

Article

The impact of Shrinkflation on CPIH, UK: January 2012 to June 2017

Shrinkflation is used to describe the business practice of changing product pack size, while keeping its price the same. This article examines the effect of this practice on inflation.

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Table of contents

1. [Authors](#)
2. [Introduction](#)
3. [Identifying and adjusting for weight changes](#)
4. [Analysis](#)
5. [Results](#)

1 . Authors

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2 . Introduction

Shrinkflation is a term used to describe the business practice of changing the physical weight of a product, while keeping its price constant. The “shrink” part of the term refers to the change in package size, typically a reduction, whereas the latter part of the word refers to inflation – the rise in the general price level. If products “shrink” in size, inflation rises even if prices stay constant, as consumers pay the same amount of money for less of the good. In order to more accurately measure inflation, we use quality adjustment processes to isolate price movements from the changes in product’s weight or quality.

3 . Identifying and adjusting for weight changes

We collect prices each month in shops around the UK for many different goods and services. During price collection, collectors are able to indicate a change in a product’s weight by using a “W” indicator code on their hand-held computers when they enter a price quote for a particular product¹. Collectors are then prompted to include more details, in particular the old and new weight of the product. Using this description, as well as the preceding months’ data, our analysts are then able to account for weight changes.

For example, let’s say a price collector notices a chocolate bar reduce in size from 85 grams to 80 grams in June. First, they confirm that no other significant changes were made to the chocolate bar that would make it incomparable to the one collected in May. If this is the case, the price collector indicates that the chocolate bar has experienced a weight change using the “W” indicator code. A comment is then added detailing the change. Providing that the price quote passes our validity checks², our analysts then apply a quality adjustment process to account for this weight change.

Typically, price changes are measured using “price relatives”, which are derived by comparing the item’s current price with its base price (in the UK Consumer Prices Index including owner occupiers’ housing costs (CPIH), this is January of each year). When quality adjusting for weight changes, our price analysts impute a new base price using the information provided by price collectors. The following formula is used for base price imputation:

$$\text{New base price} = \text{Current base price} * \frac{\text{New weight}}{\text{Old weight}}$$

Using the earlier example, if the original base price of the chocolate bar was 50p, our analysts would compute the new base price as follows:

$$\text{New base price} = 0.50 * \frac{80}{85}$$

$$\text{New base price} = 0.471$$

This essentially calculates what the price of the product would have been in January, if the chocolate bar had then weighed 80 grams. This new base price can then be used to calculate a new price relative for the chocolate bar. In this example, if we assume the shelf price remained unchanged from January to June, the price relative between January and June would now be:

$$\text{New price relative} = \frac{\text{Current price}}{\text{New base price}}$$

$$\text{New price relative} = \frac{0.50}{0.471}$$

$$\text{New price relative} = 1.062$$

In this example, because the package size reduced you would in effect be paying 6% more for your chocolate bar, even though the actual price did not change. If we did not adjust for the weight change, the price relative would be equal to one, and this increase would not be captured in our statistics, resulting in our inflation measure misrepresenting the true value of price change in the economy.

Notes for: Identifying and adjusting for weight changes

1. If you want to find out more about price collection please see chapter 5 of the [Consumer Prices Technical Manual](#).
2. If you want to find out more about validity checks please see chapter 6 of the [Consumer Prices Technical Manual](#).

4 . Analysis

In the recent months, shrinkflation has gained much media attention, as seemingly, more food products have been reducing in package size.

The lead measure of inflation in our publications is the Consumer Prices Index including owner occupiers' housing costs (CPIH), which measures the change in prices of a broad sample of the goods and services that are consumed by households. As part of this analysis, we wanted to see what the effect on the CPIH figure would be if the weight adjustment procedure was not conducted. Products' weight data is not kept on our systems for a long enough time to conduct an exact reversal of this procedure. Instead, we matched each product that experienced a weight change to its unadjusted base price and recalculated the price relative to then compute an unadjusted item index. Note that if an exact product was not found in the matching process, it was disregarded from the analysis. These indices were then merged with the rest of the items that did not experience a weight change to calculate an unadjusted CPIH series.

