United Kingdom and Global Economics

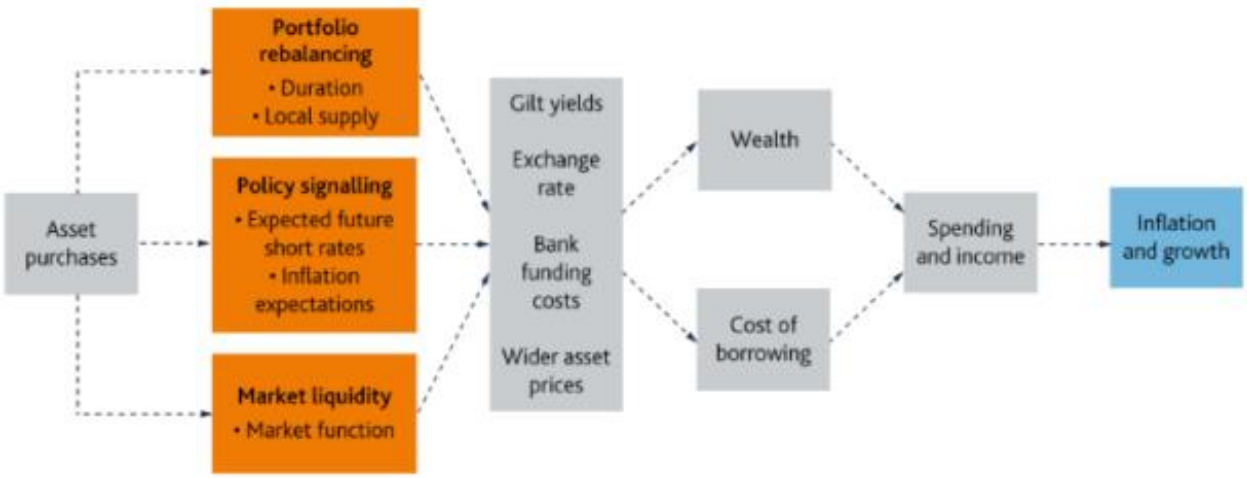
From QE to QT: Smooth transition or turbulent pivot?

Many central banks across the developed world have already begun, or are planning to begin, a transition from quantitative easing to quantitative tightening (QT), whereby they will reduce the assets they have accumulated and held on their balance sheets over the past 15 years. Expanding balance sheet holdings was one of the approaches taken in response to the economic downturn following the 2007-08 Global Financial Crisis. Its use as a policy tool continued and was extended to tackle a variety of challenges faced by economies. Although the full impact of QT remains uncertain, we have analysed a wide range of academic literature and conclude that central banks should seek to unwind their balance sheets in a cautious and well-planned manner. We believe QT will have a material impact on tightening monetary policy, particularly at times of market distress, albeit less so than recent interest rate hikes.

Quantitative Easing (QE) – Central banks' weapon of choice

At the time, the Global Financial Crisis was the most significant economic downturn across Europe since the Second World War. The nadir of the crisis saw politicians and central bankers working through the night in an effort to preserve the international financial system. As part of the response, interest rates across the developed world were slashed. The objective was to promote recovery by lowering the cost of debt servicing for companies, and to stimulate more borrowing, investment and ultimately economic growth. However, this strategy alone was not deemed to be sufficient to tackle the full scale of the crisis. Once rates started to edge close to zero, central banks started to implement what was referred to as additional "extraordinary monetary policy measures". Chief amongst these was pursuing quantitative easing (QE). At its inception, this was viewed as a temporary measure, but QE has since been repeatedly extended and used as a policy tool in response to a variety of challenges economies have faced. QE is effectively a process by which central banks create new money, which is then used to buy up government bonds (as well as other securities). Investment in these securities in turn injects capital into the financial system, providing liquidity for the banking sector.

