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**Underlying inflation,
commodity prices and
recent monetary policy**

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The opinions expressed in this paper are those of the authors and do not necessarily reflect the views of the Bank of Finland.



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1 Underlying inflation and monetary policy –the basics¹

The aim of monetary policy is to promote price stability over the medium term, which is the relevant time horizon from a monetary policy perspective. The main reason for the choice of the medium term is that monetary policy tools cannot generally influence average prices in the economy in the short term.

In order that monetary policy decision-makers can have at their disposal the best information on the processes that determine medium-term price trends, assessments also draw (in addition to overall inflation) on the figures for underlying inflation, from which certain prices (eg food and energy prices) have been removed. Calculated thus, underlying inflation should reflect less the more unstable elements of the price basket, which can be assumed to have only a short-term effect on overall price trends.²

Hence, the reason underlying inflation is monitored and used in setting monetary policy is not that central bank governors themselves do not eat or drive a car. The practice is based on the fact that food and energy prices fluctuate vigorously and possibly do not reveal much about future price trends more generally.

There are, however, two important – if interlinked – preconditions for the use of underlying inflation:

- a) Underlying inflation should be considerably more accurate in predicting future average price developments than other inflation indicators.
- b) Food or energy price instability should be symmetrical over the relevant time horizon for monetary policy.

The first reservation has attracted heated debate in the early years of the new millennium, particularly in the United States, where the Federal Reserve, in the face of an emerging rise in the price of oil, increased the weight of underlying inflation in its decision-making, stressing its greater accuracy for predicting inflation (see eg Blinder 2005). On the other hand, recent studies have rather eroded the importance of the difference between underlying and overall inflation. The superiority of underlying inflation as a predictor of future inflation has been

¹ With thanks to Tuuli Koivu, Hanna Freystätter and Jarmo Kontulainen for their comments.

² Here, the definition of underlying inflation is deliberately restricted so as to eliminate only certain commodity components from overall inflation; also, the article does not consider other possible methods of calculating the indicators of underlying inflation (eg trimmed mean). A slightly different sort of debate has analysed what is in general the key price basket for monetary policy purposes (eg the addition of asset prices).

shown to be either negligible over the long term (Thornton 2011; Bryan & Meyer 2011) or else only statistically significant across individual time horizons (Crone et al. 2011). In the case of Europe, the capacity of underlying inflation as a better predictor of price trends has been reported to be non-existent (Lenza 2011). This has given weight to criticisms of the excessive use of underlying inflation, according to which the advantages of using it are questionable or at the least insufficient relative to the disadvantages (eg Bullard 2011).

Among the possible disadvantages of using underlying inflation, we could include weakening the credibility of the central bank if the public were to suspect that the central bank was using statistical means to hide monetary policy failure. In this regard, Bullard (2011) has reminded us that trend-like changes in relative prices are not solely a feature of oil or foodstuffs.

Partly for the same reason, there has been much consideration of what impact overall inflation and, hence, commodity price fluctuations have on future inflation expectations. The results have varied from country to country according to the credibility of monetary policy and the relative shares in the price basket of raw material commodities (IMF 2011b). For example, in the United States, the price of oil, in particular, has been shown to have some impact both before the crisis (Harris et al. 2009) and during recent upward movements in the price of oil (Celasun et al. 2011). However, these results are difficult to interpret. Viewed historically, fluctuations in inflation expectation indicators have, admittedly, been small. On the other hand, in the light of generally stable expectations, even small changes may be considered noteworthy.