5 . Results

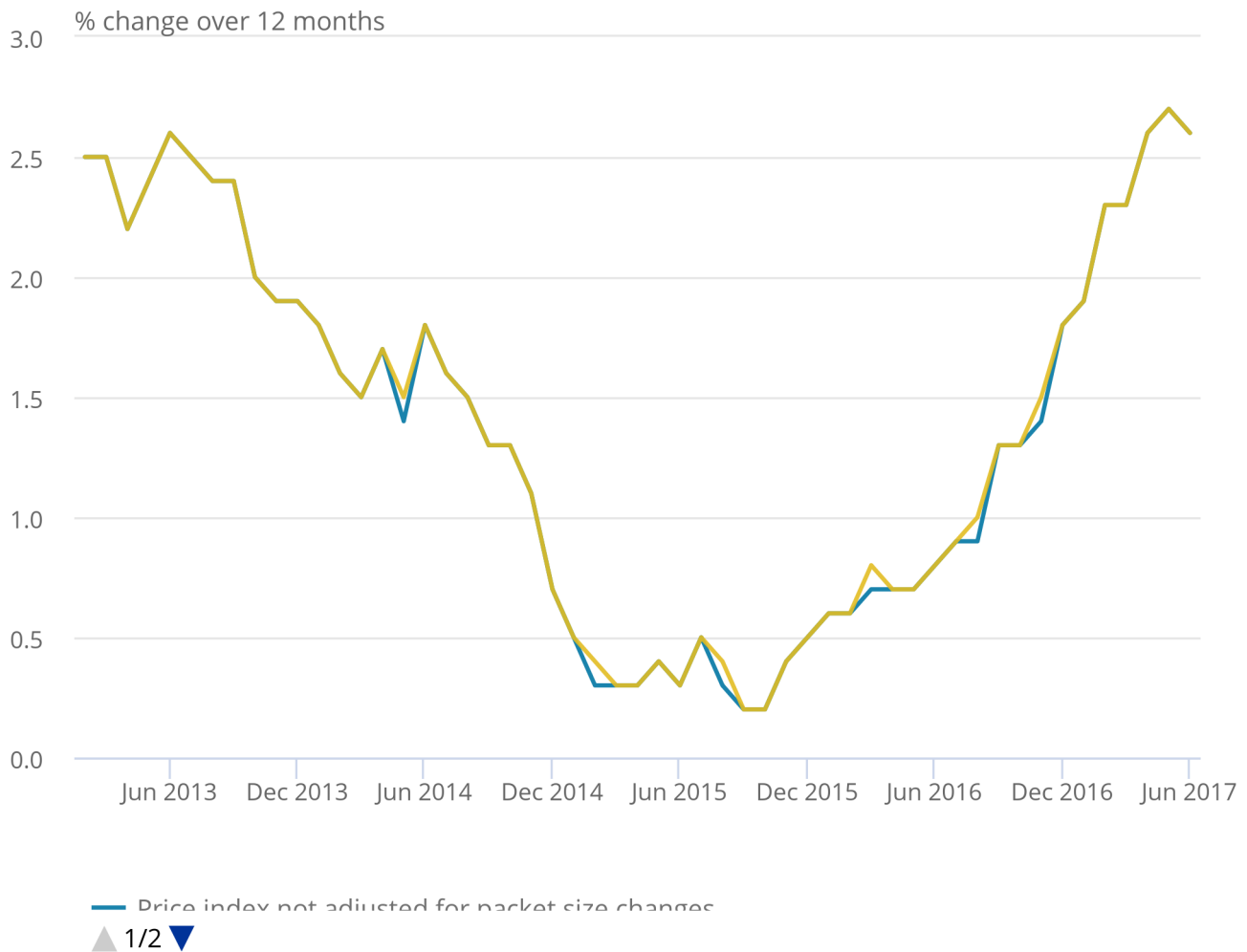
The analysis showed that the Consumer Prices Index including owner occupiers' housing costs (CPIH) figure remained largely unchanged: the difference between the adjusted and non-adjusted series was about 0.03 percentage points since 2012, with the published index being marginally greater than the non-quality adjusted index. This is because more items have reduced weight than increased, and as we've seen from the example above, this results in an underestimate of inflation if these are not included. If we look at the 12-month growth rate, over the past 5 years, there have only been 6 months where the unadjusted growth rate differed from the published CPIH series. All of the 6 differences showed the published CPIH to be higher than the non-adjusted series. Furthermore, no change was larger than 0.1 percentage point (Figure 1).