Figure 1: Transmission of QE

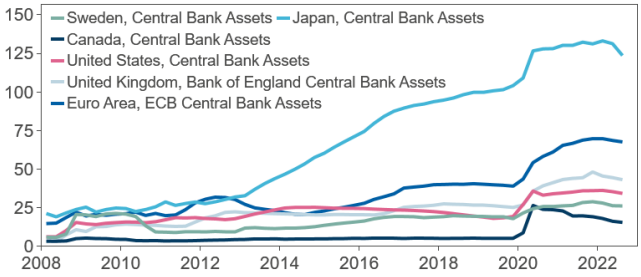


Source: Bank of England

Conceptually, the transmission mechanisms from QE policy to the macro economy are threefold: firstly, it may alter the risk profile of savings and wealth, leading to a change in the mix of financial assets held by the public; secondly, it may signal to economic agents, not least in financial markets, a commitment to keep interest rates low for longer, which can encourage business investment; thirdly, it provides liquidity to counteract tightening monetary conditions and can reassure investors in times of uncertainty (see Figure 1).[1] Lastly, in underpinning 'risk-free' asset prices[2], a wide range of asset prices that base themselves off these prices have all seen their valuations increase.

How has QE developed?

Figure 2: Central Bank Balance Sheets as a % of GDP



Source: Macrobond

Central bank balance sheets have been expanding across the developed world since 2008 – although this trend has not been uniform. The composition of QE has varied: for example, currently the Bank of England's balance sheet is mostly made up of UK Government gilts[3], while the Federal Reserve's balance sheet is composed of US Treasuries and mortgage-backed securities at a ratio of roughly 2:1[4].

The European Central Bank (ECB) took a slightly different approach to QE than the UK and the US. Following the Global Financial Crisis, the ECB initially focused on liquidity injections to restore frozen interbank activity. This gave Eurozone banks unlimited access to liquidity from the ECB at a fixed interest rate, as long as they could provide the required capital[5]. The Bank of England has also provided funding for banks via the Term Funding Scheme – offering banks the ability to borrow funds at a rate close to bank rates for up to four years – but this was only introduced in 2016[6]. In addition, the ECB made some targeted purchases of eurozone bonds to address debt crises in Greece, Ireland and Portugal in the early 2010s[7].

In Sweden's case, the Riksbank initiated its first QE programme in 2015, which was focussed on buying up Swedish government bonds. The bank then embarked on a second phase of QE when the pandemic hit. The second QE programme, however, focused primarily on the purchase of covered bonds (mortgage bonds), alongside some purchases of municipal bonds[8].

These varying approaches have meant that the scale and composition of overall balance sheet expansion has been very different across the western world (see Figure 2).

Despite the differences, QE became the policy tool of choice for central banks during the 2010s and was significantly ramped up following the onset of the COVID-19 pandemic. The balance sheets of the Federal Reserve, BoE and ECB roughly doubled as a percent of GDP over the course of the pandemic, extending already significant central bank balance sheets.

What impact has QE had?

Evidence suggests that QE has proven effective in dealing with market distress. One study looking at the GBP 200bn of QE in the UK from the onset of the Global Financial Crisis to February 2010 suggests that medium- to long-term government bond yields were depressed by 100 basis points[9], helping to improve borrowing conditions across the economy at a time of extreme financial market turbulence. The equivalent impact of the Federal Reserve's QE programme was estimated to lower the ten-year term premium on US Treasuries by between 30 to 100 basis points, highlighting how QE undertaken at sufficient scale, can lower longer-term interest rates[10] (and how wide the plausible expectations of impact might be). There

[1] *Bank of England, Staff Working Paper No.899, December 2020*
[2] *See, for example: Bank of England, The Financial Market Impact of Quantitative Easing in the United Kingdom, September 2011*
[3] At its height, the Asset Purchase Programme held GBP 875bn in gilts, while corporate debt amounted to GBP 20bn.
[4] As of week ending November 30, 2022, US Treasuries held by the Fed amounted to USD 5,532,648m and MBS were USD 2,660,660m (see: h41.pdf (federalreserve.gov))
[5] *ECB, Effectiveness and Transmission of the ECB's Balance Sheet Policies, July 2014*
[6] *Bank of England, The Term Funding Scheme: design, operation and impact, 2018 Q4*
[7] *Journal of Economic Perspectives, Unconventional Monetary Policies in the Euro Area, Japan, and the United Kingdom, 2018*
[8] *Sveriges Riksbank, Speech by Cecilia Skingsley, May 2022*
[9] *Bank of England, The Financial Market Impact of Quantitative Easing in the United Kingdom, September 2011*
[10] *Federal Reserve Bank of New York Staff Reports, Large-Scale Asset Purchases by the Federal Reserve: Did they work?, March 2010*