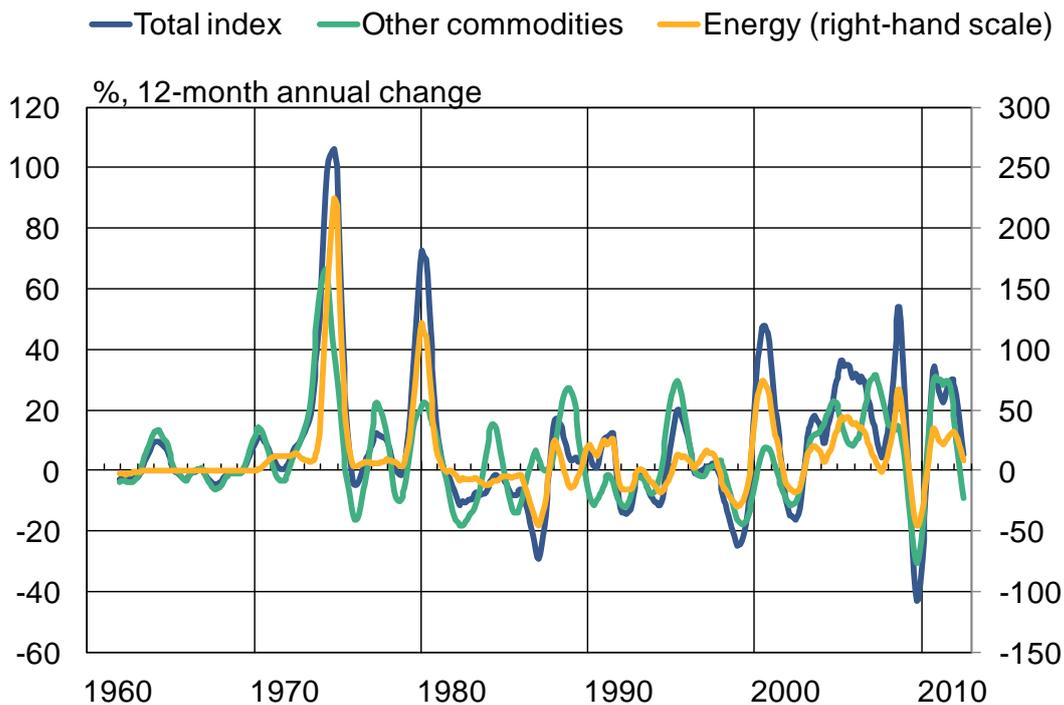
Concern over the interdependency between inflation expectations and changes in raw material prices had also been growing as price instability had become almost a permanent phenomenon. With the difference between overall inflation and underlying inflation being substantial in both the United States and the euro area throughout the first post-millennium decade, it became difficult to dismiss the change in the relative prices of commodities not included in underlying inflation as merely temporary fluctuations.

2 Commodity prices and inflation trends

Fluctuations in commodity prices are both large and, even in the short term, vigorous. Hence the energy and food components of the consumer price index also vary rather a lot, although in eg the United States the price components of foodstuffs in the price basket have been

noted to actually fluctuate less than average (Crone et al. 2011). This supports the use of underlying inflation as a monetary policy indicator, as this would enable the avoidance in decision-making processes of too much influence from short-term price changes (Chart 1).

Chart 1. Annual changes in commodity prices



Source: HWWI.

Examination of short-term price swings does not, however, provide a clear-cut answer to the question of whether the difference between overall inflation and underlying inflation caused by fluctuations in energy and food prices is symmetrical. The answer is 'yes and no'. According to US price statistics, relative prices in respect of these two indices have over the long term remained surprisingly similar, and hence the cumulative difference between the different inflation indicators appears small. For example, compared with the beginning of 1959, there was essentially no cumulative difference between inflation and underlying inflation 25–30 years later. Thus, relative prices in respect of these indices had scarcely moved at all (Chart 2). The stability of relative prices was admittedly partly due to divergent developments in energy and food prices, with a rise in the price of energy balancing a relative decline in food prices in the 1990s (Chart 3).

