private rents, in particular the FRS.

This does not, however, rule out a general increase in the quality of rented properties overall during this period. Indeed, since 2012 the difference between the VOA input data and the OOH index has averaged around 1.4 percentage points. The question is therefore whether it is possible to identify a direct change in quality sufficient to explain the difference between the series.

6.3 Analysis of the private rented market using the English Housing Survey data

VOA data used to calculate the ONS private rents price indices contains only a limited number of quality variables. Therefore microdata collected for the EHS, and published by DCLG, are used to explore how the quality of the housing stock in the privately rented market has changed over time.

6.3.1 Private rented dwellings

Increases in the quality of private rented dwellings can occur in one of two ways. Firstly, the existing stock can be improved through increased renovation. Alternatively, the property mix can change; new properties can enter the sector that are of a higher quality than the existing stock, and properties of lower quality may leave the market.
A significant increase in the number of private rented dwellings can be seen in figure 6.15 below. In 1996 there were 2 million properties in the sector; by 2012 the sector had more than doubled to 4 million properties, with the largest year on year increase in 2008. This means it is possible for the composition and quality mix to have changed substantially during this period, driven by new properties entering the sector.

**Figure 6.15: All private rented dwellings, thousands of dwellings**

Landlords do not always invest in property to become landlords. Instead they may find they become landlords due to extenuating circumstances. For example they might meet a new partner and move into their property, keeping their own to rent. They might move abroad but make a decision to keep their home in the UK. They might even have trouble selling their property, or want to wait until the market improves before selling. In all of these examples the property was in the owner occupier sector when purchased, and it subsequently moved into the private rented sector. These landlords are often referred to as “accidental” or “reluctant” landlords. In 2009, the first year the Association of Residential Letting Agents (ARLA) asked its member offices (or member letting agencies) if they had seen an increase in rental properties entering the market because they could not be sold, 94 per cent confirmed this was true. By the first quarter of 2014 this had declined to 13 per cent. A significant increase in the number of reluctant landlords due to the economic downturn could explain some of the increase in the stock of private rented dwellings in 2008, and

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30 ARLA collects information on the private rented sector via two quarterly market surveys. The Residential Landlord survey is completed by landlords who visit the ARLA website and the Private Rented Sector survey is distributed and collected by email to their member offices. The ARLA survey reports are available here: [http://www.arla.co.uk/info-guides/market-surveys.aspx](http://www.arla.co.uk/info-guides/market-surveys.aspx). Together they are used to form the ARLA Review and Index for Residential Investment available here: [http://www.arla.co.uk/info-guides/buy-to-let-reviews/2014.aspx](http://www.arla.co.uk/info-guides/buy-to-let-reviews/2014.aspx)

also a change in the quality of the rental stock. Evidence from the 2008 EHS\textsuperscript{32} states that 67 per cent of owner occupied dwellings meet the decent homes standard, while for private renters, this is 56 percent, suggesting a difference in the quality of the housing stock by tenure.

6.3.2 Property size

Two variables which could indicate an increase in the quality of housing in the rented sector are the number of bedrooms and floor area. Larger properties would, other things being equal, command higher rents. The EHS shows that the average floor area, which is not captured in VOA rental data, of private rented property has fallen from 77 square metres in 2008 to 74 square metres in 2012. This could suggest a reduction in the quality of the stock of housing in the private rented sector.

Analysing change in the number of bedrooms is more complex. The EHS collects data on the number of bedrooms on two different bases: \textit{households} and \textit{dwellings}. Several households can live within the same dwelling; for example, four individuals with a bedroom each in a single property would be counted as four one-bedroom households, but one four-bedroom dwelling

\begin{figure}
\centering
\caption{Distribution of number of bedrooms in private rented dwellings, 2005 – 2012}
\begin{tabular}{|c|c|c|c|c|c|c|c|c|}
\hline
\hline
1 beds & 18 & 18 & 17 & 17 & 18 & 19 & 19 & 19 \\
2 beds & 38 & 38 & 38 & 39 & 39 & 40 & 40 & 40 \\
3 beds & 32 & 33 & 34 & 32 & 31 & 31 & 31 & 32 \\
4+ beds & 11 & 10 & 12 & 13 & 11 & 10 & 10 & 10 \\
\hline
\end{tabular}
\end{figure}

Figure 6.16 indicates a small shift towards smaller (one- and two- bed) properties and away from larger properties, again suggesting a small decline in quality. However, the picture is different if one considers households, rather than dwellings, as shown in figure 6.17. This analysis also excludes properties for which no rent is paid, which are generally not part of the private rental market.

\begin{figure}
\centering
\caption{Distribution of number of bedrooms in private rented households, 2005 – 2012}
\begin{tabular}{|c|c|c|c|c|c|c|c|}
\hline
\hline
1 beds & 24 & 23 & 22 & 19 & 19 & 21 & 19 & 19 \\
2 beds & 39 & 38 & 38 & 38 & 40 & 40 & 41 & 40 \\
3 beds & 27 & 29 & 31 & 31 & 31 & 30 & 30 & 31 \\
4+ beds & 10 & 10 & 10 & 12 & 10 & 10 & 10 & 10 \\
\hline
\end{tabular}
\end{figure}

Source: Survey of English Housing / English Housing Survey, DCLG

Figure 6.15 indicates the opposite trend to figure 6.16; a small shift towards larger three bedroom households and away from smaller one-bedroom households.

Over the last few years, the trend has been towards slightly smaller dwellings, both in terms of floor space and the number of bedrooms, but towards slightly larger households. What is clear is that none of these trends indicates the substantial increase in quality of private rented housing required to explain the difference between average rents and a rent price index and so other indicators are considered.

6.3.3 Property age

The relationship between property age and property quality is not clear-cut. On the one hand, one might expect newer properties to be better in some ways, for example they are likely to be more energy efficient. However, property age might also capture some elements of quality that are apparent to the renter, but not easy to quantify, such as the architectural style of the property. Figure 6.18 below sets out the profile of private rented dwellings by age in 2006 and 2012. If, for whatever reason, newer properties command higher rents, then the shift towards newer properties between 2006 and 2012 seen in figure 6.18 may have driven some of the increase in the average price of private rents. However, more evidence is needed before this conclusion can be drawn and is considered in subsequent sections.

**Figure 6.18 Age profile of private rented dwellings, 2006 and 2012**


6.3.4 Other indicators of property quality

The English Housing Survey collects a wide range of information about private rented properties, many of which can be used to assess possible quality changes in the underlying stock. They include information on energy efficiency, the standard of repair of the property, and whether the property meets the Decent Homes Standard.
To meet the Decent Homes Standard, a property must meet statutory minimum standards, be in a reasonable state of repair, provide "reasonably modern" facilities and have both effective heating and insulation (DCLG, 2014, pp81-86). The EHS shows that the proportion of private rented properties failing the Decent Homes Standard has fallen from 47 per cent in 2006 (the first year for which comparable data are available) to 33 per cent in 2012 (EHS Table 12).

Basic repair costs are measured in terms of ‘standardised repair costs’, the average cost per square metre (at 2001 prices) of carrying out any work deemed necessary in the next five years by the visiting EHS surveyor. In 2005, this figure stood at £28 per square metre. By 2012, it had fallen to £16 per square metre, a fall of 45 per cent in real terms (EHS Annex Table 3.3). In other words, there was a substantial improvement in the state of repair of private rented properties over the period.

These two variables point towards an increase in the quality of the stock of rental properties.

6.4 Quantifying quality change

The previous sections have explored some of the ways the private rented housing stock has changed since the VOA data were first collected in 2005. Some of these changes have the potential to explain some of the growth in average prices compared with a price index. However, it is not clear how much impact these changes could reasonably have had.

