Inflation spike and falling product variety during the Great Lockdown

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Executive summary
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Background

The COVID-19 pandemic led many countries to implement social distancing, lockdowns and travel restrictions, which have resulted in a collapse in the world economy unprecedented in peacetime. Although the real-time effects of the 'Great Lockdown' on employment and consumer expenditure have been widely documented, much less is known about how the crisis is impacting inflation. In this paper, we use comprehensive scanner data from the United Kingdom to measure inflation for fast-moving consumer goods during the Great Lockdown in real time.

Data

We use household-level data that are collected by the market research firm Kantar FMCG Purchase Panel. The data cover purchases of fast-moving consumer goods brought into the home by a sample of households living in Great Britain (i.e. the UK excluding Northern Ireland). This sample includes all food and drinks (including alcohol), as well as toiletries, cleaning products and pet foods. At any point in time (including over the lockdown), the data set contains purchase records of around 30,000 households. Participating households are typically in the data for many months. Each household records all products (or barcodes) that they purchase using a handheld scanner, and they send their receipts (either electronically or by post) to Kantar. For each transaction, we observe quantity, expenditure, price paid, product characteristics and whether the item was on promotion.

Our data set runs until 17 May 2020. In the UK, lockdown started on 23 March 2020. The availability of historical data enables us to compare inflation in 2020 with preceding years, as far back as 2013. We focus on the period from the beginning of the year to 17 May. Over this period in 2020, we observe 13.4 million transactions and 102,000 unique products. We measure both week-to-week inflation and month-to-month inflation. In the former case, we focus on the 20 seven-day periods starting from 30 December, through to 17 May. For the monthly analysis, we define months as running from the 18th of one month to the 17th of the following month. We focus on the five months running from 18 December to 17 May.

Stylised facts

In Figures 1–3, we present descriptive evidence. We report what happened to average product price, the share of transactions that involve either a price promotion (e.g. 25% off, £1 off) or a quantity discount (e.g. two for the price of one) and the number of unique products (i.e. barcodes) purchased, at the weekly level in 2020 in comparison with previous years. The red line denotes the week in which the UK's lockdown was introduced.

Figure 1 shows the evolution of average price over time. In each week, for every product, we compute price as the ratio of total expenditure on that product to total quantity. The figure shows how the average of these prices varies across weeks. Average price evolved similarly across years up until the week of lockdown, when it jumped by almost 3%. The increase has persisted in the following weeks. This figure provides simple descriptive evidence of an increase in prices around the point of lockdown. Whether this translates

into higher inflation depends on the composition of the products in households' grocery baskets.

Figure 1. Average price
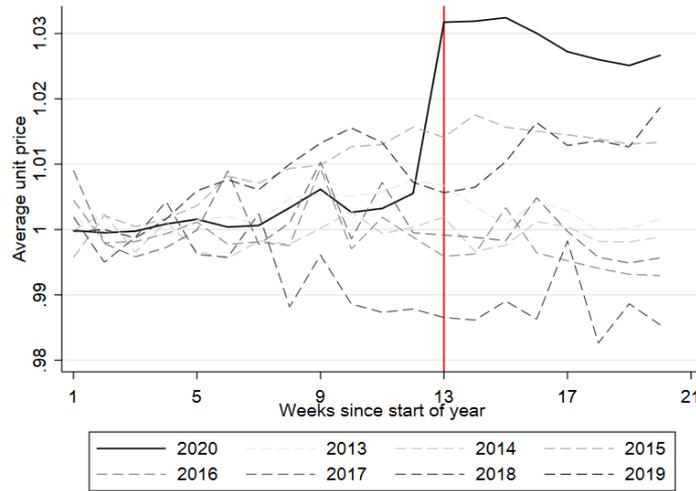
Note: Figure shows the evolution of the average price in each of the first 20 weeks of the year. It conditions on products purchased in every week (which account for around 77% of total expenditure). In each case, the line is normalised by the mean value in the first four weeks. The red vertical line denotes the first week of lockdown.

Source: Figure 1b of X. Jaravel and M. O'Connell, 'Inflation spike and falling product variety during the Great Lockdown', IFS Working Paper 20/17, 2020, https://www.ifs.org.uk/publications/14873.

