The CPI and measures of underlying inflation

The Riksbank has chosen since the start of 2009 to highlight the measure of underlying inflation known as the CPIF as a particularly important measure for monetary policy. However, this does not mean that the inflation target has changed. The target is still to attain an inflation rate of 2 per cent in terms of the CPI. But the repo rate has been cut substantially since the financial crisis erupted and is expected to return to more normal levels during the forecast period. Under these circumstances CPI inflation will be affected considerably, through the effects on households' interest expenditure. To clarify how the CPI is affected by these changes in the repo rate, the Riksbank has chosen to supplement the CPI forecasts with forecasts for the CPIF. If monetary policy is designed so that the CPIF is close to 2 per cent, the CPI will also be close to the target when the effects of all the interest rate changes have waned. As long as the forecasts for the CPI and the CPIF differ throughout the forecast period, and the difference is primarily due to the Riksbank's policy, it is natural to also highlight the CPIF as an important measure of underlying inflation.

The inflation target is defined in terms of the CPI…

The Sveriges Riksbank Act states that "the objective of the Riksbank's operations shall be to maintain price stability". The Riksbank has specified its operational target as keeping inflation, measured by the consumer price index (CPI), at 2 per cent a year. This target wording has remained the same since the inflation target was announced in 1993.[28] The wording of the target has been established in the clarification of the Riksbank's monetary policy strategy published since then.[29] The fact that the target is defined in terms of the CPI is because it is a broad price index that represents normal purchases and it is well known to the general public. Moreover, the CPI statistics are of good quality, are not normally revised, and are published soon after the end of the month.

Monetary policy cannot be used to permanently raise the level of production and employment. However, changes in the repo rate affect the real economy in the short term. By striving to stabilise production and employment around paths that are sustainable in the long term, the Riksbank contributes to the attainment of the general economic policy objectives of good growth and high employment. In practice, this means that the Riksbank conducts a policy of flexible inflation targeting, in that it strives in its rate-setting both to stabilise inflation around the inflation target and to stabilise resource utilisation around a normal level.

…but monetary policy is often governed by other measures of underlying inflation

Even though the inflation target is defined in terms of the rate of increase in the CPI, the Riksbank regularly follows and analyses the development

28 See Press release no. 5, 1993, Sveriges Riksbank.

29 See L. Heikensten, "The Riksbank's inflation target – clarifications and evaluation" *Sveriges Riksbank Quarterly Review* No. 1, 1999, and "Monetary Policy in Sweden, 2010", Sveriges Riksbank.

of various measures of underlying inflation. By this we mean measures of inflation where price movements on certain goods or services have been excluded. Sometimes the CPI is affected by factors that have only temporary effects on inflation, and which the Riksbank therefore does not need to counteract with monetary policy. By excluding such components from the CPI one can produce a measure of inflation that provides insights into the more lasting inflation, which can be useful in our analysis and forecasting work.[30] This could, for instance, be changes in the repo rate that affect the CPI through mortgage interest expenditure. In these cases the analysis can be supplemented with forecasts for different measures of underlying inflation. The purpose then is to illustrate how different components of the CPI develop during the forecast period and to clarify which inflationary disturbances the Riksbank will choose not to counteract with monetary policy.

Method changes in forecasting work have reduced the need for measures of underlying inflation

When the inflation target was introduced, the Riksbank made forecasts for two years ahead. These forecasts were based on the assumption that the repo rate would be held unchanged during the forecast period. There was a great need to report different measures of underlying inflation, as it was a relatively common occurrence that various temporary inflation disturbances had not yet waned within the two-year period.[31] Since then the monetary policy forecasting work at the Riksbank has changed. The forecasting horizon was extended from two to three years in connection with the publication of the year's first Inflation Report in 2005. The assumption of an unchanged repo rate was also abandoned, to enable us to make realistic forecasts extending three years ahead. With effect from the publication of this report, the assumption was instead that the repo rate would follow market expectations, as reflected in implied forward rates, and then in the first Monetary Policy Report of 2007 the Riksbank began to report its own forecast for the future repo rate.[32] The purpose of extending the forecasting period was to illustrate more clearly how inflation is sometimes affected by temporary inflationary disturbances. The idea was that temporary inflationary disturbances that had not yet waned within the earlier two-year horizon would have time to do so within the three-year horizon. There would thus be less need to report measures of underlying inflation where temporary inflationary disturbances are excluded.[33]

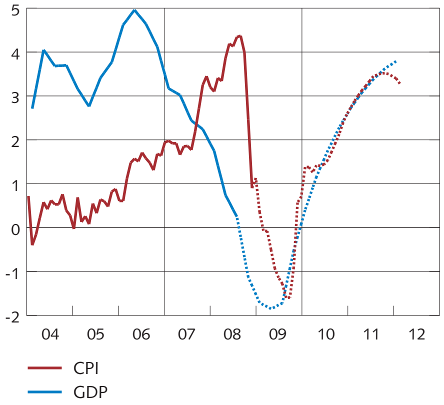
30 See J. Hansson, J. Johansson and S. Palmqvist, "Why do we need measures of underlying inflation?" *Economic Review*, no. 2 2008 Sveriges Riksbank.