To try and quantify this, 2012 English Housing Survey microdata was used to develop a regression model for private rents, based on the characteristics of the property. Similar to the hedonic regression models developed for technology goods in the consumer price indices, the model is ‘log-linear’. The results of the regression are shown in figure 6.19 below.

Figure 6.19 Model estimates for private rent prices, 2012

<table>
<thead>
<tr>
<th></th>
<th>Exp (Parameter estimate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>887</td>
</tr>
<tr>
<td>Basic Repairs (£/m2)</td>
<td>0.99</td>
</tr>
<tr>
<td>1 Bedroom</td>
<td>1.00</td>
</tr>
<tr>
<td>2 Bedroom</td>
<td>1.24</td>
</tr>
<tr>
<td>3 Bedroom</td>
<td>1.40</td>
</tr>
<tr>
<td>4 Bedroom</td>
<td>1.77</td>
</tr>
<tr>
<td>5+ Bedroom</td>
<td>2.30</td>
</tr>
<tr>
<td>pre 1850</td>
<td>0.94</td>
</tr>
<tr>
<td>1850-1899</td>
<td>0.90</td>
</tr>
<tr>
<td>1900-1918</td>
<td>0.88</td>
</tr>
<tr>
<td>1919-1944</td>
<td>0.90</td>
</tr>
<tr>
<td>1945-1964</td>
<td>0.86</td>
</tr>
<tr>
<td>1965-1974</td>
<td>0.89</td>
</tr>
<tr>
<td>1975-1980</td>
<td>0.93</td>
</tr>
</tbody>
</table>
The model can be thought of as follows. The base case, a 1 bedroom ‘city’ flat in London built after 1990, has a rent of £887 per month. For each of the characteristics in the table above, except repair costs, the modelled rent price is the base case multiplied by the factor in question. So, for example, a 2 bedroom property would have a modelled rent of 1.24 times the rent of the base case, a property with 1 bedroom. In other words, the modelled rent of a 2 bed property is around 24 per cent above that of a property with 1 bedroom.

In the case of repair costs, the factor is around 0.99 raised to the power of basic repair costs per m², so if £100 of repairs are required per m², the modelled rent would be $0.99^{100} = 0.89$ times that of a property with no need of basic repairs (that is, about 11 per cent lower) \(^3\).

Unsurprisingly, properties with more bedrooms command much higher rents. Detached houses attract slightly higher rents than flats, but semi-detached and terraced houses attract lower rents. Rural rents are lower than those in urban and suburban areas. Rents in London, and to a lesser extent the South East of England, are much higher than in other regions.

Interestingly, property age is also a factor. Properties built after 1990 attract the highest rents, with the next highest rents being paid for properties built before 1850. This suggests that the declining age profile of the rental housing stock could explain some of the increase in average rent.

\(^3\) Result based on actual rather than rounded coefficient.

<table>
<thead>
<tr>
<th>Region</th>
<th>Factor</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-1990</td>
<td>0.89</td>
</tr>
<tr>
<td>post 1990</td>
<td>1.00</td>
</tr>
<tr>
<td>city</td>
<td>1.00</td>
</tr>
<tr>
<td>suburban</td>
<td>0.99</td>
</tr>
<tr>
<td>rural</td>
<td>0.94</td>
</tr>
<tr>
<td>East Midlands</td>
<td>0.46</td>
</tr>
<tr>
<td>Eastern England</td>
<td>0.58</td>
</tr>
<tr>
<td>North East</td>
<td>0.44</td>
</tr>
<tr>
<td>North West</td>
<td>0.46</td>
</tr>
<tr>
<td>South East</td>
<td>0.69</td>
</tr>
<tr>
<td>South West</td>
<td>0.56</td>
</tr>
<tr>
<td>West Midlands</td>
<td>0.49</td>
</tr>
<tr>
<td>Yorkshire and the Humber</td>
<td>0.45</td>
</tr>
<tr>
<td>London</td>
<td>1.00</td>
</tr>
<tr>
<td>Terrace</td>
<td>0.95</td>
</tr>
<tr>
<td>Semi Detached</td>
<td>0.99</td>
</tr>
<tr>
<td>Bungalow</td>
<td>1.01</td>
</tr>
<tr>
<td>Detached</td>
<td>1.10</td>
</tr>
<tr>
<td>Flat</td>
<td>1.00</td>
</tr>
</tbody>
</table>

Source: English Housing Survey, DCLG and ONS calculations
Similarly, there is a relationship between repair costs and rents; an improvement in the state of repair of the housing stock will also raise rents.

Average private rents for the EHS sample were calculated for the period 2008 – 2012, adjusting for changes in the mix of properties over the period. The index was almost identical to the unadjusted price index, suggesting that changes in the quality of the private rented stock over this period were negligible. The model has yet to be extended over a longer time period.

It should be noted that the model had an R-squared value of 0.56; that is, the model parameters only explained around 56 per cent of variation in private rents. This suggests that there may be variables that have not yet been tested that could improve the model. In particular the location of the property (including the neighbourhood and access to local amenities) could be an important price determinant which has not been captured in the above model. It is also possible that a large part of what determines the rent of a property may not be easily quantified. In such circumstances, quantifying quality change is difficult.

### 6.5 Analysis of the private rented market using census data

Published census data from 2001 and 2011 have also been used to explore changes in the private rents market, with a focus on variables which might correlate with a change in the underlying composition and quality of the rental properties. The census does not collect rental price, therefore it is difficult to quantify the exact impact of the changes seen. Figure 6.20 presents dwelling counts for the privately rented sector for the two census years. The counts show that growth in the private rents sector can be seen in all regions, but with London growing the most, expanding by 121 per cent between 2001 and 2011. As discussed earlier, these compositional changes, in particular the growth in London - a region with much higher than average rental prices, can distort average rents. In particular average rents produced by the LCF, EHS and FRS. In addition, properties new to the rental sector between these years have the potential to substantially change the quality of the private rental stock.

#### Figure 6.20: Census - counts of privately rented dwellings

<table>
<thead>
<tr>
<th>Region</th>
<th>2001</th>
<th>2011</th>
<th>Per cent change</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East</td>
<td>128,363</td>
<td>167,736</td>
<td>+31%</td>
</tr>
<tr>
<td>North West</td>
<td>348,791</td>
<td>501,717</td>
<td>+44%</td>
</tr>
<tr>
<td>Yorkshire and The Humber</td>
<td>251,504</td>
<td>386,206</td>
<td>+54%</td>
</tr>
<tr>
<td>East Midlands</td>
<td>221,333</td>
<td>307,772</td>
<td>+39%</td>
</tr>
<tr>
<td>West Midlands</td>
<td>280,342</td>
<td>355,415</td>
<td>+27%</td>
</tr>
<tr>
<td>East</td>
<td>285,063</td>
<td>387,083</td>
<td>+36%</td>
</tr>
<tr>
<td>London</td>
<td>390,805</td>
<td>861,865</td>
<td>+121%</td>
</tr>
<tr>
<td>South East</td>
<td>436,715</td>
<td>624,193</td>
<td>+43%</td>
</tr>
<tr>
<td>South West</td>
<td>253,029</td>
<td>419,047</td>
<td>+66%</td>
</tr>
<tr>
<td>Wales</td>
<td>137,737</td>
<td>204,635</td>
<td>+49%</td>
</tr>
<tr>
<td>England and Wales</td>
<td>2,733,682</td>
<td>4,215,669</td>
<td>+55%</td>
</tr>
</tbody>
</table>
6.5.1 Analysing the change in the composition of the rental sector using area classifications

Output areas (OAs) are the lowest geographical level at which census estimates are published. They were designed to have similar population sizes and be as socially homogenous as possible based on tenure of household and dwelling type. Each output area is assigned an area classification 34 (see box 6.3).

