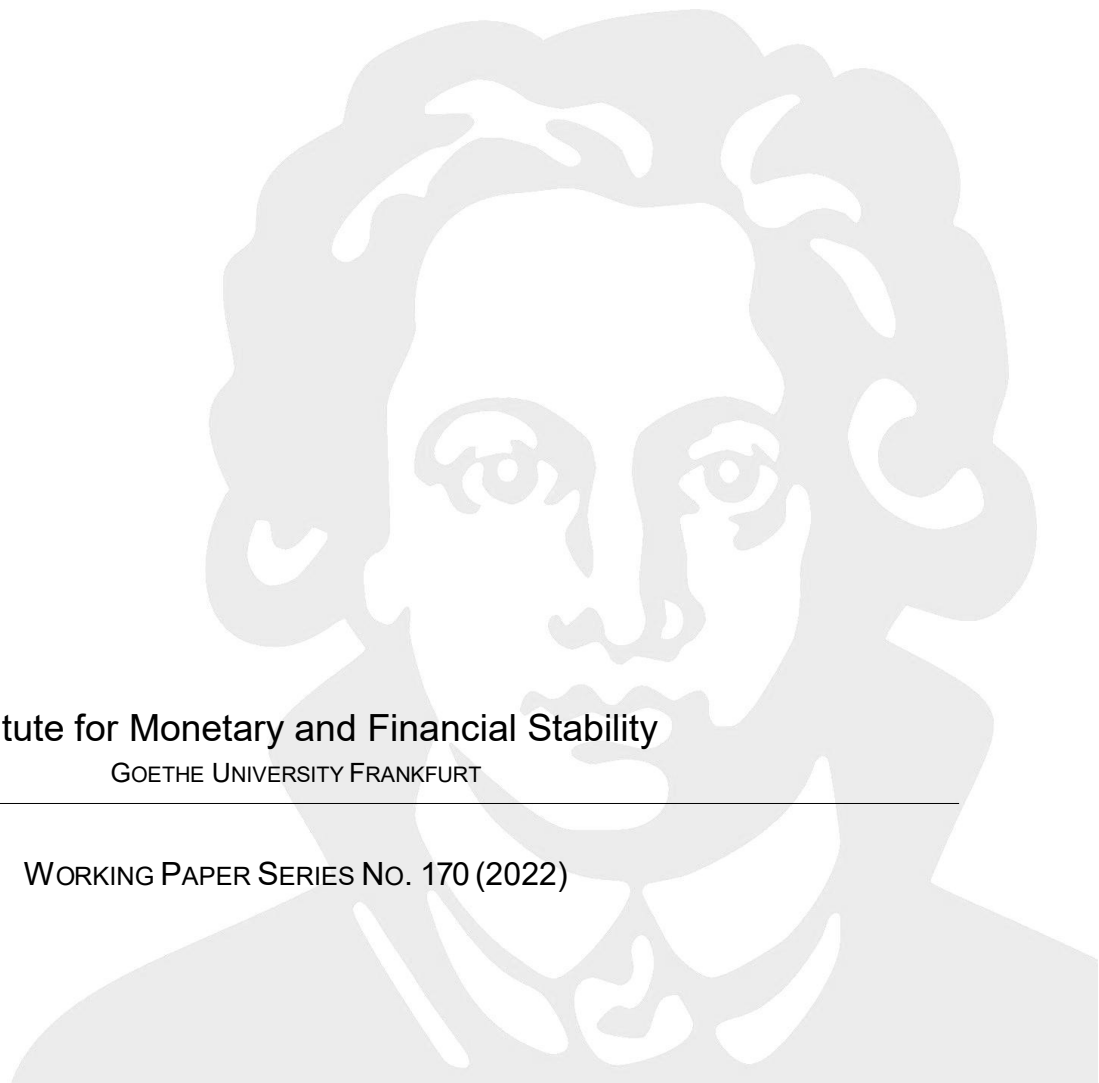


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A new age of uncertainty?
Implications for monetary policy

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A new age of uncertainty? Implications for monetary policy¹

Per Jacobsson Lecture, 26 June 2022

Dr Jens Weidmann, former President of the Deutsche Bundesbank and former Chair of the BIS Board of Directors

Abstract

Central banks have faced a succession of crises over the past years as well as a number of structural factors such as a transition to a greener economy, demographic developments, digitalisation and possibly increased onshoring. These suggest that the future inflation environment will be different from the one we know. Thus uncertainty about important macroeconomic variables and, in particular, inflation dynamics will likely remain high. Discussion on what this could mean for monetary policy.

¹ I am very grateful to André Schmidt, Stefan Ried, Emanuel Mönch, Volker Wieland, Hendrik Hegemann, Claudio Borio and Otmar Issing for comments and suggestions.

Introduction

It is so good to see you all again! First, I would like to thank you all for being here. I feel truly honoured to speak to such a distinguished audience today. I have been attending the Annual Meetings of the BIS for the last 11 years and have always thought that the Per Jacobsson Lecture marked a highlight of these gatherings. Thus, I felt flattered, but also a bit intimidated, when Agustín called to ask whether I would be willing to step into the big shoes of all those impressive previous speakers. I accepted with a view to honouring our distinguished predecessor, Per Jacobsson, who shaped two important institutions at the heart of our central banking community, the IMF and the BIS, to which I personally feel very attached.

