# What inflation developments reveal about the Phillips curve: implications for monetary policy

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## Introduction

In October 2013, inflation in the euro area dropped to 0.7 %, well below the quantitative definition of price stability applied by the Governing Council of the European Central Bank (ECB). That was one reason why, at its meeting in November 2013, the Governing Council cut the interest rate for main refinancing operations from 0.5 to 0.25 %. However, despite this recent fall, the level of inflation in the euro area has remained surprisingly stable since the onset of the financial and economic crisis in 2008. Although inflation has declined somewhat, it has not dropped to exceptionally low levels, apart from the negative inflation rates recorded for overall inflation following the collapse of commodity prices in the autumn of 2008. Since 2009, underlying inflation has averaged 1.3 %, compared to around 1.7 % on average in the first ten years of stage three of Economic and Monetary Union (EMU). Moreover, according to its September 2013 macroeconomic projections, the ECB expects inflation to remain above 1 % again next year, at an average of 1.3 %. This relative stability of inflation is striking in view of the extent – in terms of both depth and duration – of the recent economic and financial crisis. According to traditional economic theories and historical observations, a sharp contraction in economic activity actually reduces inflation significantly. Recent developments therefore indicate that this traditional, cyclical pattern of inflation has become less marked nowadays.

The reduced sensitivity of inflation to cyclical fluctuations seems to suggest that the determinants of inflation have changed over time, perhaps as a result of structural changes in the economy or of changes in the conduct of monetary policy, for example. Identifying the changes affecting the inflation process is vital for monetary policy-makers, especially for the Eurosystem whose primary objective is to maintain price stability. Against that backdrop, this article tries to ascertain the factors behind the reduced cyclicality of inflation dynamics. To this end, we estimate an open economy Phillips curve with time-varying parameters for the euro area for the period 1980-2013.

The rest of this article is structured as follows. Section 1 gives a brief account of the lower but – perhaps surprisingly – stable level of inflation in the euro area since the crisis, and illustrates the reduction in its cyclicality. Section 2 analyses the changes in inflation dynamics by means of a Phillips curve with time-varying parameters. More specifically, it describes how the relative importance of the various determinants of inflation – inflation expectations, past inflation rates, economic activity and external price shocks – has evolved over time. We also propose some possible explanations for the observed changes in the inflation process, enabling an examination in Section 3 of the implications of these changes for the conduct of monetary policy.

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## 1. Inflation in the euro area during the economic and financial crisis

Headline inflation measured by the harmonised index of consumer prices (HICP) has exhibited an erratic pattern since the onset of the great recession, especially in comparison with the picture for the preceding ten years. While inflation peaked at 4 % in mid-2008, just before the crisis, it became negative just over a year later at –0.5 %. It gathered pace again in 2010 and 2011 before starting to fall from the end of 2011. On average, headline inflation has stood at around 1.7 % since 2009, compared to 2.2 % over the period 1999-2008. On the basis of the total HICP, the inflation rate has therefore remained relatively high.

Importantly, the volatility of energy and food prices is largely responsible for the strong fluctuations observed in headline inflation. Underlying inflation, which corresponds to HICP inflation excluding food and energy, offers a less volatile picture of domestic inflationary pressure. Specifically, unlike headline inflation, underlying inflation has been more stable during these last four years, although it has still displayed a cyclical pattern. Underlying inflation at an average of 1.3 % since 2009 is lower than the figure of around 1.7 % recorded in the preceding ten years; yet oscillating between 0.7 and 2 %, it has not been exceptionally low either, and so far negative inflation or even deflation has been avoided[(1)]. In view of the scale and persistence of the contraction in economic activity, it could even be said that underlying inflation has remained surprisingly high. That situation contrasts with what happened in Japan, for example, where the eruption of an economic and financial crisis triggered deflationary pressures which have now persisted for more than two decades.