Using the associated traits of the population living in each area classification (or cluster), the level of affluence of each cluster can begin to be assessed. All things being equal, affluent areas tend to be more expensive to rent in than poorer areas. If there is a shift in the composition of the private rented market towards more affluent areas, it is likely to result in a rise in average rents that would be excluded from a price index.

These area classifications have been used to assess how the composition of the private rented market is evolving over time. Figure 6.21 presents the proportion of each supergroup in the private rented sector in each region in each census year. Across all regions there is an increase in the proportion of privately rented properties in the ‘Cosmopolitans’ supergroup, whereas the proportion in the ‘Hard Pressed Living’ supergroup declines between 2001 and 2011. There are also some other patterns that merit further research. The population of people living in the Hard Pressed Living supergroup are characterised as having a smaller proportion of people with higher level qualifications and as having unemployment rates above the national average35.

For most regions (figure 6.21), the growth in the privately renting proportion in the ‘Cosmopolitans’ supergroup is driven by reasonably equal growth across the four groups (‘Students Around Campus’, ‘Inner-City Students’, ‘Comfortable Cosmopolitans’ and ‘Aspiring and Affluent’) that make up this supergroup. Two of these groups include students, who are usually thought to purchase cheap accommodation close to universities and/or city centres. However, it is worth pointing out that students typically share accommodation, splitting their accommodation costs across a number of individuals. While one individual’s cost for the accommodation may seem

relatively cheap, the total amount spent on accommodation by the household can be high, often out of reach of other household types (for example a family) which might consider living in the same dwelling. London is the exception where the group ‘Aspiring and Affluent’ is driving the change at the supergroup level. The ‘Aspiring and Affluent’ group has a higher proportion of people with higher level qualifications compared to the national average, where people are more likely to work in the information and communication, and financial related industries, where earnings are higher than average\textsuperscript{36}.

The growth in the proportion of private rental properties in the more affluent ‘Cosmopolitan’ supergroup, and the decline in the less affluent ‘Hard Pressed Living’ supergroup, suggests that an increase in the quality of the underlying stock of rental properties is possible.

\textbf{Figure 6.21 Private renters grouped by region and classification groups}

6.5.2 Deprivation classification: households by deprivation dimension

Census datasets also include variables which relate to deprivation, referred to as “selected characteristics” in 2001 and later as “dimensions” in 2011\(^\text{37}\). These variables have been analysed to investigate how the deprivation of residents in privately rented property has changed between the two census years.

\(^{37}\) Classified independently of the Indices of Multiple Deprivation and should not be directly compared with them.
The four dimensions broadly are:

1. **Employment**: Any member of the household aged 16-74 who is not a full-time student and is either unemployed or permanently sick.

2. **Education**: No member of the household aged 16 to pensionable age has at least 5 GCSEs (grades A-C) or equivalent AND no member of the household aged 16-18 is in full-time education.

3. **Health and disability**: Any member of the household has general health 'not good' in the year before Census or has a limiting long-term illness.

4. **Housing**: The household’s accommodation is either overcrowded (occupancy indicator is -1 or less), OR is in a shared dwelling OR does not have sole use of bath/shower and toilet OR has no central heating.

For each output area, the percentage of households deprived in at least one dimension was plotted against the percentage of dwellings privately rented. The result is displayed in figure 6.22 below. In 2001 the data points are skewed towards the top as output areas with a high proportion of dwellings privately rented were more likely to also be deprived. In 2011 the results are much less skewed, as many more output areas with high proportions of dwellings in the privately sector also have lower levels of household deprivation in at least one dimension. Although this scatter plot cannot tell us which dimension is driving this change, it can still be used to corroborate the results from the cluster analysis presented above, which suggests that more people are now renting privately in more affluent areas.

**Figure 6.22 Deprivation against percentage of rented properties, 2001 and 2011**
6.6 Summary
The evidence presented has shown that the difference between the IPHRP published by ONS and alternative sources of data on rental prices can be attributed to a number of factors. Average rental prices published by private companies with an interest in the rental market usually base their measures on new lets made in the reference month, and are therefore a flow measure of rents, whereas ONS measure is a stock. The one private company, Countrywide, which also publishes an occupied average (a stock measure) shows that flow and stock measures can move in very different ways in the short term. Comparing average 12-month growth rates for IPHRP with the Countrywide occupied rents series shows that the two series are indeed very similar in 2014.

Government surveys, and indeed the VOA’s own average rents series, measure the change in average rent paid, rather than the change in rent prices. The former will reflect changes in the composition of the private rented sector, while rent price indices compare like with like and so exclude this effect. Average rents have risen faster than rent prices, which imply that compositional changes have had an upward effect on average prices. Census data in 2001 and 2011 supports this theory, with the size of the London rental market increasing disproportionally compared to England and Wales as a whole.

Finally, all of these data sources include changes in price due to changes in the underlying quality of the rental sector, whereas the ONS rents prices indices aim to capture only pure price change, in other words like for like. Some of the evidence provided points towards an increase in quality in the private rents sector. For example, in recent times, the size of the private rented housing stock has more the doubled, and some of this supply has probably come from the owner occupied market which is generally in better repair that the rental market. Evidence from the EHS suggests that rented properties are now better maintained than they were a few years ago. People in more affluent areas are now more likely to rent than they were in 2001, which leads to a higher average rent paid, but without the rent prices of individual properties increasing. There are also indications that changes in data collection practices have introduced discontinuities in the average prices calculated from some of the data sources.

However, all of the evidence provided is open to interpretation. Although the evidence presented suggests a change in the composition and quality of the private rented market, it is difficult to quantify this and provide definitive evidence.

7. Impact on National Accounts

7.1 Impact of OOH revisions on the UK National Accounts
Estimates of household expenditure on actual rentals and owner-occupied imputed rentals are both included in the National Accounts. Estimates of the volume of these are produced first, and then these are inflated to give a current price estimate. From 2010 onwards38, this inflator has been fixed to the CPIH price estimates for actual and owner-occupied rental.

The revision to the OOH index described in this article will therefore directly affect the relevant household expenditure current price estimates in the National Accounts, but not the volume

estimates. Revisions to the OOH component in CPIH will be taken on as part of the Blue Book 2015 process, with publication due in June 2015.

7.2 Impact of methodology revisions to imputed rents on OOH weight

When CPIH was launched in early 2013, weights for the OOH component were calculated using the Blue Book 2012 estimates for expenditure on imputed rentals. In Blue Book 2013, a revision to the methodology used to calculate imputed rents in the UK National Accounts\(^{39}\) resulted in a step change upward in the weights used for OOH in CPIH, increasing it from a weight of 12.2% in 2013 to 15.6% in 2014.

Further improvements to the methodology for actual rents and imputed rents in the National Accounts will be introduced in Blue Book 2016 (BB16). The changes include using VOA as a source of private rents data and will result in further upward revisions in the expenditure on imputed rents, which will in turn increase the OOH weight in CPIH.

Weights are usually not altered historically in consumer price inflation statistics as the measures are designed to give the best possible picture at the time of the release. The value of updating weights when new information becomes available is, in general, outweighed by user need for consistency, particularly when the index is used for indexation. However, CPIH is a relatively new consumer price inflation statistic and its use is still limited. In addition, CPIH has reverted to experimental status and revisions to the OOH price component will be introduced in March 2015. Therefore ONS has a one-time opportunity also to make retrospective changes to the OOH weight to align it historically and to reflect planned changes to the measurement of imputed rents in BB16.