Chart 2. Development of US inflation and underlying inflation indices

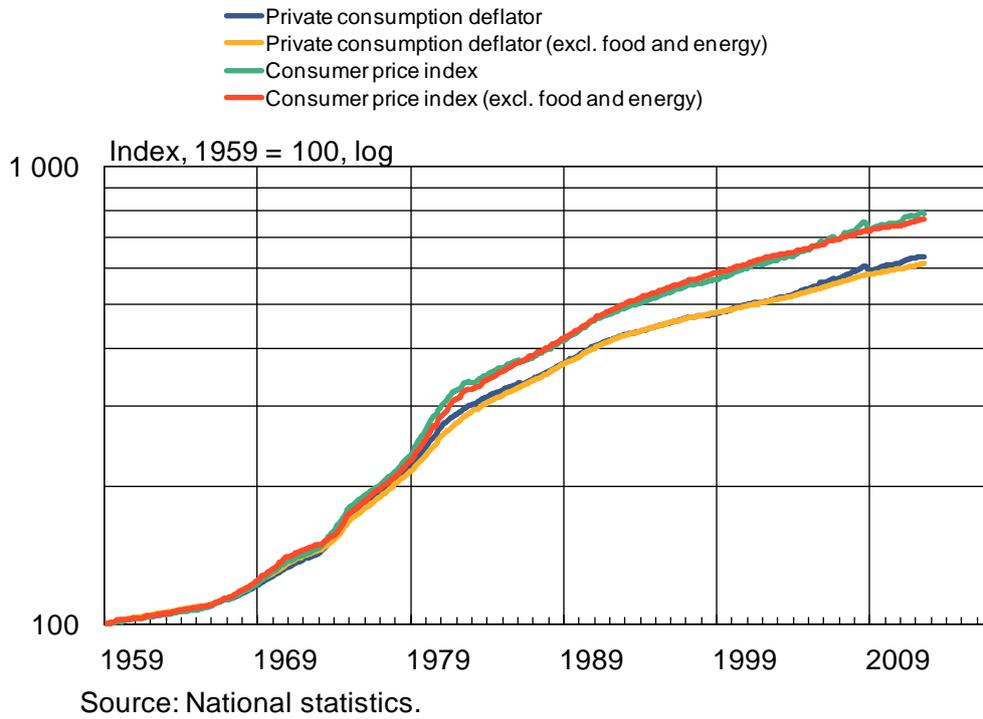
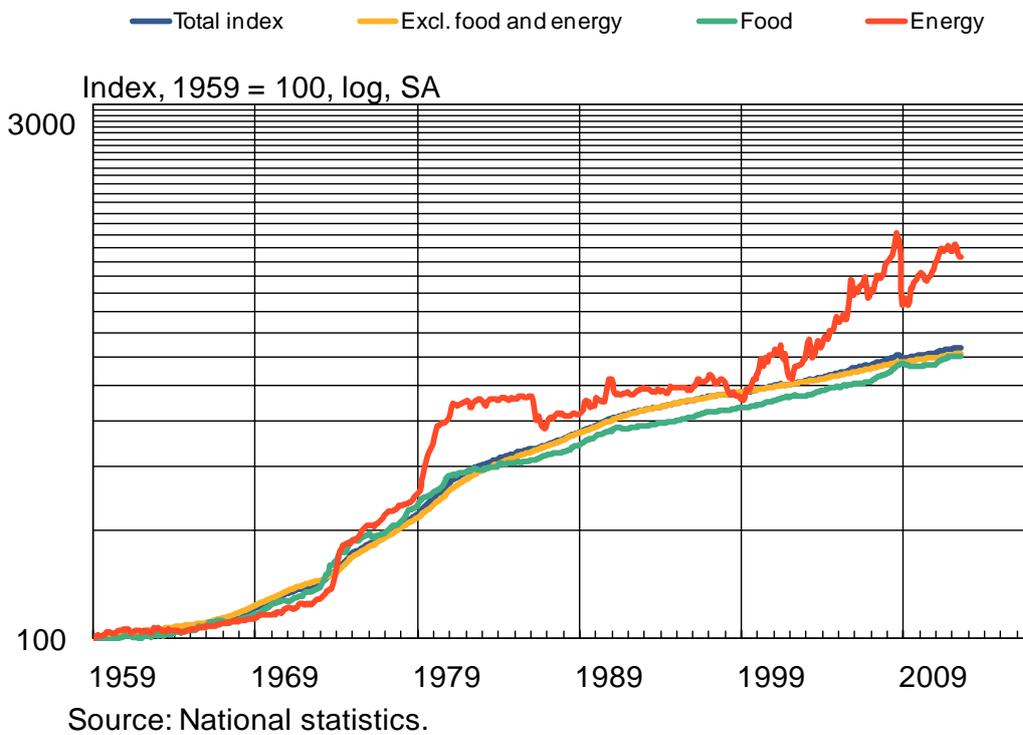