is also strong evidence that QE can reduce credit spreads: in France, for example, following the ECB's announcement of QE at the beginning of 2015, the riskiest 10 percent of loans with the highest interest rates displayed a credit spread of 270 basis points in Q1 2015 compared to 450 basis points in Q4 2014[11]. Evidence from the US also shows that the Federal Reserve's policy responses to the Global Financial Crisis and the more recent COVID-19-induced crisis were important in containing the rise in corporate bond spreads[12]. It is also notable that research published by the European Commission argues that QE's stabilising impact on economic activity, employment and wage incomes means that potential income and wealth inequality has been mitigated[13].

However, QE is not without controversy. There is evidence that QE conducted at times when markets are not in a state of distress can be less effective in achieving some of its goals[14]. It has also been noted by some analysts that BoE asset purchases have at times closely matched UK government borrowing requirements, leading to suggestions that QE has surreptitiously become a tool for monetary financing of government borrowing – although this is firmly denied by the Bank of England[15] and the UK Debt Management Office[16]. And while there is relatively high consensus about the role QE can play in reducing market dysfunction at times of turbulence, there is also evidence of broader long-term macroeconomic impacts. It is especially notable that while central bank analysis of QE is broadly positive, academic literature is at times more critical[17].

One of the key criticisms is that QE has inflated asset prices and potentially caused a speculative bubble across fixed income, equity and property markets[18]. Certainly the fact that QE persisted far longer than initially anticipated together with general low interest rates has given time for asset prices to drift upwards, incorporating assumptions of persistently low long-term interest rates into valuations. However, while supporting asset prices was one of the initial objectives of QE, attributing all of the asset price rises in recent years to QE would ignore broader structural market impediments. These include issues such as a planning system that constrains housing supply and drives up prices.

The scope of the inflationary impact of QE is also a contested point. Consumer price inflation has in most countries been stubbornly low until recently. QE and the expansion of the money supply has had an impact across a far broader range of the economy than is measured through traditional inflation indices, which focus on prices for goods and services. This was anticipated at the outset, with the Bank of England specifically citing 'support of asset values' as one of the expected outcomes of its QE programme. What is also notable is that the Bank of England itself estimated that the initial GBP 200bn of QE put in place after the Global Financial Crisis pushed up inflation by 0.75 percent to 1.5 percent[19].

Moving forward to 2020, there are reasons to suggest that the QE undertaken during the COVID-19 pandemic may well have been more inflationary. This is not just because the latest tranches of QE were larger than previous rounds, but also because it coincided with a period of substantial welfare spending, while other inflationary shocks such as supply chain bottlenecks and a rapid recovery in demand following the pandemic were also impacting the economy[20]. Naturally enough, this logic applies equally to other developed markets, and the scale of the QE response to the pandemic is generally thought to be exacerbating current inflationary pressures across the developed world[21].

Time to unwind QE cautiously

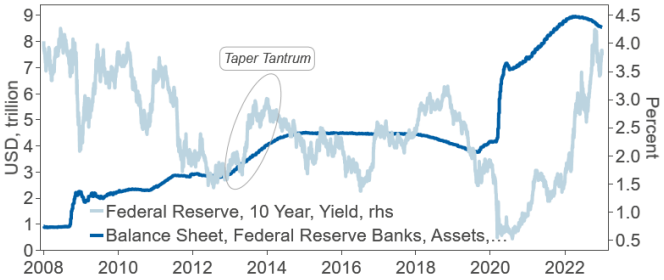
Developed economies were already seeing inflation well above their various target levels in February 2022, and when Russia invaded Ukraine, European economies – and to a lesser extent the US – faced further inflationary pressures, mostly energy-related. Central banks initiated, or accelerated, their interest rate hiking cycle in response. Interest rates are traditionally the most important tool for central banks to use in countering inflation, but many central banks