Not revising would leave OOH weights significantly out of line with the National Accounts, hence the decision to align the weight for this item only. After the revisions are introduced in March 2015, and CPIH has been reaccredited as a National Statistic, the approach to revisions in CPIH will revert to that which is usual for consumer price indices and follow the procedures as set out in the CPIH revisions policy\(^{40}\).

8. Next steps

The experimental IPHRP and back series have been revised in the October to December 2014 results published today (30 January 2015), to coincide with the publication of this article. The improvements to the OOH component in CPIH will be introduced as part of the 2015 annual update of consumer price indices published on 24 March 2015, with the historical series recalculated back to 2005. At the same time, improvements to the estimation of the private rents component in the suite of consumer price inflation statistics will also be made.

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\(^{39}\) Prior to Blue Book 2013, owner occupiers’ imputed rentals in the UK National Accounts were presented with owner occupiers’ estimated expenditure on maintenance and repairs removed. To ensure full compliance with ESA95, in Blue Book 2013, a revised methodology was implemented so that imputed rentals are now presented on a gross basis (that is, including the estimation of maintenance and repairs which was previously deducted). Further detail is available here: http://www.ons.gov.uk/ons/rel/consumer-trends/consumer-trends/q1-2013/blue-book-2013--improvements-to-household-expenditure-estimates.html#tab-Improvements-to-sources-and-methods

The revised historic CPIH series, showing the impact of both revising the OOH series and updating the OOH weights historically (to reflect the Blue Book 2016 changes), will be made available in a separate article to be published on 17 March 2015.

Following improvements made by ONS to the measurement of private rental price indices, a user event has been arranged to provide users of private rental statistics the opportunity to discuss these improvements as well as discussing the private rental sector more generally. The event will take place on Friday 20 February 2014 in London. Further details regarding the venue, timings, content and how to register for a place can be found on the ONS website41.

Acknowledgments
The authors thank Simon Hayter at Countrywide for the useful discussion and analysis on the private rental market.

The authors would also like to thank Arthur Bennett and Phillip Wales for carrying out a literature review and initial analysis into the relationship between private rents and house prices in the UK. Their analysis has been provided in annex C.

References


Annex A – Owner occupiers’ housing costs and development of CPIH

Owner occupiers’ housing costs are the costs of housing services associated with owning, maintaining and living in one’s own home. OOH does not include costs such as utility bills, minor repairs and maintenance, which are included separately in consumer price indices. CPIH uses an internationally recognised approach called rental equivalence to measure OOH. Rental equivalence uses the rent paid for an equivalent house as a proxy for the costs faced by an owner occupier. In other words this answers the question “how much would I have to pay in rent to live in a home like mine?”

Prior to 2013, the development of a measure of OOH had been taking place for a number of years. The initial driver was a desire by the European Statistical System to include OOH into the Harmonised Index of Consumer Prices (HICP). However, the pace of European development was slower than met UK needs and ONS decided that it should aim to develop a measure independently of Europe while still playing a leading part in the European development programme. The development of this measure was one of the first issues that the Consumer Prices Advisory Committee (CPAC) was asked to advise upon when it was formed in 2009. The decision to move ahead of Europe was welcomed by UK stakeholders and also became a commitment of the coalition government formed in 2010 in their programme for government.

Numerous internationally recognised methods for measuring OOH were considered, though this was narrowed to two viable choices – the net acquisitions and rental equivalence methods, by the time ONS reported to the UK Statistics Authority in September 2010. Over the following eighteen months ONS undertook a work programme to develop robust OOH indices using these two methods. The Authority Board made this work a top priority for ONS at its September 2010 meeting.

In developing the rental equivalence method, ONS determined that the existing source of private rental data information (the key component of the method) used in the Consumer Prices Index (CPI) and Retail Prices Index (RPI) was not suitable for creating a robust measure of OOH. This tallied with some previous concerns from Eurostat and ONS staff over the existing method of collecting private rental prices.

Research by ONS identified that rental data collected by the Valuation Office Agency (VOA) for England, plus Welsh and Scottish Governments provided a solid basis for the measurement of OOH and could also improve the measurement of private rental prices in the CPI and RPI. These data were collected by the respective bodies for the purposes of calculating the Local Housing Allowance. From an OOH perspective, key advantages of these data over existing private rental data included a far larger number of quotes (enabling a sample of over 200,000 annually compared with a sample of around 1,500 in the existing private rents sample) and improved metadata which would allow the drawing and weighting of a sample that reflected the composition of the owner occupiers’ housing market. ONS was able to gain agreements from the Welsh and Scottish governments to have access to their microdata, which enabled ONS to develop OOH indices from

42 http://www.direct.gov.uk/prod_consum_dg/groups/dg_digitalassets/@dg/@en/documents/digitalasset/dg_187876.pdf
these data in-house. However, the legislation governing the VOA\textsuperscript{44} meant that it was not possible for them to share microdata with ONS. A compromise was reached whereby ONS developed a method for calculating OOH and private rental indices. ONS staff worked with VOA to implement this into their systems.

During summer 2012, ONS ran a public consultation on the preferred method of OOH. Respondents to the consultation were split between those who preferred rental equivalence and net acquisitions. Following this consultation ONS recommended that the rental equivalence method should be adopted. The board of the UK Statistics Authority approved this recommendation. The Authority also approved the use of these new sources of data to measure private rental prices in all consumer price inflation measures. CPIH (the new measure including OOH using the rental equivalence method) was launched in early 2013. Concurrently, these new data were introduced to measure private rental prices.

CPIH was assessed and CPI re-assessed for National Statistics status during the first half of 2013. The assessment report\textsuperscript{45} was published on 25 July 2013 and following the implementation of requirements, CPIH was granted National Statistics status on 21 November 2013\textsuperscript{46}.

These data were also used as the basis for the Index of Private Rental Housing Prices (IPHRP), a new experimental index of private rental prices at a sub-UK level. The IPHRP was developed in response to user demand for improved statistics on the private rental market as identified by the National Statistician’s review of housing market statistics.

Following the adoption of these new data, a number of users questioned the different price evolution shown by the new ONS measures of private rental prices when compared to other sources of information on private rental process. These queries resulted in some questioning the validity of the method used to measure OOH in CPIH. ONS worked with VOA to understand these differences to determine whether any improvements to the methods used in the ONS measures was possible. This work identified a number of areas where improvements in the practical implementations of the methods were possible. These issues have now been resolved and are presented within this paper.

\textsuperscript{44} Commissioners of Revenue and Customs Act 2005
Annex B - Improvements implemented

This annex details the improvements to the private rents price indices used in OOH and IPHRP. Comparisons are made between the improved methodology and previous methodology using metrics produced by VOA during the development of the revised series.

B.1 Sample optimisation

Under the previous methodology, each January nearly all available price quotes were used to form the sample which resulted in a heavily depleted substitution pool at the start of the year, as shown in figure B.1 below. The small substitution pool at the start of the year made it difficult to find comparable replacements needed for the methodology. This resulted in the sample size declining due to the attrition of properties that could not be matched. As a result, properties with no price change (those carried forward) had a bigger influence on the growth rates calculated. Therefore, during a period of rental price increases, this attrition led to a downward bias in the resulting index.

Figure B.1: Sample size and substitution pool size under previous methodology

![Graph showing sample size and substitution pool size](image)

Source: VOA

In the improved methodology, the sample is optimised to leave a sufficient supply of properties to be used as replacements throughout the year. Half of all records entered into the system over the previous 14 months are used to construct the sample, the remainder forming the substitution pool. This sample size strikes a better balance between a robust initial sample and the maintenance of the sample over the year.