Figure 1: CPIH 12-month growth rate, published¹ and non-adjusted

January 2012 to June 2017, UK

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Source: Office for National Statistics

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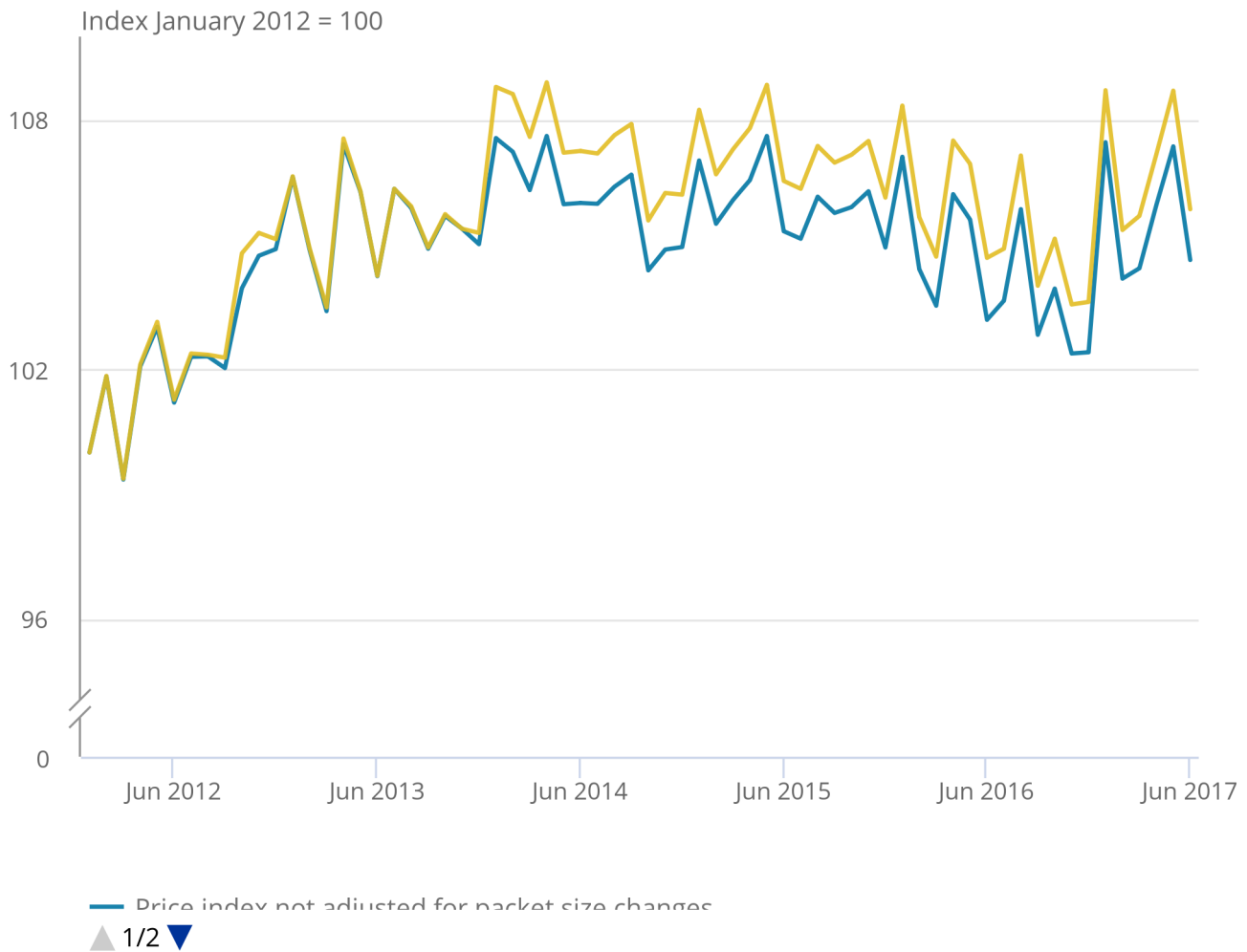
Notes:

1. The published index has already been adjusted for shrinkflation.

In fact, the only category in the basket of goods that experienced a notable change was the “Sugar, Jam, Syrups, Chocolate and Confectionery” category. The published index was greater than the non-quality adjusted index by 1.22 percentage points over the period since 2012. As the quality adjusted index was greater, this shows that items have “shrunk” in weight, yet not in price.

Figure 2: Sugar, jam, syrups, chocolate and confectionery index, published and non-adjusted

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Source: Office for National Statistics

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However, as the sugar, jam, syrups, chocolate and confectionery category only makes up 1% of the entire basket of goods and services that is used to calculate CPIH, there is very little effect on the aggregate measure. [Note: the original article stated that the confectionery category only makes up 0.01% of the CPIH basket. This was an error and was corrected on 25th July 2017 at 10.00am. We apologise for any inconvenience.]