And it is exactly in the pioneering spirit of Per Jacobsson that the BIS under the leadership of Agustín Carstens has adapted over the past years to better serve its constituency, for instance through the establishment of the BIS Innovation Hub.

We are gathering in difficult times. Uncertainty seems to be pervasive and on everyone's lips – especially among central bankers. John Williams earlier this year delivered a speech entitled "A time of uncertainty",² Christine Lagarde discussed "Monetary policy in an uncertain world"³ and François Villeroy de Galhau talked about "Monetary policy in uncertain times"⁴ – and these are just some of the many speeches stressing the uncertainty that currently besets monetary policy.

Some may look back a bit wistfully to the – supposedly – less uncertain times of the past. But are they right to do so? In any case, the widespread perception that uncertainty is particularly high *right now* is not a new phenomenon: some 45 years ago, John Kenneth Galbraith published *The Age of Uncertainty*.⁵ He painted a picture of a world in which a golden age of stability and predictability was coming to an end, to be succeeded by a period of significantly heightened uncertainty.

Four decades later, Barry Eichengreen looked back at this book and came to the following conclusion: "Viewed from the perspective of 2017, however, the uncertainty of 1977 seems almost enviable. [...] If Galbraith were writing the same book in 2017, he probably would call the 1970s The Age of Assurance."⁶ The irony is that, from today's perspective, the years before the coronavirus pandemic and the Russian invasion of Ukraine look comparatively safe and stable.

So, is uncertainty always on the rise? Some might say "yes". In an increasingly complex world, making predictions and forecasts is becoming more and more difficult. Bob Rubin in his book *In an Uncertain World* makes the important point that uncertainty forces policymakers to "[...] delve into [exactly] those complexities to identify the relevant considerations and inevitable trade-offs."⁷ And indeed, many papers have been written over the past years about the specificities of the

² J Williams, "A time of uncertainty", Remarks at the Griswold Center for Economic Policy Studies 2022 Spring Symposium, Princeton, 2 April 2022.

³ C Lagarde, ""Monetary policy in an uncertain world", speech at "The ECB and Its Watchers XXII" conference, 17 March 2022.

⁴ F Villeroy de Galhau, "Monetary policy in uncertain times", speech at the London School of Economics, London, 15 February 2022.

⁵ J K Galbraith, *The Age of Uncertainty*, Houghton Mifflin Harcourt, 1977.

⁶ B Eichengreen, "The age of hyper-uncertainty", *Project Syndicate*, 14 December 2016.

⁷ R Rubin and J Weisberg, *In an Uncertain World: Tough Choices from Wall Street to Washington*, Random House, 2003

environment monetary policy has operated in for so long and the necessary changes to its toolkit to deal with them. Others might say “no”. Another explanation of the perceived increase in uncertainty could be that the certainty about the outcomes of past events and developments take away their power to frighten.

In retrospect, the solutions to conflicts and problems then appear to have been predetermined. But those involved may have felt differently at the time. And as we will hear later, some of the trends that have contributed to an increase in complexity, like globalisation, are faltering. Personally, I felt that the past 15 years have been particularly turbulent with one crisis after another, and monetary policy has been pushed into uncharted territory.

Either way, the words of Charles Bean hold true: “Wisdom with hindsight is a wonderful thing.”⁸ But unfortunately, this is a luxury that policymakers do not have. I have dealt with uncertainty for a large part of my professional life, particularly in my role as a monetary policy decision-maker. And there were many moments when I longed for the wisdom of hindsight. Perhaps I also speak for some of my colleagues here.

Today, I would like to take a brief look back at some of these moments. But above all, I want to look ahead: is monetary policy facing a (new) era of uncertainty? A number of structural factors suggest that the future inflation environment will be different from the one we know. If this turns out to be true, what would that mean for monetary policy? And, since we are in Switzerland, I will take you on a hiking tour. So please get ready to lace up your boots and join me!

1. Looking back over the past 15 years: a story of shocks

Fifteen years ago, many thought we were in a permanent “Goldilocks” economy. With inflation seemingly conquered, large fluctuations in economic output appeared to be a thing of the past too. By keeping prices stable, central banks looked as if they were able to moderate the business cycle, thereby providing for overall macroeconomic stability.

Much like Francis Fukuyama, who hoped that the end of the Cold War meant that the major ideological conflicts had been settled once and for all,⁹ many economists seemed to think that the end of major economic crises was within reach. For example, Nobel Laureate Robert Lucas declared that the central problem of preventing economic depression seemed to have been solved.¹⁰ But on both dimensions that was too good to be true. Once again, the “this time is different”¹¹ trap had snapped shut.

The outbreak of the global financial crisis brought the “Great Moderation” to an abrupt end. The Lehman Brothers collapse shocked the world economy and marked the beginning of what we would come to know as the “Great Recession”. During this period, both macroeconomic and financial uncertainty measures rose to their highest

⁸ C Bean, “Monetary policy in an uncertain world”, speech given at the Oxonia Distinguished Speakers Seminar, 22 February 2005.

⁹ F Fukuyama, *The End of History and the Last Man*, New York: The Free Press, 1992.

