

## Monetary Policy Normalization: Scenarios and Risks

Key findings from a SUERF conference hosted by EY  
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### Conference Report

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*Monetary policies worldwide are at a turning point. After a long period of ultra-expansionary policies in response to the financial, economic and sovereign debt crises, monetary policy is returning towards a more neutral stance. The buoyant world economy is helping this process, while consumer price inflation globally remains unusually muted. A normalization of the monetary policy stance is necessary with a view to avoiding the build-up of dangerous financial imbalances and to creating policy space for future downturns. But it also involves risks given high valuations in a number of asset categories and high debt and financial vulnerabilities in several sectors, including banking, insurance, pension funds and government budgets. A careful and smooth management of the process of monetary policy normalization makes effective central bank communications central. Central banks' task of normalization is also rendered challenging, because usual monetary policy guideposts, such as potential output and the output gap, the NAIRU, the natural rate of interest and the inflation process itself, have been affected by the crisis and by globalization.*

*This SUERF conference, hosted and sponsored by EY, London, brought together leading academics, policy makers, and industry representatives to examine scenarios for central bank policies in the next few years. It also discussed in detail what the "new normal" of interest rates and central bank balance sheets might be, and what the economic drivers and underlying policy choices are. Various implications for financial markets and firms were discussed.*

**Mark Gregory, Chief Economist, EY**, opened the conference. He welcomed the long-standing and fruitful cooperation between EY and SUERF. The course of monetary policies in the years to come has important implications for the financing conditions of the real economy. Bringing together academic research, policy makers' perspectives and views from the private sector is particularly valuable in such a period.

**Urs Birchler, University of Zurich and President of SUERF**, appreciated the opportunity for this joint conference and dialogue and thanked EY for their loyal support for SUERF.

**Ewald Nowotny, Governor of the Oesterreichische Nationalbank**, gave this year's SUERF Annual Lecture. **Monetary policy in the euro area is at an important turning point.** After ten years of non-standard policies, a broad-based economic expansion has taken hold giving



the ECB Governing Council the opportunity to start thinking about normalization. Previous experiences with exiting from very accommodative monetary policies like the early 2000s suggest that balancing the risks of tightening too early and tightening too late is not easy. A key challenge is the real-time availability of measures for the output gap and underlying inflation. A

second challenge is the impact of prolonged accommodative monetary policy on financial markets.

Today, a key question concerns the nature of the “new normal.” Several observers argue that the functioning of our economies has changed, citing the apparent decline in long-run real interest rates over the last decades and a flattening of the Phillips curve due to the globalization of goods and labor markets, which makes domestic inflation increasingly depend on global factors beyond the remit of individual central banks. While some economists have argued for adjusting existing inflation-targeting frameworks by lowering the inflation target or switching to explicit target ranges, Governor Nowotny found that the framework of the ECB is already well equipped to deal with the evolving economic setting. The ECB has from its beginnings focused on the medium term, thereby explicitly taking into account lags in monetary policy transmission. If lags have become longer, this can be accommodated accordingly. But longer lags also mean that the side-effects on financial stability are more likely to materialize.

The ECB has lowered monthly net asset purchases from 60 billion EUR to 30 billion EUR from January 2018. But even after a possible end to net asset purchases, the broad set of measures currently in place will ensure that the ECB’s policy will continue to be very accommodative. The ECB is the only major central bank operating with negative interest rates and has signaled that rates will remain at very low levels well past the horizon of net asset purchases. Monetary stimulus will also be provided by the stock of APP asset holdings and by the ECB’s reinvestment policy. The Eurosystem should not wait too long to get the next steps of the monetary policy normalization process started.

**Session 1**, chaired by **Patricia Jackson**, dealt with **fundamental drivers of interest rates and discussed scenarios for the future**.

**Cinzia Alcidi**, **Centre for European Policy Studies**, began by decomposing long-term interest rates into two components: expectations and the term premium. Both have been declining over the past 30 years across the globe. In some countries, the term premium has even turned negative. The recent fall of the term premium



may be due to a number of factors. First, low inflation expectations may lead bonds to be viewed as an insurance against deflation. Second, quantitative easing (QE) absorbs the supply of bonds, and thereby depresses the term premium. Third, investors are seeking safe assets, such as US Treasuries and German bunds. These factors may reverse in the near future.

