7 November 2023

The Best Way to Fight Inflation[1]

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Do we need to rethink our monetary policy framework either in the light of what we learnt through the 2021-23 global inflation shock, or as a result of major structural changes that we know to be underway in the global economy?

[1] An earlier draft of this paper was presented at the Nomura Foundation Macro Economy Research Conference on "Monetary Policy and Its Impact During Inflation" on 19 October 2023

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Contents

Section 1: Overview

The global inflation shock of 2021-23 has once more focussed economic policy makers around the world on the challenge of controlling inflation.

According to the latest IMF World Economic Outlook[4] global headline inflation peaked at 11.6% in the second quarter of 2022 (at a quarterly annualised rate) compared with an annual average rate of 3.5% in 2019-17. It has subsequently declined to 5.3% (as of Q2 2023). However, the experience has raised two distinct, but related questions.

First, are there lessons we need to learn on how to fight inflation from the experience of the shock itself? And second, are there other trends underway in the global economy and politics that should lead us to update the current monetary and financial stability framework?

The two decades up to the 2008-9 Global Financial Crisis (GFC) saw the emergence of a broad consensus in advanced - and many emerging - economies on the most effective way to control inflation and maintain financial stability.

Key elements included: independence (or operational autonomy) of monetary and financial regulatory authorities; use of an inflation targeting policy framework with a symmetric target range around 2%; emphasis on transparent frameworks and effective communication; and the use of short-term interest rate as the sole policy instrument.

This was supplemented after the GFC with (a) the use of Unconventional Monetary Policy (UMP) such as Quantitative Easing (QE) in circumstances where the zero lower bound (ZLB) for interest rates had effectively been reached; and (b) the development of new policy frameworks and instruments to ensure macro-financial stability along-side the operation of monetary policy.

However, this framework has been severely tested during the past three years. Central banks had to cope first with the complex and fast changing impacts of the pandemic followed by the global energy, fertiliser and food shortages that followed Russia's attack on Ukraine. This created a very difficult policy making environment.

But some commentators also argue that central banks compounded the inflation problem through significant and consequential errors in how they ran monetary policy - both in the period from the GFC to the pandemic, and then during the pandemic itself. More specifically, after each shock, they kept monetary policy too loose for too long.

To the extent this was true, it raises the question of whether the errors arose because of flaws in the consensus framework itself, or how it was operated. For example, did central

[4] International Monetary Fund (2023), *World Economic Outlook October 2023: Navigating Global Divergences*, International Monetary Fund, https://www.imf.org/en/Publications/WEO/Issues/2023/10/10/world-economic-outlook-october-2023

banks misdiagnose how the pandemic - combined with government lock downs and financial support for those affected - would affect the balance of supply and demand?

In any event, to correct the multi-decade high inflation that emerged by 2022, central banks were forced to raise interest rates very rapidly from early 2022 onwards.

Ideally the adjustment in interest rates would have been more gradual, but once the inflation surge was underway this was no longer an option.

In some countries the speed of the interest rate increase led to stress in the financial system, either because lax prudential regulation had allowed certain banks to become too exposed to interest rate volatility or because tougher market conditions exposed long-standing management weaknesses.

It has also had distributional effects in so far as the poor are generally less able to protect themselves than the rich from surging inflation due to inelastic demand for basic consumption goods, lack of credit facilities and proportionately greater reliance on conventional energy supplies.[5]

A further question, therefore, is whether there is more that should be done, alongside reviewing the monetary policy framework itself, to mitigate the impacts of very sharp interest rate rises on the economy. This could include strengthening existing prudential and macro-prudential instruments and/or expanding their scope and better monetary and fiscal policy coordination.

Lastly, as we consider the lessons to be learnt for the interest rate setting framework from the recent inflation shock, we should also take the opportunity to ask whether there are other structural changes underway in our economies and politics which may require changes in the established framework for fighting inflation.

In this paper we focus on four such factors: the trend towards **fragmentation** in global markets for goods, services, labour and capital; the appearance of **much bigger and more frequent economic shocks** reflecting geopolitical, climate-related, global health and other developments; the impact of enormous **new spending needs for the net zero transition**; and the trend towards **greater political polarisation** which could threaten public consent for monetary policy independence.

This is not an exclusive list of trends (which might include fintech and digital currencies, public and private sector debt overhangs) that could yet prove large enough to impact on the operation of monetary policy and its institutions, but we argue they are currently the most significant and also most in need of pre-emptive action by central banks.

Analysis of these factors could reenforce the lessons for monetary policy to be learnt from the recent inflation shock or it may suggest other measures that it would be prudent to take.

[5] Pabst, A., and Mosely M. (2022), 'The Unequal Impact of Rising Inflation', National Institute of Economic and Social Research Blog, 31 January 2022, https://www.imf.org/en/Publications/WEO/Issues/2023/10/10/world-economic-outlook-october-2023

Our focus in this paper is primarily on the advanced economies (US, euro area, Japan and UK), although we also highlight lessons that we think are of wider applicability in e.g., emerging economies. This is important as in the course of the pandemic several emerging economies adopted new post-GFC techniques, such as quantitative easing, which had until then only been seen in the advanced economies.

