The return of inflation

Key findings from the 49th OeNB Economics Conference and the 35th SUERF Colloquium (May 23/24, 2022)[1]

Ernest Gnan, Kilian Rieder (OeNB and SUERF); Teresa Messner, Fabio Rumler, Mirjam Salish (OeNB)[2]

After several years of persistently below-target inflation rates, global inflation has been increasing sharply since 2021. Several driving factors have been identified: (i) the vigorous post-pandemic economic recovery; (ii) disruptions in global value chains for intermediate and final goods, due in part to short-term pandemic-related factors and in part to a possible reversal of globalization; (iii) cycles in commodity and energy production and prices, some of which may also be related to actual or anticipated climate protection measures; and (iv) labor market shortages resulting from pandemic-induced structural changes in labor demand and supply. Whether the rising inflation rates are temporary or more permanent has been subject of lively debates. Among other things, the answer hinges on the reaction of expectations and wages to the rise in headline inflation. Central banks worldwide have come under pressure to tighten their policy rates. The risk of missing a timely response and of inflation becoming entrenched, as a result, contrasts with concerns of strangling the post-pandemic economic recovery amid the fallout from the war in Ukraine and Western sanctions against Russia. At a political economy level, the interplay between monetary policy, fiscal policies and financial stability has become more complicated, with high debt, high asset market valuations and climate challenges potentially hampering central banks' perceived anti-inflationary resolve.

Against this background, on May 23 and 24, 2022, some *750 participants* attended – either in person at the premises of the OeNB in Vienna or online – the 49th OeNB Economics Conference and the 35th SUERF Colloquium to discuss the underlying drivers of inflation, short- to medium-term prospects for price developments, policy implications and the latest findings from economic research to shed light on these issues. The conference brought together *37 top expert speakers and decision makers* from central banking, the finance industry and academia.

Instead of following the sequence of presentations outlined in the conference program, this report aims to extract key insights by grouping the topics under *three overarching themes*: first, *longer-term trends and drivers of* (global) inflation (i.e., demographics, (de-)globalization, climate change and protection); second, the role of *inflation perceptions and expectations and the use of granular price data* to improve our understanding and forecasting of inflation; and third, *lessons for policy*.

1 Long-term drivers of (global) inflation: aging, (de-)globalization and climate change

In the longer term, inflation will be driven by structural forces, including aging…

In his keynote lecture, *Manoj Pradhan*, Chief Economist and Founder of Talking Heads Macro Ltd, analyzed *secular inflation trends in the 2020s*. Before sharing some of the main insights of his 2020 book The Great Demographic Reversal, co-authored by Charles Goodhart, Pradhan stressed that inflation is going to be with us for a long time. We are currently seeing three inflation cycles affecting us simultaneously: (i) inflation related to COVID-19 (supply bottlenecks, pent-up demand); (ii) cyclical inflation; and (iii) demographic inflation. In the last three decades, demographic shocks have kept inflation low. In China, for instance, internal migration from rural to urban sectors and the increasing participation rate of women have contributed to an upward labor supply shock and exercised downward pressure on wages. As the marginal product of labor usually exceeds wages and workers additionally save a share of their income, a positive labor supply shock has a deflationary effect. Yet, the working age population continues to increase only in Africa and India, while in China and Eastern Europe it has already started to decrease. The non-working population only consumes (and consumption does not decline with age); hence, as the labor force shrinks and the share of the elderly grows, inflationary pressures rise. As a consequence of these demographic developments, the debt-to-GDP ratio will increase and productivity and economic growth will not be sufficient to deal with the rising burden of debt. As a solution, apart from taxation and aggressive rate hikes, Pradhan suggested expanding central banks' balance sheets. This can serve to turn bonds into variable coupon consols, thereby forgiving debt over a long horizon.

