

Changes in calculation methods for the inflation rate

Statistics Sweden's CPI committee has decided to make a number of changes in the method for calculating the consumer price index and the inflation rate. The new calculation methods will be introduced with effect from January 2005. This box describes the changes in methods and analyses how they can be expected to affect recorded inflation.

New method for calculating inflation rate

The consumer price index, CPI, measures the price of a basket of goods and services. The prices of the different goods and services are weighted together on the basis of their representative proportions of household consumption. Goods that are consumed on a large scale are given a greater weighting in the CPI and vice versa. As CPI is a cost-of-living index, it aims to answer the question, "How much do consumers' incomes have to change for their utility to remain the same when prices change?" If the price of a product rises, there is usually some level of substitution, whereby this more expensive product is replaced by cheaper ones. Individuals' incomes therefore do not need to rise by as much to provide unchanged utility when this substitution is made. To provide a correct answer to the question, the consumption weights are thus changed from year to year to take this substitution into account.

At present there are two different ways of calculating the rate of change in CPI. The main difference between them is the way they treat substitution effects. The first way amounts to simply calculating the annual percentage change in the index figure. This method of calculation is applied when using CPI for index-linking and cost compensation. As CPI in itself is calculated using the most up-to-date weights possible, the annual percentage change in CPI measures the change in price of a basket of goods that changes over time, partly because of substitution resulting from relative price changes.

The other method involves trying to neutralise the effects of changed consumption patterns. This measure of the rate of change is usually called the "CPI inflation rate". The inflation rate can thus be regarded as the change in price of an unchanged basket of goods over a twelve-month period. This is the measure that the Riksbank has until now forecast and analysed in its Inflation Reports. With effect from January 2005, adjustments will no longer be made for substitution effects when calculating the inflation rate, that is to say, there will no longer be two different measures of the rate of change in the CPI. Inflation will instead be measured as the annual percentage change in CPI, that is to say, according to the first of these two means of measurement.

New method for calculating CPI

At the same time as the method for calculating the inflation rate is changed, a new index construction is being introduced for calculating the actual CPI figure. CPI is a chain index with annual links. This means that price increases over one year are multiplied together – chained – to earlier years' price increases, which provides a measure of how current prices relate the prices in 1980 (the base year for CPI). The current index construction means the yearly links are calculated on the basis of prices applying in December of that particular year. The current yearly link therefore reflects how prices at the end of one year relate to prices at the end of the previous year. The chain is concluded with a link that compares prices during the current month with the prices in December of the previous year.

With the new index construction, the chain linking will follow whole years rather than just December. This will be achieved by using average annual prices when calculating the yearly links. The new yearly links will therefore reflect how the average prices during one year

relate to the average prices during the previous year. Another change is that the concluding link will measure prices during the current month in relation to average prices two years ago.

Consequences for inflation forecasts

What effect will these method changes have on recorded inflation? One way of finding out is to study the size of the differences between the two means of measuring the CPI's rate of change from a historical perspective. Since January 1981, the two different methods show

largely the same development (see Figure B18). However, the differences can be substantial with regard to individual years (see Figure B19).

Since 1981 the difference between the two measures has averaged just under 0.2 percentage points a year. The fact that the CPI inflation rate usually indicates a higher rate of increase than the annual percentage change in CPI is related to the adjustment made to neutralise substitution effects when calculating the CPI inflation rate. Price increases on individual goods have a greater impact in an index with constant weights than an index that takes into account the fact that consumers consume less of the products that have become more expensive.

