

Article

# Additional analysis of the Producer Price Index (PPI) and Consumer Price Index (CPI): focus on the effects of changes in the sterling exchange rate

This article provides some additional analysis of the July PPI and CPI headline statistics and previous trends with a particular focus on how movements in the sterling exchange rate may have influenced these data.



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# 1. Introduction

This article provides some additional analysis of the July [Producer Price Index](#) and [Consumer Prices Index](#). It has a particular focus on how previous and current movements in the sterling exchange rate may have influenced these data.

## 2. Main definitions

Producer Price Index (PPI): measures change in the prices of goods bought and sold by UK manufacturers. The PPI index is divided into an input price index and an output price index. The input price indices measure change in the prices of materials and fuels bought by UK manufacturers for processing. These are not limited to just those materials used in the final product, but also include what is required by the company in its normal day-to-day running.

The output price indices measure change in the prices of goods produced by UK manufacturers (these are often called “factory gate prices”).

Consumer Prices Index (CPI): measures consumer prices over the year to date. A way to understand this is to think of a very large shopping basket containing all the goods and services bought by households. Movements in price indices represent the changing cost of this basket. Further details on definitions and methodology for producing [CPI](#) are contained in the statistical release.

Further details on definitions and methodology for producing [PPI](#) are contained in the statistical release.

Sterling effective exchange rate: measures the relative strength of a currency relative to a basket of other currencies.

## 3. How could changes in the exchange rate affect producer and consumer prices?

Changes in the exchange rate can have an impact on the prices of goods and services purchased by consumers. In theory, when the value of a currency falls, the sterling equivalent price of imported goods purchased in a foreign currency increases. Other things being equal, this should place upwards pressure on the inflation rate, as it takes more domestic currency to purchase the same quantity of goods from abroad. However, in practice, there are likely to be time lags before higher prices of import intensive goods may be passed on to consumers.

This article covers the following.

An analysis of the contributions to input PPI growth since August 2014 by the main components for inputs. These components include imported materials and fuels such as crude oil, fuel, food, metals, and chemicals. This analysis is also included in the Economic context section of the [PPI](#) July release.

An analysis of the contributions to CPI growth since January 2007, grouped by the import intensity of the products and services contained in the basket of goods measured by the CPI. This updates analysis published in the [August ONS Economic Review](#) to include July 2016 data.

Background notes to this article contain references to further detailed methodology and quality information for the CPI and PPI.