Pradhan then analyzed the current inflation surge considering the arguments previously presented. The response to this surge depends on how large the disturbances are. Expectations, wages and prices react to what is happening right now, which means that it is important to act holistically here and now, instead of solely focusing on future inflation expectations. Bringing inflation back to its target will be a demanding task for central banks, as curbing inflation might result in high unemployment. Stagflation may pose a challenge to central bank independence, result in a possible fragmentation within the EU and have adverse effects on politics in general (e.g., high food inflation can easily derail governments and the World Bank argues that food prices will rise until 2024).

…(de-)globalization…

In the SUERF Marjolin Lecture, Professor *Harold James* from Princeton University offered a *long-term perspective on the relationship between inflation and (de-)globalization* in the form of a short preview of his book on inflation and globalization that will be published in 2023. He started out by looking at the year 1975 in the UK, when James himself was a student in Cambridge and consumer price index inflation in the UK had reached 25%. Back then, a combination of unfortunate events, lack of political will and insufficient understanding of the economy led to a backward movement in globalization. Globalization was by many perceived as a potential

threat to price stability. Similarly to today, this resulted in deglobalization being actively discussed and domestic production taking center stage.

According to James, higher inflation in times of supply shocks does not necessarily suggest that globalization is on the retreat. It rather indicates that more globalization is needed. Historically, inflation has been pushed by three factors: (i) fiscal dominance and (ii) financial dominance, which both imply that central banks must keep interest rates low if they want to avoid a financial crisis or sovereign default; and (iii) social dominance, which results in inflation being used to "buy" social peace. Given the widespread consensus that high inflation is traumatic and undesirable, as it is a strain on federal systems and leads to distributional conflicts, central banks should guarantee price stability. Historically, episodes of high inflation were followed by a return to monetary policy keeping prices and expectations under control (as was the case with the gold standard or the inflation targeting regime of the 20th century). The demand for stability, including social stability, cannot be met by the private sector.

Globalization has a big impact on inflation. It has reduced the long-run level of inflation and it has altered the relationship between economic slack and inflation. According to James, economists that claim otherwise err on the question of when globalization began. Many assume that it was at the beginning of this century, when China was admitted to the World Trade Organization, but, in fact, globalization began much earlier. We can identify two phases when globalization took off – after the 1970s and after the 1840s. In light of supply shocks caused by crop failures across Europe in the 1840s, the view emerged that Europe needed more trade to gain wider access to resources. In the 1970s, the initial reaction to supply shocks was protectionism. Only gradually did the idea that an open world would be better for everyone develop. As the world is facing major challenges, including the COVID-19 pandemic and the war in Ukraine, low inflation again is under threat. Shifts in labor and energy markets pose a challenge to the provision of fiscal relief packages; shifts in relative prices following technology and supply shocks pose a challenge to inflation targeting; and finally, costs of government borrowing are much more uncertain. When asked about the factors that will push globalization this time, James pointed to the fact that each globalization period is different. This time, it will be future artificial intelligence, electronic communication and the globalization of services that will characterize the new period of globalization. In James' view, more globalization is needed and will materialize in the future.

…and climate change and protection

In a session moderated by OeNB Director *Birgit Niessner* and dedicated to the *effects of climate change and climate mitigation on inflation*, it was shown that climate change-related shocks constitute a major risk factor for economic and price stability. After all, these shocks alter supply (e.g., bad harvests and resulting food shortages) and demand factors (e.g., higher demand for green technologies and skills), and may affect the transmission of monetary policy. Not only climate change itself but also its mitigation can affect relative prices and inflation. As was highlighted by *Blandine Barreau*, Coordinator at the International Energy Agency, governments' decarbonization efforts and respective investments still need to be scaled up drastically around the globe, and in emerging market economies in particular, to meet the net zero emission goals within the next decade. But it is not only governments