¹⁰ R Lucas, “Macroeconomic priorities”, *American Economic Review*, vol 93, no 1, 2003, pp 1–14.

¹¹ C Reinhart and K Rogoff, *This Time Is Different: Eight Centuries of Financial Folly*, Princeton, 2009.

levels since 1960.¹² While we were still dealing with the aftermath of the global financial crisis, the sovereign debt crisis shook the euro area. Measures of uncertainty climbed again, this time notably in the form of economic policy uncertainty.¹³

In 2020, the world was hit by another shock: the Covid-19 pandemic triggered an unprecedented economic slump, shrinking the global economy on a historic scale. Entire economic sectors came to a standstill. Global trade fell suddenly and sharply, and international supply chains came under stress. Against this backdrop, it is not surprising that uncertainty indicators shot up to new record highs across the board.¹⁴ The VIX, for example – a popular measure of the “risk-neutral” stock market’s expectation of volatility based on S&P 500 index options – rose to over 80 in mid-March, up from under 15 a month earlier. And the Global Economic Policy Uncertainty Index jumped from 235 to 437 between December 2019 and March 2020.

Thanks to large-scale fiscal and monetary policy support, it was possible to avert a downward spiral. This exceptional policy response paved the way for a rapid recovery. When the constraints were lifted, output bounced back. Over the course of the recovery, production in certain sectors was, at times, unable to keep up with the surging demand for goods. Companies struggled with shortages, rising shipping costs and delivery delays. Agustín Carstens recently found that “[t]he initial policy response to the pandemic was meant to provide a bridge to the recovery. With the benefit of hindsight, policy settings, at least over the past year, may have served as a springboard for the rapid expansion.”¹⁵

As a result, in combination with the surge in energy prices inflation has risen sharply to rates that we have not seen for decades. As this came as a surprise to markets, analysts and academics, forecast errors were unusually large. Originally, most observers were expecting the high rates to gradually subside over the course of this year but Russia’s invasion of Ukraine has fuelled another sharp rise in commodity prices, especially for energy, and has further disrupted global supply chains. Moreover, the war has darkened the economic outlook and triggered a massive new wave of uncertainty.

This combination brings back unpleasant memories of the 1970s, a period marked by persistently high inflation and economic stagnation. So the spectre of “stagflation” is looming once again and some, like Agustín Carstens, even talk about a “new inflationary era”. As I see it, there is little to suggest that inflationary pressures will ease soon. I agree with Isabel Schnabel in her recent speech¹⁶ on the globalisation of inflation that it is unlikely that global excess demand will dissipate quickly: the lingering pandemic combined with strict containment measures in China as well as the war in Ukraine, which will probably not end anytime soon, mean that supply bottlenecks will persist for some time to come. Fiscal support packages for the most

¹² K Jurado, C Ludvigson and S Ng, “Measuring uncertainty”, *American Economic Review*, vol 105, no 3, 2015, pp 1177–16 and S Ludvigson, S Ma and S Ng, “Uncertainty and business cycles: exogenous impulse or endogenous response?”, *American Economic Journal: Macroeconomics*, vol 13, no 4, 2021, pp 369–410.

¹³ Deutsche Bundesbank, “The macroeconomic impact of uncertainty”, *Monthly Report*, October 2018.

¹⁴ H Ahir, N Bloom and D Furceri, “The world uncertainty index”, *NBER Working Papers*, no 29763, February 2022.

¹⁵ A Carstens, “The return of inflation”, speech at the International Center for Monetary and Banking Studies, Geneva, 5 April 2022.

¹⁶ I Schnabel, “The globalization of inflation”, speech at a conference organised by the Österreichische Vereinigung für Finanzanalyse und Asset Management, Vienna, 11 May 2022.

vulnerable, tight labour markets and some remaining pent-up demand support the demand side. This environment bolsters the pricing power of firms and the bargaining power of labour.

But again, the outlook is exceptionally uncertain. Thus, to sum up the main message of this retrospective discussion, it is safe to say that – on average – uncertainty has been markedly higher after the Great Financial Crisis than before. And that broadly holds regardless of the fact that there are different kinds of uncertainty, captured by different indicators. Looking beyond the immediate concerns, the inflation environment could remain clouded in uncertainty, and it could shift in a more persistent way. The economy is facing profound structural changes that will also have an impact on inflation, as these changes matter for wage- and price-setting dynamics. But how these important transformations play out with respect to inflation is difficult to predict.

I would now like to outline some of the structural forces that are contributing to uncertainty over years to come. And I will lay out how they could affect the future path of inflation.

2. Structural changes as sources of uncertainty

2.1 Decarbonisation¹⁷

Let me begin with the Herculean task of climate action to limit global warming to the targets set out in the Paris Agreement. To be able to achieve these targets, the world economy will have to undergo a far-reaching transformation. In order to give consumers, producers and investors the right incentives, carbon pricing is required – swiftly, markedly and globally. Higher carbon prices may influence consumer prices in multiple ways: directly, through higher energy prices, and indirectly, through increased production costs for businesses.

The transition to a greener economy might have also dampening effects on inflationary pressures as, with a low short-run substitution elasticity between fossil and renewable energy sources, real household income and demand could shrink.¹⁸ Furthermore, the transition could also lead to additional political uncertainty that would then weigh on investment.