What drives the natural rate of interest? One approach is to investigate the demand and supply of savings. However, as the sensitivity of interest to savings and investment is hard to identify and changes over time, it is more promising to study secular trends in potential drivers of desired investment and savings. The latter are driven by a number of factors. First, an ageing population implies that the cohort of people with a higher propensity to save increases; as they retire, the future effect from demographics becomes less clear but will likely keep depressing equilibrium interest rates. Second, income inequality implies that income and wealth are concentrated among people with higher savings rates, and no reversal is in sight. Third, the savings surplus from emerging market economies is also unlikely to be reversed in the next years.

The propensity to invest is depressed by a number of secular drivers. First, in the last few years the equity risk premium (the spread between risk-free rates and the cost of capital) has increased, which may reflect increased risk aversion. As a result, the weighted average cost of capital (including debt and equity financing) has increased, thus depressing investment. Second, public investment has been falling since the 1980s. Third, the relative price of capital goods has fallen, which implies that a lower share of production is required to maintain a certain level of capital. Fourth, the profitability of

investment has sharply fallen since 2007. Fifth, increased concentration of market power may imply that the many firms with less market power earn less, leading to lower investment. It is very hard to predict whether these trends are permanent or might be reversed. A reversal of monetary policies will likely affect short-term interest rate expectations and the term premium. But it will not affect equilibrium real long-term rates.

**Phurichai Rungharoenkitkul, Bank for International Settlements**, juxtaposed the above arguments from a long historical perspective. While saving-investment factors such as productivity and demographics seem to work very well in explaining the interest rate decline over the last three decades, any correlation becomes elusive once one adopts a longer-term perspective. Overall, real factors as explanations for secular real interest rate trends find little empirical support outside of the recent period. Even the marginal product of capital, the linchpin of natural interest rate in most models, has a very tenuous relationship with real interest rates in the data.

What then are alternative explanations? A research conducted at the BIS looks at 19 advanced economies since late 19th century, and finds that reversals of real interest rate trends typically coincided with changes in monetary policy regimes. In fact, monetary policy regimes consistently explain level shifts in real interest rates over long horizons, even after accounting for real saving-investment factors. The result implies that monetary policy is not as neutral as commonly presumed. Furthermore, the study shows that the synchronized movements of global interest rates can be explained by monetary policy in the dominant country being propagated to other countries through global financial integration. Real interest rates therefore have a substantial global component, with a monetary policy root.

The question then arises whether central banks have really been passively tracking an exogenous natural real rate of interest, or whether they themselves may have been actively influencing the secular trends of real interest rates. If it were the latter, what could be the underlying mechanism? One possibility is that monetary policy induces a long-lasting real effect via demand

hysteresis and endogenous growth. Also potentially important is the role of financial booms and busts, which allows monetary policy to have a more persistent real effect than through aggregate demand. Ultimately, the debate is about the usefulness of the natural rate of interest as a practical guide for monetary policy. Indeed, most central banks use it as just one input into policy analysis, with a large grain of salt.

Where then is monetary policy headed? One scenario is that central banks continue to perceive persistently low natural rates and target the lower new normal, at least as long as inflation remains subdued. The risk is that this could lead to asset prices overshooting and even greater debt service burden. Another scenario is that central banks revise upward the trajectory of the natural rates, either because they see a reversal in saving-investment factors (e.g. ageing) or because a continued economic expansion validates a perception of higher potential growth. This would bring us closer to the old normal, with less concern about secular stagnation and the zero lower bound of interest rates.

**Session 2**, chaired by **Tom Huertas**, addressed **implications of monetary policy normalization for financial firms and markets: Are we heading towards a volatile and challenging future?**

**William Perraudin, Imperial College and Risk Control Limited**, presented a report prepared by Risk Control for the European Commission on liquidity in corporate bond markets. The report aimed to bridge the gap between regulatory and industry perspectives. While the industry remains quite pessimistic about liquidity in the corporate bond market, regulators tend to have a more optimistic view, believing that liquidity is improving after having dried up during the crisis. However, studies on which regulators base their conclusions tend to conflate risk and liquidity, such that a perceived reduction in liquidity problems may only be a reflection of a reduction in risk following the financial crisis.