## 4. Analysis of PPI

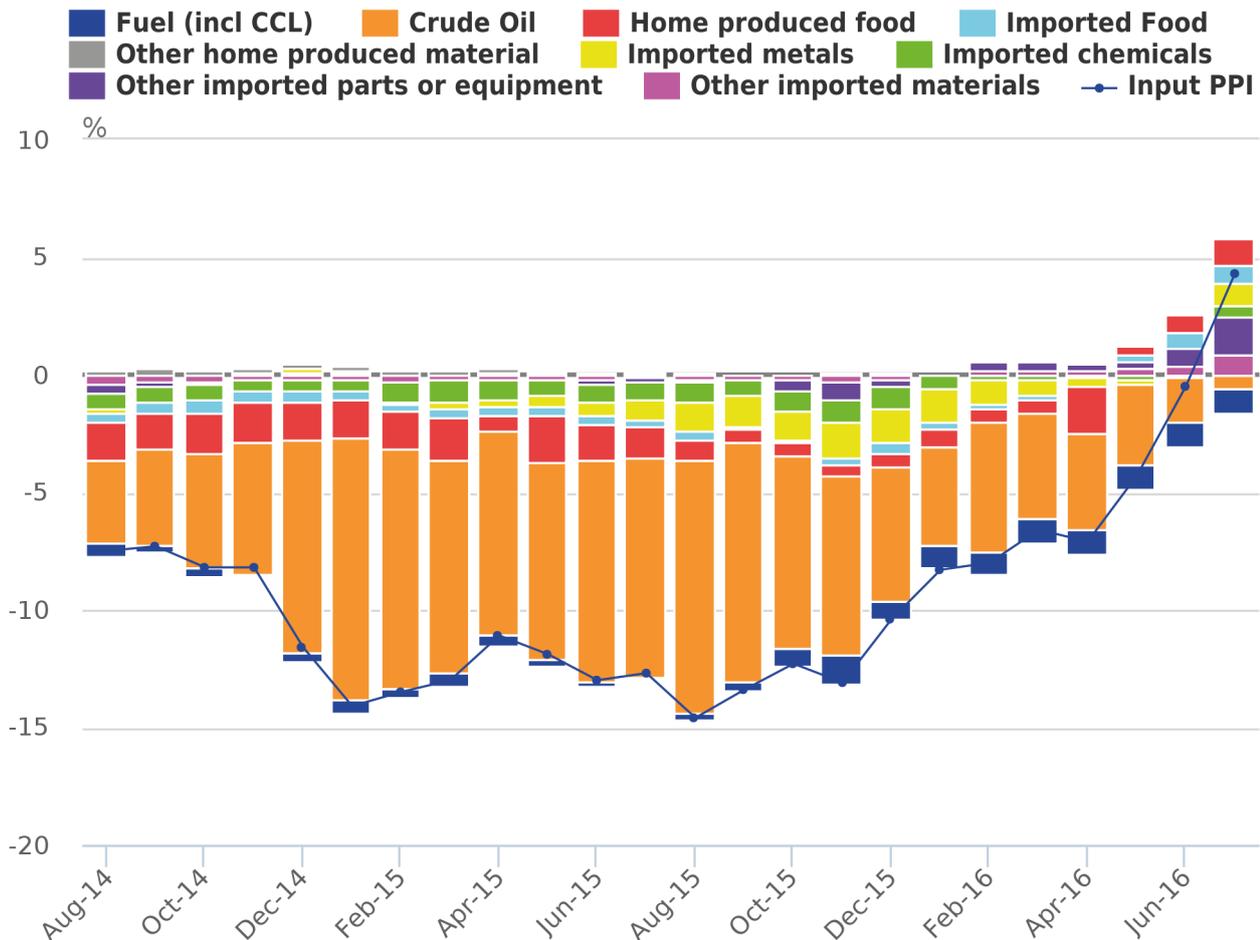
This analysis is also covered in the Economic context section of the [PPI bulletin](#).

Sterling appears to have had a greater impact on PPI input prices than on PPI output prices in July 2016. Input producer prices increased 4.3% in the year to July 2016, in contrast to a 0.5% decrease in the year to June 2016. This continued a trend of upward pressure on producer input prices – slowing the rate of deflation – since the middle of 2015. Output producer price inflation also increased to 0.3% in the year to July 2016 compared with -0.2% in June 2016.

Figure 1 shows the contribution of the main components of PPI input prices to the annual growth rate, some of which are affected by changes in the sterling exchange rate. For example, crude oil and other commodities such as metals and chemicals are often priced in US dollars and other foreign currencies. To the extent to which UK producers pay for these goods in foreign currencies, the sterling equivalent price will rise or fall, other things being equal, as the pound depreciates or appreciates respectively.

**Figure 1: Contributions to the 12-month rate of input producer price inflation and overall input PPI rate – percentage points and %**

UK, August 2014 to July 2016



Source: Office for National Statistics

Figure 1 provides some evidence that there has been positive contribution to input PPI inflation by imported food, other imported parts and equipment, and other imported materials as well as home produced food since May 2016, and these have further increased in June and July. The marked increase in the contribution to input PPI inflation in July 2016 from imported metals for example, which has moved from making a negative to a positive contribution to PPI input prices, may be partly related to the depreciation of sterling.

However, oil prices are also likely to have been a factor in the upward trend in input producer price inflation. The stabilisation and recent recovery of the oil price over the last year means that the contribution of crude oil to the PPI inflation series has waned in recent months. This can be seen in Figure 1 as the negative contribution of crude oil to input producer price inflation began to ease off from August 2015 onwards, contributing to the gradual rise of the input PPI inflation rate. There has been a similar easing of the negative contribution from refined petroleum products to output producer price inflation.