Chart 3. Components of US private consumption expenditure

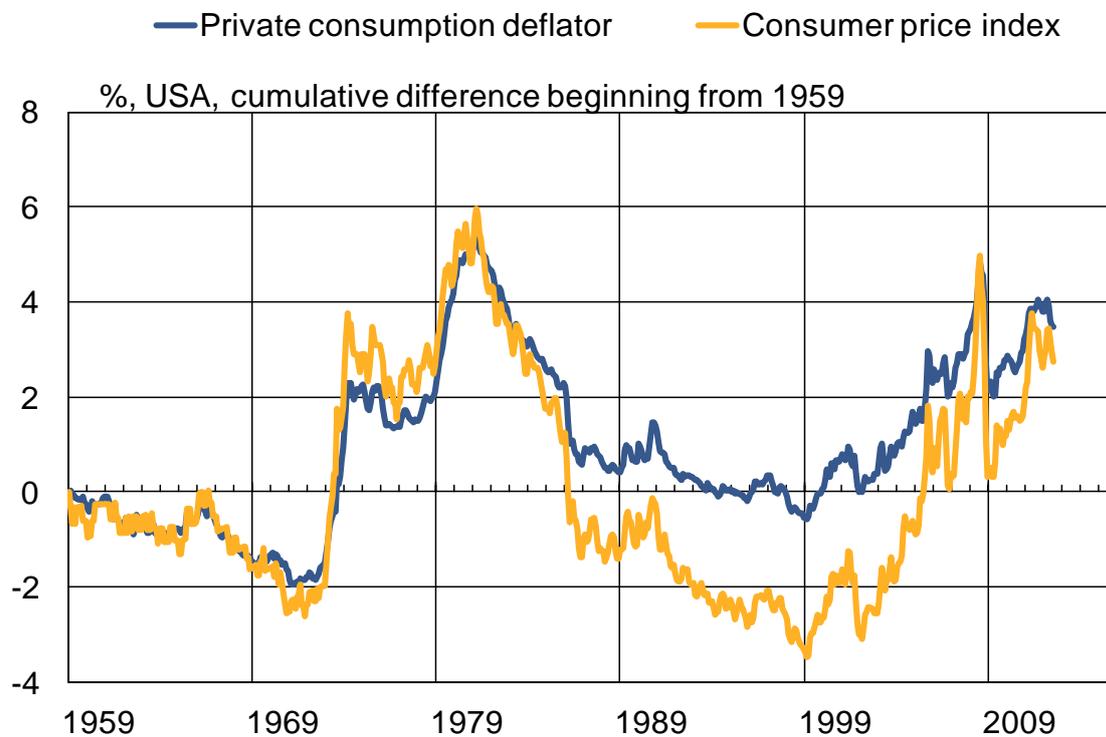


On the other hand, selection of a slightly shorter and hence more relevant period from the perspective of monetary policy already produces substantial and relatively long-lasting differences in relative prices. In other words, relative changes in commodity prices are not merely short-term fluctuations; they have continued in the same direction for considerable periods of time.

Although a 0.5 percentage point annual difference between overall inflation and underlying inflation, as such, appears small, the cumulative outcome is already substantial if the difference continues without a break for eg 15 years. For example, the acceleration in overall inflation in the United States due to the oil crises of the 1970s and 1980s led to a cumulative difference of a couple of percentage points relative to underlying inflation. Over the next decade, the decline in commodity prices was slow but sustained, and underlying inflation actually exceeded overall inflation on average all the way through to the end of the 1990s.

Following the change of direction, overall inflation has during the past ten years been more or less constantly higher than underlying inflation. Although there have been fluctuations, which have at times been large, the current cumulative difference between the two is once again substantial. This lends itself to the conclusion that the asymmetry of the difference has been so great during this period that excessive weighting in monetary policy of an assessment based solely on underlying inflation has not, in view of the retrospective data, been justified with a view to the monetary policy objective of price stability (Chart 4). Although the attached chart draws on US data, due to the duration of the statistical data available, European developments over recent decades do not differ substantially from the picture presented here.

Chart 4. Cumulative difference between overall and underlying inflation



Source: National statistics.