Perraudin's report seeks to avoid these pitfalls by studying subsets of the market, and by considering bonds that are not traded. Having compiled the most comprehensive dataset on European bond liquidity ever

investigated, Perraudin conducted a statistical analysis that allowed him to control for risk. For example, when looking at price-based indicators of liquidity such as bid-ask spreads at a high level of aggregation, those appear to have risen dramatically during the crisis but to have been coming down to more normal levels since 2014. However, controlling for different levels of volatility shows that spreads have not really fallen since the crisis, and that there is now an enormous gap in the trading costs for bonds of different volatilities – and this raises serious questions as to whether there would be sufficient liquidity in the market in case of a crisis.

Likewise, looking at dealer inventories as a proxy for dealer profitability, it appears that there was a break in inventories towards the end of 2011, particularly for non-financial bonds. This suggests that there was a significant negative trend until the ECB began its corporate bond purchasing programme. There is no clear moment when inventories fell and markets became less liquid, which suggests that these changes are not due to a single factor, but rather to multiple forces operating simultaneously, including regulations such as the liquidity coverage ratio (LCR) and net stable funding ratio (NSFR), which together made it more difficult for institutions to offer intermediation services. As a result, questions may be asked as to whether regulations have gone too far, or at least whether it might be possible to de-risk banks' trading books without excessively increasing the cost of holding bond inventories, or whether corporate bonds might be treated differently under the LCR. In any event, the report shows that there has been a significant deterioration to liquidity in the corporate bond market, and this should be of concern to both banks and regulators.

**Peter Hahn, London Institute of Banking and Finance**, discussed the implications of monetary policy normalisation for financial firms and markets, and raised a number of questions to encourage a debate on how widely present liquidity issues in the financial system are. Most generally, when there is a liquidity crisis or a perceived change in liquidity, the critical factor is the sequencing of which assets are dumped first, and then which subcategories degrade. How to price those assets then becomes a big issue.

With the withdrawal from QE and subsidized funding programmes, banks will want to sell assets, but this could be disruptive if all banks decided to sell at the same time. Considering that loan quality has also been steadily declining, there is a re-pricing risk. While banks have taken substantial profits on the sizeable bond portfolios they hold, buyers of such instruments will be different as QE ends. Commercial banks are starting to think about whether deposits will become more competitive in a higher rate environment. In any case, it is likely that banks will be unwilling to help other banks in times of crisis, because many of the institutions that did so previously have suffered post-crisis. When thinking about who will provide liquidity if there is a challenge, it may be helpful to consider whether regulators would introduce risk-weighted capital dynamics to deal with loans that today have a certain risk weighting, but may need to change quite quickly.

From the perspective of bond investors, the increase in interest rates poses a number of challenging questions: Will some sectors of the market simply lose interest in corporate bonds? What will happen if all the bond funds exit the market at the same time? If derivatives are used more, will there be collateral shortages? All these issues point to the fact that the validity of pricing and valuations will be particularly challenging. A further question is about the effects of the lack of experience of bond trading in an increasing rates environment. In particular, Hahn is concerned about innovations such as artificial intelligence and algorithmic trading that increase the speed of trading, and thinks the prospects are potentially frightening.

As far as commercial banks are concerned, there are many questions as to whether net interest margins will actually increase, as many banks have been expecting for several years. Indeed, the supply and demand of loans and deposits are not as tightly tied as they were historically. Further, in order to satisfy their Liquidity Coverage Ratio (LCR) requirements, banks have been taking liquid money on the derivatives curves to earn more yield. They are now locked-in on those kinds of yields for many years. As a result, an increase in interest rates could mean an increase in costs for banks, but not an increase in yield for quite some time.

For central banks, the main question as rates go up is whether they will be smoothing, assuming they have the capacity to do so. The concern is that if they did so, they would effectively start guaranteeing the market again.