Overall and with respect to headline inflation, however, decarbonising our economies is likely to fuel consumer price inflation during the transition, that is, over many years. Given the length of this transition phase and the persistence of potential price effects, it will be difficult for central banks to “look through” them if they want to keep expectations anchored around their targets. While the direction of the induced trend is clear, the wide range of differing estimates illustrates the high

¹⁷ A different, but somehow related, topic is the uncertainty surrounding climate change itself and the economic costs stemming from it. What this means for the role of central banks in combating climate change is discussed in L Hansen, “Central banking challenges posed by uncertain climate change and natural disasters”, University of Chicago, Macro Finance Research Program, Working Paper, no 2021-64, September 2021.

¹⁸ See eg M Konradt and B Weder die Mauro, “Carbon taxation and inflation: evidence from the European and Canadian experience”, *CEPR Discussion Papers*, no 16396, 2021.

uncertainty surrounding its magnitude. This depends primarily on the timing of the climate policy measures, the use of the revenues generated by carbon taxes etc.¹⁹

Simulations by the Network of Central Banks and Supervisors for Greening the Financial System indicate that, even in the event of an orderly transition, the euro area, for instance, could temporarily experience significantly higher inflation rates. Due to climate policy measures, annual inflation rates up to 2030 could, on average, be between 0.3 and 1.1 percentage points higher than in a scenario without the influence of climate change and climate policy.^{20,21} Pivoting away from fossil energy sources also satisfies the desire to achieve greater strategic autonomy and energy independence. Under the impact of Russia's invasion of Ukraine, the decarbonisation of our economies could, therefore, be accelerated further and this would reinforce climate policy-related price pressures.

2.2 Digitalisation

A second structural force driving change is digitalisation. The digital transformation affects the economy through a number of channels, including productivity, employment, competition and prices. In the wake of the pandemic, many of us have come to acknowledge and appreciate the benefits of digital technologies – and we are not alone. A wave of digitalisation has swept through our societies and may have reinforced some of the longer-term trends.

The impact of the digital transformation on inflation is not clear-cut and may vary over time. On the one hand, the expansion of e-commerce may deliver cost savings and boost price transparency and competition. A study by the ECB concluded that the e-commerce effect in the EU has reduced non-energy industrial goods inflation by 0.1 percentage point on average per year since 2003.²² These inflation-dampening effects are likely to wane as the diffusion of digitalisation and e-commerce technologies reaches a saturation point. When this saturation point will be reached, however, is difficult to predict. On the other hand, the rise of "superstar" firms may reduce competition and lead to higher mark-ups in the longer term. In a more dynamic setup, though, "superstar" firms too might be forced to defend themselves against competition.

Looking at mark-ups in the United States since 1982, Autor et al²³ find that larger companies have higher mark-ups and that the size-weighted aggregate mark-up has increased more than the unweighted average mark-up. They conclude that this pattern underscores the centrality of superstar firms for the evolution of the mark-up. The bottom-line impact that the countervailing effects of digitalisation will have

¹⁹ Deutsche Bundesbank, "Climate change and climate policy: analytical requirements and options from a central bank perspective", Monthly Report, January 2022.

²⁰ Network for Greening the Financial System, "NGFS Climate Scenarios for central banks and supervisors", June 2021.

²¹ Of course, it should be borne in mind that the different scenarios are not directly comparable, due to significantly different assumptions.

²² European Central Bank, "Low inflation in the euro area: causes and consequences", *ECB Occasional Papers*, no 181, 2017, Box 3.

²³ D Autor, D Dorn, L Katz, C Patterson and J Van Reenen, "The fall of the labor share and the rise of superstar firms", *Quarterly Journal of Economics*, vol 135, no 2, 2020, pp 645–709.

on inflation cannot yet be quantified.²⁴ In any case, the total effect is likely to be limited, but uncertainty remains.

2.3 Demographic change

The third factor I would like to address is demographic change. Charles Goodhart's work on this issue has shed new light on the development of inflation in recent decades.²⁵ When China, former Soviet states and other emerging economies entered world markets in the 1990s, they dealt a massive supply shock to the global economy. Agustín said in a recent speech that about 1.6 billion workers from these regions have joined the effective global labour force (and that such a boost to global aggregate supply may not be repeated on such a significant scale for a long time to come).²⁶

Faced with risks of offshoring and job losses, unions had become more restrained with their wage demands and put job security first. Thus, I agree with you, Agustín, that this supply shock had marked disinflationary effects. But at the same time one has to acknowledge that it is difficult to disentangle them from other changes that took place at the same time, such as the transition of central banks to inflation targeting in advanced economies.

Practically all countries are experiencing population ageing.²⁷ The imminent retirement of the baby boomers could reduce the global labour supply over the coming decade and (demographic) headwinds holding back wages and inflation would then turn into tailwinds. In addition, population ageing will increase expenditure on health as well as elderly care and non-tradable services more generally. Depending on the price-elasticity of supply, relative prices and the inflation rate too will be affected. Indeed, a recent study suggests a stable relationship between demography and inflation in data from 1870 to 2016.²⁸

But Charles Goodhart's hypothesis is not uncontroversial. Countries with more retirees and fewer workers, such as Japan, have experienced particularly low inflation. One could also argue that population ageing leads to less consumption, innovation and investment, and thus to low inflationary pressure. This once more underlines the high level of uncertainty.