The interaction between the sample and substitution pool following the implementation of the improved methodology can be seen in figure B.2 below. Although the substitution pool can become depleted slightly during the year, it still remains relatively large and is re-optimised the following January based on data availability in each strata.
B.2 Comparable replacements

When a property reaches the end of its validity period, a process is implemented to match the existing quote to a property in the substitution pool with sufficiently similar characteristics to be deemed comparable. Analysis of the data suggested that this process was not efficient, resulting in some suitable replacements not being made. There were also a small number of matches that were duplicated.

As shown in figure B.3 below, across nearly all months, fewer than 50 per cent of the required replacements were made. If a replacement was not made then under the previous methodology the property would drop out of the sample. Figure B.3 also re-affirms the observation that under the previous methodology it was easier to replace a property later in the year, once the substitution pool had grown.
Three main reasons were identified for the low success rate of finding required replacements:

- Some properties that required a match were not actually put forward to be matched
- Matched properties that failed the validation check were not re-matched
- The substitution pool did not include the required replacement

In short, not every property that required a replacement achieved one; approximately one third of properties needing a replacement were not put forwards to be matched. Of the properties put forwards to be matched, not all could be matched, either because there was no replacement available, or because it failed the validation check made on the rental price.

Improvements have since been implemented so that all records requiring a match are now put forward to be matched and records that initially fail the validation check are re-matched. The optimisation of the sample at the start of the year, as previously discussed, has also provided a bigger substitution pool throughout the year, increasing the chance of finding a comparable replacement.

Combining the effects of optimising the sample and improvements made to the matching increased the proportion of required replacements successfully made to around 75 per cent, as shown in figure B.4 below.
**B.3 Non-comparable replacements and imputation**

As discussed in the section above, if a comparable match could not be achieved under the previous methodology, the record would drop out of the sample and not be replaced. As a result, the sample size fell over the year due to the attrition of the properties that could not be matched. Therefore, properties with no price change (those carried as they are within their validity period) had a bigger influence on the growth rates calculated. During periods of rental price increases, this led to an overall downward bias on the index.

To rectify this, a new process has been implemented so that if a comparable match cannot be found, a new property is included as a non-comparable replacement. A January (base) price for the new property is then imputed from the price movements of comparable replacement properties made in the same strata, similar to the practice for other components of consumer price indices. Overall, under the new methodology this accounts for around 15 per cent of required matches.

**B.4 Contract length**

Because there is no operational requirement to do so, VOA has no formal procedures in place for following up properties. Therefore a validity period needs to be applied to rental prices, should a new price update not be received. Under the previous methodology this validity period was 18 months - a figure based on a report from the Association of Residential Letting Agents (ARLA) which found that 71% of tenancies last between 13 and 24 months with the largest proportion (36%) saying that the length of continuous stay in a property is between 13 and 18 months\(^\text{47}\).

Recent analysis has shown that the validity period should be shortened to 14 months (the reasoning for this is set out in Annex D).

\(^{47}\) Figures taken from ARLA Members Survey Quarter 3 2011
Annex C – Relationship between private rents and house prices

Private rental prices and house price statistics are related in the sense that changes in house prices are thought to be a key determinant of movements in private rental costs (Gallin 2008). Both series can provide useful information about conditions in the housing market, and the ratio of rents to house prices is frequently used as an indicator of market disequilibrium. This section sets out a conceptual framework for thinking about the relationship between house prices and rents, before comparing the new IPHRP data and ONS house price series.

C.1 Framework

A considerable academic literature is devoted to modelling the relationship between rents and house prices, using a range of different methods and emphasising several different findings. As rents are thought to reflect the per-period value of the housing services associated with a specific unit of accommodation, and as house prices should reflect the discounted value of the expected future housing services from that unit, most papers begin from the contention that rents and house prices should move together. Analogously to the dividend-price ratio of a listed stock, the market should work to ensure that, over the long-term, rents and house prices move in line with each other. In equilibrium, households should be indifferent between renting and owner occupation: rents should reflect the ‘user cost of owner occupation’.

However, estimating the user cost of owner occupation is challenging. One approach to modelling the user cost is to consider owner-occupiers who purchase their dwelling at the start of each period and selling it at the end of each period: the user cost of housing reflects the net cost incurred in this process (as set out in Johnson (2015)):

\[
\text{Full user cost} = \text{Mortgage interest paid} + \text{Interest foregone on capital invested} + \text{Depreciation} + \text{Running costs} - \text{Capital gain}
\]

The owner-occupier would incur interest costs including mortgage interest payments and the opportunity cost of the interest foregone (i.e. the lost interest from funds that could have been invested elsewhere). Other costs include depreciation and maintenance (i.e. the costs of returning the dwelling to its original condition). Offsetting these costs would be any capital gain made on the property over the period (the purchasing price less the selling price). While several elements of this approach are unobserved, it makes clear the central importance of both current and future house prices to the user cost – which in turn should be reflected in rents.

Building on the framework set out by Poterba (1984) and that developed above, Bracke (2013) makes this link explicit, arguing that the ratio of rent to house price for any specific property can be modelled as:
Equation C.1

\[ \frac{Rent^*}{Price} = r_f + \delta + m - g \]

where \( Rent^* \) is net rental income (after allowing for vacancies); \( r_f \) is the rate of return on a risk-free investment; \( \delta \) is a risk premium; \( m \) is a term that combines both the depreciation and maintenance rate; and \( g \) is the expected capital appreciation of the unit. All other things being equal, rents are likely to be higher when the interest rate is higher and when the depreciation costs and risks associated with a specific property are greater. Rents will be correspondingly lower, the larger the expected capital gain on the property.

Several papers present evidence on the relative importance of the parameters on the right-hand-side of equation C.1. Campbell et al. (2009) use the dynamic version of the Gordon growth model to decompose the movements in rent-price ratios of US metropolitan areas into the contributions of real interest rates, and housing risk premia. They show that housing risk premia are variable and account for a significant fraction of rent–price ratio volatility at the national and local levels. Sinai & Souleles (2005) find that risk is important in determining rent levels – finding that both rent risk and asset price risk are significant for the household choice between renting and owner occupation. Consistent with the model presented above, they also find that the cities with the highest expected growth rates of prices and rents have the highest price-to-rent ratios.

Bracke (2013) finds that rent-price ratios vary widely by area and unit type in Central London. He also concludes that risk premia are important in determining the rent-price ratios for a set of matched properties that are offered both for rent and for purchase in a short time frame, but he finds that expected capital gains are also important. An expected doubling of house prices lowers the rent-price ratio by between 1.6% and 2.5% in his model. All of these factors may cause the offered price and rental income from a property to move in different directions in the short term.

At the whole economy level, several studies have considered how long rents and house prices can sustain different rates of movement. Meen (2013) presents a life-cycle model of household housing choice, and concludes that a fixed relationship between house prices and rents only holds if the user cost is also constant. Using his measure of user costs, he finds that there may be large departures from the relationship which may last several years.

Gallin (2008) uses US city-level data to examine whether changes in the rent-price ratio can anticipate growth in house prices or rents, as predicted by the dividend discount model. He finds that, when house prices are high relative to rents, subsequent changes in real rents are larger than usual and subsequent changes in real house prices are smaller than usual, suggesting that the two may move apart over the short term, but may correct over the longer term.