**Nicholas Lincoln, LCH**, offered a perspective from financial market infrastructures (FMIs), and in particular central counterparties (CCPs), for whom volatility is a key concern when considering increasing interest rates. Explaining how CCP margin models work, Lincoln argued that the issue for FMIs is not so much the absolute level of rates, but rather their relative movements. Considering a couple of examples to illustrate how risk models would behave in an increasing rate environment, Lincoln showed that models using absolute and relative returns are very different. While the former are relatively stable, the latter become “explosive” when rates approach zero, because the relative return could be infinite once rates start increasing. The upshot is that in a low rate regime it is critical to test the performance of models for a high rate regime, and in particular for the transition from low to high rates.

Looking at the evolution of Italian treasury bond yields during and after the crisis, Lincoln argued that if QE is reversed too quickly, some countries may struggle to meet interest payments on their outstanding debt without borrowing more money, which in turn could lead to a repeat of the stress events observed in Italy at the height of the crisis. Such a situation would then make it necessary to return to some form of quantitative easing. In other words, policy normalization involves a delicate balance, and it is important not to move quickly, and to keep in mind that different countries in the Euro area will have different sensitivities to increasing rates.

**Klaus Wiener, German Insurance Association (GDV)**, examined the impact of policy normalisation on insurers. Noting that unorthodox monetary policies have had a number of undesirable side effects (for example an inefficient allocation of resources, bubbles in bond markets, discouraging retirement saving and removing incentives for structural reforms in the EU), Wiener showed that yields (and in particular short-term yields) have hardly moved since the end of the crisis. This poses a challenge for insurers, as it has reduced the propensity to save – and insufficient old-age provisions are a

particular concern given looming demographic changes. In terms of their investments, insurers have already been active in response to the low yield environment (e.g. increasing the duration in fixed income portfolios and the share of investments in corporate bonds), but have not been on an excessive search for yield. However, most of their portfolios are in fixed income, and investment strategies cannot be easily changed given both regulatory constraints and the need for stable, foreseeable income. As such, policy normalization would be unambiguously positive for the insurance industry, as yields for new investments would be higher, and the present value of liabilities would be smaller. In terms of liabilities, insurers have mainly responded by increasing the variety of their products, notably with more flexible, less capital-intensive products.

As far as interest rates are concerned, since 2010 there has been a strong decline in short-term real interest rates, while potential output has not declined much. The biggest risk is a “1994-style” quick increase in interest rates. If yields snapped back up quickly, this would be problematic for the industry for a number of reasons, but mainly due to losses of reserves on fixed income products. Therefore, policy normalization and higher, more flexible bond market yields would be positive for the economy at large, old-age savings and the insurance industry. However, doing so will likely be much more difficult than it was to adopt unorthodox monetary policy measures during the crisis.



The conference afternoon was devoted to future central bank policies and challenges. **Paul Fisher, Kings College London, Centre for Data Analytics for Finance and Macroeconomics**, in his keynote speech addressed **the implications of choices for central bank balance sheets**. Balance sheets are central banks' main tool for influencing market interest rates, and it is also through the balance sheet that central banks perform their lender of last resort function.

Central banks strongly expanded their balance sheets during the crisis, and in Fisher's view they are now likely to unwind them by less than some might expect. First, most of the expansionary effect of QE has already worn off. Second, financial markets are no longer dysfunctional, so QE no longer has a notable impact. Thus, what will be more relevant for future decisions on the size of central banks' balance sheets are financial stability considerations. New liquidity and capital requirements for one thing affect how monetary policy functions. However, little attention has been paid to the operational features of central banks' monetary policies, including how their balance sheets affect financial institutions' liquidity metrics (e.g. liquidity coverage ratios, net stable funding ratios) and leverage ratios. Central banks should become more aware of these effects, and be more proactive rather than reactive in making policy choices. Given the limitations of established macro-prudential instruments, central banks might also use their balance sheets positively as a macro-prudential tool, without, however, compromising monetary policy objectives. As central banks pump liquidity into the financial system, this by necessity also increases bank reserves. This has immediate effects on the liquidity coverage ratio and on the leverage ratio.

What then are the key issues that central banks should consider when making choices regarding their balance sheet?