2.4 De-globalisation?

In addition to these three forces, the globalisation tailwinds discussed before could also turn into headwinds. Even before the pandemic, protectionism was on the rise – take Brexit or US trade policy under Trump, for example. Considering the experience after the outbreak of the pandemic, many countries have sought to limit their dependence on global value chains in certain areas, such as the semiconductor or pharmaceutical sectors. And the war against Ukraine may reinforce this trend,

²⁴ R Anderton, V Jarvis, V Labhard, J Morgan, F Petroulakis and L Vivian, "Virtually everywhere? Digitalisation and the euro area and EU economies", *ECB Occasional Paper Series*, no 244, June 2020 (revised December 2020).

²⁵ C Goodhart and M Pradhan, *The Great Demographic Reversal: Ageing Societies, Waning Inequality, and an Inflation Revival*, Palgrave Macmillan, 2020.

²⁶ A Carstens, *ibid*, see footnote 16.

²⁷ United Nations, *World Population Prospects 2019: Highlights*, 2019.

²⁸ M Juselius and E Takáts, "Inflation and demography through time", *Journal of Economic Dynamics and Control*, vol 128, July 2021.

especially with regard to the supply of energy, but also more broadly as demands for “friend-shoring” are rising in the political arena.

In pursuit of greater strategic autonomy, there could be a deliberate shift in critical supply chains to domestic markets or to regions that share the same values. This could potentially lead to a world economy that is again divided into political blocs.

All this makes a decrease in competition in labour and product markets more likely, which then will have implications for wage- and price-setting behaviour. Should the retreat from globalisation gather pace, workers will regain bargaining power and this would ease the brake that globalisation has put on wages and prices. This list of structural factors that could have a marked impact on inflation processes is, of course, not exhaustive. And evidently there are other developments that increase the uncertainty of the environment central banks are operating in, with geopolitical uncertainty being an obvious example.

2.5 Fog on the path of inflation

Have you noticed? We have been walking on the path of inflation for a while now. On balance, globalisation, digitalisation and demographic change may have had a dampening effect on inflation over the past decade. This goes some way towards explaining why inflation remained stubbornly in the lowlands during that time.

But the future path of inflation could differ from its past trajectory as the economy enters a new landscape. The dampening effect that these megatrends have had on inflation so far could fade away or even reverse. In combination with the impact of the green transition, a new inflation environment could emerge. Putting it more succinctly, Charles Goodhart doubts that the economic system we have known over the last 30 years will continue and, further, that inflation and nominal interest rates will remain at rock-bottom levels. His message is that “the future will be nothing like the recent past”.

Political reactions to the war in Ukraine are reinforcing or accelerating some of the existing trends. And a series of price-increasing shocks would make a shift towards a new regime with higher inflation rates more likely. Inflation dynamics are likely to be non-linear.

With low inflation rates, not too distant from the central banks’ targets, it is likely that economic agents are rationally inattentive vis-à-vis inflation dynamics and don’t spend much time or resources in fine-tuning their expectations. These expectations are basically backward-looking and the central bank’s inflation target provides a solid nominal anchor. Once inflation crosses a certain threshold and becomes a matter of concern and public debate, however, expectations may react more strongly to shocks and de-anchor quickly.²⁹ Carvalho et al,³⁰ for instance, formalises this idea in a New Keynesian model in which the degree to which inflation expectations are anchored depends on an endogenous link between long-term expectations and short-term forecast errors. Forecast errors lead agents to attach a higher weight to more recent

²⁹ There are other ways to derive such non-linearities: in a stimulating recent paper, for example, Martín Harding, Jesper Lindé and Mathias Trabandt present a model generating similar non-linearities with a Phillips curve that steepens as inflationary pressures rise based on a quasi-kinked demand schedule for goods. This implies that shocks, in particular cost-push shocks, propagate more strongly to inflation when inflation is high and rising.

³⁰ C Carvalho, S Eusepi, E Mönch and B Preston, “Anchored inflation expectations”, *American Economic Journal (Macroeconomics)*, forthcoming, draft dated 27 September 2021.

observations. Subsequent underestimations of inflation would prompt agents to assume non-stationarity, which then increases inflation expectations, further fuelling inflation.

The authors can show that their model captures quite well the pronounced rise in inflation expectations in the late 1970s as well as the remarkably stable inflation expectations since the end of the 1990s. I am sure that we are all curious to see where the inflation path will take us on our hike. Unfortunately, we can't see all that far into the distance because of the fog of uncertainty.

Even our binoculars don't help us much, for two reasons: First, the emerging megatrends will play out in combination. This further complicates model-based analyses and macroeconomic forecasts. Speaking more technically, model uncertainty will rise. Second, while some uncertainties can be quantified and thus captured by probability theory, this is not possible for several of the developments I described. These are cases of "Knightian" uncertainty,³¹ where forecasting models reach their limits.

