

# THE MEASUREMENT OF INFLATION DURING THE LOCKDOWN: A TRIAL CALCULATION

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# The measurement of inflation during the lockdown: a trial calculation

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## *Abstract*

The big changes in consumption patterns during the Lockdown need not of themselves have a big effect on measured inflation. Using a guesstimate of lockdown weights for different types of consumption and applying them retrospectively to the 2019 inflation data as an experiment led to a slight increase in measured CPIH from 1.7% to 1.9%. This net increase comes as some types of expenditure whose expenditure shares are reduced by Lockdown include ones with lower inflation (such as Clothing and Footwear) and some higher (Restaurants and Hotels) than CPIH. The experiment suggests that the net effect is thus small. The behaviour of inflation as measured by the CPIH may remain a reliable statistic during the lockdown period, but we need to keep a close look at the details as the effect of the lockdown might lead to changes that make the CPIH less reliable.

**Table 1: Inflation and the lockdown weights 2020**

	<b>January</b>	<b>Feb</b>	<b>March</b>
<b>CPIH</b>	1.8%	1.7%	1.5%
<b>CPILW</b>	1.9%	1.8%	1.8%

The March CPIH has fallen to 1.5% from 1.7% in February. The Lockdown weighted CPILW for March was unchanged at 1.8%. The difference mainly reflects the fact that most of the expenditure categories affected by the LP had low inflation rates in March: Clothing and footwear, Furniture and household equipment, Transport, Recreation and Culture. Despite the fall in CPIH, CPILW remained constant and the gap between the headline and the trial measure increased from 0.1% to 0.3%. Although the collection of prices by the ONS happened before the full lockdown on 24<sup>th</sup> March, perhaps the behaviour of retailers and consumers was changing in anticipation of the lockdown. Retailers in sectors likely to be affected by the lockdown might have cut prices to sell stock before it came (for example in Clothing and Footwear).

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Inflation is one the best known and most important economic statistics. Its value influences the behaviour of many economic agents, not least as driving the indexation of many regulated prices and fares, pensions and benefits. It is also targeted by the Bank of England. It has been stable with an average of 2.1% since 1993.

But the measurement of inflation will raise many issues for the next few years. The ONS has developed a tried and tested methodology for measuring inflation each month. About 120,000 Prices are collected both locally and centrally in the second week of each month for around 800 basic items across the UK. The prices are combined into the Consumer Price Index using the UN COICOP classification (Classification of individual consumption by purpose) system.<sup>1</sup> This is a hierarchical system, which has 12 divisions (such as food and non-alcoholic beverages, alcohol and tobacco, clothing and footwear, education, communication and so on). The divisions are divided into groups which are further divided into classes and even sub-classes. The ONS aggregates the individual prices using expenditure weights for each COICOP category (class/group/division). The expenditure weights for 2020 are based on the expenditure shares of each COICOP category in the years 2019. Today's April release will be for inflation in March and its production will have been relatively unaffected by the lockdown which took effect from 24<sup>th</sup> March 2020.

However, next month's release of the inflation for April 2020 will have several problems. First, there is the problem that collection will have to be online only. Secondly, the expenditure patterns will have shifted due to the Lockdown Policy (LP) imposed as part of the "war" on Covid-19. The LP is both a supply and a demand shock. It acts as a supply shock by requiring all but essential workers not to go to their normal workplace and instead work from home as far as possible. This policy has the further effect of driving many businesses that were on the margin of survival into bankruptcy and hence closing down and laying off workers. This process started very quickly, with unemployment rising almost immediately after the LP was put in place. The LP reduced the supply of many products and services. Since LP was widely followed by our major trading partners as well, the domestic effect was reinforced by the restriction of international supply chains feeding into and out of the UK economy.

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<sup>1</sup> For the COICOP classification, see Classification of Individual Consumption According to Purpose (COICOP) 2018, Statistics division UN. Statistical Papers Series M No. 99.

LP also acts as a demand shock. First, there is the direct effect of preventing certain types of expenditure: restaurants, hotels, holidays, flights. Even for those whose income is largely unaffected by LP, they are unable to spend money the restricted items. There will naturally be some switching of expenditure to those things that can be bought, notably the first two COICOP divisions: Food and Non-alcoholic beverages, and Alcohol and Tobacco. Indeed, online retailers who can deliver supply a wide range of goods. However, the second effect of LP is that for those who have lost their jobs or are worried that they may lose their jobs, there will be a reduction in demand as they either run out of savings or simply cut back expenditure to cover the risk of job loss. NIESR estimates that the overall effect of the LP may be to reduce GDP in 2020 Q3 by as much as 25% compared to its level in 2019 Q4.

