

## Disinflation and the Phillips curve

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### **Speech by Isabel Schnabel, Member of the Executive Board of the ECB, at a conference organised by the European Central Bank and the Federal Reserve Bank of Cleveland's Center for Inflation Research on "Inflation: Drivers and Dynamics 2023"**

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After more than a year of significant monetary tightening, the outlook for the euro area remains highly uncertain. Activity has moderated visibly, and forward-looking indicators signal weakness ahead. But important pockets of resilience remain, especially the labour market.

Headline inflation has come down, mainly on the back of previous supply-side shocks unwinding. But underlying price pressures remain stubbornly high, with domestic factors now being the main drivers of inflation in the euro area. Therefore, a sufficiently restrictive monetary policy is critical for bringing inflation back to our 2% target in a timely manner.

I would like to start my remarks this morning by discussing the drivers behind the recent deterioration in the economic outlook. I will ask how quickly the slowdown in economic growth can be expected to lead to a decline in underlying price pressures and whether the euro area can still hope for a "soft landing". This largely depends on the slope of the Phillips curve – a topic that will be discussed extensively at the conference later today.

I will close my remarks by explaining why the current environment of high uncertainty warrants an approach to monetary policy that is data-dependent and robust, in the sense that it considers not only the most likely future path of inflation but the entire distribution of risks. Assessing the monetary policy stance meeting-by-meeting and adjusting it when necessary will ensure that it remains appropriate at all times.

### **Incoming data point to stagnating activity**

For a long time, the euro area economy proved remarkably resilient in the face of Russia's war on Ukraine. Despite one of the largest terms-of-trade shocks since the Second World War, it defied expectations of recession. This was largely due to the combination of pent-up demand from the pandemic and government measures shielding firms and households from the rise in energy prices.

Over the past few months, however, economic sentiment has steadily deteriorated. In the manufacturing sector, activity and the volume of order books have fallen sharply to levels typically only seen in deep

recessions, even if sentiment may be showing first signs of bottoming out (Slide 2, left-hand side).

Weakness has gradually spread from the manufacturing to the services sector. While strong pent-up demand for services has been able to offset the drag on growth coming from industry so far, reported orders and activity in the services sector are now declining, too.

Fiscal policy is also expected to become more restrictive as governments have committed to winding down energy support measures and are expected to embark on gradual fiscal consolidation in line with guidance from the European Commission.

The slowdown in aggregate demand is gradually affecting employment expectations (Slide 2, right-hand side). Although the labour market remains exceptionally tight, the recent reported decline in services firms' intention to hire, and manufacturing firms' intention to reduce headcount, is consistent with historical evidence of the labour market weakening only later in the cycle.

In conjunction, these developments point to growth prospects being weaker than foreseen in the baseline scenario of the June Eurosystem staff projections.

At the same time, there are indications that the euro area economy may not be on the brink of a deep or prolonged recession. One encouraging sign is the visible improvement in consumer confidence over previous months, even if the recovery has lately come to a halt (Slide 3, left-hand side).

Confidence has improved on the back of high nominal wage growth, often including generous one-off payments, and declining energy prices, which are providing an increasing compensation for the loss of real disposable income due to the terms of trade shock. This should support private consumption in the future (Slide 3, right-hand side).

## Repercussions of energy shock may slow disinflation

Today's economic conditions pose two important and related questions to policymakers.

The first is whether the current slowdown will prove sufficiently strong and persistent to reduce underlying price pressures in a way that ensures a timely return of inflation to our target. The answer to this question depends on the drivers of the recent deterioration in the business climate.

The marked rise in interest rates has certainly contributed to recent developments. Bank lending flows to both firms and households have dropped sharply in recent months as banks have increased their lending rates and tightened their credit standards (Slide 4).

Our bank lending survey confirms that the level of interest rates is a key reason behind the contraction in loan demand (Slide 5). Credit standards, particularly for loans to firms, are expected to tighten further in the coming months, albeit at a slower pace.