[11] *Banque de France, Quantitative easing and a lasting decline in credit spreads, November 2017*
[12] *Federal Reserve Bank of St Louis, Credit Spreads during the Financial Crisis and Covid-19, February 2021*
[13] *European Commission, The distributional effects of conventional monetary policy and quantitative easing: Evidence from an estimated DSGE model, 2018*
[14] See, for example: *Hoover Institution, Quantifying the costs and benefits of Quantitative Easing, 2022*
[15] *FT Opinion, The Bank of England's message on monetary financing needs clarity, September 2020*
[16] *OMFIF, UK DMO chief on crisis borrowing, August 2020*
[17] *NBER Working Paper Series, Fifty Shades of QE: Comparing findings of central bankers and academics, April 2021*
[18] See, for example: *Most Wiedzy, Quantitative easing policy and its impact on the global economy, 2022*
[19] *Bank of England, Staff Working Paper No. 899, December 2020*
[20] *House of Lords Economic Affairs Committee, Quantitative Easing, November 2021*
[21] *Kenneth Rogoff; "The Age of Inflation"; Foreign Affairs; Nov-Dec 2022*

also examined how they might undertake the process of unwinding their accumulated QE asset purchase programmes. The logic behind such a move seems to be threefold: firstly, the move acts as an additional disinflationary brake alongside rising interest rates; secondly, for a monetary policy instrument to be effective in future, it needs at some point to return to 'normal'; and thirdly, QE has distorted the cost of capital and as a consequence raised asset prices, so QT could well contribute to a reversion to mean for the yields of a range of assets. The process of unwinding QE is known as quantitative tightening (QT).

This process of QT is not without risk. The link between falling asset prices and broader economic confidence has been extensively debated, and while it does depend on the asset under consideration, housing values resonate more with consumers' idea of their wealth than pension fund holdings[22], so our view is that the relationship between the two is meaningful.[23]. Concerns have also been raised that as central banks seek to shrink their balance sheets, the private sector is being asked to absorb additional government bonds, and such a process could add unwelcomingly high upward pressure on yield curves[24], which in turn would raise the cost of capital across the broader economy. In 2013, the mere announcement of a reduction in bond purchases by the US Federal Reserve led to a spike in US Treasury yields – the so-called "taper tantrum". This was seen as imperilling broader financial markets and the policy was rapidly reversed. Notably, when in 2017 the Federal Reserve actually began to reduce the size of its balance sheet, it made a successful effort to communicate its policies more effectively and there was a much less volatile reaction from financial markets (see Figure 3).

Figure 3: US Balance Sheet vs 10 Year US Treasury Yield



Source: Macrobond

This experience of QT highlights two important principles for central banks. The first is that changes to QT programmes will need to be fully explained and communicated in a way that provides financial markets with confidence. The second is that central banks need to implement QT more slowly than they did QE, allowing asset prices to adjust and private sector investors to absorb assets previously held by central banks without causing market dysfunction. There is very limited experience with QT and its potential impacts. Some estimates suggest a modest impact from QT in the short term. For example, Morgan Stanley has modelled the changes in financial variables and concluded that balance sheet normalisation in the US this year is equivalent to just 25bp in hikes in Fed Funds[25]. However, if QT turns out to have an equal and opposite impact to that of QE, then central banks would be justified in being cautious.

Central banks appear to be heeding this advice. As of December 2022, the ECB has only committed to reduce its roughly EUR 9trn balance sheet by EUR 15bn per month by not reinvesting all of the principal payments from maturing assets (passive QT), initially for the four months from March 2023[26],[27]. The Federal Reserve on the other hand is planning a faster QT process this time compared with its previous programme from 2017–19. However, the economy is now at a more advanced stage of the business cycle and the Fed has made sure it is communicating its plans[28]. It presented its initial plans for shrinking its balance sheet in January 2022, added full details of the roll-off schedule in May, and began implementing that plan in June[29]. The BoE started its QT programme passively in March 2022, waiting for assets in the Asset Purchase Programme (APP) to mature before