In research focused on historical long-run patterns, Ambrose et al. (2013) analyse the behaviour of rent-price ratios in Amsterdam between 1650 and 2005. They also find that variations can be persistent and long-lasting, that market correction of the mispricing occurs mainly through house prices not rents, and that this correction back to equilibrium can take several years.
C.2 Analyses

Given this discussion, it seems reasonable to expect there to be a broad relationship between indicators of new rental prices and house prices. Stronger (weaker) house prices are likely to raise (lower) the costs of capital for landlords, and all else being equal they should feed into higher (lower) rents. As the IPHRP is a ‘stock’ measure of rents – capturing price information for the entire rented sector over a series of repeated transactions – the flow of new rents based on recent developments in house prices will only gradually influence its development. The HPI, by contrast, is a ‘flow’ measure, capturing only the part of the housing market that is changing as newly marketed properties are bought and sold. For this reason we could expect the HPI series to reflect more quickly changes in the wider housing market than the IPHRP series.

Figure C.1 below shows the HPI, previous IPHRP and revised IPHRP series for England indexed to January 2011, and confirms that there is a broad, positive association between these series. Whilst neither the new nor the old IPHRP series show the same degree of price change as the HPI, both move in broadly the same direction as the house prices series. Both the new IPHRP series and the house price series rise relatively strongly in the years before the economic downturn, with the former peaking around a year after the house price series. In general, the revised IPHRP rental series appears to track movements in house prices more closely than the old series, although the two series have diverged again in recent months.

Figure C.1: HPI index, previous and revised IPHRP indices, England

The approximate twelve month lag in the rental price series is examined in more detail in figure C.2, which plots the growth of house prices (left-hand axis) and rents (right-hand axis) in London since January 2006. For illustrative purposes, the growth rates of rentals are lagged by a year. It shows that the new rentals series for London is much more responsive to changes in house prices.
than the older IPHRP series – falling and recovering around a year after the respective movements in house prices between 2007 and 2011. While movements in the rentals series are proportionately smaller than changes in house prices, this is broadly consistent with differences in measurement concepts: as market conditions fed quite quickly into the house price series, the large stock of contracted rental properties is likely to mute changes in the IPHRP. In recent months, the rise in London house prices a year ago also appears to be related to a rise in rental prices.

Figure C.2: Growth of HPI and IPHRP (lagged by twelve months), London

Perhaps the strongest divergence between the new IPHRP and the HPI growth rates for London presented in figure C.2 are between 2010 and 2013. Figure C.3 below examines this in more detail by plotting the growth of the HPI for London (x-axis) against the revised IPHRP growth rate for a year later (y-axis). Points during this period of divergence are plotted in red, and appear to be well off the trend relationship between rents and house prices. While this would bear further scrutiny, this difference may reflect credit constraints arising from the financial market shocks: demand for rent may have been boosted by limited mortgage availability – in particular for first time buyers – over this period. Similar results can be found for the other regions of the UK; however, given the shortness of the time-series and the recent divergences, it remains too soon to judge the extent of the relationship between the IPHRP and HPI.
Figure C.3: Relationship between annual growth of house prices and rental prices (lagged twelve months), London

Taken together, the preceding discussion and analysis suggests that it is reasonable to expect there to be a relationship between house prices and rents, although the nature of this relationship is not precise and can vary for a wide range of different reasons. From analysing the series we see that the revised IPHRP series now tracks movements in aggregate house prices more closely than the previous IPHRP series. Both the level (figure C.1) and the rate of growth of rents (figure C.2) appear to move more in line with the HPI, albeit with a lag of around a year. This is likely to partly reflect differences in the nature of the two series. However, the recent movements of the IPHRP – and in particular the divergence between rents and prices between 2010 and 2013 – mean that it remains too early to judge the precise nature of the relationship between these two series.
Annex D - Rationale for using a 14 month validity period

Given that there are no formal procedures in place to follow up properties once they are included in the sample, an assumption has to be made for how long a price should remain valid should a new price update not be received. Following a review of sources, the new method operates using a 14 month validity period. This annex presents the analysis and thinking behind this assumption.

D.1 Contract length and occupancy length

Contract length refers to the duration of a fixed term tenancy agreement signed between a landlord and tenant. Most tenancies begin with a fixed term tenancy agreement. At the end of the initial contract period one of the following four events can occur:

- The tenant moves out and the property is let to a new tenant
- The tenant stays and the contract is renewed at the same price for a fixed term
- The tenant stays and the contract is renewed at a different price for a fixed term
- The tenant stays but the contract is not renewed and automatically becomes a periodic tenancy. The “period” is dependent on how frequently the rent is paid, usually weekly or monthly, and rolls on from one period to the next.

Fixed term tenancies are for a specific length of time and cannot be ended early without agreement from all parties, unless the tenancy includes a break clause. In addition, the rent cannot be changed during the agreement, unless there is a provision in the contract to do so.

In many instances contracts are renewed for a fixed term if the same tenants remain in the same property. This tends to happen because fixed term contracts provide both the landlord and tenant security in terms of how long the tenancy will last. However, it does remove a degree of flexibility on both sides compared with periodic tenancies. Management agents tend to use fixed term contracts to provide predictable review periods and in theory optimise the potential rental income. However, the rent is negotiable so the use of fixed term contracts does not necessarily result in rental increases. Anecdotal evidence collected by VOA Rent Officers suggests that landlords who manage their own properties are more inclined to allow contractual tenancies to become periodic tenancies. If the contract is a periodic tenancy then the landlord can increase the rent by agreement with the tenant or by entering into a new contractual agreement. To end the tenancy the landlord may serve notice to quit or the tenant can leave after a period of notice.

In contrast to contract length, occupancy (or tenancy length) refers to the length of time the same tenant stays in the same property. In most instances this will include one or more contract periods, or potentially a rolling periodic tenancy. The distinction between the two is important when considering the validity period used in the methodology applied.

Anecdotal information obtained from VOA Rent Officers suggests that landlords tend to make fewer and smaller price changes when new fixed term contracts are signed with existing tenants. This is thought to happen because landlords make a considered business decision. A smaller

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48 Some tenancy agreements include a break clause which provides an opportunity for the tenant and/or landlord to give notice during the contract. For example, if a 12 month tenancy included a 6 month break clause then either party could break the tenancy after 6 months. Break clauses are not included in standard assured shorthold tenancy agreements and are the exception to the rule
negotiated rental increase from an existing tenant with a good track record for payment is lower risk and potentially delivers a higher overall long-term rental income than experiencing a void period with no income and the associated cost of re-letting the property to a new tenant at a marginally higher rent. Therefore larger price changes tend to occur when the existing tenant moves out and the property is advertised on the open market. Any market increases since the previous letting are reflected in an increased asking rent, and the property is offered to a wider audience. The level of rent achieved is subject to the prevailing market conditions. Information from Countrywide (presented in Annex F) on new lets versus renewals corroborates this finding. Renewals with existing tenants or the creation of a periodic tenancy at the end of a contractual term are thoughts to make up a significant percentage of the private rental sector.

However, the important point here is that landlords have the opportunity to review prices at the end of each contract period. Therefore, contract periods need to be considered to help inform the optimal timeframe to use as the validity period in the methodology applied.

To assess contract lengths and occupancy lengths, VOA Rent Officers used a network of contacts in the private rental sector to gather both microdata and aggregated data from a range of data sources. In addition, ONS received analysis from Countrywide which is also presented in the following sections.