The lagged effect of past policy rate increases implies that monetary policy will continue to dampen aggregate spending. Whether it will be *sufficiently* restrictive, however, depends on the broader macroeconomic environment in which central banks operate.<sup>[1]</sup>

The lags in monetary policy are “variable”, meaning the appropriate monetary policy stance is highly state-dependent.

For example, some of the current cyclical drivers, such as the effect of the excess build-up of inventories after the pandemic on industrial orders, may weaken or reverse over time. Similarly, a more resilient US economy may reduce the current drag on euro area exports from weak foreign demand, while a deeper slowdown in China may have the opposite effect.

Moreover, some of the observed developments may be structural rather than cyclical, reflecting the secular challenges facing the euro area economy. Above all, the energy shock is still working its way through the economy and threatens to leave permanent scars on potential growth.<sup>[2]</sup>

Schnabel, I. (2023), “[The risks of stubborn inflation](#)”, speech at the Euro50 Group conference on “New challenges for the Economic and Monetary Union in the post-crisis environment”, Luxembourg, 19 June.

Although wholesale electricity prices have come down from their peak, they remain about three times their level three years ago. Price volatility, and hence uncertainty, also remains significantly higher. In August, European natural gas price futures for delivery in winter increased sharply before falling back again.

Persistently higher input costs are undermining the price competitiveness of firms in energy-intensive sectors (Slide 6, left-hand side). This seems to have contributed to the emergence of a significant and unusual wedge in industrial production of energy-intensive and other sectors (Slide 6, right-hand side).

It is therefore possible that the current weakness in activity is not only the result of a cyclical slowdown in response to increasing interest rates but also a reflection of significant structural headwinds.<sup>[3]</sup>

See also Banca d'Italia (2023), “Energy price increases and recent developments in prices and production in the Italian manufacturing sector”, *Economic Bulletin*, No 2, April.

The future path of inflation will depend on how the economy tackles these challenges.

Firms could shut down operations and relocate to outside the euro area, thereby reducing potential output.<sup>[4]</sup>

Similarly, if persistent uncertainty about energy supply and prices are holding back investment and growth, the strain on productivity growth may be inflationary rather than disinflationary in an environment of rising nominal wages. See also Schnabel, I., “The risks of stubborn inflation”, op. cit.

Alternatively, they could accelerate investment in more energy-efficient technologies to restore their competitiveness, possibly supported by public subsidies. This, together with broader efforts to fight climate change, could help explain why investment in machinery and equipment has remained surprisingly resilient so far despite tighter financing conditions (Slide 7, left-hand side).

Our latest bank lending survey corroborates this view. It shows that fixed investment related to the green transition is an increasingly important driver of loan demand, and that climate change had an easing impact for loans to “green” firms and those in transition, while it had a tightening impact for loans to fossil-fuel intensive firms (Slide 7, right-hand side).<sup>[5]</sup>

The ECB's July Corporate Telephone Survey confirms the resilience of investments related to the energy transition. See Elding, C. et al. (2023), "[Main findings from the ECB's recent contacts with non-financial companies](#)", published as part of the ECB Economic Bulletin, Issue 5.

Either way, falling supply or rising investment may attenuate the disinflationary effect of tighter monetary policy over the short term.<sup>[6]</sup>

Falling supply may slow down the pace of disinflation under two broad conditions: first, if aggregate demand remains resilient and import substitution over the short run is sufficiently weak; second, if falling supply leads to reduced competition and thus stronger pricing power of incumbents.

Higher green investment could, however, be disinflationary over the longer term. Therefore, understanding the drivers and consequences of the recent deterioration in the business climate is critical for our assessment of the appropriate monetary policy stance.

## **“Large shocks travel fast”: a state-dependent Phillips curve**

The second question facing policymakers is how fast the slowdown, should it persist, will succeed in reducing underlying price pressures. The slope of the Phillips curve is at the heart of this question.