[22] *See, for example:* *The Impact of Housing and Financial Wealth on Household Consumption: Evidence from Hong Kong, 2007*
[23] *D Berger, V Guerrieri, G Lorenzoni, J Vavra; "House Prices and Consumer Spending"; NBER, August 2017*
[24] *NIESR, Quantitative Tightening: Protecting Monetary Policy from Fiscal Encroachment, July 2021*
[25] *Milford, What impact will quantitative tightening have on Markets?, September 2022*
[26] *ECB, Christine Lagarde press conference, December 2022*
[27] *Note that the ECB's balance sheet will also reduce when banks repay loans via the TLTROs programme*
[28] *Vanguard, The Fed's plan to shrink its balance sheet, quickly, May 2022*
[29] *Federal Reserve Bank of Richmond, The Fed is Shrinking its Balance Sheet. What does that mean?, 2022 Q3*

moving gilts back to the private sector. At the start of November, the BoE became the first central bank to embark on active sales of gilts in its Asset Purchase Programme – the move to active QT being agreed unanimously by the Monetary Policy Committee[30]. At this stage, the BoE's active QT programme is seeking to sell GBP 40bn over a twelve-month period (a process started in autumn 2022) alongside GBP 36.6bn of passive QT from July 2023 to January 2024. The active sales are being timed to smooth out the path of balance sheet unwinding, filling in gaps between passive QT, all with the aim of providing as smooth and predictable a path as possible (see Table 1).

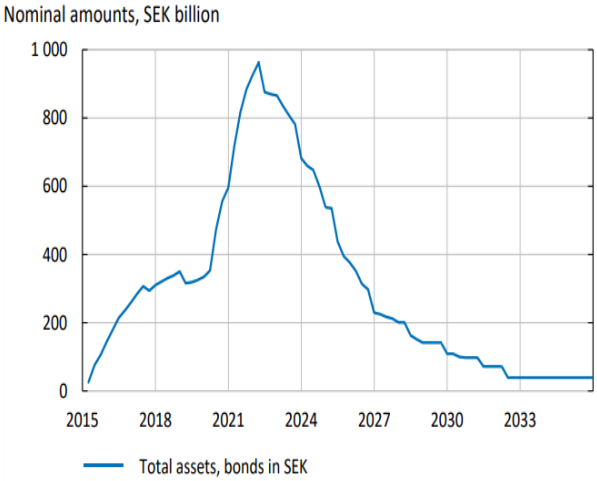
Table 1: Assets due to mature by 2024 in the Bank of England's Asset Purchase Programme

Gilt Maturity date	Total purchase nominal (GBPbn)	Cumulative (GBPbn)
07.03.2022	25.1	25.1
22.07.2022	3.2	28.3
07.09.2022	5.9	34.2
22.07.2023	14	48.1
07.09.2023	19.7	67.8
31.01.2024	2.9	70.7
22.04.2024	19.6	90.3
07.09.2024	23.5	113.8

Source: Pantheon and Bank of England

The maturity profile of other central banks' asset holdings – which are often much more short-dated than the assets in the BoE programme – mean that active QT is not required. Take Sweden's Riksbank, for example. By simply embarking on passive QT, it is estimated that the Riksbank's balance sheet will have halved by Q2 2025 (see Figure 4)[31].

Figure 4: Passive QT pathway in Sweden



Source: Riksbank (Swedish Central Bank)

What will be the impact of QT?

In terms of the impact that QT may have on monetary policy, the BoE estimates that GBP 60bn of QE undertaken in August 2016 was equivalent to cutting the bank rate by around 50bp[32]. Given this was conducted at a time of high market stress after the EU referendum, it could be argued that QT (or, indeed, QE) does not necessarily always have such a big impact on financial conditions. However, recent research from the US Federal Reserve sets out its views on the potential impact of QT. It estimates that reducing the US balance sheet by USD 2.5trn (i.e. by nearly 30 percent of the assets held by the Federal Reserve) would be equivalent to increasing the policy rate by 50bp on a sustained basis[33]. Assuming that the Bank of England pursues GBP 40bn of active QT until summer 2023, and then continues passive QT until mid-2025, at that point the gilt holdings in its Asset Purchase Programme will have shrunk by around 28 percent compared with its peak level of GBP 875bn[34]. If the impact in the UK is similar to that felt in the US, QT in the UK could end up being the equivalent of increasing interest rates by roughly 50bp by mid-2025, with financial conditions further tightening if additional balance sheet reduction takes place. This estimate is highly contingent on market conditions. It should be noted that this could be a very conservative estimate as some analysts believe that QT will have outsized