- First, the size of the balance sheet. Before the crisis, when reserve balances were small, central banks aiming at a certain level of interest rates had to adjust the quantity of reserves provided to the banking system to achieve this. But the interest sensitivity of reserve balances is quite weak. So central banks have considerable leeway in choosing

the quantity of reserves, without destabilizing interest rates. Banks now demand a much higher amount of reserves. Before the crisis, they held them only for payment purposes. Now they hold central bank reserves as liquidity buffers. This is also reflected in the strong increase in the scope and number of financial institutions with access to the Bank of England's balance sheet since the onset of the crisis.

- Second, before the crisis most central banks relied on a structural liquidity shortage in the banking system and on a corridor around the policy rate to control market rates. Going forward, many central banks may keep an excess supply of liquidity and switch to an interest rate floor system.
- Third, the choice between providing central bank liquidity through loans to banks versus outright purchases has financial stability implications. Loans (e.g. repo operations) are of shorter duration, they do not help banks to meet liquidity metrics, and the need for collateral implies that liquid assets become encumbered. By contrast, liquidity injected through outright purchases might come back to the banking system in many forms, including long-term funding. As such, outright purchases are favorable to banks' liquidity metrics. Therefore, QE will more generally have a role in the future as a financial stability tool, in addition to its monetary policy function.
- Fourth, it makes a difference which assets the central banks buys. Buying high quality liquid assets held by banks does not help them at all, as it just replaces one type of liquid assets in bank balance sheets for another. Buying non-bank assets, by contrast, net increases bank's liquid assets. Buying illiquid, lower quality assets increases the financial system's liquidity.
- Fifth, central banks may lend to banks longer-term, particularly during crises, thus benefitting banks' net stable funding ratio.
- Sixth, the rules on collateral eligibility and haircuts influence banks' liquidity situation.
- Finally, financial regulators may exempt reserve accounts with the central bank from leverage ratio calculations, as has been done by the Bank of England, in order not to damage banks' leverage ratio as a result of the central bank's balance sheet expansion.



So, central banks should be aware of these active choices, rather than letting them happen by default. Whether central banks have a financial stability mandate or not, they are influencing financial stability through their choices on their balance sheet.

**Session 3**, chaired by **Ernest Gnan**, on the **future course of monetary policy** started out with a discussion paper by **Charles Goodhart, London School of Economics**, who wondered why central banks have not managed to bring inflation back up to target, despite their very expansionary monetary policies. In his view the reason is the floor system for interest rates, whereby banks can deposit unlimited amounts at the central bank, safely and at zero cost, and these central bank deposits do not negatively affect banks' leverage and capital ratios. As a result, central banks have lost control over the monetary policy transmission mechanism via the banking system. What is more, central banks' non-conventional operations have damaged the monetary transmission mechanism by flattening the yield curve and, in some cases, even pushing interest rates below zero, thus damaging bank profitability.

Underlying trends have been favorable for central banks and their operational independence over the past 30 years. Interest rates, both nominal and real, have trended down. As a result, while debt ratios have been rising dramatically (except for banks since 2009 and except for Germany), debt service ratios have remained low and steady. Borrowers, especially public sector and corporate, have gained from low interest rates, as have those already holding assets, i.e. the old and the rich. Losers have been savers without assets, i.e. the young and poor, but they blame their governments, rather than central banks. Why has this been the case? Over the past 30 years, the world has seen the largest ever positive labor supply

shock. The baby boom implied that the dependency ratio declined very sharply in industrialized countries, and workers were available abundantly. Subsequently, the lifting of the Iron curtain and the rise of China, combined with globalization, meant that large swathes of the world were entering the global production and trade system. As a result, the global workforce more than doubled, creating strong deflationary forces. Therefore, inflation targets until five years ago should actually have been zero, and this would have prevented some of the decline in interest rates, which have caused the sharp increase in debt ratios.

Despite very low interest rates and high corporate profitability due to cheap labor, corporate debt ratios have risen strongly in many countries. Yet, the investment ratio was quite low. There are many possible explanations. One is that debt was used for stock buybacks, raising the return on equity and benefiting firms' management. Another is that cheap labor reduced the incentive to invest as a means of achieving productivity gains. Real wages and productivity positively influence each other mutually. A third explanation is the lack of further big technological advancements.