Otmar Issing among others warned that, in a time of structural changes, forecasting models cannot give the right signals if they are based on the past and cyclical experience. "You need a much broader approach to explaining inflation," he said.³² In short, looking forward, the fog shrouding the path of inflation may become thicker still – and possibly obscure the hillier landscape that lies beyond the lowlands, perhaps obscuring the fact that a demanding mountain tour lies in wait, rather than a pleasant stroll.

3. Dealing with uncertainty in monetary policy

Let me focus again on the policy-relevant horizon and the more immediate outlook, and hence on the risks surrounding the economic environment and the inflation forecasts. How should central banks deal with them? The short answer is: it depends.³³

In this setup, monetary policy has to consider a range of possible scenarios about the state of the economy at present and in the future. The resulting policy decisions may be different from those that would be optimal under certainty or what a prototypical monetary policy rule would suggest. Ideally, too, they should be robust to model misspecification. Depending on how one judges the possible outcomes and associated costs, policy measures can be more gradual or more aggressive compared with the no-uncertainty benchmark.³⁴

This is part of a broader risk management approach. It seeks to weigh up the suitability of different policy routes to achieve the inflation target assuming a certain working of the economy while taking into account the risks and side effects to the real economy and financial stability. Of course, the risks and side effects also differ across policy instruments, with unconventional measures usually associated with higher costs due to their more direct interference with market mechanisms. Cost-

³¹ F Knight, *Risk, uncertainty and profit*, Cambridge, 1921.

³² O Issing, "'Living in a fantasy': euro's founding father rebukes ECB over inflation response", *Financial Times*, 12 April 2022.

³³ In this part uncertainty is generally used to describe unknown outcomes that can be described with a probability distribution and does thus not refer to Knightian uncertainty.

³⁴ B Bernanke, "Monetary policy under uncertainty", speech at the 32nd Annual Economic Policy Conference, Federal Reserve Bank of St. Louis, 19 October 2007.

benefit considerations may also differ depending on the respective currency area and its specific institutional setup.

Government bond purchases are one example. These entail risks and side effects that are particularly pronounced in a monetary union of fiscally sovereign member states. Here, these purchases may involve a redistribution of liability risks from the national to the supranational level (through the central bank balance sheets) and introduce a fiscal union “through the back door” without appropriate institutional safeguards.³⁵

The point I am trying to make is that, with this risk management approach, it is important not to discount too heavily the more complex or longer-term risks and side effects. In general, heightened uncertainty about the outlook can suggest that monetary policy should adopt a gradual approach. This is in line with general life experience: when you enter a dark room, you don’t run into it, but move forward one small step at a time.

This also corresponds to Brainard’s gradualism principle. When there is uncertainty about the transmission or effectiveness of policy actions, then policymakers should react less forcefully than they would under the condition of certainty.³⁶

One additional rationale for policy gradualism is that sharp changes in policy could cause higher market volatility and pose risks to financial stability, which would then feed back into price instability.³⁷ However, a wait-and-see attitude can also go too far. Let’s consider a supply shock as an example. To mitigate its adverse consequences, it may be useful to initially look through the shock and tolerate some deviation from the inflation target, at least for a time. But the more persistent the shock proves to be, the more the delay in monetary tightening increases the risk that companies, households and workers will start to expect that high inflation is here to stay. And this risk is greater if inflation was already high for some time before the supply shock occurred.

Along these lines, Dupraz and his co-authors³⁸ from the Bank of France point out that Brainard’s original contribution neglects the influence of a central bank’s actions on private sector expectations. If the central bank fails to internalise the adverse effect of its policy on inflation expectations and reacts with gradualism to uncertainty, its policy instrument will ultimately move by the same increment but, in doing so, it will create greater volatility in inflation. Thus their model serves to qualify Brainard’s gradualist approach.

There are other reasons not to apply the Brainard principle too uncritically: Wieland,³⁹ for instance, argues in a model with parameter uncertainty and dynamic learning effects by the central bank as well as market participants that uncertainty

³⁵ J Weidmann, “Too close for comfort? The relationship between monetary and fiscal policy”, speech delivered at the OMFIF Virtual Panel on 5 November 2020.

³⁶ W Brainard, “Uncertainty and the effectiveness of policy”, *American Economic Review*, vol 57, no 2, pp 411–25.

³⁷ A Blinder, “Monetary policy today: sixteen questions and about twelve answers”, *CEPS Working Papers*, no 129.

³⁸ S Dupraz, S Guilloux-Nefuss and A Penalver, “A pitfall of cautiousness in monetary policy”, *Bank of France Working Papers*, no 758.

³⁹ V Wieland, “Monetary policy under uncertainty about the natural unemployment rate: Brainard-style conservatism versus experimental activism”, lecture at the Goethe University, March 2006.

might prompt an element of experimentation in policy, thus weakening the case for gradualism. Thus, the key policy challenge is to find the right balance between waiting for additional information and not falling behind the curve.

Another point worth discussing is that a risk management approach in the context of bouts of uncertainty might lead to asymmetries in monetary policy that come with their own challenges down the road. Studies suggest that greater uncertainty has generally led to a looser monetary policy stance.⁴⁰ For the United States, Caggiano and his co-authors⁴¹ as well as Evans and his colleagues⁴² provide evidence for a risk management approach by the Federal Reserve. The latter also argue that, if monetary policy is constrained by the zero lower bound under uncertainty, the optimal policy would be to delay interest rate lift-off.