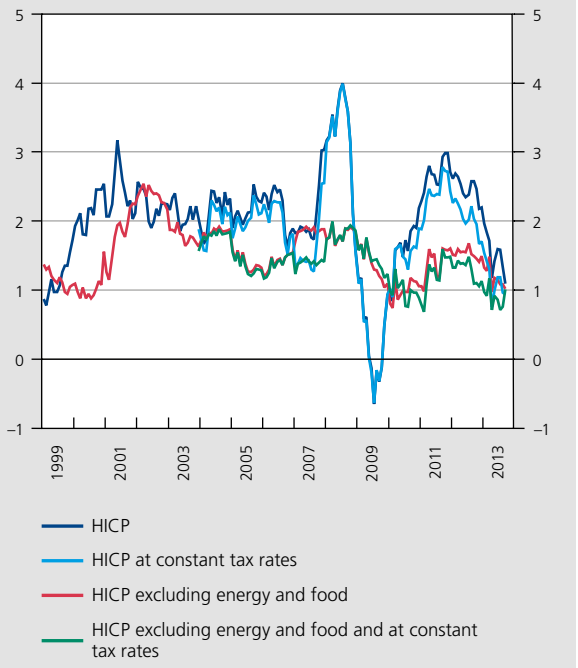
In recent years, the sovereign debt crisis in Europe has forced the various governments in the euro area to devote major efforts to fiscal consolidation. Notably, the indirect tax increases resulting from those consolidation efforts mechanically drive up inflation. If we analyse the pattern of inflation adjusted for the mechanic impact of the changes in indirect taxes, we in fact find that since 2009 the average inflation rate has been slightly lower by around 0.24 and 0.11 percentage points respectively for headline inflation and underlying inflation. That said, inflation at constant tax rates has also remained relatively high, given the substantial excess capacity in the economy[(1)].

As stated above, the pattern of inflation in the euro area during the current economic and financial crisis suggests that inflation dynamics are nowadays less affected by cyclical fluctuations than they used to be. Chart 2, which shows the relationship between inflation and cyclical unemployment over the past four decades, supports that conjecture. Whereas in the 1970s and 1980s a rise in unemployment was accompanied by a steep decline in inflation, that link has been much less apparent in more recent decades. In the 2000s, in particular, the negative correlation between the two variables seems to be virtually absent. It can therefore be said that, over the years, the traditional cyclical pattern of inflation has weakened.

To explain this change in the cyclicality of inflation requires a structural analysis of how the various determinants of inflation have changed over time. For that purpose, in the next section, we formulate and estimate a Phillips curve with time-varying parameters.

**CHART 1** INFLATION IN THE EURO AREA SINCE 1999

(percentage changes compared to the corresponding month of the previous year)

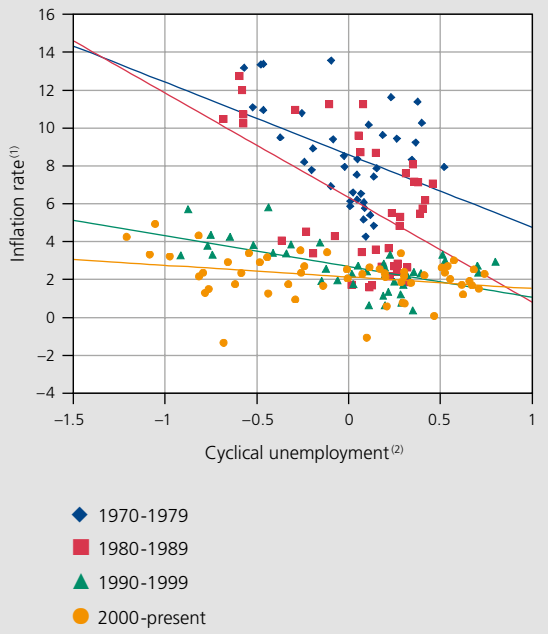



Source : Eurostat.

(1) The challenges posed by deflation are described in more detail in Ide *et al.* (2009).