3 Monetary policy and the asymmetricality of the change in relative prices

It should not be possible to permanently affect the development of relative prices through monetary policy. The difference between overall and underlying inflation that has developed during the past decade does, however, give rise to two partly opposing questions in regard to the current debate on monetary policy.³

³ We do not here discuss a third problem relating to our topic, namely how the advanced economies should in general handle the setting of inflation targets in light of the convergence process between advanced and emerging economies and hence the change in relative income and prices.

3.1 How much does monetary policy influence inflation via commodity prices?

We should first ask whether the relative neglect of global developments in commodity prices has led policymakers in the advanced economies to underestimate the inflationary impact of monetary policy.

In regard to earlier periods, this question was addressed during post-crisis analysis of the causes of the oil price rise in the 1970s. While the oil price peak has generally been linked with supply-side shocks related to oil output (Hamilton 2009), later discussions have also emphasised the impact of a relaxed monetary policy on overall global demand and hence on the development of commodity prices (Barsky & Kilian 2001). A relaxed monetary policy therefore also had a broader impact on consumer prices. Although the complexity of the situation means it is not possible to achieve total unanimity over the details, research results would seem to suggest the monetary policy of key central banks did have an impact on the development and scope of the inflation peak in the 1970s (Blanchard 2001).

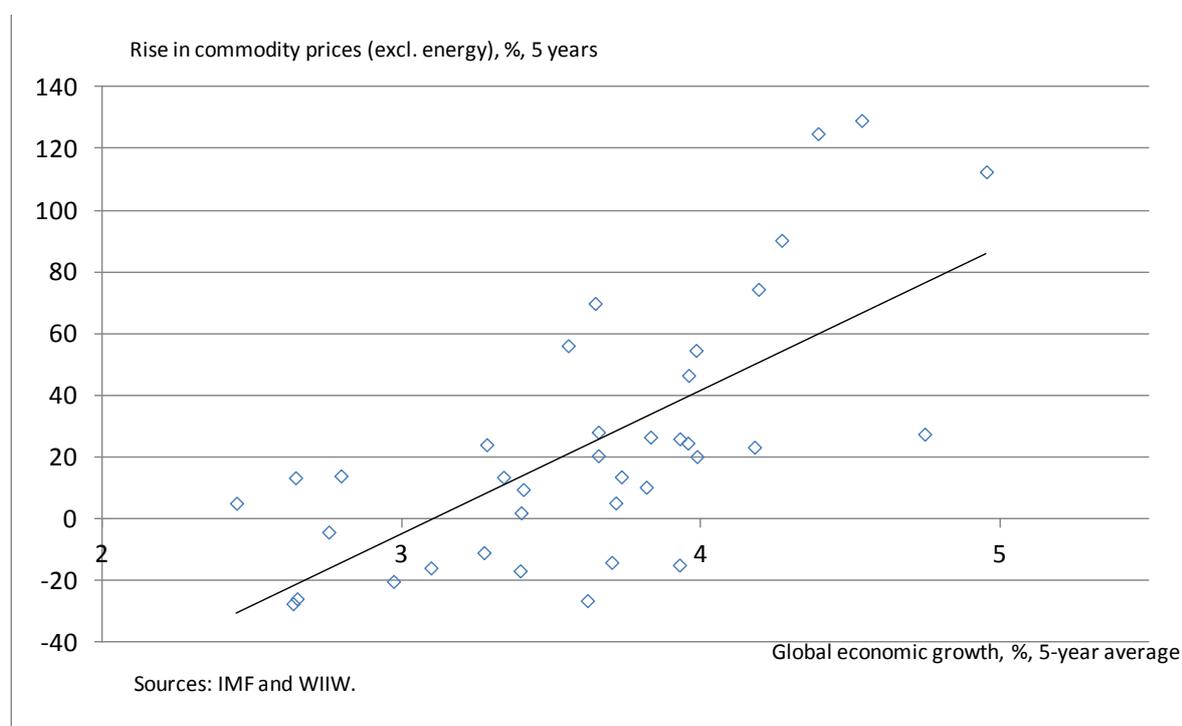
In light of this, it certainly seems surprising that during the most recent period beginning in the late 1990s, when commodity price pressures have been visible as a longer-term difference between overall and underlying inflation, this question was definitely downplayed until the broader unravelling of inflationary pressures in 2007 (eg Frankel 2006). The main focus of attention was, rather, on analysis of supply-side factors, technical functioning of the commodities markets or the design of an optimal monetary policy response in the event of an exogenous and probably short-lived supply-side shock (eg Svensson 2005).