and parliaments that need to address climate change; central banks also need to take climate change and its mitigation into account. *Christiane Nickel*, Head of the Prices and Costs Division at the ECB, demonstrated that the green transition is most likely going to put pressures on energy prices and inflation in the short to medium run. According to her, only a well-managed energy transition can safeguard, in the long run, the economy against high and volatile prices, which economies around the globe are experiencing at the moment. In addition, *Luiz de Mello*, Director of the Policy Studies Branch at the OECD, noted that the green transition affects the economic performance of companies to quite varying degrees across sectors and hinges on the substitutability of brown technologies with green technologies (investments) and the progress achieved in upskilling the labor force for green jobs. *Elga Bartsch*, Managing Director at the Blackrock Investment Institute moreover pointed out that in the new higher inflation regime, which is characterized by persistently higher inflation, stronger supply side constraints and likely higher output volatility, central banks might need to critically rethink their inflation targeting frameworks and include climate change-related costs in their policy decisions.

2 What role do inflation perceptions and expectations play, and how can granular price data improve inflation analyses and forecasts?

Inflation expectations are heterogeneous across agents and driven by psychological and sociodemographic factors

The evolution of inflation expectations is key for the further course of inflation and the appropriate monetary policy response. As long as inflation expectations are well-anchored to the inflation target of central banks, the latter can pursue a gradual path of steering inflation. If, however, inflation expectations were to become deanchored, central banks would need to take far more decisive action, which might include triggering a sharp recession to break with inflation expectations. It is therefore essential for central banks to understand how to measure inflation expectations in real time. Recent research has particularly focused on inflation expectations of different types of agents (e.g., households, firms, professional forecasters, market participants) and their differences. Researchers have also investigated how inflation expectations are formed and what causes possible non-linear, abrupt changes in inflation expectations once certain thresholds are exceeded.

A panel of top economists from the ECB, Amundi Asset Management and the University of Chicago, moderated by *Ernest Gnan*, Head of the OeNB's Monetary Policy Section, discussed what role inflation expectations play for the path of inflation, what drives inflation expectations and whose inflation expectations should be monitored. *Pascal Blanqué*, Chairman of the Amundi Institute, emphasized the role of psychology as a driver of inflation expectations of financial market participants. He argued that financial markets are going through a regime shift from financial capital to physical assets, which has the potential of driving up inflation in the future. Blanqué furthermore argued that, despite their hawkish tone, central banks are behind the curve of the tightening cycle, which leads to a repricing of portfolios and risk on financial markets. *Geoff Kenny*, Head of Section of the ECB's Monetary Policy Research Division, presented new results on inflation

expectations in the euro area, obtained from the Consumer Expectations Survey conducted by the ECB. Medium-term inflation expectations (three years ahead) have remained broadly stable at 2% since April 2020, and have only recently, i.e. in March 2022, increased to 3%. Making use of a randomized controlled trial study designed to analyze the effect of communication on inflation expectations and central bank credibility, ECB researchers found that communication on the symmetric 2% price stability target, including broader explanations of the target's role and of monetary policy in general, significantly increases the credibility of central banks and has a dampening impact on inflation expectations. *Michael Weber*, Associate Professor at the University of Chicago, reviewed inflation expectations of households and firms, drawing on different data sources used in his research. He emphasized the large heterogeneity in individual inflation expectations: These were found to be higher for the main grocery shoppers in the household (mostly women), for respondents with lower IQ scores and for those exposed to higher actual inflation (poorer households). Weber also showed that inflation expectations of firms are not very different from those of households.

Inflation perceptions and expectations of households and firms are similar and driven by the same forces