CHART 2 INFLATION AND CYCLICAL UNEMPLOYMENT IN THE EURO AREA

(in %, quarterly data)




Sources: Fagan *et al.* (2001), Datastream and own calculations.

(1) The inflation rate is the annualised quarterly change in the seasonally adjusted harmonised index of consumer prices (HICP).

(2) Cyclical unemployment corresponds to the difference between unemployment and its trend rate calculated by means of a Hodrick-Prescott filter.

## 2. A Phillips curve with time-varying parameters

### 2.1 Model

The pattern of inflation is traditionally modelled by means of a Phillips curve, named after and based on the work of the New Zealand economist William Phillips who, in 1958, was the first to postulate a relationship between nominal wages and unemployment (Philips, 1958). Taking account of the assumption that prices are set on the basis of wages, that relationship was later reinterpreted by Samuelson and Solow (1960) as an explicit link between inflation and unemployment. In its simple, modern variants, the Phillips curve not only includes a measure of economic activity or, more specifically, the degree to which activity deviates from its potential level, but it also accords a role to inflation expectations (see, for example, Clarida *et al.*, 1999). These inflation expectations are largely dependent on the credibility that the economic agents attach to the – implicit or explicit – inflation target set by the monetary authorities.

Empirical research has shown that, apart from the output gap and inflation expectations, there are two other factors that also have a major influence on inflation. First, the historical inflation path is persistent, which means that, after a shock, inflation is slow to converge towards its long-term value. That persistence implies that the current inflation rate is also influenced by its earlier values. Next, in the context of globalisation, the traditional Phillips curve may also comprise an international dimension. As stated by Borio and Filardo (2007), the increasing integration of the global economy may make inflation dynamics relatively more sensitive to global factors (such as the global output gap or the movement in import prices) than to domestic factors (on this point, see also the contributions by Benigno and Faia (2010), and by Guerrieri *et al.* (2010), which demonstrate that an increase in the openness of the economy heightens the impact of import prices on inflation).

Taking account of the above discussion, and in accordance with recent studies by Matheson and Stavrev (2013) and by the IMF (2013b), we postulate the following specification of the Phillips curve for an open economy:

$$\pi_t = (1-\theta_t)\pi_{t-1} + \theta_t\pi_t^e - \kappa_t U_t^{GAP} + \gamma_t\pi_t^m + \varepsilon_t \qquad (1)$$

where $\pi_t$ represents current inflation, $\pi_{t-1}$ inflation in the previous period, $\pi_t^e$ long-term inflation expectations, $U_t^{GAP}$ the level of cyclical unemployment (as a measure of capacity utilisation in the economy) and $\pi_t^m$ the inflation rate of the relative price of imported goods and services (as deviation from its average). This last factor does not only represent the international dimension of the Phillips curve, but is also of empirical significance. The Phillips curve in fact appears to be best suited for modelling underlying inflation. However, historical underlying inflation data are not available over a long period for the euro area. Therefore, since most commodities are imported, the import price term $\pi_t^m$ adjusts for this mismatch between the model variable and the data variable. Finally, the error term $\varepsilon_t$ picks up inflation fluctuations which cannot be explained by the specification in (1). This term includes in particular domestic cost-push shocks. We assume that these shocks have a constant variance and hover around an average value of zero.

This article will now go on to assess the importance of each of the four inflation determinants $\pi_{t-1}$, $\pi_t^e$, $U_t^{GAP}$ and $\pi_t^m$. An essential point here is that the parameters associated with these variables can change over time, which makes it possible to investigate whether inflation dynamics today differ from those in the past. An increase in the

(1) In its October 2013 World Economic Outlook, the IMF (2013a) reports an output gap of –2.7 % in 2013. Moreover, that gap is not expected to be closed until 2018.

parameter $\theta_t$ would mean that inflation expectations play a greater role in determining current inflation, and that inflation persistence is lower. Time variation in $\gamma_t$ enables an investigation into whether inflation has become more sensitive lately to international developments, e.g. owing to globalisation. Finally, on the basis of the time variation in $\kappa_t$ (the 'slope' of the Phillips curve), we can examine how the sensitivity of inflation to the domestic cyclical position has changed over recent decades.