All else being equal, inflation should be more responsive to the economic slowdown the steeper the slope of the Phillips curve. A “soft landing” scenario would see the target inflation rate being reached in the steep part of the curve. By contrast, if the slope is flat around the target, a significant or protracted slowdown in growth may be required to bring inflation back to target.

Over the past few months, underlying inflation measures have sent mixed signals about the pace of disinflation, and hence about the shape of the Phillips curve.<sup>[7]</sup>

See also Bańbura et al. (2023), “Underlying inflation measures: an analytical guide for the euro area”, Economic Bulletin Box, ECB Economic Bulletin, Issue 5/2023.

Model-based indicators built to extract the persistent and common component of inflation (PCCI) point to a rapid decline in price pressures. At the same time, other measures, which are more closely related to domestic demand and labour costs, remain elevated, with no clear signs of a turning point yet (Slide 8, left-hand side).

One reason for this divergence seems to be related to the role of supply-side factors, which are expected to drop out over time. Removing their estimated effects on underlying inflation notably reduces the range spanned by underlying inflation measures. But even in this case, underlying price pressures remain elevated, suggesting that inflation is, to a significant extent, driven by demand-led factors.

Sector-specific inflation rates provide an equally heterogeneous picture. While inflation has started to decline rapidly in the non-energy industrial goods sector, it is still rising in the services sector, where the price momentum also remains uncomfortably high despite its recent decline (Slide 8, right-hand side).

This heterogeneity implies that there is no single Phillips curve but a set of different curves pointing to different paces of disinflation across sectors and countries.

Moreover, the slope of the Phillips curve is likely to vary over time.

A growing strand of research, often using firm-level data, shows that the shape of the Phillips curve is highly state-dependent.<sup>[8]</sup>

See, for example, Nakamura, E., Steinsson, J., Sun, P. and Villar, D. (2018), “The elusive costs of inflation: Price dispersion during the U.S. Great Inflation”, *The Quarterly Journal of Economics*, Vol. 133, No 4, pp. 1933-1980; Gagnon, E. (2009), “Price setting during low and high inflation: Evidence from Mexico”, *The Quarterly Journal of Economics*, Vol. 124, No 3, pp. 1221-1263; Costain, J. et al. (2022), “Flattening of the Phillips Curve with State-Dependent Prices and Wages”, *The Economic Journal*, Vol. 132, Issue 642, pp. 546–581; and Cavallo, A. et al. (2023), “[Inflation and Misallocation in New Keynesian models](#)”, paper presented at the ECB Forum on Central Banking, Sintra, June.

When marginal costs increase rapidly and threaten to erode profit margins, firms tend to raise their prices more frequently. As a result, the Phillips curve becomes steeper.

This is what we have seen over the past two years. As the energy shock hit the euro area and marginal costs increased at a pace not seen since the oil price shocks of the 1970s, the share of goods and services seeing price increases rose sharply (Slide 9, left-hand side).

As a result, inflation surged in a way that was not consistent with the common assumption of time-dependent price setting behaviour by firms.<sup>[9]</sup>

The strong pass-through observed probably also reflects the increased market power firms have when there are demand-supply imbalances.

In other words, if prices are far away from their optimal level, firms are more likely to adjust them (Slide 9, right-hand side).<sup>[10]</sup>

See also Schnabel, I. (2021), “[Prospects for inflation: sneezes and breezes](#)”, welcome address at the ECB and Federal Reserve Bank of Cleveland’s “Inflation: Drivers and Dynamics Conference 2021”, Frankfurt am Main, 7 October; and Schnabel, I. (2022), “[Reconciling the macro and micro evidence on the effects of monetary policy](#)”, welcome address at the seventh ECB Annual Research Conference, 12 September.

Or, as Francesco Lippi recently put it at the ECB Forum on Central Banking in Sintra, “large shocks travel fast”.

The question, then, is whether the Phillips curve continues to be as steep today as it has been in the recent past. If it were, the sharp decline in marginal costs on the back of the fall in energy prices would drive inflation down just as quickly as higher costs had pushed it up.