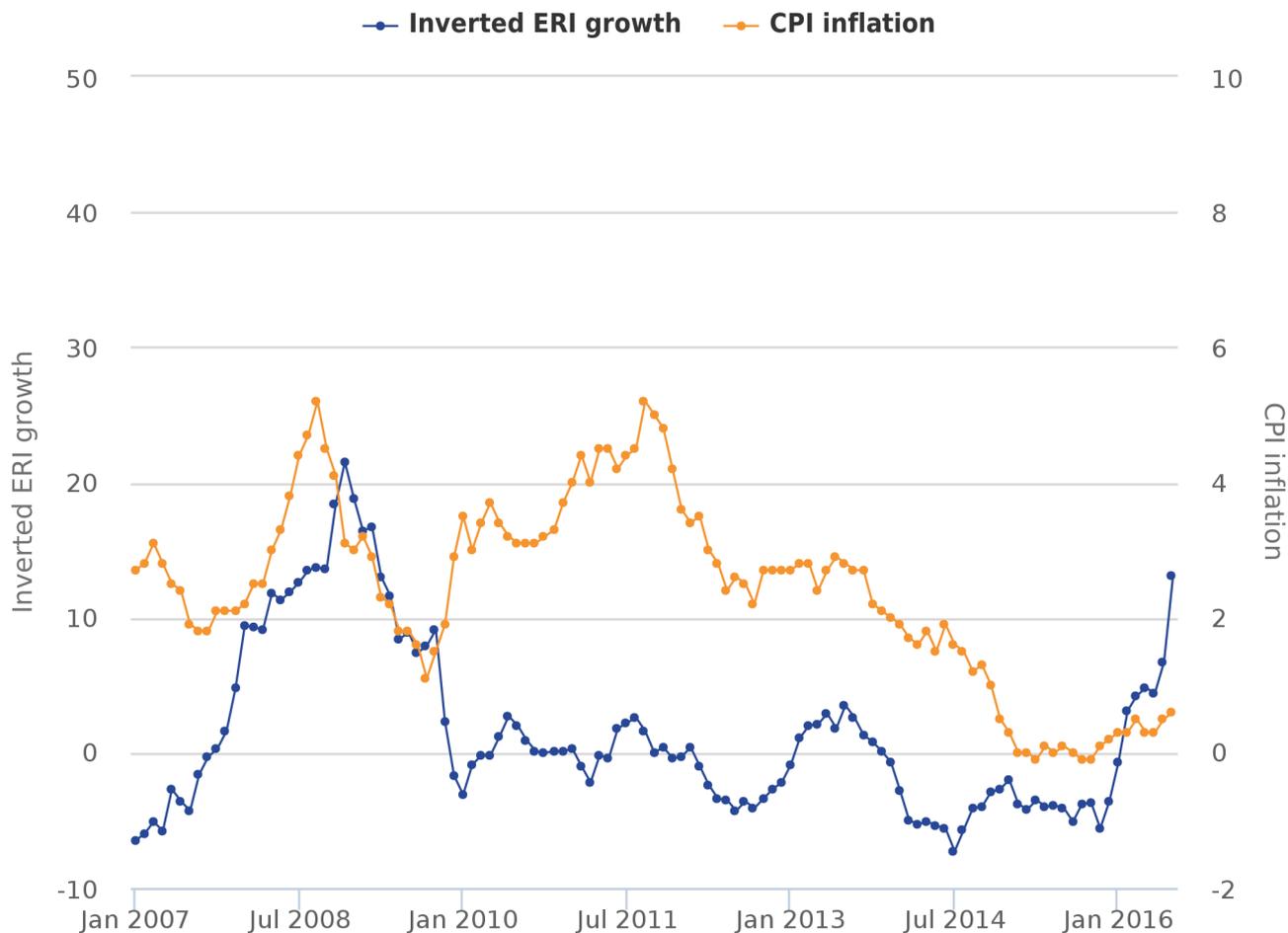
## 5. Analysis of CPI

The rate of inflation as measured by the Consumer Prices Index (CPI) increased to 0.6% in the year to July 2016, up by 0.1 percentage points compared with the previous month. Although this is the highest rate since November 2014, CPI inflation remains [low compared with its long-term performance](#). The CPI data for July 2016 also include information gathered since the UK's referendum on its membership of the European Union, and the changes in the sterling exchange rate which followed. The value of sterling compared with a basket of currencies, known as the effective exchange rate, fell by 7.3% between early August 2015 and 23 June and a further 9.5% between 23 June and the last day in July.