## 2.2 Empirical analysis and results

To estimate the parameters of the Phillips curve in equation (1), it is first rewritten in terms of a state-space model in which the parameters are regarded as non-observed variables following a simple time series process. Subsequently, the time variation in these unknown variables is estimated using Kalman filtering and Bayesian techniques. A more detailed description of the econometric analysis is presented in the box below.

The estimation is based on quarterly data for the euro area. The sample covers the period from the first quarter of 1971 to the second quarter of 2013, with the first ten years acting as a training sample in the estimation procedure. Figures relating to HICP inflation, unemployment and relative import prices were obtained from the Area Wide Model Database (Q1 1971-Q4 2011), and were supplemented by figures from Eurostat (Q1 2012-Q2 2013). All these series are seasonally adjusted. Inflation rates are annualised percentage quarterly changes, adjusted for the impact of changes in indirect taxes, but only from the first quarter of 2003 (owing to the limited availability of data). Cyclical unemployment is calculated as the difference between the unemployment rate and its trend, the latter being measured by means of a Hodrick-Prescott (HP) filter. It should be noted that for the more recent periods this estimate is subject to measurement errors, the reason being that, at the end of the sample, the HP filter accords greater weight to the trend than to the cyclical component of a time series. As a result, the cyclical component of the rise in unemployment during the recent financial and economic crisis may have been underestimated. Import price inflation is the annualised percentage quarterly change in the import price deflator compared to the GDP deflator. Data on long-term inflation expectations for the euro area are available from 1990Q1 via Consensus Economics (inflation expected for the five-year period five years ahead)[1]. For the 1970s and 1980s, these long-term expectations are estimated on the basis of the observed inflation trend, calculated using an HP filter.

Chart 3 depicts the estimated pattern of the various parameters of the Phillips curve, summarized by the median and the 68 % probability interval of the posterior distribution[2]. In line with the IMF (2013b), a number of findings can be stated. First, in the past three decades, inflation has increasingly been driven by its long-term expectations. The left-hand panel of chart 3 shows that, since the beginning of the 1980s, $\theta_t$ has risen slowly but surely, from around 0.72 to 0.81 in 2013. Conversely, this phenomenon implies that inflation persistence has declined, so that deviations in inflation from the long-term trend do not last so long now as they did in the 1980s and 1990s. These findings can be linked to a monetary policy that, after the stagflation of the 1970s, was increasingly geared to the maintenance of price stability. Indeed, the primary objective of the Eurosystem is to maintain price stability, which is defined as a year-on-year increase in the HICP for the euro area of less than but close to 2 % in the medium term. Furthermore, the average inflation rate of around 2 % recorded since 1999 promotes the credibility of the monetary policy geared to price stability, with two significant implications for inflation dynamics. First, this credibility helps to ensure that inflation expectations are firmly anchored. Chart 4 clearly reveals that, since the creation of EMU in 1990, inflation expectations have fallen, and since stage three of EMU have remained very close to the Eurosystem's definition of price stability. Second, given a credible policy aimed at price stability, economic agents will attach greater importance to long-term inflation expectations when determining current inflation, as is evident from the increase in $\theta_t$. These two effects together ultimately mean that actual inflation is more firmly anchored to the inflation target, further promoting the credibility of the central bank.

In addition, inflation in the euro area is becoming more sensitive to import prices; the central panel of chart 3 shows that $\gamma_t$ increases significantly over the period considered, namely 1980 to 2013. That trend is attributable partly to the greater openness of the euro area economy. For instance, imports from outside the euro area as a percentage of GDP have risen from an average of 27 % in the 1980s to an average of 37 % since 1999. Consequently, the increase in $\gamma_t$ confirms the hypothesis that globalisation has led to an inflation process which is more sensitive to global factors, such as import price fluctuations. Note that this finding implies that movements in the prices

(1) Up to 2003, expectations for the euro area are estimated as a GDP-weighted sum of the expectations for the euro area countries for which the data are available.