Otmar Issing described the asymmetry of monetary policy action as follows: "Most central banks seem to follow a strategy of reacting quickly and decisively in the case of an economic downturn, but only reluctantly and very moderately, when the recovery is gaining steam."⁴³

A different rationalisation of an asymmetric monetary policy response with respect to uncertainty is given by Angeloni et al in the context of the past decade's stubbornly low inflation.⁴⁴ Within an estimated DSGE model of the euro area, the authors argue that monetary policy should overstate rather than understate the persistence of inflation, and that an aggressive response to inflation shocks is advisable when there is uncertainty about the degree of inflation persistence. The cost of assuming a too low inflation persistence is higher than making the opposite mistake.

Also a monetary policy relying on r^* as a guidepost may have introduced an asymmetry in the policy reaction function during the recent past, as highlighted by Claudio Borio.⁴⁵ Temporary brakes on inflation that would imply surprisingly stable inflation rates could have led the central bank to revise r^* downwards, encouraging it to loosen its policy stance further.

In any case, central banks all over the world have employed measures hitherto considered inconceivable: pushing interest rates to zero or below, providing massive amounts of liquidity, and purchasing assets on a prodigious scale. In doing so, central banks have resorted to unconventional measures, and on an unconventional scale. Some have suggested that central banks have become inured to reacting to any kind of economic shock with additional monetary stimulus, if only to avoid being accused of inaction. Focusing on quantitative easing, Mervyn King notes that "QE tends to be deployed in response to bad news, but isn't reversed when the bad news ends. As a

⁴⁰ G Bekaert, M Hoerova and M Lo Duca, "Risk, uncertainty and monetary policy", *Journal of Monetary Economics*, vol 60, no 7, pp 771–88.

⁴¹ G Caggiano, E Castelnuovo and G Nodari, "Uncertainty and monetary policy in good and bad times", *Melbourne Institute Working Papers*, no 9/17, 2017.

⁴² C Evans, J Fisher, F Gourio and S Krane, "Risk management for monetary policy near the zero lower bound", *Brookings Papers on Economic Activity*, Spring 2015.

⁴³ O Issing, "New monetary policy guidelines: losing the anchor?", mimeo, 2022.

⁴⁴ I Angeloni, G Coenen and F Smets, "Persistence, the transmission mechanism and robust monetary policy", *Scottish Journal of Political Economy*, vol 50, no 5, 2003, pp 527–49; and G Coenen, "Inflation persistence and robust monetary policy design", *ECB Working Paper Series*, no 290, 2003.

⁴⁵ C Borio, "Navigating by r^* : safe or hazardous?", keynote lecture at the SUERF, Bocconi, OeNB Workshop on "How to raise r^* ", 15 September 2021.

result, the stock of bonds held by central banks ratchets up, expanding their balance sheets into the longer term.”⁴⁶

Indeed, central bank balance sheets have ballooned. In 2007, the central banks in the euro area, Japan, the United Kingdom and the United States had total assets ranging from 6 to 20% of nominal GDP. By the end of 2020, the Fed’s balance sheet was 34% of GDP, the Eurosystem’s 59%, the Bank of England’s 40%, and the Bank of Japan’s 127%.⁴⁷

This continued ultra-loose monetary policy was accompanied by risks and side effects. First of all, large-scale government bond purchases made the central banks the largest creditors of government. This made monetary policy more and more closely intertwined with fiscal policy. And, secondly, there were habituation effects: as cheap money and central banks were always on standby to respond to a crisis, this was increasingly seen as the norm. Such tendencies may endanger the independence of central banks. Ricardo Reis put it this way: “With its mystical ability to print money and its frequent purchases of government bonds, it is tempting to look at the central bank as a source of solace and respite.”⁴⁸

Furthermore, if central banks react asymmetrically, and systematically so, their headroom for action will diminish over time. Claudio Borio underlines another risk of this asymmetry in monetary policy, namely that it could fuel financial imbalances down the road and confront the central bank with an unpleasant trade-off: “boosting output in the near term may run the risk of a possibly larger downturn in the longer term. ... this asymmetric policy response can contribute to a downward trend in nominal rates and, given broadly stable inflation, also real rates over time.”⁴⁹

As you see, our hike has now taken us into an altogether different landscape – we have reached the Himalayan terrain of the central bank balance sheet – where, with each new shock, a new and loftier plateau is reached. But the higher one climbs, the thinner becomes the air. Indeed, central banks seem to have fallen victim to a kind of “altitude sickness”. And, in this state, finding the way back down becomes increasingly difficult.

4. Central banks’ credibility is key

Among these balance sheet peaks, central banks are currently following a variety of different routes. Some have already started their descent from the summit, some have reached a high plateau, and some are still on their way up. But for all of them, the normalisation of monetary policy will be a big challenge.⁵⁰ The highest rates of inflation in decades, structural changes in the inflation processes, and the high level of uncertainty make this task even more delicate.

The one bright spot is that longer-term inflation expectations for the United States and the euro area seem to be staying anchored around the central bank’s

⁴⁶ M King, “Quantitative easing is a ‘dangerous addiction’”, Bloomberg, 20 July 2021.