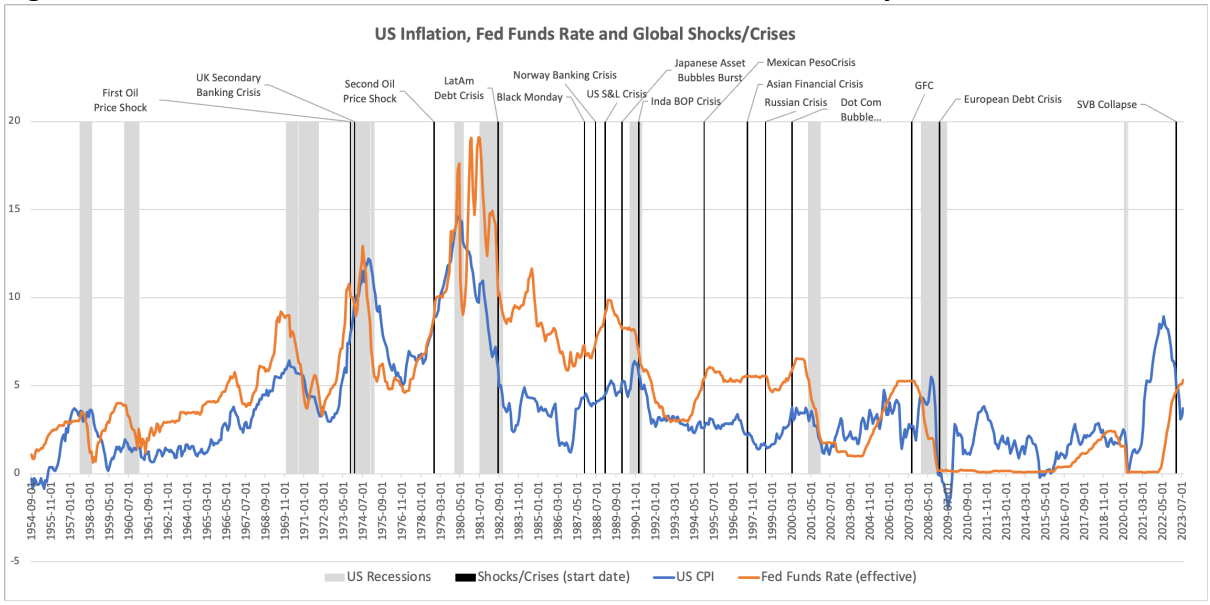
This rest of this paper is structured as follows. Section 2 describes the key elements (and their origins) of the broad consensus on how to control inflation and maintain macro-financial stability that prevailed in advanced economies and many emerging economies in 2019. Section 3 sets out different ways of viewing the causes of the 2021-23 global inflation shock. It then considers the critique now made by some commentators of central bank actions during the crisis and what this might mean for the consensus monetary policy framework. Section 4 describes in more detail the four trends that appear likely to have important implications for the operation of monetary policy in the years ahead and which it would be advisable for central banks to anticipate. Section 5 concludes by proposing practical policy measures, based on the previous analysis, which could enhance both the core monetary policy framework and complementary policies.

Section 2. The pre-pandemic consensus on the most appropriate monetary policy framework

This section sets out briefly the key elements and origins of the consensus on how to control inflation and maintain financial stability, as established in the decades before the GFC, and how that has evolved in the aftermath of the GFC. It also highlights some of the differences in how the model was implemented between the major western economies. The aim here – in the space available - is to draw out the stylised facts rather than provide a rigorous academic review.

The links between inflation, monetary policy and financial stability have been clear in the post-Bretton Woods exchange rate era. Figure 1 highlights how forceful policy rate increases, in the context of inflation pressures, have often been followed by financial sector stresses or crises.

Figure 1. US Federal Funds Rate, CPI Inflation and Financial Stability



Source: FRED database, NBER

Monetary policy has prevailed as the dominant counter-cyclical policy used to pursue price stability and a broad consensus has emerged on the key elements of an effective monetary policy framework. This has however been achieved through a combination of painful policy and conceptual mistakes, crises and concerted research efforts. Financial stability frameworks have also converged in the major advanced economies, although there remains some diversity in views on the role of monetary policy in pursuing financial stability.

Historical perspectives on fighting inflation

The "Great Inflation" (mid-1960s through early 1980s) period in the US "brought a transformative change in macroeconomic theory and, ultimately, the rules that today guide

the monetary policies of the Federal Reserve and other central banks around the world".[6]

The background to the Great Inflation period was the post-War dominance of (Keynesian) fiscal policy, large deficits ("Great Society" spending and the Vietnam War) and elevated growth of the money supply (above real GDP)[7] which were already contributing to inflation exceeding 6 percent in early 1970. The Nixon administration continued deficit spending, appointed presidential councillor Arthur Burns as Fed chair and suspended the dollar's link with gold in 1971 (effectively ending the Bretton Woods system of exchange rates and taking the world into the fiat money era).