(2) These results are robust to various alternative data measures. For instance, the results do not vary significantly if, in regard to capacity utilisation, cyclical unemployment is replaced by the percentage gap between GDP and its trend rate (measured with the aid of an HP filter). Similarly, the results continue to hold if inflation is not adjusted for changes to indirect taxes, although in that case the slope of the Phillips curve exhibits a less marked increase in the recent period. In fact, as mentioned in section 2, unadjusted inflation shows a less pronounced fall so that the same increase in cyclical unemployment is accompanied by a smaller fall in inflation.

## Box – Econometric analysis

The state-space form of the Phillips curve with time-varying parameters (1) can be written in matrix notation as follows:

$$\beta_t = I_3\beta_{t-1} + v_t, \qquad v_t \sim N(0, Q), \tag{2}$$

$$y_t = x_t'\beta_t + \varepsilon_t, \qquad \varepsilon_t \sim N(0, \sigma_\varepsilon^2), \tag{3}$$

where,

$$y_t = (\pi_t - \pi_{t-1}) \;,\; x_t = \begin{pmatrix} \pi_t^e - \pi_{t-1} \\ U_t^{GAP} \\ \pi_t^m \end{pmatrix} \;,\; \beta_t = \begin{pmatrix} \theta_t \\ \kappa_t \\ \gamma_t \end{pmatrix} \;,\; v_t = \begin{pmatrix} v_t^1 \\ v_t^2 \\ v_t^3 \end{pmatrix}.$$

The above state-space representation of the Phillips curve models the indirectly observed time variation in the parameter vector $\beta$ by means of a mathematical description of (i) the dynamic movement in the parameters (the state equation (2)), and (ii) the way in which this indirectly observed time variation is revealed in directly observed variables (the measurement equation (3)). The parameters are assumed to follow a random walk. That is why the autoregressive term in the state equation (2) is represented by the identity matrix $I_3$.

The evolution of the Phillips curve parameters over T quarters is expressed as follows: $\beta^T = [\beta_1', \ldots, \beta_T']$. Apart from $\beta^T$, the variance-covariance matrix $Q$ of the error terms in the random walk process (2) and the variance $\sigma_\varepsilon^2$ of the cost-push shocks in (3) are also unknown and have to be estimated. The model is estimated using Bayesian techniques. In a nutshell, the Bayesian method formulates a stochastic distribution for the unknown parameters (the posterior distribution) by combining the information contained in the data (the likelihood) with the *a priori* assumptions concerning the distribution of the unknown parameters (expressed on the basis of prior distributions). Since it is impossible to define a mathematical expression for the posterior, Gibbs sampling procedures are used to obtain a numerical assessment of this probability distribution. This approach involves using the Kalman filter technique and the Carter and Kohn (1994) Simulation Smoother.

In accordance with Primiceri (2005), we determine the prior assumptions on the basis of a training sample (in this case the first 36 observations, from 1971 Q1 to 1979 Q4). Thus, the average and the variance of the $\beta$-prior are chosen on the basis of the OLS estimator $\hat{\beta}_{OLS}$ and its variance $V(\hat{\beta}_{OLS})$, which result from the estimation of the time-invariant version of the Phillips curve (1) on the training sample. More specifically, the $\beta$-prior follows the normal distribution below:

$$\beta_0 \sim N\left(\hat{\beta}_{OLS}, 4.V(\hat{\beta}_{OLS})\right). \tag{4}$$

The priors of $Q$ and $\sigma_\varepsilon^2$ follow an inverse Wishart distribution,

$$Q \sim IW\left(k_Q^2 \,.\, T^{tr}.V(\hat{\beta}_{OLS}) \,,\, (D_Q + 1)\right), \tag{5}$$