As shown in Figure B19, the difference in the recorded inflation rate between the two measures varies considerably between years and the percentage 12-month change in CPI can even give a higher rate of increase in certain years. On average, however, the CPI inflation rate is just under 0.2 percentage points a year higher than the percentage 12-month change in CPI. The variations between the years are not systematic, that is to say, they cannot be forecast.¹⁴ The difference in the rate of increase reported in Figure B19 is calculated on the basis of the current index construction. On top of this there are potential effects of other method changes, although according to Statistics Sweden, these are expected to only have a marginal influence on the CPI figure and there is no systematic effect that is statistically significant.¹⁵

The inflation forecast in the main scenario of this Inflation Report refers to the new measuring method effective from January 2005, and as a direct result of the method changes the Riksbank has revised down its forecast for CPI inflation by 0.2 percentage points with effect

Figure B18. Percentage 12-month change in CPI and CPI inflation rate.
Percentage 12-month change

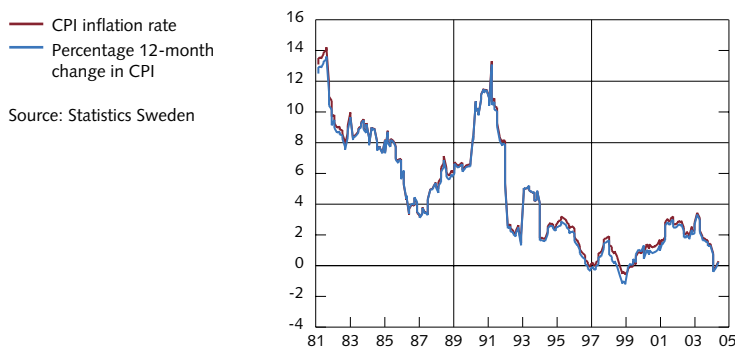
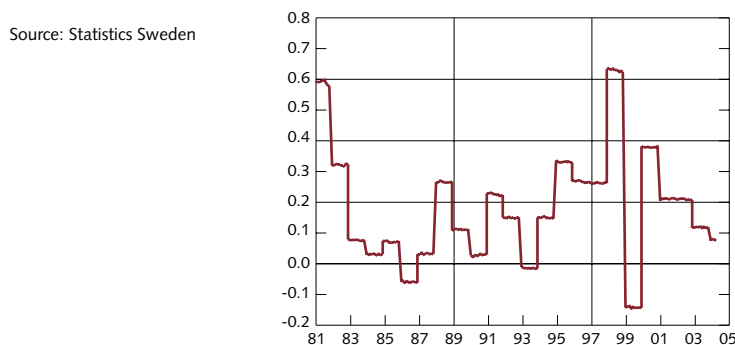


Figure B19. Difference between the CPI inflation rate and the percentage 12-month change in CPI.
Percentage points



14 While there is a high level of persistence in the difference in recorded inflation rate, this primarily concerns, as shown in Figure B19, the size of the difference during the respective year (see the stepladder-like appearance in Figure B19). On the other hand, the annual average of the difference between the two measures is described as 0.2 percentage points plus an entirely random deviation, that is to say, the fact that we know that the difference between the two measures is just under 0.1 percentage points in 2004 does not affect the assessment that the difference can be expected to be 0.2 percentage points with effect from 2005.

15 See the Riksbank's comments on the change in the press release dated 5 May 2004, on www.riksbank.se. Further details on the change can be obtained (in Swedish) from Statistics Sweden's press information on www.scb.se.

**Table B1. Inflation forecasts using the new and the current calculation methods.
Percentage 12-month change**

	12-month average		12-month rate		
	2004	2005	June 04	June 05	June 06
CPI	0.4 (0.4)	1.2 (1.4)	0.7 (0.7)	1.1 (1.3)	2.2 (2.4)
UND1X	0.9 (0.9)	1.1 (1.3)	1.2 (1.2)	1.0 (1.2)	1.7 (1.9)
UNDINHX	1.7 (1.7)	1.6 (1.8)	1.8 (1.8)	1.7 (1.9)	2.3 (2.5)
UNDIMPX	-0.6 (-0.6)	0.1 (0.3)	-0.2 (-0.2)	-0.4 (-0.2)	0.3 (0.5)

Note. The table shows the forecast in the main scenario, which includes the new calculation methods with effect from January 2005. The corresponding assessment using the present calculation methods is given in brackets.

Source: The Riksbank.

from January 2005. This is illustrated in Table B1, which shows that the forecast for CPI inflation according to the new measurement method is 0.2 percentage points lower than the forecast according to the present measurement method with effect from January 2005.