31 See the box "The Riksbank's monetary policy – target and indicators" in Inflation Report 2003:3, Sveriges Riksbank.

32 The name Inflation Report was changed to Monetary Policy Report when the Riksbank began publishing its own repo rate path in 2007.

33 See the boxes "Changes in the Riksbank's forecasting methods" in Inflation Report 2005:1, Sveriges Riksbank, and "Riksbank to publish its own forecast for the repo rate" in the Monetary Policy Report 2007:1, Sveriges Riksbank.

Figure B7. CPI and GDP. Outcome and forecasts from the Monetary Policy Report in February 2009
Annual percentage change



Sources: Statistics Sweden and the Riksbank

The CPIF can be used to illustrate how monetary policy affects interest expenditure in the CPI

There have also been changes with regard to which measures of underlying inflation are used. The CPIX measure of inflation (previously called UND1X) had for a long time a special status in the Riksbank's monetary policy analysis. However, it became apparent that the CPIX excluded a little too much. In addition to the direct effects of the Riksbank's repo rate changes, it also excluded increases in property prices and the effects of changes in indirect taxes and subsidies. As property prices have risen considerably over a long period of time, the CPIX would not coincide with the CPI even in the long run. It was then no longer possible to use the CPIX to illustrate how temporary inflation disturbances, such as changes in the repo rate, affected CPI inflation. For this reason a new measure of underlying inflation, called the CPIF (the CPI with a fixed interest rate) was introduced in the second Monetary Policy Report of 2008. In this measure the only difference compared with the CPI is that mortgage rates are held constant. The CPIF therefore has the quality of coinciding with the CPI in the long run.[34]

The repo rate was cut substantially during the financial crisis to slow down the fall in GDP growth

When the CPIF was introduced, the idea was that it would primarily be used in the outcome analysis to illustrate how the Riksbank's own repo rate changes affect interest costs in the current CPI inflation rate. The CPIF would not have the same special position as the CPIX had earlier; the monetary policy discussion would instead focus more directly on the CPI.[35] Then came the financial crisis. During autumn 2008 the repo rate was cut at a fast pace from 4.75 to 2 per cent and during the first half of 2009 the cuts continued down to 0.25 per cent. One important motive for these cuts was to try to slow down the heavy fall in GDP growth. The Riksbank then chose to conduct a monetary policy that meant that CPI inflation was expected to deviate substantially from the inflation target. This was to achieve a good balance between on the one side stabilising inflation around the target level and on the other side stabilising the real economy. An example of this is shown in Figure B7, with the decision-making situation that applied when the Monetary Policy Report was published in February 2009. To illustrate how the Riksbank's repo rate changes affect CPI inflation during the forecast period and to make clear which deviations from the inflation target can be accepted, the Riksbank has chosen to also publish forecasts for the CPIF with effect from this report.

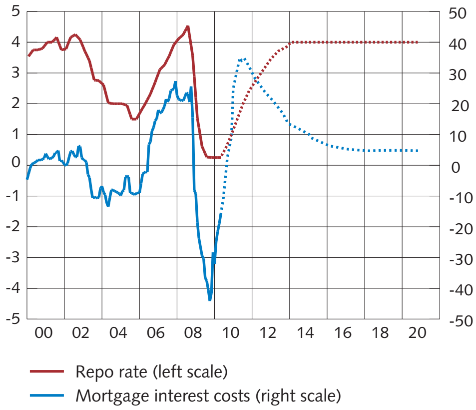
34 See the box "The rate of increase in the CPIX will be below the CPI for a long time" in Monetary Policy Report 2008:2, Sveriges Riksbank.

35 See the box "How are measures of underlying inflation used in monetary policy analysis?" in Monetary Policy Report 2008:2, Sveriges Riksbank and "The Riksbank's inflation target – CPI, other measures of inflation and phasing out the CPIX", a speech by Barbro Wickman-Parak held on 9 June 2008, Sveriges Riksbank.

When the repo rate is changed substantially interest costs will fluctuate widely

The Riksbank's forecasts for the repo rate have since then indicated that while the repo rate will be held at a low level for a long time, it will begin to return to more normal levels during the forecast period. Under these circumstances the repo rate will first contribute to lowering mortgage interest costs and then, as the repo rate is raised, push them up again. This is illustrated in Figure B8, which shows outcomes and forecasts for the repo rate and households' interest costs. Beyond the normal forecast horizon it is assumed that the repo rate will remain at around 4 per cent. The major changes in the repo rate mean that interest costs fall by almost 20 per cent during the second quarter of 2010 compared with the corresponding quarter last year, to rise during the coming years by at most just over 30 per cent.