Figure 2 examines the relationship between the CPI rate of inflation and the sterling effective Exchange Rate Index (ERI), giving some indication of the co-movement between these series. The ERI series has been inverted, so that a depreciation of the currency is represented by an increase in the line graph, helping to interpret a depreciation of the currency as representing a higher sterling equivalent price for imported goods and services.

**Figure 2: 12-month change in the sterling effective exchange rate (inverted) and CPI growth**

UK, %, January 2007 to July 2016



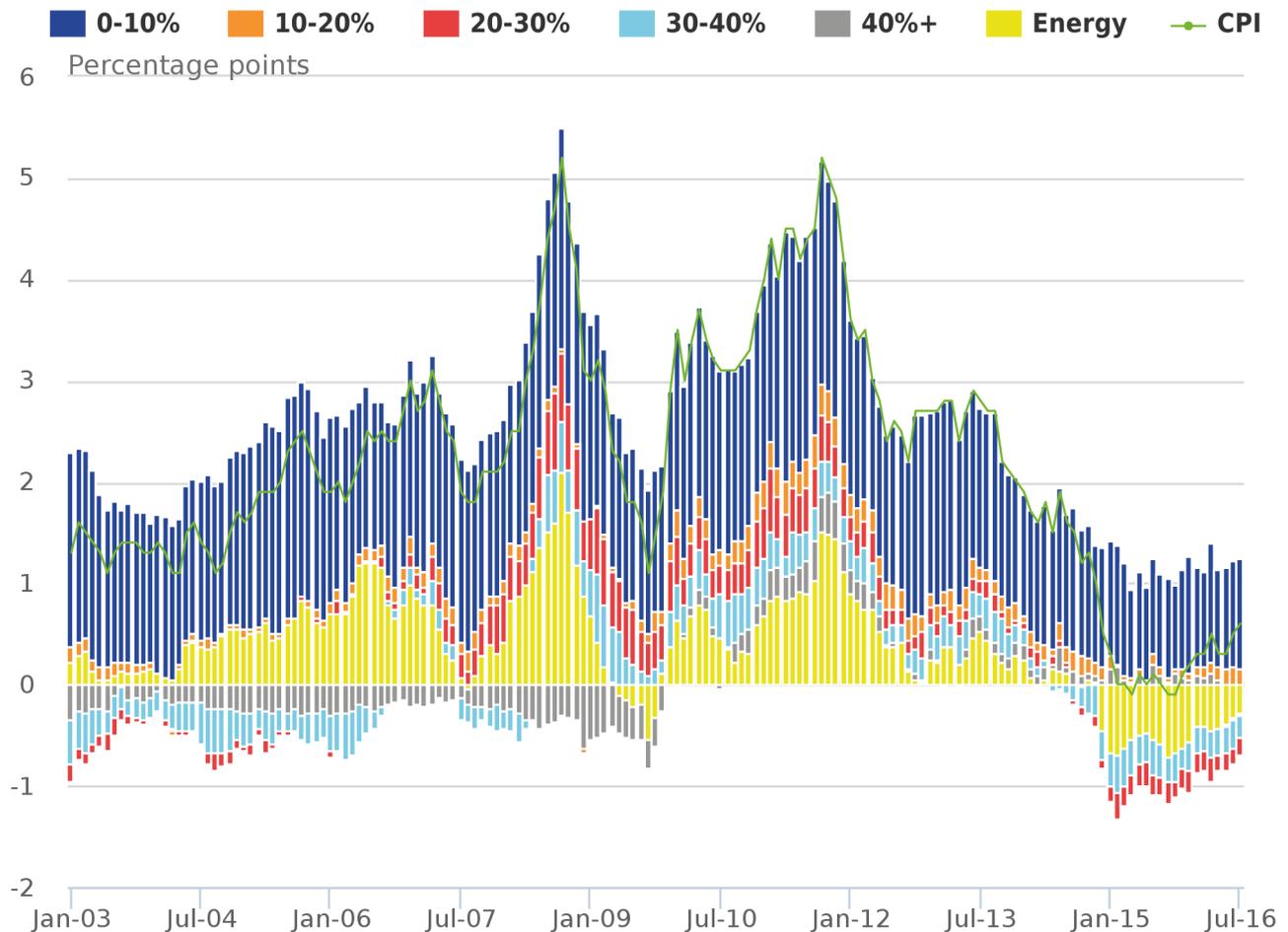
Source: Bank of England and Office for National Statistics