Inflation expectations again took center stage in an academic session moderated by *Fabio Rumler*, principal economist in the OeNB's Monetary Policy Section, in which key findings in cutting-edge academic research from around the world were presented, pinning down the *determinants of inflation perceptions and expectations of households and firms. Angelo Gutiérrez-Daza* from the Universitat Pompeu Fabra and Barcelona School of Economics presented his paper which incorporates learning by shopping into the benchmark New Keynesian model. He finds that the learning mechanisms support central banks' efforts to stabilize inflation, as they help anchor inflation expectations. As a result, monetary policy shocks have stronger effects on real activity, i.e. the slope of the Phillips curve flattens. *Daria Minina* from the University of Amsterdam investigated the close link between inflation perceptions and expectations and showed that the pass-through from perceptions to expectations is affected by sociodemographic factors, the source of information on inflation news and individual uncertainty about inflation perceptions/expectations. *James Moberly* from the University of Oxford analyzed the parameters of individual laws of motion for households' inflation expectations, based on data stemming from a Bundesbank survey on consumers' inflation perceptions and expectations. He showed that, given the heterogeneity in the formation of individuals' inflation perceptions and expectations, the response of aggregate consumption to an inflation shock is stronger and more persistent than in a representative agent model. Based on a new Banque the France survey on firms' inflation expectations, *Frédérique Savignac* from the Banque de France showed that expectations of firms are substantially less biased and also less dispersed than those of households. She furthermore showed that expectations of firms differ depending on the position the respondent holds at the firm, i.e. on whether the CEO/CFO or a lower-level manager/employee participates in the survey. *Xuguang Simon Sheng* from the American University argued – based on data from a representative firm survey in the US – that firms' aggregated expectations of unit costs are highly correlated with aggregate inflation, as unit costs are an important determinant of firms'

pricing decisions. Thus, unit cost expectations can serve as an alternative measure of inflation expectations if the latter are not directly observable. Last but not least, *Pierre Siklos* from the Wilfrid Laurier University introduced a novel indicator measuring disagreement in inflation expectations, derived from firm-level data collected in South Africa. He showed that disagreement in inflation expectations is highly correlated with disagreement in other macroeconomic variables such as wage growth, interest rates or capacity utilization.

New advances in inflation forecasting and inflation (expectations) modeling

The second academic session of the conference, chaired by *Kilian Rieder*, principal economist in the OeNB's Monetary Policy Section, was dedicated to new advances in inflation forecasting and inflation (expectations) modeling. The common theme of all academic contributions in this session was a clear strive to improve the standard New Keynesian framework currently used in inflation forecasting and modeling. *Roland Meeks* from the International Monetary Fund, demonstrated the importance of incorporating more information on the entire distribution of heterogeneous inflation expectations in forecasting models, instead of merely relying on simple aggregate measures of survey expectations. *Philippe Goulet Coulombe* from the Université du Québec noted the problematic, yet important role of unobservables in the estimate of Phillips curves and proposed an innovative way of overcoming the weaknesses of traditional proxy variables by drawing on a hemisphere neural network model. *Alistair Macaulay* from the University of Oxford, and winner of this year's SUERF Marjolin Prize, investigated the consequences of departing from the full-information rational expectation assumption in models in which rational inattention and subjective beliefs about the economy are endogenous. Macaulay's model captures key empirical facts about the interaction between information and subjective beliefs about (the impact of) inflation, drawing on the Bank of England's Inflation Attitudes Survey. The contribution by *Sebastian Rast* from the European University Institute drew on panel data from the US Survey of Professional Forecasters to show that news about long-term inflation have a stronger bearing on forecasters' long-term expectations than incoming data on current inflation. These findings imply that the coordination of beliefs through effective central bank communication may be a more (cost-)effective tool to keep inflation at target than monetary tightening. *Fabio Verona* from the Bank of Finland closed the session by highlighting the insights that can be reaped from using a frequency-domain decomposition of inflation data and its components in the New Keynesian Phillips curve (NKPC) framework for inflation forecasting. Verona showed in particular that low-frequency versions of the NKPC can significantly outperform benchmark models.

Micro, scanner and webscraped price data enhance inflation analyses

The use and analyses of micro price data, such as those underlying consumer price indices, or of scanner or webscraped price data has gained importance in inflation research in the past decade. In the final session of the conference, moderated by *Martin Summer*, Head of the OeNB's Research Section, acclaimed academics presented and discussed their recent research, making use of such data sources. *Oleksiy Kryvtsov*, Senior Research Officer at the Bank of Canada, presented his work on how webscraped data, i.e. price data from web shops of supermarkets and