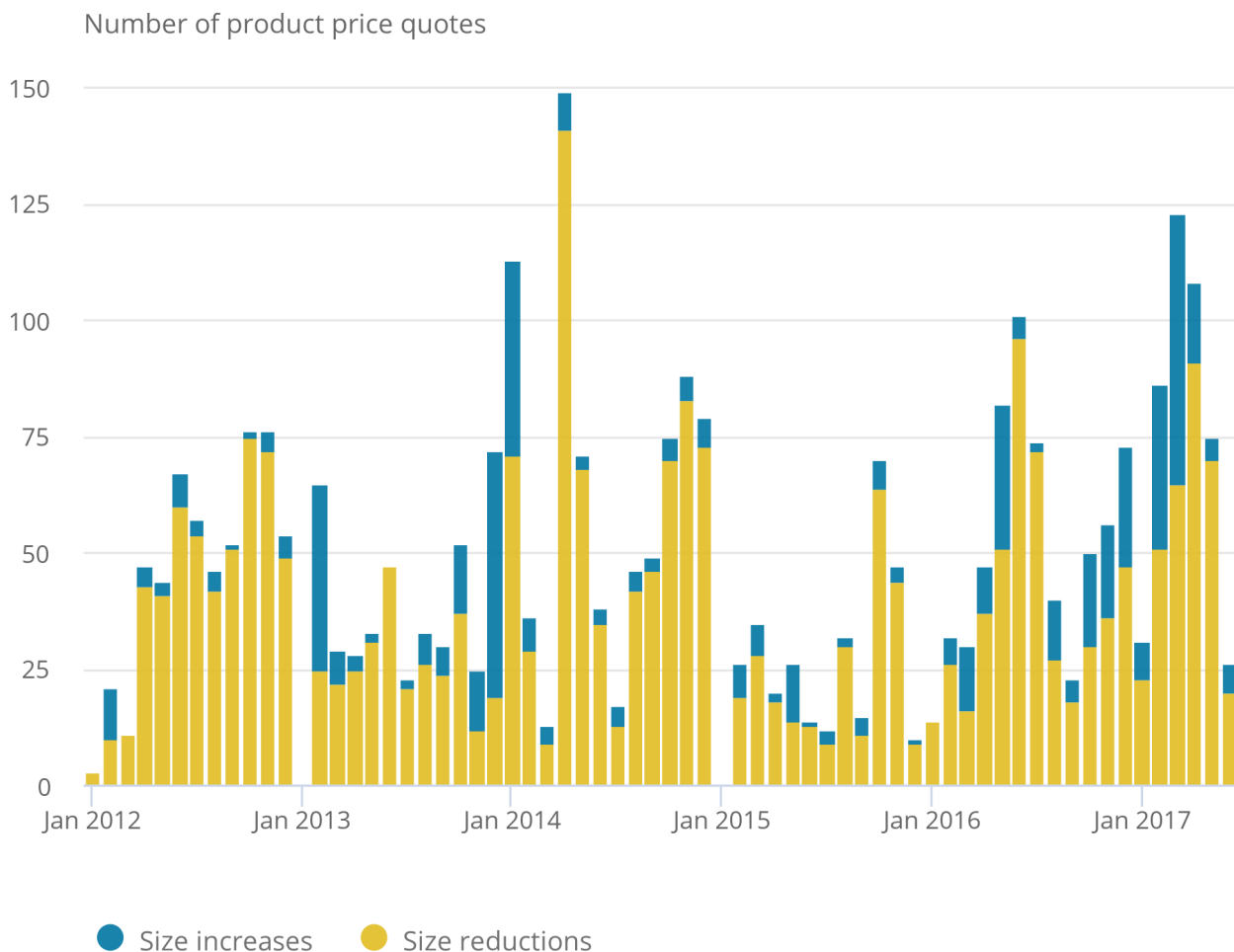
We also conducted some analysis on the number of occurrences of such weight changes. Unsurprisingly, weight changes occur most often in food products rather than any other item category. There are also consistently more reductions across both the food category and non-food items (Figure 3). However, despite some media speculation, there has not been a change in trend since the EU referendum – our data shows that shrinkflation has been used in practice consistently across the past 5 years.

Figure 3: Number of price quotes with recorded increase or reduction in package size

January 2012 to June 2017, UK

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January 2012 to June 2017, UK



Source: Office for National Statistics

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Notes:

1. This chart shows the number of food price quotes that saw a change in package size in each month. Many price quotes are collected for the same item, for example "Carton/Box of Chocolates". Price collectors aim to select products which are popular, and so it is possible that several price collectors will price the same product (a particular brand of chocolates, for example). Such a product may experience a change in size, and this helps to explain the big spike in package size reductions in April 2014, where there were 87 instances of the same item changing size.