

ARTICLE – Changed consumption during the pandemic affects inflation

The pandemic has led to unusually large changes in household consumption. This in turn means that it has become more difficult to measure inflation and that the statistics can be difficult to interpret and compare between countries. According to the calculations presented in this article, the inflation rate measured during 2020 underestimated the rate of increase in the prices actually paid by an average household. The way in which the CPIF is calculated means, however, that the changed consumption pattern will sooner or later affect the CPIF. According to Statistics Sweden's normal calculation methods, the CPIF would have been affected by the changes in 2020 mainly during 2022 and 2023. But when Statistics Sweden updates the weights in the CPIF this year, they will use a more up-to-date base for their calculations than they usually do. This will result in the rate of CPIF inflation measured being slightly higher this year than it would otherwise have been, especially at the beginning of the year. However, the change is not expected to lead to any lasting effects on inflation.

The pandemic has affected household consumption

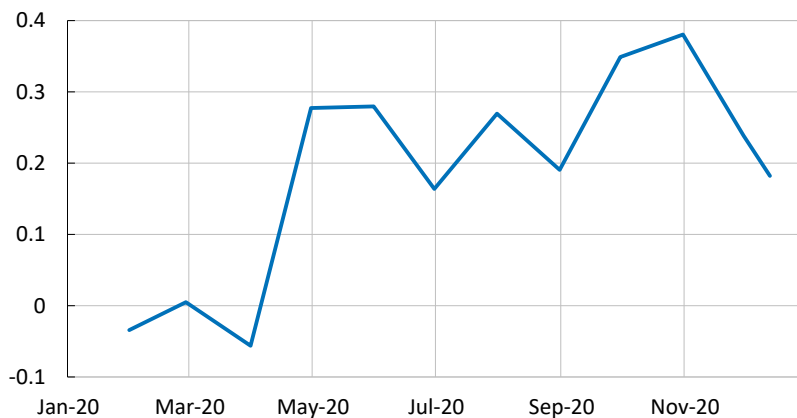
During the pandemic, there have been unusually large changes in household consumption. Air travel and package holidays were in principle not consumed at all during certain months. However, consumption of hotel stays, restaurant visits and various types of entertainment, such as theatre, cinema, sporting events has also declined substantially. Consumption of other things has increased instead, as people are to a larger extent working from home and also staying home when they are not working. This applies to consumption of food, games, products for home renovation and home electronics. The prices of the products consumed less have, in many cases, increased relatively slowly or fallen, while prices of products consumed more have in many cases instead increased relatively rapidly.

The CPIF is calculated as aggregate price movements for a representative 'basket' of products. But as the weights used to calculate the CPIF for 2020 are largely based on how consumption was broken down in 2018, the rate of inflation measured may seem to underestimate the rate of increase in the prices faced by an average household. If one had instead used the current weights for consumption, the aggregate rate of price increase would have been higher, as households have consumed less of the products with prices that are increasing relatively slowly and more of the products with prices that are increasingly relatively quickly.

Figure 59 shows the results of a calculation whereby the annual percentage change in almost 80 sub-groups, which together comprise the CPIF, have been weighed together using weights that reflect consumption during 2020. The difference between this rate of change and the corresponding rate of change calculated with weights based on consumption in 2018 is shown in the figure for 2020. During the period from April onwards, the difference has been between 0.2 and 0.4 percentage points.

Figure 59. Estimated difference between CPIF inflation calculated using weights from 2020 and weights from 2018

Percentage points



Note. Detailed data on household consumption from the National Accounts up to the end of the third quarter of 2020 has been used to calculate weights in 2018 and in 2020. After that, the actual weights for 2020 have been adjusted on the basis of the difference calculated between the whole year 2018 and the three first quarters of 2020. The annual rate of change in the 80 or so sub-groups of the CPIF has then been pooled with these weights.

Sources: Statistics Sweden and the Riksbank.

A number of studies using international data have shown the same results, that inflation would probably have been higher during the pandemic if weights based on actual consumption patterns had been used in the calculations of inflation.²⁹ A similar pattern to Sweden can be seen in other countries, where consumption of, for instance, transport services has declined substantially, at the same time as the price of these services has fallen.

Changes in consumption will affect the measured rate of inflation this year and in coming years

As the weights in the calculation system for the CPIF are normally based on consumption two years previously, the changed consumption behaviour last year has not af-

²⁹ See, for example, Cavallo, Alberto, "Inflation with Covid Consumption Basket", Working Paper no. 27352, NBER Working Paper Series (2020), Diewert, W. Ervin and Fox, Kevin J., "Measuring Real Consumption and CPI Bias under Lockdown Conditions", Working Paper no. 27144, NBER Working Paper Series (2020) and Reinsdorf, Marshall "COVID-19 and the CPI: Is Inflation Underestimated?", WP/20/224, IMF Working Paper Series (2020).

affected the measured rate of inflation yet, apart from when it has affected price developments. However, the way in which the CPIF is calculated will mean that the changes in the weights affect inflation in 2021 and the coming years.

The CPIF aims to measure how price changes affect households' costs for maintaining the same standard of consumption as before. Calculation of the index therefore needs to take into account changes in both prices and the products consumed by households. Technically, this is achieved through an index construction that tries to estimate how consumers adapt to changes in relative prices. The index construction means, for instance, that the index level changes in January every year when the consumption weights are updated. In theory, a change in the index between January and December of the previous year could therefore happen, even if all prices had remained unchanged over these months. Normally, the updating of the weights would contribute to the index falling, as households tend to have replaced products that have become relatively more expensive with products that have become relatively cheaper. This is what Statistics Sweden calls the 'basket effect'.³⁰ The purpose of this adjustment is for the index level in the CPIF to be 'right' in the long run. Consequently, sooner or later, inflation will be affected by the unusually large change in how households have been consuming during the pandemic.