other types of retailers, can inform about consumer product shortages and their impact on inflation. With this type of data, it is possible to construct high-frequency measures of product shortages for different sectors and several countries. He identifies temporary and permanent stockouts and finds that a higher share of stockouts significantly increases prices within one to three months. This inflation response is particularly pronounced for imported goods. Furthermore, based on prices and stockouts, the costs of replenishing goods can be estimated. The co-movement of prices and stockouts suggests that higher costs of replenishing inventories were an important driver of inflation during the pandemic. A respective cost shock has a sizable but less persistent effect on inflation, driven again by imported goods. *Chiara Osbat*, Adviser at the ECB, presented the webscraping projects conducted by the Price-Setting Microdata Analysis (PRISMA) research network within the European System of Central Banks (ESCB). First, she presented the advantages and disadvantages of using webscraped data and the challenges associated with building a respective database, i.e. with validating, storing and classifying those data. Subsequently, she elaborated on the use of webscraped data, particularly for nowcasting (which can help reduce forecast errors), inflation measurement (applying and experimenting with different price index methodologies) and inflation monitoring (real time analyses). One implication from the research projects is that webscraped data are particularly useful when they are complemented with other data sources such as scanner data. These data are available at a lower frequency, but they are richer in information, as they also contain information on quantities purchased. *Fabio Rumler*, principal economist in the OeNB's Monetary Policy Section, complemented the previous presentation by discussing research projects conducted by the PRISMA network using scanner data. There are two main types of scanner data, namely supermarket scanner data (i.e., data on all items scanned at the cashier's desk of a retailer) and household scanner data (i.e., data on all items purchased by a household). With the former type of data, it is, for example, possible to study price elasticities, the pass-through of costs to prices (such as VAT changes) and price-setting behavior. Analyzing the latter type of data helps understand the heterogeneity in experienced inflation across different demographics and countries. Households experience inflation rates in multiple heterogeneous ways. This heterogeneity results from different products being bought and their differences in prices; yet, it cannot be fully explained by household characteristics, such as household income and size. In his presentation, *Raphael Schoenle*, Associate Professor at Brandeis University, took up a general criticism of inflation measures, namely that aggregate measures often hide underlying or changing price dynamics. In particular, the cross-sectional distribution of disaggregated inflation rates has systematically changed over the last decades. It has therefore become important to look at different measures and statistics of inflation and account for such changes in economic models and central banks' policy frameworks.

2 Lessons for policy

Inflation is a major concern for citizens and policymakers alike

In his opening remarks, OeNB Governor *Robert Holzmann* emphasized that the recent surge in inflation rates in Europe had been a core concern of Europeans already in early 2022, i.e. already before the start of the war in Ukraine. Governor

Holzmann raised the question of why so many policymakers and academics alike were surprised by the speed with which, and the extent to which, inflation had returned. He argued that there was only a fine line between unexpected events on the one hand and missing creativity in interpreting relevant data, limited foresight and too narrow forecasting scenarios on the other. In this context, Governor Holzmann drew the audience's attention to large global trends, geopolitics and Europe's dependency on fossil energy sources as factors that may have been partly overlooked in the recent past. At the same time, he also emphasized that the current synchronization of inflation due to global shocks and the spillovers of large idiosyncratic or regional shocks was not a new phenomenon. Looking beyond purely macroeconomic and econometric explanations for the return of inflation, the OeNB Governor highlighted the important role behavioral factors play in shaping inflation and inflation expectations. To illustrate this point, he put the spotlight on recent research showing that the reaction of individuals to unexpected inflation developments largely depends on the inflation experiences they have accumulated throughout their lifetime. Governor Holzmann also argued that the concerns and ideas of younger generations should be taken into account by policy-makers when setting out to address the present challenges. The best contribution to social peace that monetary policymakers could make would be to abide by their price stability mandate.