The first oil price shock hit in 1973, contributing to inflation in the US peaking at over 12 percent in late 1974. Even when base effects fell out, headline inflation remained above 5 percent as inflation expectations became entrenched and money growth remained high. The second oil price shock contributed to headline inflation peaking at over 14.5 percent in 1980.

Enter Paul Volker, the "pragmatic monetarist"[8], who took the helm of the Fed in 1979 and proceeded with aggressive hiking of policy rates, which were associated with recessions and then substantial declines in inflation. These policy actions (while deeply unpopular at the time in many quarters) credibly brought down inflation and inflation expectations.

Bernanke[9] noted that Volker "came to represent independence…He personified the idea of doing something politically unpopular but economically necessary." **The importance of credibility, inflation expectations and a central bank insulation from political pressures to keep rates low or monetise deficits were particularly highlighted by this experience**.[10]

Following Volker, monetary policy began to be more consensual and Issing (2010)[11] suggests three reasons:

1) A conviction emerged to avoid the painful mistakes of that period;
2) Research was spurred by this experience to carefully study the question of optimal monetary policy; and,
3) Given the Bundesbank's relative success with inflation over that period, its model was increasingly seen as a different and successful option.

[6] Bryan, M., "The Great Inflation: 1965-1982", Federal Reserve History, 22 November 2013, https://www.federalreservehistory.org/essays/great-inflation.
[7] Ibid.
[8] Meltzer, A. H. (2009), *A History of the Federal Reserve*, Vol. II, book one, Chicago
[9] New York Times, 9 December 2019.
[10] One of the first policies of the UK Chancellor of the Exchequer Gordon Brown (after labour won the election in 1997) was to make the Bank of England independent and this quote from his announcement speech nicely summarises the general rationale: "The previous arrangements for monetary policy were too short-termist, encouraging short but unsustainable booms and higher inflation, followed inevitably by recession. This is why we promised in our election manifesto to ... reform the Bank of England to ensure that decision-making on monetary policy is more effective, open, accountable and free from short-term political manipulation."
[11] Issing, O. (2010), "The Development of Monetary Policy in the 20th Century – Some Reflections", Policy Colloquium at the National Bank of Belgium Brussels, 29 April 2010.

Two (eventual Nobel-Prize-winning) theoretical contributions during the Great Inflation period were central to underpin the effectiveness of monetary policy.

- Work on rational expectations highlighted how interactions between policy makers and private agents - and their expectations formation - are central to the formation of optimal monetary policy.[12]

- The theory of time-inconsistency of policy[13] suggested an inherent bias towards inflation given the constant temptation for policy makers to boost output through surprise expansions of the money supply.

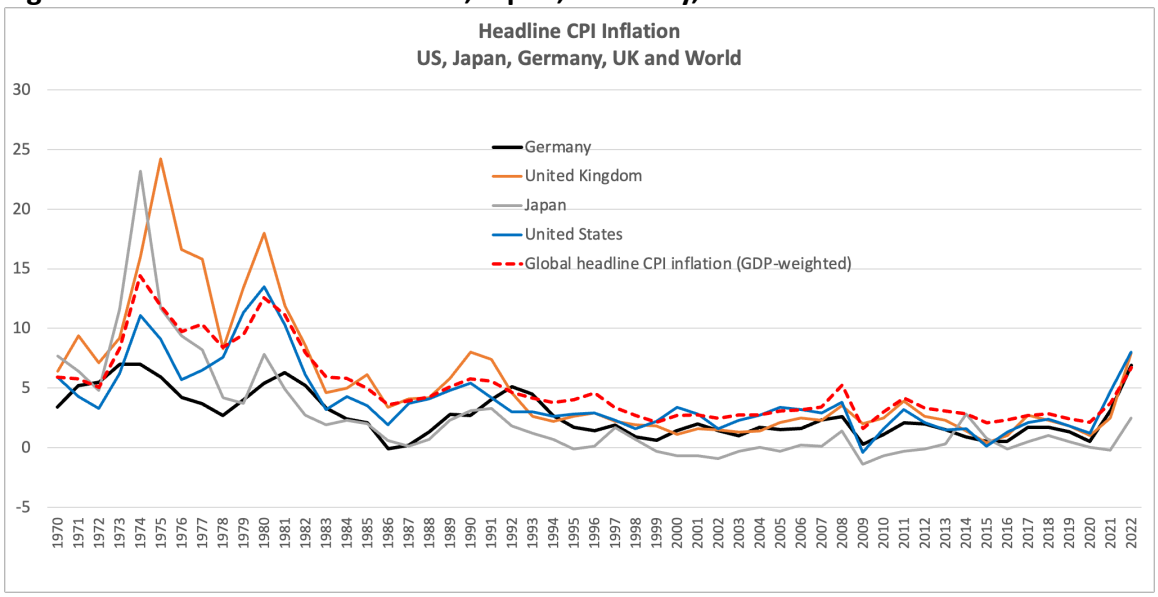
To address the inflation bias problem, Barrow and Gordon (1983)[14] proposed removing monetary policy discretion to ensure a time-consistent adherence to the price-stability objective. This did not resonate with central bankers as a viable option given their reality of facing complex and unpredictable circumstances. Yet thinking about monetary policy rules did have some very constructive consequences, including the approach of addressing time-inconsistency through credibility and communications and the insights of the Taylor rule[15]. Rogoff (1985)[16] also demonstrated how the inflation-bias from the time-inconsistency problem could be reduced in the context of an independent and conservative (with a core focus on stabilizing inflation) central bank.

