THE CPI COMPILED WITH COMPONENTS WEIGHTED FOR STANDARD DEVIATIONS

The Riksbank's inflation target is formulated in terms of the CPI. Various indicators of underlying inflation are also used as a basis for monetary policy.

Underlying or core inflation can be estimated in different ways. In the most usual approach, actual inflation is calculated excluding price movements that are judged to be transient and subject to factors other than inflation expectations and demand. UND1X, for example, represents the CPI adjusted for the net change in indirect taxes and subsidies and for house mortgage interest expenditure. In other countries, underlying inflation is often measured as the CPI excluding energy and food. There are also instances of adjustments for other goods for which price volatility has been historically high.

Another approach to measuring underlying inflation is econometric estimation. In this way, underlying inflation can be defined by, for example, identifying both expected and cyclically-related inflation in a model.

A third approach starts from statistical properties of the total CPI or various components. Examples of this are median inflation and centred mean.

Variants of all three ways of measuring underlying inflation are, or have been, presented in these reports. Yet another way is presented here; it involves basing the weights for groups of items on the *stability* of each group's price instead of on its share of household consumption. In that this approach rests on statistical properties of CPI components, it is most akin to the statistically defined measurements of underlying inflation.

Calculating this indicator involves assigning a weight to each CPI component that is inversely proportional to its standard deviation from total inflation. With this procedure, the higher the price volatility of the components, the smaller will be their impact on the total index. The standard deviations on which the components' weights are based are estimated for a time period that is moved successively forward.

Results for the CPI decomposed into 8 and 70 groups, respectively, are presented in the accompanying figures. In each case, underlying inflation has been

Figure B1. Alternative measurement of underlying inflation based on an 8-component CPI with standard deviations estimated over 12 months. Percentage 12-month change
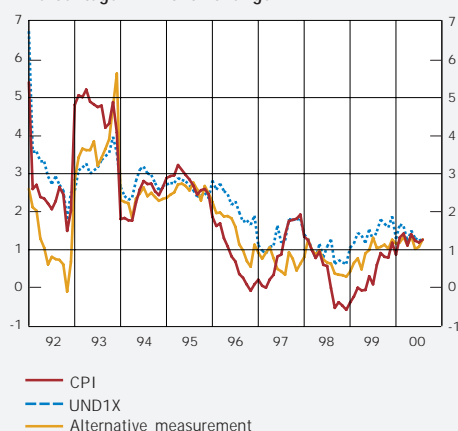
CPI
UND1X
Alternative measurement
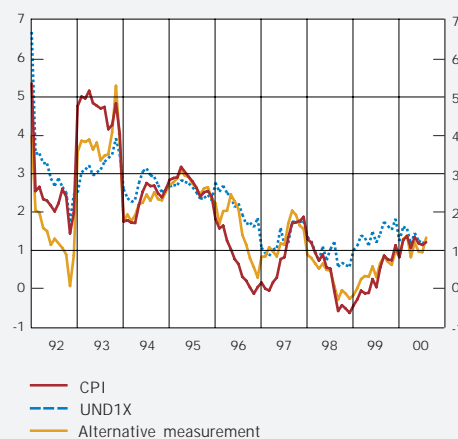
Sources: Statistics Sweden and the Riksbank.

Figure B2. Alternative measurement of underlying inflation based on an 8-component CPI with standard deviations estimated over 24 months. Percentage 12-month change

CPI
UND1X
Alternative measurement
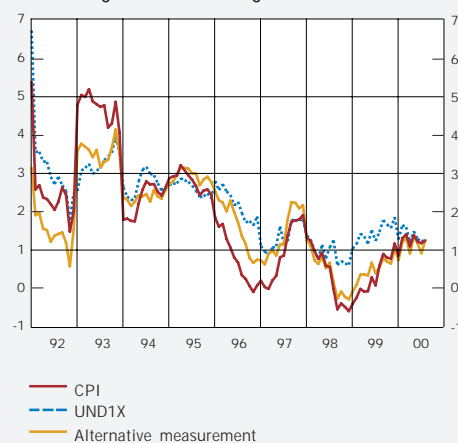
Sources: Statistics Sweden and the Riksbank.

Figure B3. Alternative measurement of underlying inflation based on a 70-component CPI with standard deviations estimated over 12 months. Percentage 12-month change

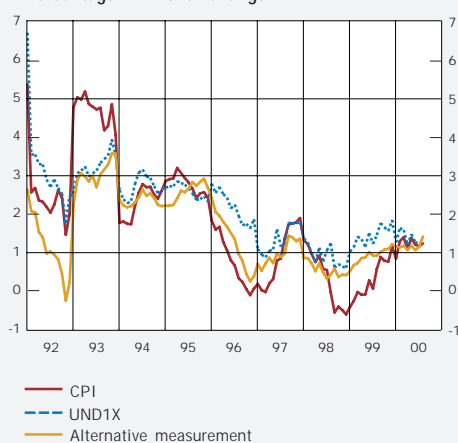—— CPI
----- UND1X
—— Alternative measurement

Sources: Statistics Sweden and the Riksbank.

Figure B4. Alternative measurement of underlying inflation based on a 70-component CPI with standard deviations estimated over 24 months. Percentage 12-month change

—— CPI
----- UND1X
—— Alternative measurement

Sources: Statistics Sweden and the Riksbank.

calculated with standard deviations estimated over 12 and 24 months, respectively. The changes in the CPI and UND1X are included for comparison.

It will be seen that both the choice of the period for the estimation of standard deviations and the number of subdivisions are crucially important for the characteristics of the calculated indicators: the shorter the estimation period and the more aggregated the subdivision of the CPI, the greater the volatility of the time series. The more detailed subdivision of the CPI (70 groups) and the standard deviations estimated over 24 months give a time series that is smoother and comparatively close to UND1X. However, this alternative index has most often been somewhat below UND1X. It appears that the index smoothes what retrospectively turned out to be transient shifts in the level of CPI inflation.

A statistically defined indicator of underlying inflation has the advantage of being simpler to compute than measurements based on larger models. Another advantage is that all price movements for items with a high price variability are weighted down, not just the items that are excluded in advance. On the other hand, the statistically defined indicators lack ties to economic theories of inflation, which may make it difficult to understand what actually underlies a change. Other problems may arise in connection with sudden shifts in the rate of price changes for items with a close historical co-variation with total inflation. Price movements occasioned by adjustments to the rate of VAT, for example, which mostly result in transient shifts in the rate of inflation, can have undesirable effects on underlying inflation measured in this way.