From the point of view of measuring inflation, the level of consumption expenditure is not itself important, but its *composition* in terms of expenditure shares. The current CPIH weights are based on the average expenditure over 2019. The exact magnitude of the LP on the total level of expenditure and its breakdown into expenditure shares will not be apparent until the GDP figures have been calculated. However, we can see immediately that household expenditure on some divisions will be greatly reduced or even eliminated: Restaurants and hotels, Recreation and Culture, Transport, Furniture and household equipment, Clothing and Footwear. Between them, these account for 45% of the CPIH expenditure weights. In addition, parts of “miscellaneous goods and services” will be affected (for example hair-cuts and beauty treatments).

The online element in expenditure is still open where delivery is possible. The LP has been very good to Amazon, which has been hiring workers, and whose share price has risen by 20% in recent months. Take away meals can be ordered from Restaurants if they are still open; footwear and clothing can be ordered online. Prior to the LP, 20% of consumer expenditure was online.<sup>2</sup> During the LP, the share will be much greater, possibly up to 30% or more. For some households, almost all of their expenditure will be online: groceries, clothing, books, software, alcohol can all be ordered online for delivery. Other households will prefer to stick to visits to the local shops and supermarkets that are open. However, other expenditures are unaffected by LP, being paid by direct debit or standing orders: for example, much rent, mortgage payments, broadband and online music and video streaming. The imputed rental for owner occupied housing is not paid at all and can continue to be imputed during the Pandemic. Mortgage payments and rent may have a “holiday”, but since they will be deferred payments and may even be paid within year, they still count as “expenditures”.

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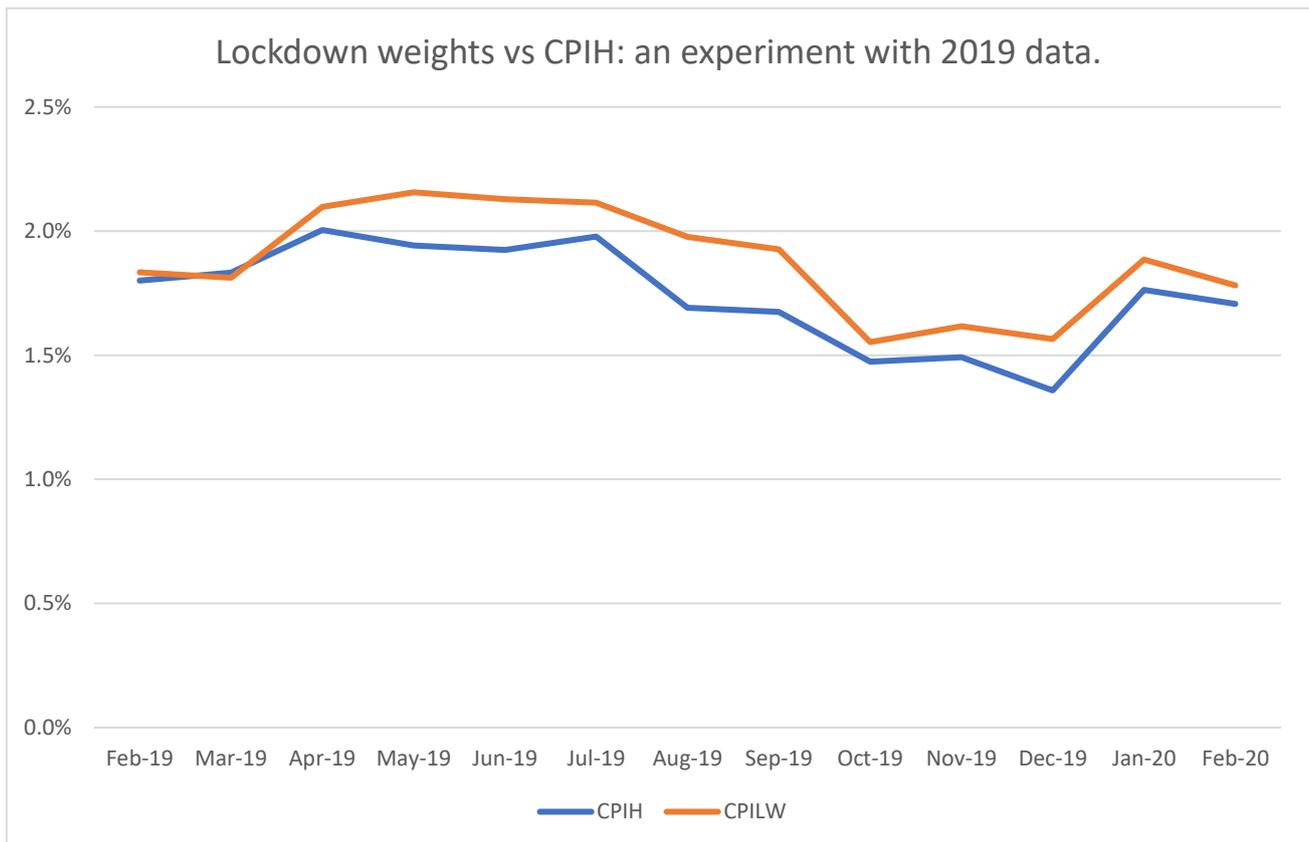
<sup>2</sup> See *Monetary policy during pandemics: inflation before, during and after Covid-19*, Silvana Tenreyro. Bank Of England April 16<sup>th</sup> 2020. Chart 7 on page 16 gives the share of online sales.