The Great Inflation was largely a global phenomenon with a notable exception of Germany (see Figure 2). The Bundesbank "model" worked well during that time which focused attention on how it differed from monetary policy in other major economies. Germany's experience of hyperinflation and loss of two currencies (1923 and 1948) strongly shaped the preferences of people in support of conservative monetary policy focused squarely on price stability.[17] Independence of the Bundesbank from political interference was embedded in (what became) the Law Concerning the Deutsche Bundesbank (1957). This mandated "safeguarding the currency", which was soon interpreted as maintaining price stability.[18] The Bundesbank adopted a monetary targeting (rule-oriented) approach post Bretton Woods which seemed to save Germany from the Great Inflation but also contributed to the Deutsche Mark being one of the most stable of the major currencies until the adoption of the Euro. Thus, the German central bank model was also important in shaping both monetary research and practice. The public acceptance of a very hard form of independence

[12] Lucas (1972), "Expectations and the Neutrality of Money", Journal of Economic Theory, 4, 103-124. There is now a vast literature on the role of expectations in monetary policy. While much of the literature on optimal monetary policy adopts New Keynesian models and emphasises rational expectation, the assumption of rational expectations is generally thought to fall far short of reality. See for example, Blanchard, O. (2018), "On the future of macroeconomic models", Oxford Review of Economic Policy 34 (1-2), 43-54.
[13] Kydland, F. and Prescott, E. (1977), "Rules Rather Than Discretion: The Inconsistency of Optimal Plans", *Journal of Political Economy*, pp. 473-491
[14] Barro, R. and Gordon, D, "A Positive Theory of Monetary Policy in a Natural Rate Model", *Journal of Political Economy*, Volume 91, Number 4, Aug., 1983
[15] Taylor, J (1993): "Discretion versus policy rules in practice", Carnegie-Rochester Conference Series on Public Policy, no 39, pp 195–214.
[16] Rogoff, Kenneth. 1985. "The Optimal Degree of Commitment to an Intermediate Monetary Target." Quarterly Journal of Economics 100: 1169-1189.
[17] Issing (2010) previously cited.
[18] Ibid.

was reflected subsequently in the constitutional arrangements for the ECB, and in the German resistance to quantitative easing in the aftermath of the GFC.

Figure 2: Headline CPI Inflation: US, Japan, Germany, UK and World



Source: World Bank Inflation Database[19]

To sum up the implications of the most important theoretical developments and hard-won practical experience around the Great Inflation:

- **Anchoring inflation expectations** is the key and that involves establishing **credibility** (established by a consistent track record) and **independence** of central banks (both legislative and de facto) with a clear **price-stability** target.

- The roles of central bank **communications** and **transparency** as credibility-building devices (especially for inflation targeting – see below) have also risen over time and are now seen as essential parts of a credible and successful monetary policy.

Following the volatility of the Great Inflation period (1965-1982) came the **Great Moderation** – typically taken as the period from 1985 up to the 2007 (ahead of the GFC). During the Great Moderation, inflation was on average less than half the level of the Great Inflation period and was also much less volatile (see Table 1).

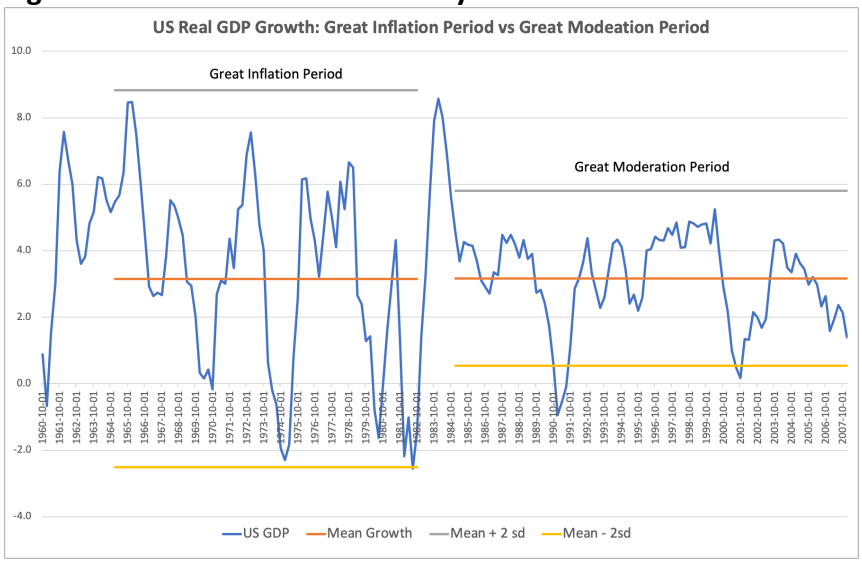
[19] Ha, J., Kose, M. A., Ohnsorge, F. (2021), "One-Stop Source: A Global Database of Inflation", Policy Research Working Paper; No. 9737. World Bank, Washington, DC."