SUERF President *Jakob de Haan* offered a more academic perspective on the recent return of inflation. When it comes to tightening monetary policy conditions, the ECB may lag behind compared, in particular, to the US Federal Reserve and the Bank of England; yet, de Haan also acknowledged that underlying second-round price pressures may still be weaker in Europe. As a case in point, euro area wages have not picked up at the same pace as elsewhere recently. He closed with a plea for more discussions on current cross-country differences in inflation levels and recalled the weaknesses of the standard New Keynesian framework for modeling and forecasting inflation.

Why did central banks fail to see inflation coming?

In a high-level panel moderated by OeNB Governor Holzmann, top decision makers discussed timely questions related to monetary policy, policy interaction and inflation in a post-pandemic world faced with severe geopolitical tensions. Governor Holzmann first asked *why we did not see inflation coming*. Were we too focused on a low-inflation environment? For instance, he specifically raised the question of whether the discussions revolving around forward guidance were neglecting the possibility that inflation targets might also be approached from above rather than from below. By referring to the current large economic shocks (notably energy and food price shocks), *Andrew Bailey*, Governor of the Bank of England, emphasized that it was the rapid succession of adverse events that would pose major challenges. The resulting price rises would hurt the poor the most. What can and should monetary policy do in this case? When pandemics and wars happen, monetary policy must still take the necessary measures to bring inflation back as fast as possible. *Joachim Nagel*, President of the Deutsche Bundesbank, recalled that the Bundesbank had never been a proponent of extraordinarily expansionary monetary policies in the first place. Central banks should be self-critical. It would be too easy to simply say that the surge in inflation was due to supply shocks.

Since monetary policies have been very accommodative for over a decade, it was no surprise that inflation started to rise after such a long period of monetary expansion.

According to *Claudio Borio*, Head of the Monetary and Economic Department at the Bank for International Settlements (BIS) and SUERF Fellow, the BIS – like most observers – had also been surprised by the strength and persistence of inflation. In his view, we need to be very humble when trying to understand ex post what we did wrong. The current surge in inflation is due to many post-pandemic factors. We underestimated pent-up demand; the shift from demand for goods to demand for services was more persistent than thought; and global supply bottlenecks were stronger and more persistent than anticipated. The war in Ukraine – which resulted in a huge negative supply shock – had not been expected either. Furthermore, what may appear as a supply shock from individual countries' perspectives, may in fact be a demand shock at the global level. The way expectations are modeled by the Phillips curve implies that bygones are bygones. In negative terms-of-trade shocks, however, one might try to recover purchasing power losses, and this can create a self-propelling inflation process. Finally, there are no non-linearities in the Phillips curve in the sense that inflation itself may propel inflation. Once inflation moves out of the realm of rational inattention and moves into focus, the inflation process can become more entrenched. What is important now is that we do not repeat past mistakes going forward. Monetary policy was constantly trying to push up inflation in pre-COVID-19 times, which was very hard to achieve. But with the current shocks, monetary policy may or may not accommodate the rise in prices. In many countries, demand is below what it would have been in the absence of the COVID-19 shock. In other countries, output is higher than in pre-pandemic times. It is not only the level but also the speed of output growth that matters, however. If supply does not respond at the same speed, inflation will rise.

According to *Tobias Adrian*, Financial Counsellor and Director of the IMF's Monetary and Capital Markets Department, the shift in central banks' monetary policy strategies toward make-up strategies was motivated by the proximity to the zero lower bound on interest rates. Pre-pandemic inflation expectations had been on a downward trend; the Phillips curve had gradually flattened. Developments in the US have been different from other countries in this respect, however. While output is back to the pre-pandemic level in the UK, it is clearly above that level in the US. The link between money supply and inflation is far from clear. These days, supply shocks are the key drivers of inflation. Central banks have been facing a sequence of severe shocks. The risk of recession is quite high in a number of European countries. China's economy is seriously slowing down. All of this explains why central banks do not act as fast as some might expect them to do. Labor markets have largely recovered in many countries (albeit to different degrees), creating potential for upward wage pressures. Central bank credibility is key now, and at very high levels in advanced economies (AEs), which is why the central banks in these countries can look through supply shocks. In emerging market economies (EMEs), central bank credibility is lower, which is why the central banks there should not look through supply shocks. Therefore, EMEs tightened their monetary policy stance earlier and more aggressively to react to surging inflation; as a result, inflation is coming down rapidly again. In AEs by contrast,

due to higher credibility, central banks can react more moderately, all the while being careful to avoid second-round effects.