⁴⁷ S Cecchetti and P Tucker, “Understanding how central banks use their balance sheets: A critical categorisation”, VoxEU.org, June 2021.

⁴⁸ R Reis, “Can the central bank alleviate fiscal burdens?”, *NBER Working Papers*, no 23014.

⁴⁹ C Borio, “Navigating by r^* : safe or hazardous?”, *BIS Working Papers*, no 982.

⁵⁰ J Weidmann, “Crises as a catalyst for change – lessons from the past, challenges for the future”, speech delivered at the 31st Frankfurt European Banking Congress, 19 November 2021.

target. These are the fruits of the credibility that central banks have earned through their commitment to price stability.⁵¹ This provides monetary policymakers with headroom, obviating the need for them to react to each and every deviation from the target (hence reducing the costs of policy gradualism).

Although, Otmar Issing pours some water in our wine – and rightly so – when he finds that “[w]ith inflation having been off the radar for many years, it is no surprise that expectations are oriented to the past, when the dominant expectation was that price stability would continue. Central banks’ credibility played a decisive role in backstopping that view. But credibility can always be called into question.”⁵²

Thus, central banks should not overstretch their hard-earned credibility. Anchored inflation expectations cannot be taken for granted; they have to be defended time and time again. Inflation rates have been above target for quite a while now. The longer actual inflation rates exceed the target, the more likely it is that doubts will arise about the central banks’ ability – and perhaps also commitment – to stabilise inflation at the target.

Regarding the rise in inflation in the last two years, it is noteworthy that inflation rates were not correctly anticipated by surveys or market data immediately before publication. The poor ability of markets and analysts to forecast current inflation may create uncertainty about the quality of these indicators. Given this additional uncertainty, the ongoing overshooting of inflation and the repeated inflation surprises, a wait-and-see approach becomes more and more risky. If central banks’ actions are perceived to be falling behind the curve, inflation expectations could shift upwards, and suddenly.

Monetary policymakers cannot afford to wait until they see de-anchoring. Because when you see de-anchoring in the data, it is too late for a measured approach to tightening even if that risks causing an economic slump. The economic costs of reining in inflation expectations are likely to increase further over time. This is one lesson of history.⁵³

Against this background, one is reminded of the argument of Angeloni, Coenen and Smets that I mentioned earlier and that should be applied symmetrically: in order to prevent de-anchoring, the persistence of inflation should be overstated rather than understated, and a forceful monetary policy response is advisable precisely when uncertainty about it is particularly high.

Also, attempts to recoup purchasing power losses, especially in the context of a negative terms of trade shock, could trigger an inflationary spiral. Again, decisive action would be appropriate.⁵⁴ “Inflation occurs when people start talking about inflation.”⁵⁵ It is now up to the central banks to make sure that people can stop talking about inflation again. In uncertain times a firm nominal anchor becomes all the more important. For that anchor to be credible any suspicions of fiscal or financial dominance need to be dispelled.

⁵¹ T Goel and K Tsatsaronis, “Anchoring of inflation expectations: has past progress paid off?”, *BIS Bulletin*, no 51, March 2022.

⁵² O Issing, “The high stakes of rising inflation”, *Project Syndicate*, 30 November 2021.

⁵³ C Goodhart, “Inflation after the pandemic: Theory and practice”, *VoxEU.org*, 13 June 2020.

⁵⁴ R Mendes, S Murchison and C Wilkins, “Monetary policy under uncertainty: Practice versus theory”, *Bank of Canada Staff Discussion Papers*, no 2017-13, 2017.

⁵⁵ O Issing, *ibid*, see footnote 54.

5. Conclusion

Every hike comes to an end. At the end of ours, we find John Kenneth Galbraith waiting for us there. Galbraith bemoaned “the extreme brevity of the financial memory” and noted that “there can be few fields of human endeavor in which history counts for so little as in the world of finance.”⁵⁶ As far as inflation is concerned, we have to make a distinction here. Researchers have found that memories of hyperinflation last for generations, whereas those of less drastic inflation experiences tend to fade away after about a decade.⁵⁷

Thus, for most people, the current price spikes are a painful reminder of the benefits of low and stable inflation. Hopefully, these spikes will go down in history as an isolated episode. Given the high degree of uncertainty, I refrain from making predictions. But there are indications that we will have to expect a rather different inflation environment than the one we have been used to. And, given this pervasive uncertainty, central banks would be well served to show humility with respect to the complex working of the economy, their capabilities to forecast it and what monetary policy can achieve. It is my conviction that acknowledging one’s own limitations and focusing on the core mandate will help to anchor inflation expectations.

Either way, monetary policymakers need not fear what lies ahead as long as they leave no doubt about their commitment to price stability. With hard-earned credibility and inflation expectations anchored around the inflation target, central banks are well equipped to maintain price stability, even in uncertain times. This makes it all the more important that these achievements are resolutely defended by central banks. The BIS will support them with great expertise, precise analysis and a clear, independent view. That I know for certain.

Thank you for your attention!

⁵⁶ J K Galbraith, *A Short History of Financial Euphoria*, Penguin Books, 1993.

⁵⁷ M Ehrmann and P Tzamourani, “Memories of high inflation”, *European Journal of Political Economy*, vol 28, no 2, pp 174–91.

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