This year, Statistics Sweden will calculate the weights on the basis of more up-to-date data than usual. The weights will mainly be based on the consumption breakdown in 2020 instead of in 2019, which would have been the normal approach.³¹ Among other things, this means that some of the adjustment in level that normally would have been visible in the index in 2022 will instead be visible as early as 2021.³² The rest of the adjustment in level will be visible in the index in 2022.

Is it possible to say anything about what direction the effect of this change will take and how large the effect will be? Intuitively, one can expect the effect to be positive. In practice, a reversed substitution effect has arisen, as households have consumed less of products whose prices have increased relatively slowly. This should contribute to a somewhat higher rate of inflation being measured in 2021 than if Statistics Sweden had applied their usual procedure.

Figure 60 shows how the forecast for the CPIF has been affected by Statistics Sweden's new method of calculating weights. The changes are expected to lead to inflation being just over 0.1 percentage points higher on average this year. At the same time, the change is expected to affect the development of the CPIF over the year and to contribute to higher measured inflation, especially during the first half of the year. One reason for this is the decreased significance given to the price of foreign travel by the new weights. Prices for foreign travel have a clear seasonal pattern, and tend to fall quickly at the start of the year and rise quickly during the summer months and

³⁰ For a technical description of how the basket effect is calculated, see the document "Korgeffekten 2020" (the Basket Effect 2020) on Statistics Sweden's website.

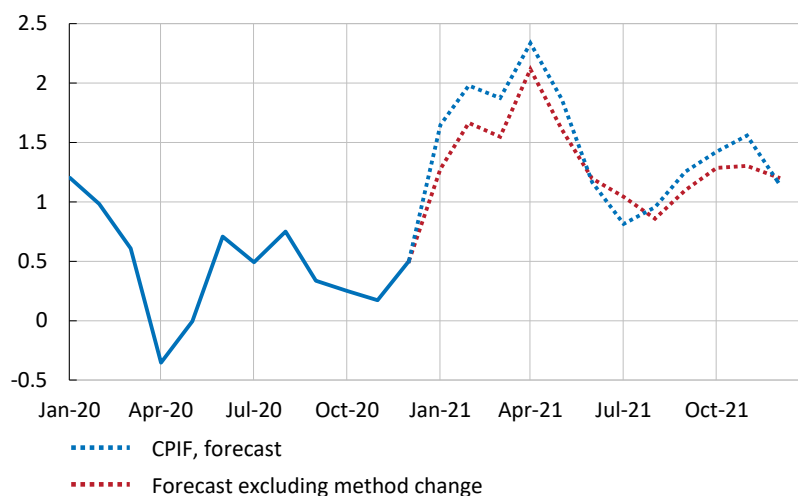
³¹ The reason why the weights are normally based on consumption two years earlier is that one then has access to more reliable data. Normally, there are not so very large shifts in consumption patterns between the years.

³² For a more detailed description of how this works, see J. Johansson, M. Löf, O. Tysklind "Changed consumption during the pandemic affects inflation", Economic Commentaries, No. 14, 2020, Sveriges Riksbank.

around Christmas, when many people have time off. As an example, the downturn in the prices of foreign travel will have less significance for the monthly change in the CPIF in January this year than the corresponding month last year, which contributes to the annual percentage change in the CPIF rising in January this year. But the assessment of the effects is uncertain, for many reasons. For one thing, the Riksbank does not have access to the same detailed data that Statistics Sweden will use as a base in calculating the final weights and, for another thing, the results depend on how prices develop over the year.

Figure 60. CPIF forecasts with and without Statistics Sweden's method changes

Annual percentage change



Note. Unbroken line refers to outcomes, broken line to the Riksbank's forecast.

Sources: Statistics Sweden and the Riksbank.

Inflation statistics will be difficult to interpret over the coming years

In addition to the problems with shifts in consumption and weights discussed in this article, there are also other measurement problems connected to certain products in Statistics Sweden's sample simply not being available, making it impossible to measure their prices.³³ The statistics on price movements are therefore difficult to interpret and will remain so in the coming years. At the same time, it will be particularly difficult to make international comparisons, as the measurement problems are of different sizes and the changed weights have different effects on inflation in different countries.³⁴

It is important to understand what is happening in the statistics, if we are to be able to assess how much of a change in the inflation rate measured is permanent and will

³³ See, for instance, the discussion in the article "Inflation outlook during the corona crisis" in Monetary Policy Report, July 2020.

³⁴ The harmonised index HICP is not affected by weight changes in the same way as the CPIF. For more information, see J. Johansson, M. Löf, O. Tysklind "Changed consumption during the pandemic affects inflation", Economic Commentaries, No. 14, 2020, Sveriges Riksbank.

therefore continue to affect inflation. The use of a more up-to-date base for calculations by Statistics Sweden this year will probably mean that measured inflation is slightly higher in 2021. However, this is not expected to lead to any lasting changes in inflation. The change can be seen as an adjustment to periodisation meaning that parts of the adjustments to the CPIF that would not have affected CPIF inflation until 2022 and 2023 will instead affect the CPIF this year.