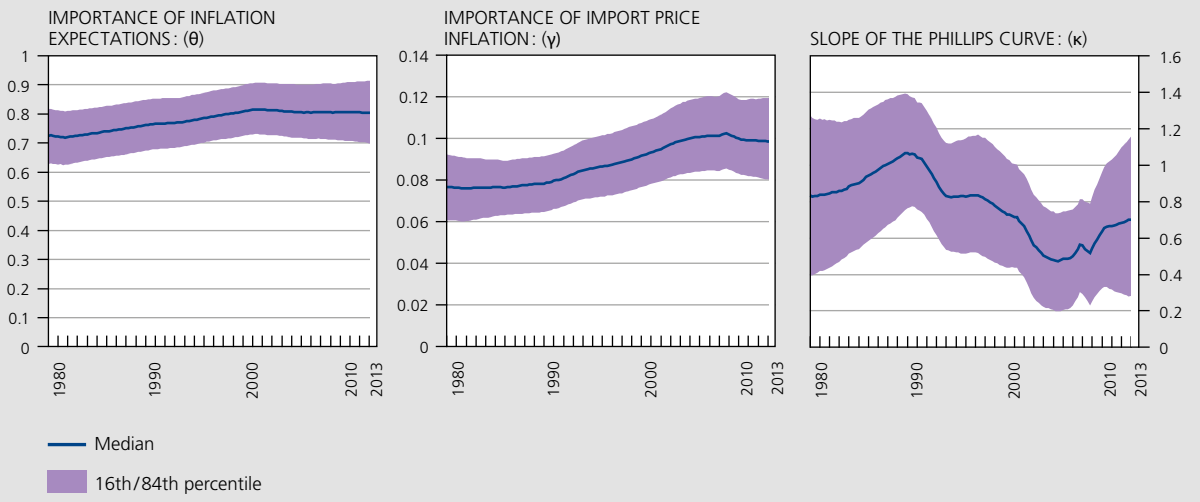
$$\sigma_\varepsilon^2 \sim IW\left(k_W^2 \,.\, (D_\sigma + 1) \,.\, I_{D_q} \,,\, (D_\sigma + 1)\right), \tag{6}$$

where,

$k_Q = k_W = 0.01$, $D_Q \equiv$ row dimension Q $(=3)$, $D_\sigma \equiv$ row dimension $\sigma_\varepsilon^2$ $(=1)$, $T^{tr} \equiv$ number of periods in the training sample (= 36).

**CHART 3** CHANGES IN INFLATION DYNAMICS

(Median and 68 % probability interval of the posterior distribution)




Source : own calculations.

of internationally traded commodities are reflected to a greater extent in consumer prices.

Finally, as is evident from the decline in the slope $\kappa_t$ of the Phillips curve in the right-hand panel of chart 3, the direct impact of cyclical unemployment on the level of inflation diminishes as more recent periods are examined. However, it should be noted that the Phillips curve has apparently become somewhat steeper again with the latest financial and economic crisis. That turnaround may be due to the criterion used to measure cyclical unemployment. As mentioned before, variations in the time series at the end of the sample are usually attributed by the HP filter to the trend in those series. Therefore, our measure of cyclical unemployment may underestimate the actual decline in demand during the current economic and financial crisis, leading to an overestimation of the slope of the Phillips curve.