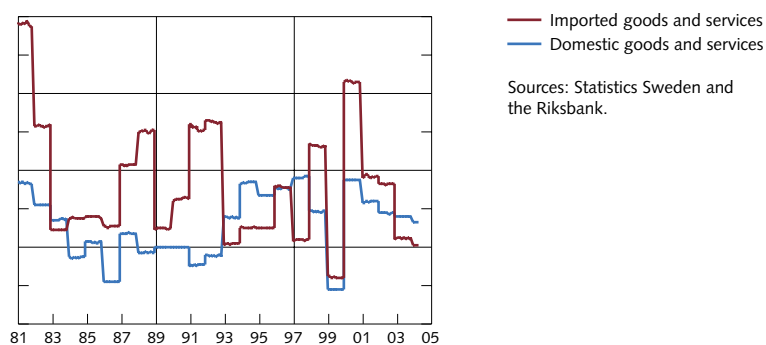
The method changes implemented in the calculation of CPI and the inflation rate will also be applied to the measures of underlying inflation calculated by Statistics Sweden on behalf of the Riksbank. UND1X is calculated as the CPI inflation rate excluding house mortgage interest expenditure and adjusted for the direct effects of changes in indirect taxes and subsidies. As UND1X inflation is only calculated according to one method, it is not possible to estimate the effects of the change in method on this measure of inflation in the same way as for CPI inflation. Interest expenditure provides only a minor contribution to CPI, and the contribution from taxes has been small during the 1990s. The Riksbank is therefore making a downward adjustment to the forecast for UND1X inflation similar to the forecast for CPI inflation, i.e. by 0.2 percentage points with effect from January 2005 (see Table B1).

The other two measures of underlying inflation, UNDINHX and UNDIMPX, have also been calculated only using the same method as CPI inflation. As they have only been calculated according to one method, it is not really

possible to study the difference between the two calculation methods for these measures. However, it is possible to obtain a rough estimate of whether the substitution effects are evenly distributed between the two measures. Figure B20 provides an estimate showing the difference between the CPI inflation rate and the annual percentage change in CPI broken down into domestic and imported goods and services respectively, that is to say, the goods and services included in UNDINHX and UNDIMPX respectively.¹⁶

On average the difference in the recorded inflation rate is just over 0.1 percentage points for the domestic goods and services in the CPI and just over 0.3 percentage points for the imported goods and services. The fact that the

**Figure B20. The difference between the CPI inflation rate and the percentage annual change in CPI broken down into domestic and imported goods and services.
Percentage points**



— Imported goods and services
— Domestic goods and services

Sources: Statistics Sweden and the Riksbank.

¹⁶ In this approximation the substitution effects that can arise as a result of changes in indirect taxes and subsidies or in interest expenditure have been disregarded.

substitution effects are greater with regard to the imported goods and services is not surprising, as imports have a relatively greater percentage of goods, which are more subject to substitution than services. As these effects only provide a rough pointer of whether the substitution effects are evenly distributed between domestic and imported goods and services, the Riksbank has chosen to make a downward adjustment to the forecasts for both UNDINHx and UNDIMPx, of 0.2 percentage points with effect from January 2005 (see Table B1). However, the estimates indicate that the effects can be slightly larger on imported inflation than on domestic underlying inflation.

Summary

With effect from January 2005, new calculation methods will be introduced for CPI and the inflation rate. The main difference compared with the present calculation method is that

the adjustment made to neutralise substitution effects when calculating the inflation rate will be discarded. The effect of this will be that the recorded inflation rate can on average be expected to be 0.2 percentage points lower per year using the new measurement method. The Riksbank has therefore made a downward revision in its forecast for CPI inflation in the main scenario, of 0.2 percentage points a year with effect from January 2005 as a direct consequence of the method changes. The method changes will also apply to the measures of underlying inflation calculated by Statistics Sweden on behalf of the Riksbank. At present there is no indication that UND1x will be affected differently from CPI inflation, and the Riksbank is therefore also making a downward revision of 0.2 percentage points with effect from January 2005 as a direct consequence of the method changes. The effects could possibly be slightly greater on underlying imported inflation than on underlying domestic inflation.