[30] *Bank of England, MPC meeting, September 2022*
[31] *Cecilia Skingsley, High inflation and a rising repo rate – what happens to the Riksbank's balance sheet?, May 2022*
[32] *Bank of England, Mark Carney speech: A Framework for All Seasons?, January 2020*
[33] *Federal Reserve, Substitutability between Balance Sheet Reductions and Policy Rate Hikes: Some Illustrations and a Discussion, June 2022*

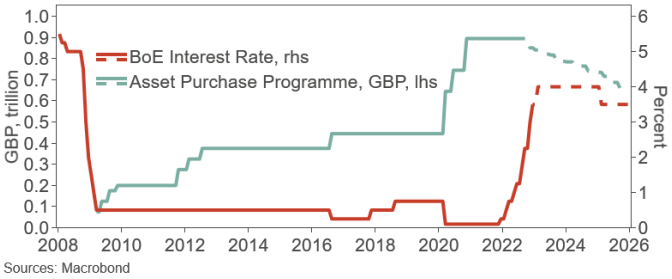
[34] *According to the BoE, the remaining stock of APF gilt holdings currently stands at GBP 831.7bn (accounts for GBP 10bn of active QT). BoE estimates that passive QT will take holdings down to GBP 659.6bn by mid-2025. Accounting for remaining active QT, this figure would fall to GBP 629.6bn. Compared to initial holdings of GBP 875bn, this would be a 28% fall.*

effects on financial stability and lead to equivalent increases to the bank rate being much higher[35].

Box 1: QE will start costing the UK Treasury money – how should UK authorities respond?

Interest rates are now typically higher than the average yields on gilts held in the Asset Purchase Programme. This means interest payments on reserves issued to finance gilt purchases are now estimated to cost the UK Treasury (which has agreed to cover the BoE's losses) over GBP 130bn over the next six years (OBR Economic and Fiscal Outlook November 2022). In light of tight government finances, one idea that has been floated in the UK is to stop paying interest on commercial bank reserves held with the Bank of England. However, no longer paying commercial banks interest on their reserves could pose significant financial stability risks. These commercial bank reserves are crucial to ensuring banks have sufficient liquidity reserves to manage stress events and are necessary for prudential regulation. If interest were no longer paid on holdings in the central bank, commercial banks might seek to place the reserves elsewhere, leaving the financial system more susceptible to a liquidity crisis (see, for example, David Smith in The Times 23.11.22). In addition, there is a matter of fairness. The UK Treasury was happy to bank the surpluses that these QE operations generated over the past decade, to retrospectively change the rules now that the Treasury finds the situation reversed would undermine the BoE's credibility as it works to promote financial stability. Other central banks are, of course, grappling with the same issues: for example, it is estimated that the Riksbank in Sweden could require a multibillion injection of sums as large as SEK 50-70bn (approximately USD 4.8-6.7bn) due to writedowns in the value of its QE programme and interest payment costs arising from rising interest rates (Handelsbanken Macro Comment, Time to pay the piper, October 26, 2022).

Figure 5: UK Monetary Policy and the pathway for BoE balance sheet unwinding



Sources: Macrobond

Note: The pathway assumes GBP 40bn of active QT and the BoE not reinvesting the proceeds from maturing assets (passive QT) until the end of 2025.

Challenges unwinding QE

The BoE has been at the forefront of implementing QT, although these best-laid plans, seeking to wind down asset holdings in an orderly manner, have already been upset. Initially, active QT had been due to start at the beginning of October 2022. However, market and political turmoil led to issues surrounding pension funds and the long-dated gilt market, meaning not only that this plan had to be delayed, but QE resumed with an emergency bond buying programme having to be hastily started[36].