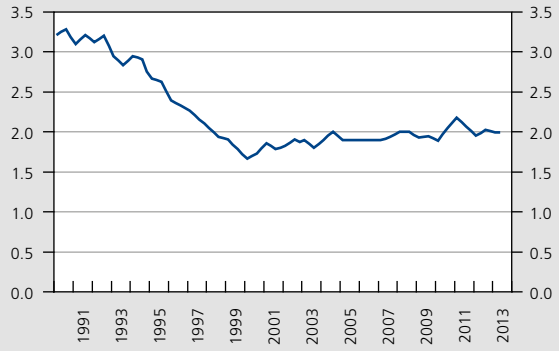
A flattening of the Phillips curve essentially reflects changes in price- and wage-setting behaviour. Recent economic literature puts forward a number of theories to explain these changes in behaviour and the decline in the slope of the Phillips curve. A first one attributes the flattening of the curve to the monetary policy conducted over the past two decades, which has aimed at price stability. On the one hand, a credible policy of price stability leads to more firmly anchored inflation expectations and ultimately more stable inflation. Bayoumi and Sgherri (2004) state that, in the presence of price adjustment costs (such as 'menu costs'), this reduced inflation volatility induces firms to be slower to adjust their prices to the economic situation. On the other hand, a fall in the average level of inflation may likewise lead to a flattening of the Phillips curve. Ball, Mankiw and Romer (1989) argue that, in a lower inflation environment, firms pay more attention to menu costs so that prices are revised less often. Other researchers (such as Coenen, 2003 ; Meier, 2010 ; Benigno and Ricci, 2011 ; and Yellen, 2012) argue that if trend inflation is low, downward nominal rigidities in prices and wages become more relevant. The latter imply for example, that workers will reject or be reluctant to accept a cut in nominal wages. When inflation is low, and a recession exerts downward pressure on wages, there will therefore be little or no reduction in wages in the case of downward nominal rigidities, so that the fall in inflation will be smaller than if the same decline in demand occurs under higher inflation.

According to an IMF study (2006), the flatter Phillips curve is a global phenomenon. From that angle, the flattening of the Phillips curve is also frequently attributed to globalisation (see, for example, IMF, 2006 and Borio and Filardo, 2007). In fact, in a globally integrated economy, foreign competition puts downward pressure on the market power of domestic firms. In response, to safeguard their market share, firms will align their prices more with the market average, which implies greater (real) price rigidity.

It should be noted that the empirical analysis examined here supports both explanations for the flatter Phillips

**CHART 4** LONG-TERM INFLATION EXPECTATIONS IN THE EURO AREA SINCE 1990 (1)

(in %, quarterly data, inflation expected for the five-year period five years ahead)




Source: Consensus Economics.

(1) Data for the euro area are available from 2003. For the period 1990-2002, expectations for the euro area are calculated as the GDP-weighted sum of the data for the euro area countries for which expectations are available.

curve, as the increase in $\theta_t$ confirms the greater credibility of monetary policy, while the increase in $\gamma_t$ indicates that globalisation influences the inflation process. In that respect, it is possible that the factors driving the changes in the parameters of the Phillips curve are closely correlated.

## 3. Implications for monetary policy

This last section aims to examine the possible monetary policy implications of the changing inflation process discussed above.

The finding that inflation is more firmly anchored to the central bank's definition of price stability – a result of inflation's greater sensitivity to inflation expectations, which, in turn, have remained in the vicinity of 2 % since 1999 – suggests that, in recent years, the traditional interest rate channel of monetary policy has become more effective. In an environment of low volatility in inflation and inflation expectations, the central bank can actually steer real interest rates more effectively through its (nominal) key interest rate. That improved effectiveness is particularly beneficial when confronted with an economic downturn – as in the great recession – and key interest rates approach their lower bound. In such situations, if declining inflation prompts expectations of a further fall in inflation, real interest rates will effectively increase. This increase cannot be offset by a further cut in the policy rate since the latter has reached its lower bound. As a result, deflation may arise, putting further upward pressure on real interest rates and, therefore, triggering a deflationary spiral.

However, this positive finding with respect to the anchoring of inflation is no reason for complacency. The more firmly anchored inflation seems to be attributable to – and hence dependent on – the policy pursued, which is clearly aimed at safeguarding price stability. In that respect, it is important that the Eurosystem continues to abide by that commitment and ensures that its policy consistently and symmetrically pursues that primary objective. Otherwise, the credibility of the central bank and the firm anchoring of inflation (and inflation expectations) to the monetary policy objective could be threatened. In addition, Svensson (2013) argues that if observed inflation exhibits a protracted, downward deviation from the definition of price stability, there could still be adverse macroeconomic implications even if inflation expectations are firmly anchored. More specifically, he claims that the resulting – *ex-post* sub-optimal – high real interest rates and wages lead to under-utilisation of production capacity, and hence to cyclical unemployment.