Table 1: Great Inflation vs Great Moderation: Average Inflation and Inflation Volatility

	Germany	Japan	UK	US
		Average Inflation		
Great Inflation (1965-1982)	4.3	7.3	10.3	6.5
Great Moderation (1985-2007)	1.95	0.66	3.21	3.05
		Inflation Volatility (Standard Deviation)		
Great Inflation (1965-1982)	1.78	4.77	5.99	3.36
Great Moderation (1985-2007)	1.32	1.25	2.00	1.07

The **Great Moderation** also was a period of reduced volatility of output and extended cycles in the US and other advanced economies (see Figures 3a and 3b). This improved macro stability is often attributed to the improved counter-cyclical policy frameworks that prevailed[20], as described above, but could also be due to good luck (less severe shocks for example) and changes in the structure of advanced economies.[21] Advanced economies saw a decline in the share of manufacturing (which tends to be more volatile) and a rise in the share of services - this would tend to reduce volatility. Other structural factors – such as technology, deregulation, increased global trade and capital flows, and just-in-time supply chains might also contribute to lower volatility of output.

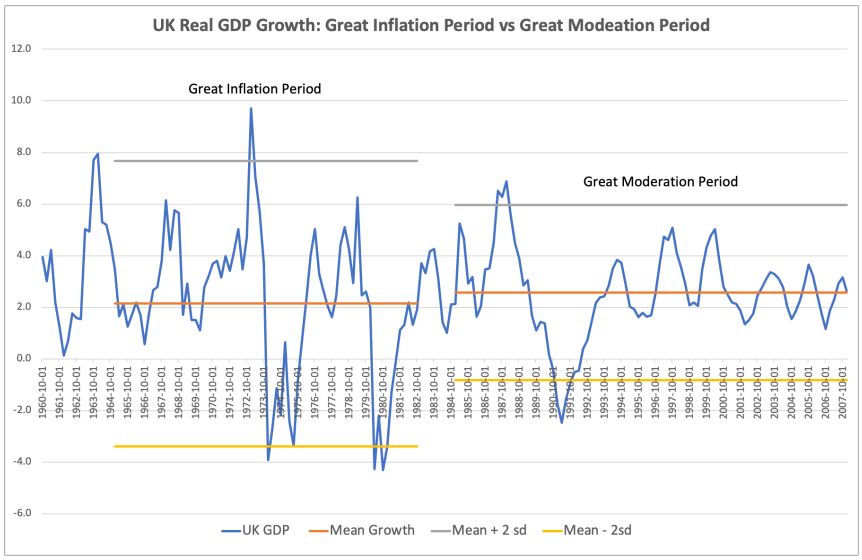
Figure 3a: US Growth and Volatility: Great Inflation Period vs Great Moderation Period



Source: FRED Database and authors' calculations

[20] Cecchetti, S. G., Flores-Lagunes, A.; Krause, S. (2004), Has Monetary Policy Become More Efficient? a Cross Country Analysis", NBER Working Paper, 2004.
[21] Hakkio, G., "The Great Moderation", Federal Reserve History, November 2022. https://www.federalreservehistory.org/essays/great-moderation

Figure 3b: UK Growth and Volatility: Great Inflation Period vs Great Moderation Period

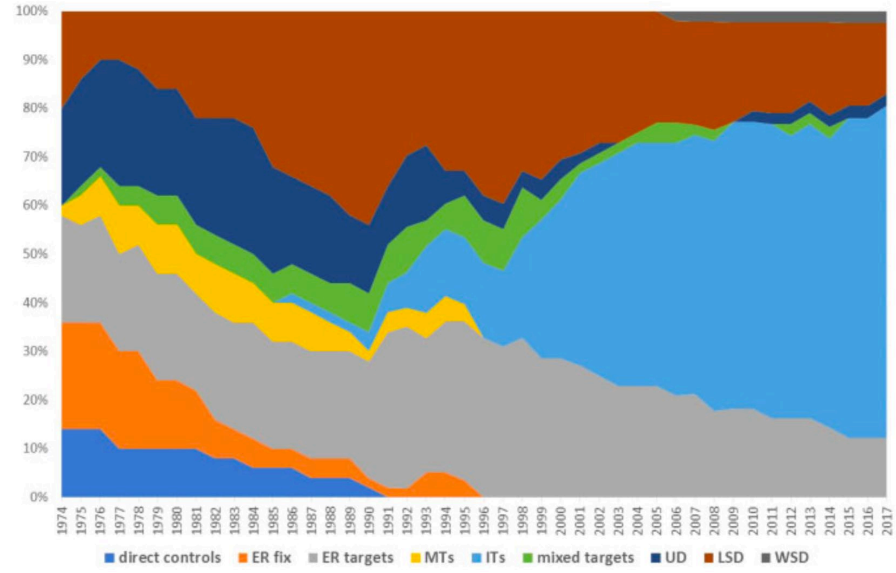


Source: FRED Database and authors' calculations

The consensus monetary policy framework before the GFC

A variety of monetary policy frameworks (and related nominal anchors) persist across the advanced, emerging, and low-income countries, spanning exchange rate targeting, monetary aggregate targeting, inflation targeting and other eclectic frameworks. [22]

Figure 4: Incidence of Monetary Policy Frameworks Over Time (all countries)



Source: Cobham (2021) (ER=exchange rates; MT=monetary targeting; IT=inflation targeting; UD=unstructured discretion; LSD=loosely structured discretion; WSD=well-structured discretion)

[22] Cobham, D. (2021), "A comprehensive classification of monetary policy frameworks in advanced and emerging economies", Oxford Economic Papers, 73(1), 2021, 2–26.