Figure 2 suggests a degree of co-movement between these 2 series: in particular, stronger inflation in 2008 and 2009 was accompanied by a depreciation of sterling and the moderation of inflation during 2014 came alongside an appreciation of sterling against its major trading partners. In both instances, however, simultaneous changes in the oil price make it difficult to be precise about the link between import prices and the CPI. Most recently, the price of oil, which fell from US \$112 in June 2014 to a low of \$32 in January 2016 is also likely to have had an effect.

Figure 3 presents contributions to the CPI from products grouped by their relative import intensities. Goods and services which consumers largely source from domestic producers are grouped together in a low import intensity group, while products which households purchase from abroad are grouped into higher import intensity groups. Energy products – which have considerable import content, but on which the price of oil has a particular impact – are grouped separately. This updates analysis previously published in the [August 2016 Economic Review](#) to include the most recent data.

**Figure 3: Headline inflation and contributions to inflation by import intensity**

Percentage points, UK, January 2003 to July 2016



Source: Office for National Statistics

Figure 3 suggests that energy and more import intensive products account for a fairly high proportion of recent movements in inflation. The least import-intensive non-energy products in Figure 2 have made a fairly steady contribution to the CPI rate of inflation over recent years. More import intensive products, by contrast, account for much of the rise in inflation following the depreciation of sterling in 2008 and 2009 and for much of the moderation of inflation over the last 2 years – a period during which sterling appreciated against its major trading partners.

In July 2016, the largest contributor to consumer price inflation and the largest upwards change in the contribution on the month continued to be goods in the lowest import intensity category (0 to 10%). The sharp depreciation of sterling seen since the beginning of 2016 may start to influence upward pressure on the CPI through the continued import of goods that are in the basket of measured goods and services. However, this could also be offset or amplified by a range of other factors such as future movements in commodity prices, consumer confidence, employment and GDP growth and any consumer response to their experience of changes in relative prices for domestically produced or imported goods.

## 6. Next steps

We will continue to monitor the impact of changes in the sterling exchange rate on all our economic statistics and will include additional analysis in the statistical releases or separate articles where appropriate.

## 7. Background notes

### Producer Price Index

An up-to-date manual for the Producer Price Index, including the import and export index is now available. [PPI methods and guidance](#) provides an outline of the methods used to produce the PPI as well as information about recent PPI developments.

A [Quality and Methodology Information \(QMI\)](#) report for the PPI describes in detail the intended uses of the statistics presented in this publication, their general quality and the methods used to produce them.

### Consumer Prices Index

A full description of how consumer price indices are compiled is given in the [Consumer Price Indices Technical Manual](#). This is supplemented by further information available from the [prices guidance and methodology webpage](#).

A more detailed [Consumer Price Inflation Quality and Methodology report](#) is available. The report assesses consumer price inflation statistics against standard dimensions of quality such as relevance, accuracy and accessibility. The report was last updated in October 2013.