Other central banks could very well face similar challenges. The Bank of International Settlements has recently warned that risks in non-bank financial sectors could prompt liquidity interventions from central banks to backstop financial systems, which would undermine attempts to tackle inflation[37]. Indeed, a similar situation whereby central banks are simultaneously engaging in both QE and QT could yet emerge in the eurozone if spreads between Germany and peripheral Euro economies widen beyond a certain limit. The ECB's first line of defence would be flexible reinvestment of assets contained within the Pandemic Emergency Purchase Programme, but it has also proposed a Transmission Protection Instrument[38], which could lead in extremis to a further selective bond-buying programme to address "undue market pressures"[39].

Pressures on sovereign debt markets could also emerge from elsewhere. For example, a potential pivot towards tighter monetary policy by the Bank of Japan could lead to broader global market disturbances

[35] *See, for example:* *CNBC, Some market players are starting to fear a major policy error from a central bank, September 2022*
[36] *Bank of England, Bank of England announces additional measures to support market functioning, October 2022*
[37] *Financial Times, Market turmoil threatens to undermine efforts to curb inflation, says BIS*
[38] *ECB, The Transmission Protection Instrument, July 2022*
[39] *K Martin; "Markets will test the ECB's resolve"; FT; 22 July 2022*

given Japanese investors currently have substantial holdings of foreign sovereign debt[40].

Conclusion: What next?

While both the Federal Reserve and the Bank of England have managed to proceed with QT, what is also certain is that as the QT process gets underway, we are likely to see situations where central banks will be required to remain agile, altering monetary policy, including initiating fresh rounds of QE, in response to market disturbances.

Interest rates across the developed world have increased markedly over the course of 2022, and this will undoubtedly be the primary driver of asset revaluations. At the same time, there are justifiable concerns as to what additional impact QT might have on asset values, and in turn, what impact those asset revaluations might have on the wider economy. As we have set out, QT in the UK could be the equivalent of a 50bp increase in interest rates by mid-2025, with financial conditions further tightening if additional balance sheet reduction takes place, although there is considerable uncertainty associated with these estimates. Should market distress increase in the future, it is very plausible that the impact of QT could be larger. In light of this uncertainty, central banks across the developed world will need to unwind their balance sheets in a cautious and well planned manner.

With respect to the potential impact that tighter monetary policy, mainly driven by higher policy rates, will have on asset prices, the three broad categories are: debt, equity and property.

For debt, the impact of rising yields has been experienced before, and so the scope and scale of the response in prices will be well understood, if not always welcomed. There are implications for business investment too. Raising the cost of capital, in whatever form, is clearly going to curtail investment, although it is also likely to mean better returns on investments. As for business leaders delaying investment as a result of QT, arguably what we are experiencing is not temporary tightening, which businesses could wait out, but rather a long-delayed reversion to mean. Central banks' holdings of assets will be falling steadily for some time to come, so there is little reason to delay investing in the hope that fresh tranches of QE will again begin to drive up asset prices. Business leaders may well find it better to reassess expected payouts of investment projects and decide whether to proceed based on the new reality of the world in which we find ourselves.

For equity, there are two implications. Loose monetary policy helped equity valuations to surge, because corporate earnings were rising and because the future valuation multiple placed on these cash flows steadily increased. More conservative outlooks on potential future earnings, alongside more realistic views on the multiples that should be attached to future earnings, have pulled back equity valuations. Secondly, we are seeing the end of an era in which companies were able to drive up earnings per share by reducing outstanding equity shares through exchanging equity for (low-priced) debt. This will come as an unpleasant shock to investors who have grown used to this practice delivering long-term capital gains.

Lastly, a look at residential property prices in the UK. The implementation of QT and the raising of longer-term costs of capital is clearly going to have an impact on the cost of debt and thus property prices. We note that residential property rental yields naturally deliver a premium over gilt yields, and that in broad terms, the steady fall in gilt yields over the past decade has been mirrored by falling property rental yields (i.e. rising house prices). Given the reversal of gilt yields from their all-time lows in August 2020, we expect property yields to follow suit, albeit given lower liquidity that is part and parcel of the property market, with a lag of up to two years. Rising property yields could of course come from rising rents, but a far more likely course will be a decline in house prices. Certainly in the UK we are forecasting house prices to drop from peak to trough by roughly 10 percent in nominal terms.

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[40] *For example, Japanese investors are the largest foreign holders of US Treasuries (Bloomberg data, 29.12.22)*

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