Whilst it is premature to give any exact figures for the expenditure shares during the LP, I have made some guesstimates by going deeper into the COICOP classification and also making some assumption about the level of online expenditures within each division to arrive at some “Pandemic weights”. I went through each detailed class within the COICOP classification and made a judgement as to whether it would be entirely absent during Lockdown or would remain with a smaller value online. I then added up within the affected COICOP divisions and then reweighted them so that they add up to 100%. In Table 1 I give the trial “Lockdown weights” in the bottom row for each division and the current CPIH weights. The actual figures for household consumption broken down into COICOP categories for 2020 Q2 will not be published until September 2020, so these guesstimates can be checked then.

**Table 2 Expenditure Weights Compared**

COICOP DIV	1	2	3	4	5	6	7	8	9	10	11	12
	FOOD AND NON-ALCOHOLIC BEVERAGES	ALCOHOLIC BEVERAGES AND TOBACCO	CLOTHING AND FOOTWEAR	HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	FURNITURE, HOUSEHOLD EQUIPMENT AND MAINTENANCE	HEALTH	TRANSPORT	COMMUNICATION	RECREATION & CULTURE	EDUCATION	RESTAURANTS AND HOTELS	MISCELLANEOUS GOODS AND SERVICES
CPIH	7.9%	3.2%	5.1%	29.6%	5.0%	2.2%	12.0%	1.7%	13.6%	2.4%	9.6%	7.7%
CPILW	13.1%	5.3%	0.8%	49.1%	2.5%	3.6%	2.5%	2.8%	7.3%	4.0%	2.5%	6.5%

If we compare the Lockdown and COICOP expenditure shares used in CPIH, we can see that there are big increases for divisions 01, 02, 04 and big reductions for 03, 07 09 and 11. Each COICOP division behaves differently: some are more volatile than others, some more seasonal. We can conduct an experiment and use the Lockdown expenditure weights and apply them to the past data. I have done this using the published indices for the divisions.<sup>3</sup> If we retrospectively applied the Lockdown weights we can recalculate a “Lockdown Weighted” CPI inflation rate, CPILW, for the 12 months from Feb 2019 to Feb 2020.



The overall effect in this experiment is to increase inflation above the published CPIH, from 1.7% to 1.9% over the period Feb 2019-Feb 2020. This net increase comes as some Divisions whose expenditure shares are reduced by LP include ones with lower inflation (such as Clothing and Footwear) and some higher (Restaurants and hotel) than CPIH.