As the financial crisis came to a head following the collapse in prices – which initially looked like it would remove the problem altogether – the question of the impact of key central banks' monetary policy on developments in global inflation emerged once again, particularly once the US Federal Reserve began quantitative easing. The question was also dealt with briefly in the IMF's *Spillover Report* (IMF 2011a). Although the impact of monetary policy on asset prices, including commodity prices, has not, as such, been questioned (eg Bayoumi & Trung Bui 2011), the possibility of a broader inflationary problem has clearly been downplayed (eg Yellen 2009). Admittedly, in the context of a crisis, this could reflect concerns over the threat of deflation once the bubble had burst, and a little extra inflation could have been seen in the context as a stabilising factor.

From the perspective of longer-term price developments, however, we can see a clear connection between global economic growth and commodity prices (Chart 5). During the last 40 years, there has been no period in which average commodity prices over a 5-year period

have declined at the same time as average global economic growth has been in excess of 4%. The last period in which global economic growth calculated as a 5-year average exceeded 4% came to an end in 2008. In addition to supply-side effects, global price developments at that time could also be interpreted as an expression of inflationary pressures caused by growth in excess of global potential growth, which must at least be partly due to the influence of monetary policy. We can also assume that central banks in the largest and most important of the advanced economies cannot in this situation be considered as merely innocent victims of the consequences of each others' policies, as Harris et al. (2009) suggest.

Chart 5. Correlation between global economic growth and rising commodity prices (1970–2011)



In the advanced economies, this process was evidently also manifested in a supply-side shock that served to reduce output potential. This would give more evidence for retrospective assessments under the Taylor rule regarding the overly relaxed stance of monetary policy (eg Hofmann & Bogdanova 2102). The cause of this sort of behaviour on the part of the transmission mechanism may have been that price pressures have initially unravelled in those markets with the largest relative impact from global demand and the most flexible

developments in prices, ie the commodity markets. Basically, however, this does not differ much from the normal impact of monetary policy on the recovery in aggregate demand and the course of inflation.

If we examine this argumentation in the context of eg the IMF forecast published in summer 2011 (IMF 2011c), in which global economic growth approaches its medium-term average at the same time as the price trend is believed to remain very moderate, we can deduce a rule of thumb according to which there is a constantly present threat of overestimating the negative output gap at the global level. In this case, a substantial monetary policy stimulus to the global economy would probably serve to increase inflationary pressures. Supporting the current forecast trajectory would, however, probably fit well with the inflation objectives of monetary policy. In any case, there is no reason for monetary policy planning at key central banks to treat commodity price developments as merely an exogenous variable.⁴

3.2 What would monetary policy look like if there were after all an about turn in relative prices?

Another question to arise from an examination of the divergent developments in overall and underlying inflation in recent decades is what the inflation trend in the euro area would be if the change in relative prices were after all to change direction and eg halve the cumulative difference between overall and underlying inflation by the end of 2015, for example.⁵

Technically, there are three alternatives.

One alternative is a marked acceleration in underlying inflation. If food and energy prices were to continue at more or less the same level as now, which as such could include even a small dip in the market prices of commodities, underlying inflation should approach the 2.9% annual growth limit around the middle of 2013 and remain there until at least 2015. In addition, there would need to be an equally long zero growth curve for food and energy consumer prices. Only then would overall inflation not exceed 2%.