The introduction of an inflation targeting (IT) monetary framework, pioneered by the Reserve Bank of New Zealand in 1989, brought many of the prevailing elements of monetary policy consensus together in a compelling way. IT involves adoption of an explicit and published inflation target, publication of the central bank's inflation forecasts, and monetary policy—within an independent central bank—primarily geared towards ensuring the inflation forecast moves to the inflation target over a specified timeframe. The framework necessitates high degrees of transparency and accountability and effective communications; and has been adopted by an increasingly large number of countries according to a recent monetary framework classification system[23] (see Figure 4).

The ECB and Fed have adopted many of the elements of IT but do not officially call themselves inflation targetters. Since the adoption of its new framework in 2020, the Fed's framework has been described as moving from *flexible inflation targeting* to ***flexible average inflation targeting***, with the Fed's long-run objective for inflation shifting to it seeking "to achieve inflation that averages 2 percent over time"[24].

Whether formally or flexibly pursuing an inflation target, the major advanced economies or regions have converged on **operationally independent central banks** with a **focus on an inflation target** (annual target, range, on average or over the long term) and full employment as primary objectives, using **inflation forecasts** (with substantial **transparency** and **communication** around these), using **overnight policy interest rates** as a primary instrument, and open market operations (OMOs) and lending/deposit facilities to keep overnight market rates around the target policy rate. Unconventional monetary policies are discussed below.

Pre-GFC, the **monetary transmission mechanism** under traditional monetary policy in an advanced country involved changes in the **policy rate** (monetary policy instrument) affecting **market rates** (and thus cash flows and credit), **asset prices** (and thus wealth and collateral values), **expectations/confidence** (and thus consumption and investment) and **exchange rates**[25] which push aggregate demand towards aggregate supply (output) and thus guide inflation towards the target range. The full transmission lags of monetary policy are thought to be long and variable, and a meta study[26] suggests these can exceed 2 years in advanced economies. There was already much discussion about the flattening of the short-run Phillips Curve (implying a higher sacrifice ratio) prior to the pandemic.[27]

[23] Ibid.
[24] *2020 Statement on Longer-Run Goals and Monetary Policy Strategy*, effective August 27, 2020.
[25] Exchange rates affect aggregate demand via the tradable sector but also have a more direct effect on inflation via the impact on the domestic price of imported goods.
[26] Havraneka, T. and Rusnak, M., (2013), "Transmission Lags of Monetary Policy: A Meta-Analysis", *International Journal of Central Banking*, December 2013.
[27] "Another key development in recent decades is that price inflation appears less responsive to resource slack. That is, the short-run price Phillips curve…appears to have flattened, implying a change in the dynamic relationship between inflation and employment." Federal Reserve Vice Chair Richard Clarida, remarks delivered on Sept. 26, 2019. https://www.federalreserve.gov/newsevents/speech/clarida20190926a.htm

Country variations in the pre-GFC framework

While all four central banks we consider have features of inflation targeting or flexible inflation targeting there are some important differences in key aspects such as mandates, definitions of targets, operating instruments and operations and communication and transparency frameworks.

Mandates: all 4 central banks target price stability, and the Fed also has another mandate to promote maximum employment (and thus is often referred to as having a dual mandate).[28] The ECB's monetary policy framework is perhaps the most complex as it has to consider the 20 member countries.

Definitions of Price Stability: The definition of price stability also varies between the four central banks and has changed over time.

- In the ECB, the Governing Council had originally defined price stability as "a year-on-year increase in the Harmonised Index of Consumer Prices (HICP) for the euro area of below 2%" and indicated price stability "is to be maintained over the medium term". In 2003, the Governing Council clarified that it aims to maintain inflation rates below but close to 2% over the medium term[29], while in the latest (2021) review[30] it has moved to "aiming for 2% inflation over the medium term" stressing the target is symmetric (such that negative and positive deviations are equally undesirable). The ECB also plans to consider costs of owner-occupied housing by eventually including these in the HICP and in the meantime, to consider estimates of these in its wider set of inflation indicators.

- In 2012, the Fed defined explicitly (for the first time) price stability as an inflation rate of 2 percent. Following the 2019-2020 review of monetary policy, the *2020 Statement of Longer-Run Goals and Monetary Policy Strategy* indicated "the Committee seeks to achieve inflation that averages 2 percent over time, and therefore judges that, following periods when inflation has been running persistently below 2 percent, appropriate monetary policy will likely aim to achieve inflation moderately above 2 percent for some time."[31] (This is the *flexible average inflation targeting* mentioned earlier). The Fed considers, as its measure of inflation, the annual change in the price index for personal consumption expenditures (PCE) rather the CPI.