However, there are reasons to believe that this may not be the case, as there is often an asymmetry between positive and negative cost-push shocks. While firms are quick to pass large cost increases on to consumers, they may be more reluctant to pass on declines in marginal costs.<sup>[11]</sup>

See also Lafrogne Joussier, R., Martin, J. and Mejean, I. (2023), “Cost Pass-Through and the Rise of Inflation”, Insee Documents de Travail, No. 2023-13.

And indeed, the share of firms currently planning to reduce prices is nowhere near the share of firms that intended to raise prices when marginal costs were increasing, even though producer and import prices are currently falling more rapidly than they had risen before (Slide 10).

In the manufacturing sector, only 12% of firms said in August that they intended to cut prices, with a similar share reporting planned price increases. In the retail and services sectors, far more firms still plan to raise rather than reduce prices. This suggests that the reversal of previous cost-push shocks will take time to be fully reflected in underlying inflation numbers.

Research suggests that the presence of trend inflation, which is largely determined by the central bank's inflation target, can help explain this stylised fact.<sup>[12]</sup>

Karadi, P. and Reiff, A. (2019), "Menu Costs, Aggregate Fluctuations, and Large Shocks", *American Economic Journal: Macroeconomics*, Vol. 11, No 3, pp. 111–146.

If firms expect the general price level to rise over time, they will hesitate to reduce prices in the presence of negative cost shocks, or at least they will do so very cautiously. This is because trend inflation will over time re-align their prices with those of their competitors even in the absence of price cuts.

One takeaway, therefore, is that a microfounded Phillips curve based on marginal costs rather than the output gap can help explain the surge in inflation. But such a curve would likely point to price pressures fading more gradually.<sup>[13]</sup>

Gagliardone, L. et al. (2023), "Anatomy of the Phillips Curve: Micro Evidence and Macro Implications", *NBER Working Paper*, No 31382.

## **Labour shortages can lead to a steeper Phillips curve**

Research that will be presented later today, however, suggests that, for the United States, a Phillips curve built on an adequate measure of labour market tightness can explain last year's inflation outburst equally well, with potentially different implications for the pace of disinflation.<sup>[14]</sup>

Benigno, P. and Eggertsson, G. (2023), "It's Baaack: The Surge in Inflation in the 2020s and the Return of the Non-Linear Phillips Curve", *NBER Working Paper*, No 31197. See also Hooper et al. (2019), "Prospects for Inflation in a High Pressure Economy: is the Phillips Curve Dead or is it Just Hibernating?", *NBER Working Paper*, No 25792.

All that is needed is downward wage rigidity that makes the slope of the Phillips curve non-linear. Without giving too much away, Gauti will show that labour shortages, defined as the number of job vacancies exceeding the number of unemployed workers, was accompanied by a rapid surge in inflation in the United States, implying a steepening of the Phillips curve.

In the euro area, as economies reopened after the pandemic, the ratio of vacancies to unemployed workers also increased sharply to record highs, but it remains notably below the unitary threshold identified by Gauti and Pierpaolo.



The question is whether this threshold is necessarily identical across countries for labour shortages to generate inflation. In the euro area, unemployment is structurally higher than in the United States. More than a third of those currently unemployed have been out of work for 12 months or more, which typically reduces their likelihood of finding work again.<sup>[15]</sup>

For a seminal contribution, see McGregor, A. (1978), “Unemployment Duration and Re-Employment Probability”, *The Economic Journal*, Vol. 88, No 352, pp. 693-706. For a more recent contribution, see Hall, R. E. and Schulhofer-Wohl, S. (2018), “Measuring Job-Finding Rates and Matching Efficiency with Heterogeneous Job-Seekers”, *American Economic Journal: Macroeconomics*, Vol. 10, No 1, pp. 1-32.