Figure 2. Promotions
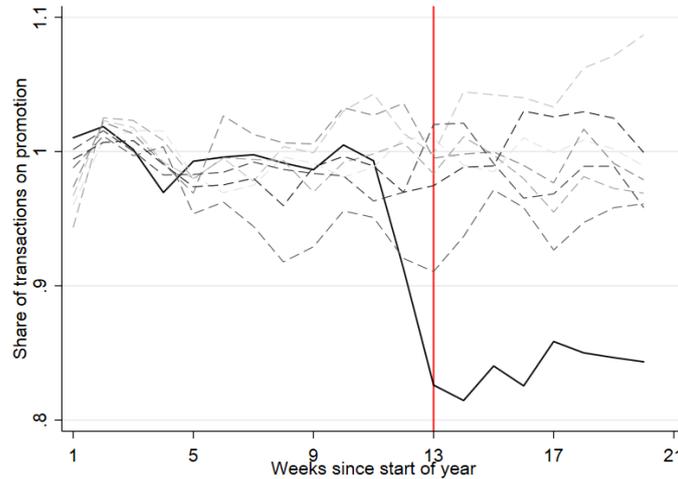
Note: Figure shows the evolution of the share of transactions that involve a price or quantity promotion in each of the first 20 weeks of the year. In each case, the line is normalised by the mean value in the first four weeks. The red vertical line denotes the first week of lockdown.

Source: Figure 1c of X. Jaravel and M. O'Connell, 'Inflation spike and falling product variety during the Great Lockdown', IFS Working Paper 20/17, 2020, https://www.ifs.org.uk/publications/14873.

Figure 3. Number of unique products purchased

Note: Figure shows the evolution of the number of unique products purchased in each of the first 20 weeks of the year. In each case, the line is normalised by the mean value in the first four weeks. The red vertical line denotes the first week of lockdown.

Source: Figure 1d of X. Jaravel and M. O'Connell, 'Inflation spike and falling product variety during the Great Lockdown', IFS Working Paper 20/17, 2020, https://www.ifs.org.uk/publications/14873.
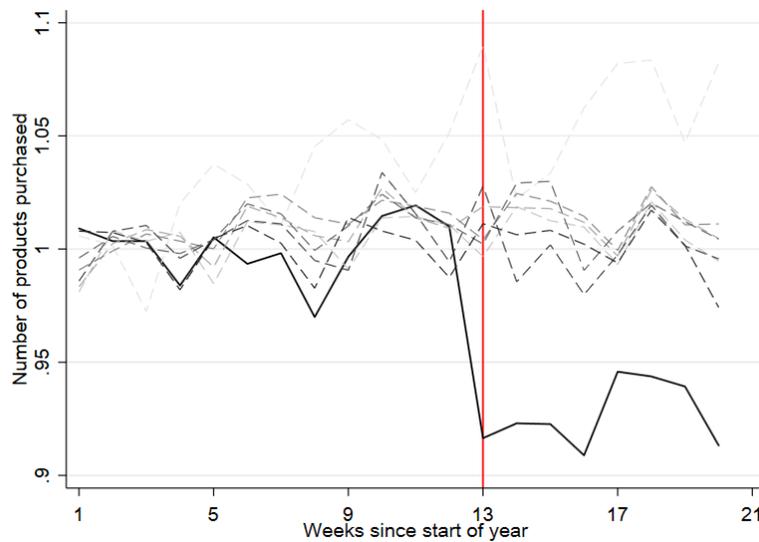
Figure 2 shows that the share of transactions on promotion in 2020 dropped by around 15% from the beginning of lockdown. This reduction in the promotion frequency is one possible driver of higher average prices and any associated inflation.

Figure 3 documents changes in the number of unique products sold over time. Prior to the start of the lockdown, and similar to previous years, the number of products sold in each week is stable. However, from the beginning of lockdown, there is a fall of around 8% in the number of products we observe purchased. This points towards a reduction in product variety, which, independently of price rises, will have a negative impact on consumers.

Aggregate inflation

Figure 1 shows that, on average, product prices increased at the beginning of lockdown. However, it does not take account of how important products are in households' grocery baskets – a seldom-purchased product is weighted the same as a very popular product. Price indices, which are used to measure inflation, weight individual products by how much expenditure households allocate to them. Aggregate inflation measures are based on the basket of a representative household (i.e. weights reflect product popularity across all households).