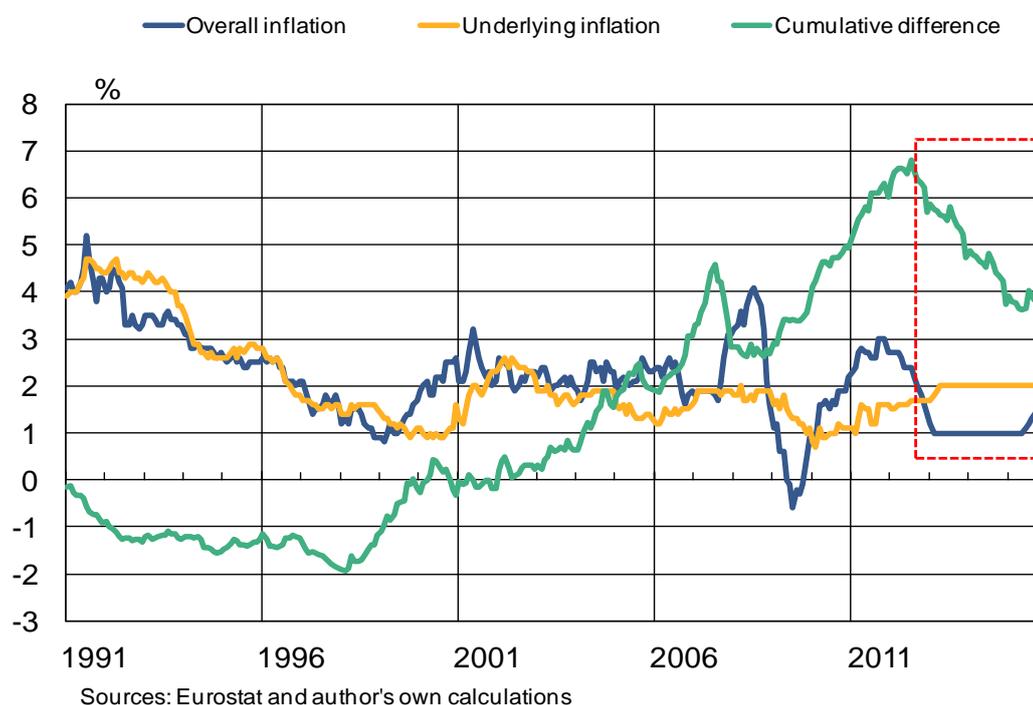
An alternative scenario (Chart 6) would require a permanent acceleration in underlying inflation in the immediate years ahead, but at a lower rate – eg 2% annually. The

⁴ It is worth emphasising that, in the case of non-standard monetary policy measures, assessment of the monetary policy stance is more complex than normally. For example, the United States' Operation Twist was not interpreted by the markets as solely an ongoing relaxation of monetary policy, but more as the maintenance of the prevailing monetary policy stance in a situation where the dynamic impact of quantitative easing was fading.

⁵ These types of scenarios are always sensitive to the time frame selected. Here, the problem has been resolved in the easiest way by selecting the longest time frame immediately accessible in the ECB's statistical database.

continuation of food and energy prices at their current level would then not be enough to halve the difference accumulated in the past decade. To ensure this outcome, consumer prices of these components would need to decline an additional 1.3% per annum for a couple of years still. Inflation during that period would then be consistently around 1%, well below eg the 2% price stability target.

Chart 6. Euro area inflation and underlying inflation in scenarios where the cumulative difference is halved in 3 years and underlying inflation accelerates to 2%



If underlying inflation were to remain at the present level, which in light of the drop in food and energy prices and current forecasts is perhaps a more credible idea, the 'required' annual change in the consumer price index would come down to perhaps as low as $\frac{1}{2}\%$. This would naturally feed fears of a broader deflationary cycle, although on its own this level of inflation would simply be the result of a symmetrical evening out of the rise in relative prices to the historical average.

Thus, we could assume that the change in relative prices in recent decades has increased the probability of a period of low overall inflation in the immediate future. At the same time, a period of slow inflation could be essential to the longer-term credibility of monetary policy in order to dispel expectations of asymmetrical monetary policy in the future, too.

4 Conclusions

Longer-term changes in relative prices are not the same thing as short-term fluctuations, which in turn form the basis for the concept of underlying inflation. When it's a case of longer-term changes, too much emphasis on underlying inflation in the preparation of monetary policy can lead to underestimating the risks to price stability. Key central banks are therefore well advised to taking account in their monetary policy stance of the impact of a relaxed monetary policy on global activity, the output gap and hence also on developments in domestic prices.

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