<sup>3</sup> The indices for CPIH and its components are given in the ONS Consumer price inflation tables, Table 56. <https://www.ons.gov.uk/economy/inflationandpriceindices/datasets/consumerpriceinflation>

However, the expenditure shares are not the end of the story. As we move forward to look at inflation from April onwards, the real supply and demand shocks will cause prices to respond. For example, Food and Non-alcoholic beverages had quite low inflation in 2019 (1.4%). Since there has been a disruption in supply and an increase in demand (people are eating out less and cooking more at home), one might expect food prices to increase by more than pre-crisis. Perhaps the LP and shift to online shopping will raise prices for some types of goods? Food prices are very flexible and can respond to supply and demand rapidly. However, other prices respond more slowly. In transport, rail and bus fares are often regulated. Rents (real and imputed) change only slowly.

But online markets are highly competitive and there are often several sellers. The ability to raise prices in the absence of a real supply shortage might be limited. It is hard to predict, since whether supply shortages develop will depend on which falls faster, demand or supply. Overall, whilst shortages might emerge in the coming months, I would not view them as highly likely. They are more likely as the LP is relaxed and a period of pent up demand is released. Inflation is thus unlikely to emerge until late 2020 or 2021. And of course, it is also perfectly possible that the demand contraction will predominate if unemployment and bankruptcies continue to increase through 2020 and inflation remain subdued. In a recent speech on April 16th Silvana Tenreyro of the MPC expressed the view that inflation was likely to remain low in 2020.

The ONS has developed a High Demand Product (HDP) inflation measure as part of its faster statistics. It has 22 items, from pet food to dried pasta, paracetamol to toilet paper, collecting the prices online at a weekly frequency. The most recent results show that Pet foods have risen in price by 19% in the 4 weeks from March 16<sup>th</sup>, whilst food items have fallen slightly (1%). For those without pets to feed, there has been little inflation in the first four weeks of the LP. The series is quite volatile and its properties remain to be revealed as the weeks roll on. The HDP index has measured 4.8% inflation over the first four weeks. Whilst this is a considerable annualised figure (84%), the role of pet food in the CPIH is less pronounced.

The LP will affect consumption patterns for at least Q2 of 2020, and possibly Q3. Indeed, consumption patterns may change long after the height of the pandemic. Older people might be advised to stay in self isolation until a vaccine is found may be well into 2021. There will probably be a permanent shift in consumption patterns as people have been forced to learn the possibilities of online consumption. If you have subscribed to the met Opera to see live opera from New York in your living room, will you be so keen to get on a train to go see the opera at Covent Garden? As we move on to 2021, if the ONS uses the 2020 expenditure weights, then these will have been seriously affected by the lockdown and

may well not reflect the expenditure patterns of 2021. We would expect the shares to move back towards their pre-pandemic levels. However, as our experiment with reweighting 2019 has shown, the shift in expenditure shares need not have a large effect on the headline inflation.

The Pandemic provides challenges to the ONS and other bodies around the world that are new: the UK has only published inflation statistics since 1947 (for RPI) and nothing like this has happened before. The big changes in consumption patterns during the LP need not of themselves have a big effect on measured inflation. Applying my guesstimates of the Pandemic weights to 2019 led to a slight increase in measured CPIH from 1.7% to 1.9%. This is because the most affected sectors have inflation rates that are both above and below the CPIH headline. This suggests that the ONS can continue to use the current expenditure weights (reflecting 2019) where possible during the pandemic. Where goods and services are not available, those parts of COICOP should be left out. Very simply, the ONS should only include those items which are reasonably widely available and for which reliable prices can still be collected online. The remaining COICOP weights can be adjusted accordingly.

The real supply and demand shocks caused by the LP may increase or decrease inflation, depending on whether the fall in demand outweighs the fall in supply across the range of sectors. This of course remains to be seen. However, the restriction and limitation of demand during the LP may well mean that as economists we would like to “impute” prices to the restricted goods. You are unable to go to a restaurant during LP: but how much would you be *willing* to pay to go to a restaurant? If we imputed prices to our non-consumption of restricted items, perhaps there has already been inflation, albeit not reflected in actual prices paid. However, the ONS methodology has always been to base the measurement of inflation on the actual transaction prices of goods, and even the imputed rent of owner-occupied housing is based on the actual rentals of similar properties. In my opinion it is still worthwhile to measure inflation even in a Pandemic and the published figure will still be meaningful. However, the ONS will need to keep a close eye on the effects of expenditure weights and try to keep the collection of prices as wide as possible so as to capture the actual range of goods and services actually consumed.