In Figure 4, we show cumulative monthly inflation over the five months running to 17 May for all years from 2013 to 2020. In the first three months of 2020, month-to-month inflation is close to zero and similar to previous years. However, in the month 18 March to 17 April, there is a large increase in inflation of 2.4 percentage points. This is unprecedented across all comparison years. In the month 18 April to 17 May, there is modest deflation, though prices remain well above their pre-lockdown level.
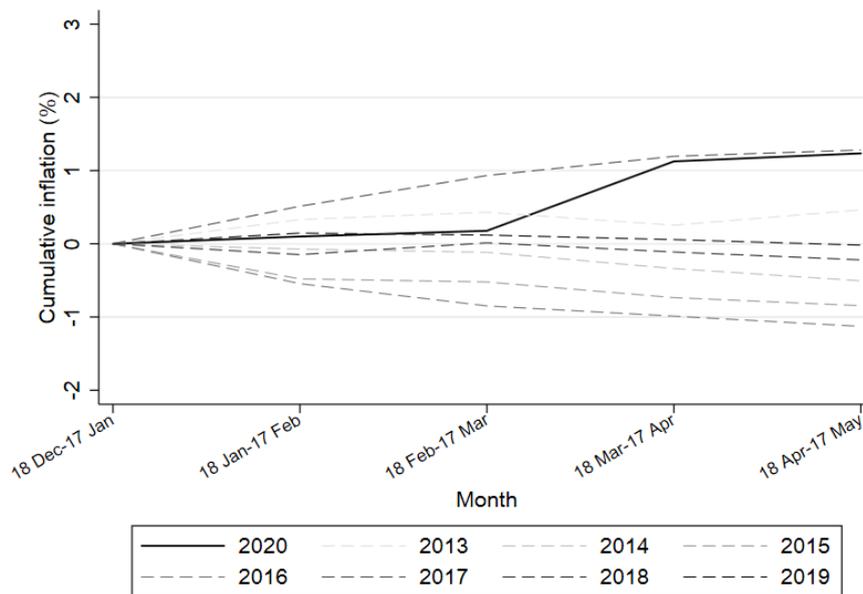
Figure 4. Aggregate inflation, monthly
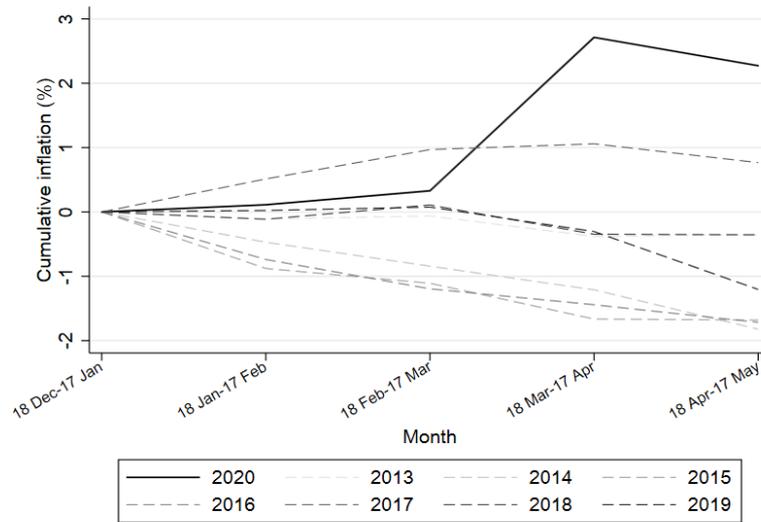
Note: Figure shows cumulative monthly inflation based on a chained Fisher price index.

Source: Figure 2a of X. Jaravel and M. O'Connell, 'Inflation spike and falling product variety during the Great Lockdown', IFS Working Paper 20/17, 2020, https://www.ifs.org.uk/publications/14873.

Figure 5. Aggregate inflation, monthly, no promotions

Note: Figure shows cumulative monthly inflation based on a chained Fisher index, based only on transactions that involve no promotion.

Source: Figure 2b of X. Jaravel and M. O'Connell, 'Inflation spike and falling product variety during the Great Lockdown', IFS Working Paper 20/17, 2020, https://www.ifs.org.uk/publications/14873.

Figure 6. Aggregate inflation, weekly
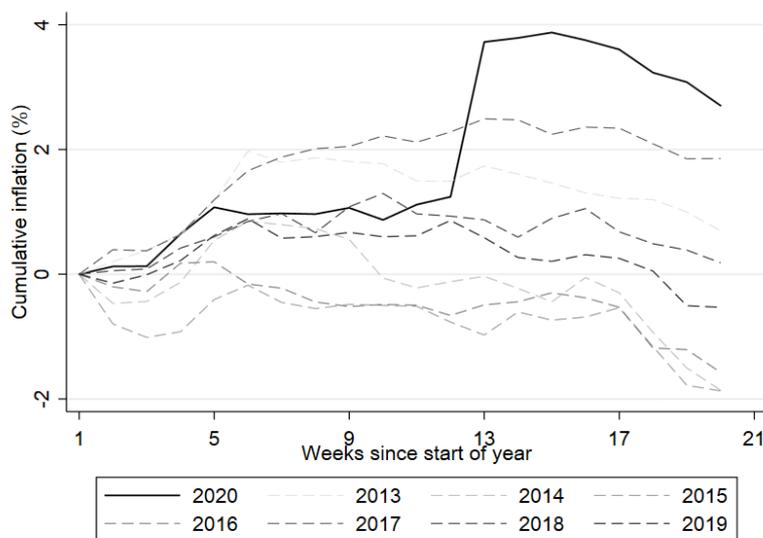
Note: Figure shows cumulative weekly inflation based on a fixed base Fisher index. It conditions on products available in all weeks (which represent around 77% of total expenditure).