In other words, it could well be that labour market tightness in the euro area is consistent with ratios of vacancies to unemployed workers being lower than in the United States.

Indeed, many indicators are signalling unprecedented tightness in the euro area labour market. For example, the share of firms reporting labour as a factor holding back production remains near record highs (Slide 11, left-hand side).<sup>[16]</sup>

A recent survey by the ifo institute showed that in Germany, in spite of the more pronounced slowdown of the economy, 43% of surveyed firms reported a shortage of skilled workers in July, a slight increase from the previous survey in April. See ifo (2023), “Germany’s Shortage of Skilled Workers Worsens Slightly”, *ifo Business Survey*, 16 August.

In any case, the shape of the euro area Phillips curve using the ratio of vacancies to unemployed workers looks strikingly similar to that in the United States (Slide 11, right-hand side). A soft-landing scenario would see inflation fall back quickly towards the 2% target on the steep part of the curve, provided that both the shape and location of the Phillips curve remain unchanged.<sup>[17]</sup>

The curve may flatten again, for example if the pricing behaviour of firms changes as the state of the economy evolves. The curve may shift in the face of new supply-side shocks and changes in inflation expectations.

So, all in all, how the euro area economy will ultimately adjust to the tightening of monetary policy will crucially depend on whether consumer prices will be as flexible on the way down as they were on the way up, and on whether the imbalances in the labour market will be resolved in a way that brings wage growth back to a level in line with our 2% target, thereby containing second round effects and keeping inflation expectations anchored.

This uncertainty about the pace of disinflation is also reflected in recent developments in market-based measures of inflation compensation.

In the past, a slowing economy, or expectations thereof, tended to systematically go hand in hand with investors requiring less compensation for being exposed to inflation risk over the policy-relevant horizon (Slide 12, left-hand side). This is currently not the case, however, as inflation-linked swap rates have increased measurably in recent months, mainly driven by an increase in inflation risk premia (Slide 12, right-hand side).

Such a countercyclical pattern could be consistent with investors hedging against the risks of central banks not leaning forcefully enough against inflation remaining above target.

One way to see how the market perceives the monetary policy stance is to look at the gap between short-term real risk-free rates and a market-based measure of the natural rate of interest. Until recently, this gap was deeply negative. This means that, so far, most of the increase in real short-term rates removed policy accommodation. Only recently, rates moved into firmly restrictive territory (Slide 13).

## **Uncertainty calls for data-dependent and robust approach to monetary policy**

The uncertainty about the pace of disinflation lends support to the data-dependent approach adopted by the Governing Council. This approach recognises that monetary policy needs to be mindful of, and responsive to, the way the economy reacts to the steepest rate hiking cycle in the history of the euro area. The lack of a historical precedent means that we can rely less on past experience.<sup>[18]</sup>

Lagarde, C. (2023), "Policymaking in an age of shifts and breaks", speech at the annual Economic Policy Symposium "Structural Shifts in the Global Economy" organised by Federal Reserve Bank of Kansas City in Jackson Hole, 25 August.

Therefore, at every upcoming meeting, we will assess whether the impact of the cumulative tightening on the future path of inflation is sufficiently strong to ensure a sustained and timely return of inflation to our 2% target, or whether the pace of disinflation is too slow for us to be confident that our current monetary policy stance can provide medium-term price stability.

To ensure robustness, we will need to consider not just the baseline scenario for the inflation outlook but the entire distribution of risks. This is because even though forecast errors are starting to become smaller, there is still an exceptionally large degree of uncertainty about the medium-term inflation outlook.

This can be seen when considering our latest survey of professional forecasters. Both individual uncertainty, measured by the average of the standard deviations of each respondent's probability distribution, and aggregate uncertainty, measured by the standard deviation of the aggregate probability distribution, remain exceptionally high (Slide 14).

And although the disagreement across survey participants, measured by the standard deviation of point forecasts, has recently declined, it still stands at more than twice the historical average since 1999.

The wide range of views reflects risks in both directions.