[28] In practice, all central banks will consider economic conditions in setting monetary policy within the flexibility they have on the speed of returning to the price stability goal.
[29] See ECB: https://www.ecb.europa.eu/ecb/educational/shared/img/MP_0806_300dpi-textsheet.en.pdf
[30] See ECB's monetary policy strategy statement: https://www.ecb.europa.eu/home/search/review/html/ecb.strategyreview_monpol_strategy_statement.en.html
[31] See Fed: https://www.federalreserve.gov/monetarypolicy/review-of-monetary-policy-strategy-tools-and-communications-statement-on-longer-run-goals-monetary-policy-strategy.htm

- In 2013, Bank of Japan (BOJ) defined price stability explicitly for the first time as 2 percent in terms of the year-on-year change in the CPI.

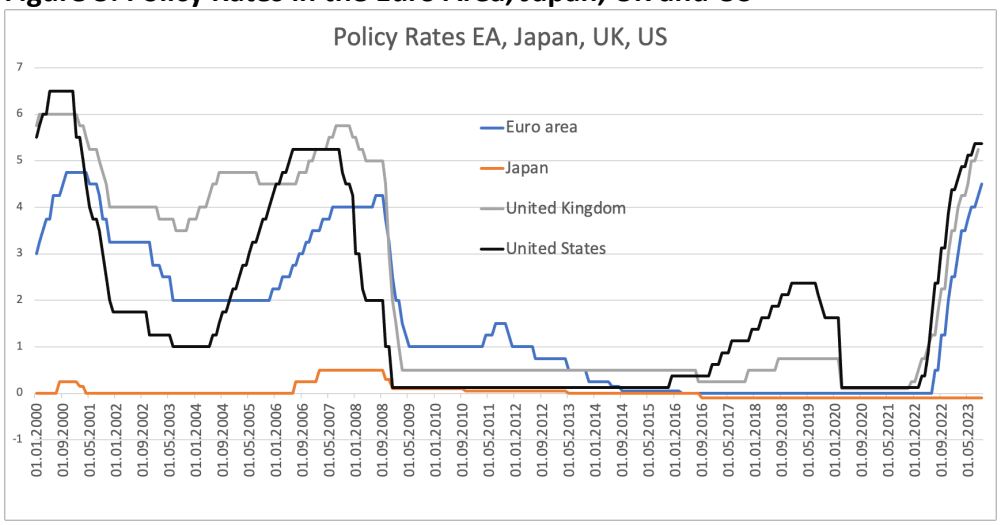
- In the UK, the Government sets the inflation target for the Bank of England (BOE) at 2%. If the BOE misses this target by more than 1 percentage point on either side, the Governor of the BOE must explain why in a letter from the Governor to the Chancellor of the Exchequer.

Unconventional monetary policies post GFC

During the GFC, all four major economies/regions faced the Zero Lower Bound (ZLB) – see Figure 5 - yet greater monetary accommodation was clearly desirable (e.g., Taylor rules suggested the need for substantially negative rates during GFC and especially so during the COVID shock – Figure 6).

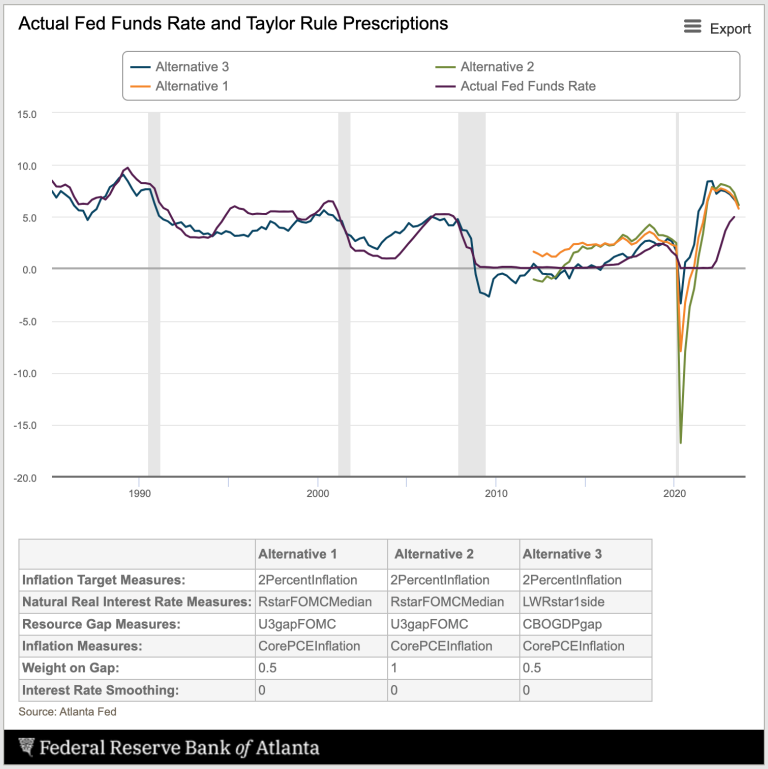
Unconventional monetary policies (UMP) were adopted around the GFC and aimed to restore the functioning of financial markets and intermediation; and provide further monetary accommodation at the zero lower bound. At the short end of the rates spectrum, some central banks adopted **negative rates** on banks' reserves at the central bank (e.g., Danish, Swiss, and European Central banks in 2015 and BOJ in 2016). While zero turned out not to be the lower bound, there was an **Effective Lower Bound (ELB)** in practice to how negative policy rates could get. Concerns about the effects of negative rates meant the Fed and BOE chose not to use negative rates, which stands out as one key difference between the ECB's and BOJ's UMP toolkit versus that of the Fed and BOE.