With its forward guidance policy, the Eurosystem does seem to underscore its commitment to safeguarding price stability – which, in the present situation, means avoiding a downward deviation from the inflation target. That policy was confirmed in November and reinforced by a cut in the interest rate on the main refinancing operations and the marginal lending facility to 0.25 and 0.75 %, respectively. This accommodative monetary policy stance is expected to underpin the economic recovery so that, in the medium term, inflation rates are once again compatible with the definition of price stability.

The importance that central banks (including the Eurosystem) attach to the maintenance of price stability is based on the belief that this approach is the best contribution that monetary policy can make to a stable macroeconomy[1]. Theoretical findings, such as the principle of divine coincidence formulated by Blanchard and Gali (2007), seem to confirm this. According to this principle, stabilising inflation also implies stabilising the output gap. In other words, the central bank does not face a short-term trade-off between the stabilisation of inflation and economic activity. As recognised by Blanchard and Gali (2007), this divine coincidence is less relevant in practice since it only applies in a very simple model. In a more realistic set-up, supply shocks, such as the cost-push shocks in the Phillips curve described above (1), imply a short-term

(1) For a discussion of the implications of the financial crisis for the mandate of central banks – and, in particular, whether they should also include financial stability in their mandate – see Smets (2013). However, those issues are beyond the scope of this article.

trade-off between the stabilisation of inflation and economic activity. For that reason, the Eurosystem's definition of price stability explicitly focuses on the medium term, avoiding the need for an immediate response to short-term fluctuations in inflation due to supply shocks. The exact speed of the central bank's response to changes in inflation therefore depends on whether it considers these fluctuations to be driven by demand or supply. Consequently, a well-thought-out policy decision requires a detailed analysis of the factors underlying the observed business cycle fluctuations. The flattening of the Phillips curve makes that analysis all the more relevant.

In the case of demand shocks, the flatter Phillips curve appears to reduce the information content of inflation variations. In such a situation, minor deviations from the inflation target may conceal substantial real disequilibria – i.e. sizeable output gaps. The flatter Phillips curve also increases the trade-off in the case of supply shocks. More specifically, restoring inflation to the target level following a supply shock requires a bigger change in the output gap. Consequently, if the Phillips curve is flatter, it is vital to respond rapidly and effectively to fluctuations in inflation caused by demand shocks, but also to respond in a prudent way to variations in inflation resulting from supply shocks. These considerations highlight the importance of a detailed analysis in support of monetary policy decisions, and of monetary policy strategies which permit sufficient focus on the medium term (see also IMF, 2013b). Note that stronger anchoring of inflation also allows the central bank to respond more gradually to supply shocks, since that anchoring reduces the volatility of inflation.

Finally, it should be pointed out that the flattening of the Phillips curve cannot be used as grounds for stimulating economic activity beyond its potential level – at the cost of an inflation level which appears to be hardly any higher. In fact, as discussed in the previous section, the flattening of the Phillips curve is not necessarily a structural phenomenon, but could be specifically due to – and dependent on – a credible monetary policy geared to price stability. Consequently, a change in the conduct of monetary policy with less attention to price stability could not only damage the anchoring of inflation but could also result in a re-steepening of the Phillips curve.

Although the above discussion presents an overview of the monetary policy implications of the observed change in inflation dynamics, it also exposes the need for a deeper structural analysis of the causes of those changed dynamics. It is particularly important to examine in greater depth whether the flattening of the Phillips curve is due to a change in the conduct of monetary policy or to structural factors such as globalisation. Testing the robustness of the results to a model-consistent measure of the output gap is also on the research agenda.

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