Do central banks need to fundamentally review their inflation forecasting models?

With respect to inflation forecasting, the question was raised of whether central banks' forecasting models that have not managed to forecast inflation well over the past two years should be subject to external reviews. *Claudio Borio* argued that the Phillips curve can be a useful tool, but that central banks would also need to think more broadly, notably when transitioning from low to high inflation regimes, as these regimes differ widely. When inflation is high, the common component of inflation is much bigger – there is a self-reinforcing nature of inflation. This is not included in standard models. Borio moreover argued that an external review of central banks' models would not be very helpful, since all institutions rely on the same models. Forward guidance should not be the preferred go-to tool, as flexibility is key in the current context. *Joachim Nagel* emphasized the need for checks and balances in all tools used. Whether this would require an external auditor is unclear; in any case, central banks would need sufficient resources to evaluate forecasting performance internally. Regarding wages, it seems to be clear that the German wage moderation of the last years is over. In the second half of 2022, we will see high wage settlements. According to *Andrew Bailey*, the question is what forecasting models are being used for. Unlike a clockwork, these models may not guarantee internal consistency in every instance, but they allow expert judgment to be incorporated in instances where modelling economic relationships becomes difficult. According to *Tobias Adrian*, the baseline typically behaves in a linear way, whereas specific scenarios can be identified through non-linearities. Inflation may be higher and more persistent than thought, however. On financial markets, there are already concerns about a de-anchoring of inflation expectations. On the real economic side, there are huge downside risks at this point, i.a. due to the recent economic developments in China and the war in Ukraine. In addition, probability distributions are unfortunately characterized by very fat tails at the moment, thus pointing to extreme events.

Why have central banks not reacted as forcefully to inflation as one would have expected?

OeNB Governor Holzmann moreover raised the question of *why central banks have not reacted quite so forcefully to the rise in inflation* as one would have thought. Was this due to their high credibility that allowed them to adopt a wait-and-see attitude or due to uncertainties over what caused the current shocks? Are there deep-rooted historical drivers or can differences in the speed of reactions be explained by the composition of central bank decision-making committees? Or is a very cautious and gradual response appropriate anyway? *Tobias Adrian* explained that what central banks are trying to achieve is a soft landing. Central banks always have to balance trade-offs. In EMEs, negative output gaps were much larger when inflation surged; they nevertheless responded more aggressively to the marked rise in inflation, since their central banks lacked credibility. Asset markets have corrected heavily, but these corrections have so far been orderly. Financial conditions have to become tighter, but in an orderly manner.

Claudio Borio pointed to different circumstances in different countries. In Latin America, for instance, a sharp rise in inflation required a strong monetary policy reaction. At turning points, central banks usually wait a bit – there is what is referred to as "reversal aversion." While this is not a good reason, it may partly explain central banks' behavior. Gradual responses are not mistakes; when circumstances change, this needs to be recognized (which takes time) and communication needs to be adjusted gradually. In fact, the size and speed of the surge in inflation surprised the entire economic field and all policymakers alike. Debt levels and financial vulnerability are very high worldwide; financial markets have taken on a lot of risk. Under the current circumstances, a given extent of monetary tightening may have a stronger effect now than in the past. *Joachim Nagel* recalled that there were some institutions, like the BIS, that highlighted inflation dangers early on. Central banks' inflation forecasting models failed to adequately deal with structural and serial shocks, however. *Andrew Bailey* pointed out that shocks have become bigger over time. The current aim must be to bring inflation back to target without undue damage to output. What role should forward guidance play in this context? It will likely be used also in the future, but it should be seriously reconsidered. Turning to financial stability, households' balance sheets are now more robust to shocks than in the past, due to action taken in the aftermath of the global financial crisis aimed at reinforcing financial stability.