Source: Figure 2d of X. Jaravel and M. O'Connell, 'Inflation spike and falling product variety during the Great Lockdown', IFS Working Paper 20/17, 2020, https://www.ifs.org.uk/publications/14873.

Figure 5 shows the same information as Figure 4 except it is based only on transactions that do not involve price or quantity promotions. It shows that inflation for non-promoted items in the month of lockdown is considerably less than inflation across all transactions. This shows that the reduction in the frequency of promoted items (see Figure 2) is a significant driver of the lockdown inflation.

Figure 6 shows the evolution of inflation computed at a weekly level. The weekly inflation measure shows that inflation sharply rose at the very beginning of lockdown: up until week 12, weekly inflation in 2020 is very similar to in previous years; in week 13 (which corresponds with the introduction of lockdown), inflation rises by around 2.5 percentage points; and afterwards inflation is close to zero or negative, but by 17 May prices remain well above their pre-lockdown level.

The monthly and weekly inflation measures are computed in different ways: the first is a chained index, the second a fixed base index. Readers are referred to the working paper for more details. However, both measures point to the same picture – a spike in inflation at the start of lockdown.

Household-specific inflation

Individual households will experience price changes differently depending on the products they choose to buy. As we observe the same households through time, we are able to compute household-specific inflation rates. In Figure 7, we show the distribution of household-specific inflation rates over the period 18 December 2019 to 17 May 2020. We also plot the distribution over the same period in the preceding year. In both 2019 and 2020, there is substantial variation in household-specific inflation; the standard deviation in 2020 is 1.7 percentage points, rising from 1.5 in the preceding year. However, in 2020,

almost all households experience inflation; in contrast, in 2019, fewer than half of households had positive inflation rates.

Figure 7. Distribution of household-specific inflation rates
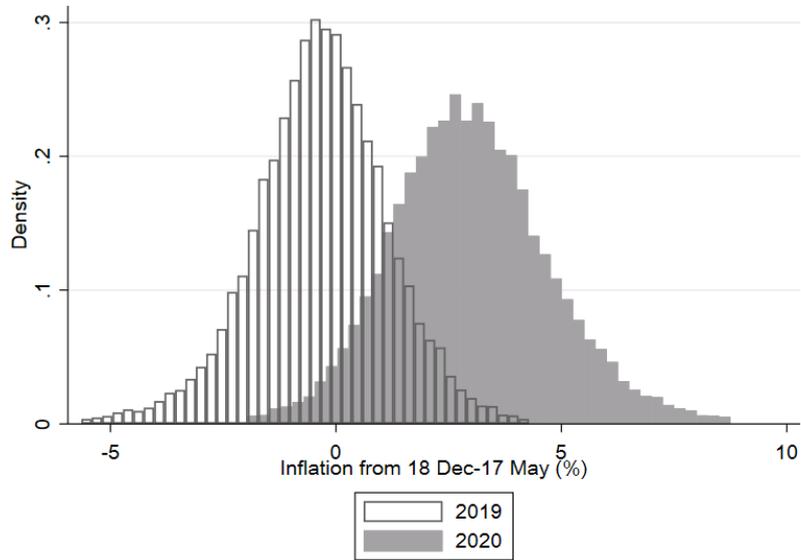
Note: For each household that records at least £40 expenditure in the periods 18 December to 17 January and 18 April to 17 May, we compute household-level inflation using a fixed base Fisher index and common prices. This conditions on products available in all months (which represent around 93% of total expenditure). Figure shows histograms of household-specific inflation over 18 December to 17 May in 2019 and 2020.

Source: Figure 4 of X. Jaravel and M. O'Connell, 'Inflation spike and falling product variety during the Great Lockdown', IFS Working Paper 20/17, 2020, https://www.ifs.org.uk/publications/14873.