**Contract length analysis**

Countrywide PLC provided ONS with contract length statistics, split by length of contract, as a proportion of all contracts signed for a given region in 2014. In addition, counts were provided so a mean contract length has also been calculated. The results are presented in figure D.1 below. For all regions, with the exception of Scotland, and to some extent Wales, the vast majority of contracts are signed for 12 months. In Scotland 64 per cent of contracts signed with Countrywide letting agencies are for 6 months, with the remaining 36 per cent signed for 12 months. The mean contract length varies between 8.1 months in Scotland and 15.4 months in Central London.
Figure D.1: Countrywide, contract length statistics, 2014*

<table>
<thead>
<tr>
<th>Region</th>
<th>Periodic tenancy</th>
<th>6 month contract</th>
<th>12 month contract</th>
<th>18 month contract</th>
<th>24 month contract</th>
<th>36 month contract</th>
<th>Mean contract length**</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East</td>
<td>3%</td>
<td>27%</td>
<td>65%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>North West</td>
<td>4%</td>
<td>34%</td>
<td>59%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Yorkshire and The Humber</td>
<td>3%</td>
<td>32%</td>
<td>63%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>East Midlands</td>
<td>3%</td>
<td>26%</td>
<td>67%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>West Midlands</td>
<td>..</td>
<td>26%</td>
<td>69%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>11</td>
</tr>
<tr>
<td>East of England</td>
<td>..</td>
<td>16%</td>
<td>78%</td>
<td>-</td>
<td>-</td>
<td>3%</td>
<td>11</td>
</tr>
<tr>
<td>Greater London</td>
<td>..</td>
<td>5%</td>
<td>90%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>12</td>
</tr>
<tr>
<td>Central London</td>
<td>-</td>
<td>2%</td>
<td>71%</td>
<td>-</td>
<td>21%</td>
<td>4%</td>
<td>15</td>
</tr>
<tr>
<td>South East</td>
<td>..</td>
<td>11%</td>
<td>82%</td>
<td>-</td>
<td>-</td>
<td>4%</td>
<td>12</td>
</tr>
<tr>
<td>South West</td>
<td>4%</td>
<td>38%</td>
<td>56%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>10</td>
</tr>
<tr>
<td>Wales</td>
<td>..</td>
<td>46%</td>
<td>50%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>9</td>
</tr>
<tr>
<td>Scotland</td>
<td>-</td>
<td>64%</td>
<td>36%</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8</td>
</tr>
<tr>
<td>Total</td>
<td>2%</td>
<td>26%</td>
<td>67%</td>
<td>1%</td>
<td>3%</td>
<td>1%</td>
<td>11</td>
</tr>
</tbody>
</table>

*Percentages may not sum to 100 due to rounding

**Mean includes those on periodic tenancies (which have a contract length of 1 month)

.. less than 3%

Source: Countrywide PLC

**Mydeposits** provided VOA with compiled summary level data over a 24 month period (June 12 – May 14). The mean contract length ranges between 9 and 12 months, London being the highest at 12 months. The median contract length also ranges between 9 and 12 months, with London, the South East and East Midlands the highest at 12 months. If the majority of contracts are signed for 6 or 12 months, then one would expect the median contract length to be either 6 or 12 months. However the median length results from Mydeposits (figure D.2) are not always consistent with this. This is could be happening because the agents and/or landlords responsible advising Mydeposits that a tenancy has ended do so late and/or do not enter an accurate date. In addition the results will include statutory periodic tenancies where the landlord agrees to a tenant staying on for a few months whilst renegotiating a new contract or before moving home.
Figure D.2: Mydeposits, contract length statistics, June 2012 to May 2014

<table>
<thead>
<tr>
<th>Region</th>
<th>Mean contract length</th>
<th>Quartile 1 contract length</th>
<th>Median contract length</th>
<th>Quartile 3 contract length</th>
</tr>
</thead>
<tbody>
<tr>
<td>North East</td>
<td>10</td>
<td>6</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>North West</td>
<td>9</td>
<td>6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>Yorkshire and The Humber</td>
<td>9</td>
<td>6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>East Midlands</td>
<td>10</td>
<td>6</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>West Midlands</td>
<td>10</td>
<td>6</td>
<td>10</td>
<td>12</td>
</tr>
<tr>
<td>East of England</td>
<td>11</td>
<td>7</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>London</td>
<td>12</td>
<td>12</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>South East</td>
<td>10</td>
<td>7</td>
<td>12</td>
<td>12</td>
</tr>
<tr>
<td>South West</td>
<td>9</td>
<td>6</td>
<td>9</td>
<td>12</td>
</tr>
</tbody>
</table>

Source: Mydeposits

Aggregated data was also provided by the Deposit Protection Services (DPS) on mean contract length for the years 2012, 2013 and 2014 (partial). Across all years the mean contract length is between 8 months and a maximum of 11 months seen in London (see figure D.3)

Figure D.3: Deposit Protection Services (DPS), contract length statistics, 2012, 2013, 2014

<table>
<thead>
<tr>
<th>Region</th>
<th>Mean contract length</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2012</td>
</tr>
<tr>
<td>North East</td>
<td>9</td>
</tr>
<tr>
<td>North West</td>
<td>8</td>
</tr>
<tr>
<td>Yorkshire and The Humber</td>
<td>8</td>
</tr>
<tr>
<td>East Midlands</td>
<td>8</td>
</tr>
<tr>
<td>West Midlands</td>
<td>8</td>
</tr>
<tr>
<td>East of England</td>
<td>9</td>
</tr>
<tr>
<td>London</td>
<td>11</td>
</tr>
<tr>
<td>South East</td>
<td>9</td>
</tr>
<tr>
<td>South West</td>
<td>8</td>
</tr>
<tr>
<td>Wales</td>
<td>8</td>
</tr>
<tr>
<td><strong>England and Wales</strong></td>
<td><strong>9</strong></td>
</tr>
</tbody>
</table>

Source: DPS

Occupancy length analysis

Average occupancy lengths from Countrywide are presented in figure D.4 below. Across all regions, with the exception of Central London and the South East, there has been a slight increase in average occupancy lengths between 2012 and 2014. In 2014 London had the highest average occupancy length at 17.7 months and Wales had the lowest at 14.7 months.
Figure D.4: Countrywide, mean occupancy length, 2012-2014

<table>
<thead>
<tr>
<th>Region</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>North</td>
<td>15.7</td>
<td>15.6</td>
<td>15.9</td>
</tr>
<tr>
<td>Midlands</td>
<td>15.8</td>
<td>15.7</td>
<td>16.1</td>
</tr>
<tr>
<td>East of England</td>
<td>15.2</td>
<td>15.5</td>
<td>17.1</td>
</tr>
<tr>
<td>Greater London</td>
<td>15.9</td>
<td>17.0</td>
<td>17.7</td>
</tr>
<tr>
<td>Central London</td>
<td>18.3</td>
<td>19.0</td>
<td>16.9</td>
</tr>
<tr>
<td>South East</td>
<td>16.7</td>
<td>16.9</td>
<td>16.5</td>
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<td>16.1</td>
<td>16.2</td>
</tr>
<tr>
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<td>15.5</td>
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<tr>
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<td><strong>15.9</strong></td>
<td><strong>16.0</strong></td>
<td><strong>16.3</strong></td>
</tr>
</tbody>
</table>

Source: Countrywide PLC

DPS data on occupancy length, figure D.5 below, suggests a mean occupancy period of 22 months, this varies between 21 and 23 months across the regions, and a median occupancy length of 14 to 15 months.

Figure D.5: DPS, occupancy length statistics, April 2007 onwards

<table>
<thead>
<tr>
<th>Region</th>
<th>Mean occupancy length</th>
<th>Quartile 1 occupancy length</th>
<th>Median occupancy length</th>
<th>Quartile 3 occupancy length</th>
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<tbody>
<tr>
<td>North East</td>
<td>22</td>
<td>8</td>
<td>14</td>
<td>24</td>
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<tr>
<td>North West</td>
<td>22</td>
<td>8</td>
<td>14</td>
<td>25</td>
</tr>
<tr>
<td>Yorkshire and The Humber</td>
<td>21</td>
<td>8</td>
<td>14</td>
<td>24</td>
</tr>
<tr>
<td>East Midlands</td>
<td>22</td>
<td>8</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>West Midlands</td>
<td>23</td>
<td>8</td>
<td>15</td>
<td>28</td>
</tr>
<tr>
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</tr>
<tr>
<td>London</td>
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<tr>
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<tr>
<td>South West</td>
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<td>24</td>
</tr>
<tr>
<td><strong>England</strong></td>
<td><strong>22</strong></td>
<td><strong>8</strong></td>
<td><strong>15</strong></td>
<td><strong>25</strong></td>
</tr>
</tbody>
</table>

Source: DPS

Each quarter the Association of Residential Letting Agents (ARLA) sends out a survey of residential landlords to its members. The latest ARLA report, which relates to Q4 2014\(^49\), has an average occupancy length of 20.5 months for its members.