Figure B8. Repo rate and mortgage interest costs, outcome, forecast and forward projection
Per cent and annual percentage change respectively



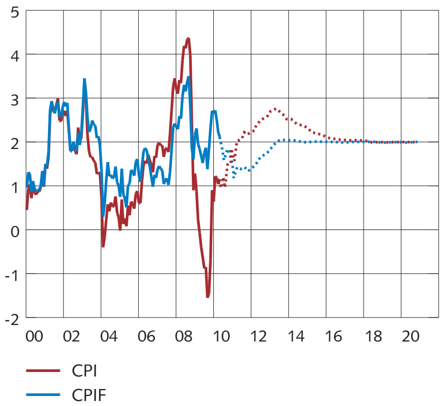
Sources: Statistics Sweden and the Riksbank

In the long run the CPI and the CPIF coincide

What are the consequences for the CPI under these assumptions? With such large fluctuations in the repo rate and in interest rate costs, not even three years is sufficient time for the temporary inflation disturbances to wane (see Figure B9).[36] Mortgage interest expenditure currently accounts for just over 6 per cent of the CPI and contributes to holding CPI inflation around 1 percentage point below the CPIF. As the repo rate is raised, the reverse should occur and interest costs should push up the CPI almost 1 percentage point above the CPIF.[37]

The only difference between the CPI and the CPIF is that mortgage rates are held constant in the CPIF. The two measures will therefore coincide when the effects of the interest rate changes have waned and interest costs have stabilised. This is illustrated in Figure B9, which shows outcomes and forecasts for the two measures of inflation. Beyond the forecast horizon it is assumed that the CPIF will coincide with the inflation target. It is clear from this very stylised example that if monetary policy is designed so that the CPIF is close to 2 per cent, the target variable, the CPI, will also be close to this level in the long run. The CPIF can be regarded as an indicator of how the CPI will develop in the longer run. However, it is also clear that the two measures will differ over a long period to come as a direct result of the Riksbank's monetary policy.

Figure B9. CPI and CPIF, outcomes, forecasts and forward projections
Annual percentage change



Note. Beyond the end of the forecast period it is assumed that the CPIF will increase by 2 per cent and that the repo rate will amount to 4 per cent and then remain at that level until 2020.

Sources: Statistics Sweden and the Riksbank

In the CPIF all changes in market rates are held constant

The CPIF also excludes a little too much. The purpose of the measure is to exclude the direct effects that a change in the repo rate has on households' interest costs. However, the interest rate included in the calculation of households' interest costs is not the repo rate, but mortgage

36 The fact that such circumstances could arise was also noted by J. Hansson, J. Johansson & S. Palmqvist in, "Why do we need measures of underlying inflation?" *Economic Review,* no. 2 2008 Sveriges Riksbank.

37 One can calculate the contribution to CPI inflation from interest costs approximately by multiplying the weight of the interest costs (6 per cent) by the annual percentage change in the interest costs. For a more exact calculation method, see Memorandum no. 4 2010 "Räntekostnadernas bidrag till KPI-inflationen" published by the National Institut of Economic Research.

rates with different maturities. When calculating the CPIF, these market rates are held constant. When the repo rate is changed as much as it has been since the outbreak of the financial crisis, and as much as it is expected to change in the future, market rates will vary substantially as a direct consequence of the changes in the repo rate. However, market rates can also change for other reasons than changes in the repo rate. For example, the long market rates could rise if confidence in the inflation target declined, which would push up the CPI through higher mortgage interest costs. In such cases it is not likely that one would wish to allow monetary policy to be guided by a measure of underlying inflation where all market rates are held constant as in the CPIF.[38]

The target is still to attain 2 per cent in terms of the CPI

As the Riksbank has emphasised on a number of occasions, there is no individual measure of underlying inflation that functions in all situations and which always excludes exactly that which has temporary effects on CPI inflation. As long as the forecasts for the CPI and the CPIF differ throughout the forecast period, and the difference is primarily due to the Riksbank's policy, it is natural to also highlight the CPIF as an important measure of underlying inflation. This does not mean, any more than it did before, that the target for monetary policy has changed. The inflation target is defined in terms of the CPI, which is a broad price index that represents normal purchases and is well-known to the general public.[39]

38 The CPI includes households' mortgage costs as part of housing costs. There is thus a direct link between market rates and housing costs. But even using other methods to calculate housing costs, such as the rental equivalence approach, there will be a link between market rates and housing costs, as rents normally rise if market rates rise.

39 See also "Monetary Policy in Sweden" (2010), page 4, Sveriges Riksbank.