How to deal with financial stability risks arising from monetary tightening in an already fragile situation?

When asked about potential risks to financial stability resulting from monetary policy, *Joachim Nagel* responded that when inflation rates are this high, the central bank mandate is clear on the required course of action. To reduce the risk of financial market turmoil, it is paramount to give markets clear guidance in order to reduce uncertainty and support financial stability. *Claudio Borio* emphasized that central banks have a clear mandate that they need to fulfill, while taking financial stability into account. Whenever central banks exercise this judgment, they must not fall into the trap of financial dominance. This might happen in cases where the financial system as a whole is regulated properly. Since the global financial crisis, a lot of progress has been achieved in banking systems. By contrast, in nonbank financial firms, progress is lacking. Central banks and securities markets regulators have different views on this, however. Finally, *Andrew Bailey* warned that central banks would possibly lose credibility if they tightened monetary policy too fast in a crisis and would then have to reverse course if the economy were to fall into a recession.

Improving models and paying closer attention to tail risks to avoid inflation crises in the future

In her concluding remarks, OeNB Vice President *Barbara Kolm* thanked the organizers and all the participants for a truly inspiring conference. She then offered her thoughts about what could be done to be better prepared for future inflation surges, proposing, i.a., to incorporate non-linearities into (forecasting) models, pay closer attention to tail risks, closely monitor the anchoring of inflation expectations and try to counteract adverse effects of high inflation on vulnerable households in a timely manner. She concluded by expressing her hopes that, at the next

conference hosted by the OeNB and SUERF, we will be in a position to discuss the current surge in inflation in retrospect.

(Geo-)politics play a central role for economic and price developments

The development of inflation needs to be considered in the broader context of global and longer-term (geo-)political, societal and economic developments. In his dinner speech, Martin Selmayr, Head of Representation of the European Commission to Austria and Professor at the University of Saarbrücken, raised the question of whether we are witnessing a "Zeitenwende." While Russia's war against Ukraine indeed implies a tectonic shift in global affairs, several other events – which of course cannot and should not serve to relativize Russia's aggression – have also fundamentally changed our world over the past decades (e.g., the events of 9/11, the global financial crisis, Russia's annexation of Crimea in 2014, the election of Donald Trump as US President or the COVID-19 pandemic).

Where does this "Zeitenwende" lead us to? There are five views: First, some claim that it marks the start of the age of strong leaders who shape our future, since democracies have failed. In Selmayr's view, the contrary is true: Western democracies have shown that they are capable of coping very well with the crises we have seen over the past decades and that they are likely to fare better than totalitarian regimes. A second view claims that we are now in an era of deglobalization. Again, Selmayr disagreed: The EU benefits tremendously from globalization, and a halt to trade with Russia, with its modest 3% of world GDP, does not imply a halt to globalization. On the contrary, the EU would instead even further intensify its links with other parts of the world. A third claim is that this highly disruptive period, marked by a pandemic, high inflation, economic uncertainty and – most depressingly – war, is the end of peace. In Selmayr's view, after 30 years of relying on the US, it is high time for the EU to build its own defense capacities. Of course, this does not mean that Europe now wants war. A fourth concern is that the energy crisis triggered by the war in Ukraine will put a stop to climate protection policies. In Selmayr's opinion, the EU's efforts to substitute oil and gas from Russia with other sources of oil and gas are needed to ensure energy supply in the short term. Overall, the energy crisis will boost Europe's greening and decarbonization efforts. Fifth and last, many claim that Russia's invasion of Ukraine marks the end of the rules-based international order. Selmayr, by contrast, pointed out that the international court of justice has clearly declared Russia's actions illegal. Now, not only the Western Balkans but also Ukraine and Moldova seek to join the EU. The war has undoubtedly shown that the EU is a model for the future, not of the past. To conclude, instead of living in a dystopia, we should recognize how successful our route of democracy – underpinned by a rules-based global system, openness and European integration – has been.