The EHS also collects data on occupancy length and the results for private renters are presented in figure D.6 below. The results suggest that the average occupancy length could be much longer at 3.8 years, across the whole of the private rental sector. The difference could potentially be attributed to the inclusion of private landlord who could behave differently to letting agents.

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\(^49\) [http://www.arla.co.uk/media/908792/Arla-RI-2014Q4.pdf](http://www.arla.co.uk/media/908792/Arla-RI-2014Q4.pdf)
In summary, mean contract lengths range between 8 – 12 months (possibly longer in some parts of London) while the median contract length tends to be either 6 or 12 months. Therefore, in principle, 6 months is the optimal validity period, as it would capture contract periods of 6 months or more. However a 12 month validity period would also capture the majority of contract changes. The occupancy lengths statistics show that the mean stay in a property is 15 months or longer.

**D.2 Operational Update Times**

The validity period chosen needs to be balanced against operational practices, in particular the time it takes Rent Officers to follow up the same property. In the methodology applied, the preference is to achieve a price update for the same property rather than making a comparable or non-comparable replacement.

As previously discussed in Section 5, VOA Rent Officers are notified via a monthly report of properties which are about to reach the 12 month anniversary since their last update. To maintain the size of dataset, Rent Officers need to ensure that they maintain a regular supply of monthly data and this can be achieved in part by following up on properties on the monthly report. Although this report does not guarantee that properties are followed up, analysis of VOA data shows that over 40 per cent of properties were followed up in 2013.

The set of charts presented in figure D.7 and D.8 below shows, for the properties followed up, the cumulative percentage followed up each month since they were previously collected. Using London as an example, the green bar at 12 months shows the per cent of properties updated within 12 months since they were previously collected (around 37 per cent) and the red line at 14 months shows the number of properties updated within 14 months since they were previously collected (around 80 per cent). Clearly there is an emphasis on following up properties between 12 and 14 months since they were last collected, and therefore there are methodological benefits (in terms significantly improving the number of property updates) to using a 14 monthly validity period over using a 6 month period (which would only capture a very small portion of updates) and a 12 month period (which would capture around half of the updates).
A similar pattern is observed in all of the English regions (figure D.8), with a significant increase in the number of properties followed up between 12 and 14 months. In all regions the cumulative percentage reaches 100 per cent by 18 months.

Figure D.7: Months between updates (2013 sample, London)

Figure D.8 Months between updates (2013 sample, English regions)
Annex E - Additional Metrics

This annex presents metrics for the revised methodology. Results presented in this section relate to VOA data only.

E.1 Sample size

Following the optimisation of the sample at the start of each sample period (January), figure E.1 below presents the size of the sample and substitution pool over time.

Figure E.1: Sample and substitution pool over time

As detailed in section 5, April 2008 saw the introduction of the Local Housing Allowance (LHA) which led to a substantial change in VOA collection practices. This included a substantial increase in the number of rental prices collected. The result of this is reflected in the sample size used for the ONS rents price indices, which grew from around 115,000 in early 2008 to 230,000 towards the end of 2010. During this period, the interaction between the sample and substitution pool leads to a seasonal pattern as new collected rents initially boost the substitution pool during the year before contributing to a bigger sample at the beginning of a new sample period. Since 2011 the sample and substitution pool have stabilised as the number of property prices collected has remained reasonably consistent.

E.2 Updates

Changes as the result of the introduction of the LHA also led to an increase in the number of properties followed up. This is seen in figure E.2 which displays the number of property updates monthly as a percentage of the sample used to calculate ONS private rent price indices.
Aggregating these monthly updates to an annual total, as shown in figure E.3, shows that by 2013, nearly 40 per cent of the records in the sample had received a price update. The remaining being replaced through comparable or non-comparable replacements where needed.

Figure E.3: Annual updates as a percentage of the sample (14 month validity period)

Figure E.4 displays the distribution of price updates, in the form of price relatives, for these properties. In the majority of cases the updates do not result in any price change (i.e. the price relative equals one). The small peaks either side of 1 occur because rents tend to be rounded by set increments, for example £25.
Presenting this information slightly differently, figure E.5 shows that around 70 per cent of properties do not experience a price change as the result of an update. Similar results are seen in data provided by Countrywide (Annex F). The peaks around October for both increases and decreases are thought to be driven by a large number of contracts being re-negotiated during this period.
E.3 Comparable replacements

If a property has not been updated by the end of its validity period (14 months), then a comparable replacement is sought for the property. During 2013 these comparable replacements accounted for around 4 per cent of the sample each month, as seen in figure E.6 below. On an annual basis this accounts for around 45 per cent of the sample.

Figure E.6: Comparable replacements as a percentage of the sample

As seen in figure E.7, in many instances a comparable replacement does not result in a price change, i.e. the property being replaced, and the new property, have exactly the same rental price about 15 per cent of the time.

Figure E.7: Histogram of comparable replacements
In Annex B it was noted that due to shortcomings in the previous methodology, the replacements made as a percentage of replacements required was around 30 per cent. Following improvements made to the matching process and re-optimisation, this has now improved to around 75 per cent in later years as seen in figure E.8

**Figure E.8: Replacements made as a percentage of replacements required**

Prior to 2008, a smaller sample size (and associated substitution pool) resulted in a slightly lower match rate. From 2010 onwards a seasonal pattern can be seen. In January of each year the balance between the sample and substitution pool is optimised. Over the year the substitution pool becomes slightly depleted (although it is topped by new rents collected each month) which results in slightly lower comparable replacement rates towards the end of the year. However the comparable replacement rate still remains high (over 70 per cent).
Annex F – Countrywide data

Countrywide PLS provided ONS with a range of statistics on the private rents market. This includes a monthly new lets average rental price and more recently, based on their portfolio of 65,000 properties, an occupied lets and a contract renewal average rental price. The three series are presented, by region, as levels in figure F.1 and as 12-month growth rates in figure F.2.

Figure F.1: Countrywide new lets, occupied lets and renewals, average price
Figure F.1: Continued...

Figure F.2: Countrywide new lets, occupied lets and renewals, 12-month growth rate
Figure F.2: Continued...
Countywide also carried out detailed analysis on the frequency of price change when contacts are renewed with the same tenants. The results (presented in figure F.3) are important as it can help users understand the relationship between stock and flow measures of private rents. For Great Britain, the vast majority (75 per cent) of rental prices do not change when a contact is renewed. At a regional level, Central London has the biggest proportion of price increases, around 50 per cent increasing in price on contract renewal. However, as shown in Annex D, figure D.1, Central London has the longest mean contact length (15 months) and a significant proportion (21 per cent) on 24 month contracts (which mean contracts are renewed less frequently on average).

Figure F.3: Countrywide contract renewals, proportion of price changes
Figure F.3: Continued...

<table>
<thead>
<tr>
<th>Region</th>
<th>Graph Details</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>Wales</td>
<td>Blue: No Change, Red: Increase, Green: Decrease</td>
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