Upside risks include stronger-than-expected growth in unit labour costs, possibly driven by lower than projected productivity growth, firmer corporate pricing power and risks of new adverse supply-side shocks.<sup>[19]</sup>

See Schnabel, I., "The risks of stubborn inflation", op. cit.

If such risks materialised, inflation could subside only very gradually or could even reaccelerate.



Amongst these upside risks, climate-related risks seem more pressing than ever.<sup>[20]</sup>

According to the Copernicus Climate Change Service, July was the hottest month in recorded history.

Unprecedented non-linearities in sea and air surface temperatures coupled with the speed at which the polar ice caps are melting mean that dangerous tipping points may be reached more quickly than previously expected (Slide 15, left-hand side). The latest El Niño event is further reinforcing climate-related risks.

As a consequence, we have recently observed a sharp rise in the number of extreme weather events, which are threatening harvests and tourism. Crucial water routes, such as the Panama Canal, are drying up, causing new supply chain disruptions.

These factors are posing significant risks to food prices and inflation more broadly. While a few food commodity prices have already increased sharply in recent months, most of the effects are likely to become apparent only in 2024 (Slide 15, right-hand side).

On the downside, there is a risk that the effects of monetary policy could unfold more forcefully over the medium term.

For example, while the marked increase in the share of household loans with a fixed interest rate implies that the impact of the increase in policy interest rates on households' net interest income has been fairly limited so far, these effects could accumulate over time when more and more loans have to be refinanced at higher rates.

On net, respondents in our survey of professional forecasters judge that the balance of risk for inflation in 2025 remains tilted to the upside (Slide 16).<sup>[21]</sup>

The balance of risk is calculated as the estimated mean of the aggregate probability distribution minus the average reported point forecast.

Moreover, respondents also see upside risks to inflation over the longer term. The distribution of inflation expectations for 2028 continues to show a fat right-hand tail, with a significant probability for inflation outcomes being above 2.5% (Slide 17, left-hand side). Option prices in financial markets also suggest upside risks to the longer-term inflation outlook (Slide 17, right-hand side).

At our upcoming meetings, we will carefully weigh these and other relevant risks.

Should we judge that the policy stance is inconsistent with a timely return of inflation to our 2% target, a further increase in interest rates would be warranted. In an environment of tight labour markets and structural inflationary headwinds, this would also insure against the continued elevated risk of inflation remaining above our target for too long.

By contrast, should our assessment of the transmission of monetary policy suggest that the pace of disinflation is proceeding as desired, we may afford to wait until our next meeting to gather more evidence on how the slowdown in aggregate demand will feed through to price and wage-setting over time.

Under this data-dependent approach, we cannot predict where the peak rate is going to be, or for how long rates will have to be held at restrictive levels. We can also not commit to future actions, meaning we cannot trade off a need for a further tightening of monetary policy today against a promise to hold rates at a certain level for longer.

Such a promise would raise time inconsistency issues. If investors anticipated that the central bank in the future might renege on its promise if economic conditions change, they would not price a future path of short-term interest rates that would result in sufficiently restrictive financing conditions.

Ultimately, the incoming data may well prescribe holding rates at restrictive levels over a significant period of time. The degree of restrictiveness, in turn, will also depend on the evolution of inflation expectations, as what ultimately matters for consumption and investment is real, not nominal, interest rates.

The past few weeks have highlighted the pertinence of this consideration. Real risk-free rates have declined across the maturity spectrum and are now back to the level observed at the February Governing Council meeting, as investors have revised their expectations for economic growth, inflation and monetary policy (Slide 18). This decline could counteract our efforts to bring inflation back to target in a timely manner.

By setting monetary policy meeting-by-meeting, with an open mind and based on the incoming data and an assessment of the risks to the inflation outlook, we can take such developments into account to ensure that the key ECB interest rates are set at sufficiently restrictive levels for as long as necessary to achieve a timely return of inflation to our 2% medium-term target.

Thank you.