This will have important implications if and when monetary policy normalizes and central banks are no longer borrowers' best friends. How will politicians react? As highly indebted corporates and private households are hit by the end to very low interest rates, how will insolvencies be handled? We end up in a debt trap, in which, on the one hand, it becomes virtually impossible for central banks to raise interest rates fast and very far and, on the other, indebtedness would further deteriorate, if central banks keep interest rates quite low instead.

How to get out of this debt trap? First, growth would be the nice way out, but it is precluded by ageing populations. Countries in continental Europe would actually be quite well off if they could do as well as Japan, where the output growth per worker of the past 10 years was around 2%. Second, debt could be cancelled. But in today's financial system this would mostly hurt financial intermediaries, with negative systemic consequences. Third, inflation might be a serious possibility, as central banks' independence could be threatened as they try to

raise interest rates. With hindsight, the last 30 years of central banking may turn out to have been the golden years of central banking. Fourth, default is unlikely as, it would spell financial and economic disaster. The best option in Goodhart's view would be to switch debt into equity. The information requirements for this to become feasible might become possible with the advance in big data.

**Stephen King, HSBC**, weighed the benefits and risks from globally synchronized economic growth, and asked whether historically such periods might have the seeds of crises built into them. Looking at data from 50 countries since the late 1980s, he defined a period of synchronized global growth as one where more than 30 countries grew simultaneously above trend. There were not many years with such situations: 1994, 1997, 2000, 2004, 2006-2007, 2010 and 2017. A first category among these episodes comprises 2004 and 2010, which were periods following unusually weak growth. As a second category, years associated with financial shocks were 1994 (major bond market sell off and Mexican crisis) and 1997 (Asian crisis). A third category were years with financial crises and economic upheaval combined. These episodes were 2000 (bursting of the dot com bubble and the following recession) and 2006-2007 (global financial crisis and Great Recession).

The current situation does not fit the first category and might be associated with financial or economic upheaval. A possible reason might be collective excessive risk-taking due to a mistaken feeling of safety, à la Minsky cycles. A second reason might be that if many countries experience a boom at the same time, inflationary pressures are more likely to build up, including in asset prices. A third possible reason is monetary surprise. Years associated with a financial or economic shock, i.e. 1994, 1997, 2000 and 2006-2007, were periods when the Fed raised interest rates by more than what markets anticipated. Given the current high levels of debt, we might expect central banks to tighten monetary policies cautiously. But the synchronized boom might lead to an unexpectedly rapid monetary tightening, which might lead to abrupt asset price adjustments and economic upheaval. Besides bond markets, stock markets also appear particularly vulnerable, given high current valuations, which are comparable to the years 2000 and 1929. In such an adverse scenario, central banks would

now have little leeway left to provide additional necessary stimulus.

King found it surprising how narrowly central banks keep gearing monetary policy towards maintaining consumer price stability. In 300 years of Bank of England history, the only recessions associated with high inflation were in times of war and in the 1970s. The majority of recessions were linked to financial crises. Over the past months, bond markets have been soft, stock markets until recently very strong and the US dollar exchange rate was weak. The last situation with such a mix was 1987, when the international coordination of monetary policies broke down. Similarly, at the moment, we are witnessing a breakdown of global trade coordination.

**Christian Schulz, Citigroup**, provided Citigroup's assessment of prospects for economic growth, inflation and monetary policy in the US, the UK and the euro area. The baseline forecast is that there will be strong global growth and low inflation, trade disputes will only have limited effects, US fiscal expansion will not result in a recession, Brexit will be made with relatively long transition periods and will not trigger a recession, and the euro area will not experience another crisis. Assuming this quite optimistic base case, he set out the following monetary policy scenarios:

- Regarding net asset purchases, the Fed stopped them four years ago. The Bank of England never had open ended QE but made another expansionary monetary policy package after the Brexit referendum. The ECB will likely end net asset purchases in December 2018.
- Regarding interest rates, the orthodoxy of sequencing now seems to have become that interest rate hikes follow only some while after the end to net asset purchases (although the sequencing could, in principle, also be chosen differently). In the case of the Fed, it took 14 months – longer than expected. In the UK, it took 9 months. For the ECB, it is unclear how long “well past” the end of net asset purchases will eventually be. Citibank expects the first rate hike for June 2019. The Fed and Bank of England both chose the standard 25 basis points for the first rate hike. The ECB might initially hike the deposit facility by 15 basis points. After the first hike, it took the Fed another year until the second



one, since then it has raised rates in three steps per year. Regarding the Bank of England, Schulz expects them to hike rates every 9 months, by all means very gradually. At the ECB, President Draghi has introduced the new term „at a measured pace“. In practice, the second rate hike might happen six months after the first one.

- At some point thereafter, central banks choose to somewhat reduce the size of their balance sheets. In the case of the Fed, this happened when the Federal Funds rate reached 1 ¼ % in September 2017. The Bank of England provided guidance in 2015 that they would end reinvestments once they can cut the bank rate in the case of an emergency by 150 basis point, i.e. when the bank rate will have reached 1.5%, which will probably be in 2021. But given the uncertainties about the UK economic outlook, it might also be later. The ECB will possibly face risks of sovereign bond market upheavals once it starts to reduce its holdings.
- Central bank balance sheets will ultimately end up much larger than before the crisis, e.g. because of increased cash in circulation and banks' increased demand for central bank reserves post-crisis.
- Schulz expects the Fed interest tightening cycle to stop at 3%, the Bank of England between 2% and 2 ½% and the ECB will reach 1 ½% in 2022.

**Pasquale Diana, Morgan Stanley**, discussed the prospects for monetary policy normalisation in smaller economies in Central and Eastern Europe and Scandinavia. To capture the increasing policy divergence among those countries, Diana grouped them into three broad categories, based on where their central banks' fall in terms of four major "fault lines" that are likely to determine the speed, shape and extent of policy normalization: 1) does the economy show signs of overheating; 2) are there price and wage pressures; 3) is the central bank concerned about financial stability (and in particular the housing market); and 4) is the central bank worried about an FX appreciation if it exits from unconventional policies before the ECB does.

The first category of countries is the frontrunners, such as the Czech Republic and Romania. Their central banks have started raising rates ahead of the pack, in response to a perceived threat from wage growth, and a desire to

bring rates closer to neutral. Neither central bank is concerned about FX gains that may come from being 'ahead of the pack'. The Czech central bank started hiking rates last summer in response to faster wage growth, and wants to take rates towards neutral via a mix of higher rates and stronger FX. The ECB's outlook might influence the speed and timing of rate increases but does not determine what the CNB does. In Romania, excessively loose fiscal policy has led to overheating. The central bank raised rates twice this year already in response to overheating and inflation headed to 5%, double its target. The NBR does not have to worry about the FX when it raises rates, given that the current account deterioration represents a headwind to the currency.

The second category, which includes Poland and Hungary, are the "Goldilocks." They perceive no serious threat to the inflation outlook, and believe that wage pressure is not serious enough to warrant tightening. They believe that the trade-off between growth and inflation is extremely favorable and does not require policy action. Despite strong growth, the Polish central bank now feels that the strong growth it has witnessed can coexist with low inflation for a long time. The NBP has guided the market to expect no rate hikes this year, and possibly the next. The Hungarian central bank remains adamant that loose conditions need to stay in place and risks of overheating are negligible. Hungary's large external surplus and improving fundamentals have bought the NBH significant leeway versus the past.

Finally Sweden and Norway, which are in the third group, "Getting the House in Order", show an intent to normalize policy from an extremely loose current stance, but concerns about leverage, housing, disappointing core inflation and FX appreciation act as headwinds. These countries are heading towards an exit, but with differing levels of confidence. Inflation in Sweden has lost momentum, and there are some concerns about housing. There are indications that a postponement of the first rate hike is likely given repeated CPI disappointments. The Riksbank would probably rather err on the side of being too late to normalize rather than too early. In Norway, the central bank has been paving the way for a rate hike by upgrading its growth outlook and its interest rate path. The recent lowering of the inflation target also implies a somewhat tighter policy in the near term.