Figure 5: Policy Rates in the Euro Area, Japan, UK and US



Source: BIS policy rate statistics

Figure 6: Taylor Rules for the Fed Funds Rate



	Alternative 1	Alternative 2	Alternative 3
Inflation Target Measures:	2PercentInflation	2PercentInflation	2PercentInflation
Natural Real Interest Rate Measures:	RstarFOMCMedian	RstarFOMCMedian	LWRstar1side
Resource Gap Measures:	U3gapFOMC	U3gapFOMC	CBOGDPgap
Inflation Measures:	CorePCEInflation	CorePCEInflation	CorePCEInflation
Weight on Gap:	0.5	1	0.5
Interest Rate Smoothing:	0	0	0

Source: Atlanta Fed

Federal Reserve Bank *of* Atlanta

Notes: In the default settings of the chart, "RStarFOMCMedian" refers to the difference between the medians of the longer-run federal funds rate and PCE inflation projections made by FOMC meeting participants. "LWRstar1side" is the most recent estimate of the natural (real) interest rate from the Laubach and Williams (2003) model regularly updated by the Federal Reserve Bank of New York. "U3gapFOMC" is twice the negative of the difference between the (quarterly) unemployment rate and the midpoint of the central tendency of the FOMC meeting participants' longer-run projections of it. "CBOGDPgap" is the percentage point difference between real GDP and the most recent estimate of potential real GDP made by the Congressional Budget Office. "CorePCEInflation" is the four-quarter inflation rate for the chained price index of personal consumption expenditures excluding food and energy. The default range of the chart starts at 1985:Q1, but users can zoom into a narrower plot range by selecting the area inside the chart they would like to display. To incorporate changes to the settings of the chart, click the "Draw chart" button.

Source: Atlanta Fed: https://www.atlantafed.org/cqer/research/taylor-rule#Tab1

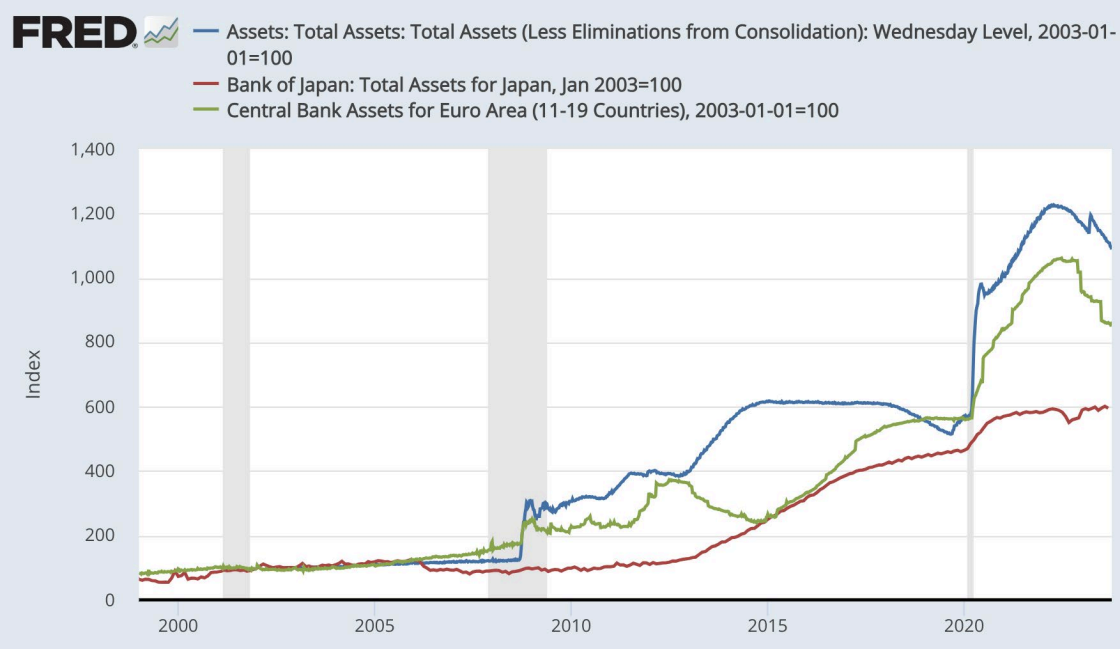
Expansionary monetary (at the zero-lower bound) could still reduce real interest rates (nominal rates minus expected inflation) if inflation expectations can be boosted by monetary policy. Hence central banks moved on to target real long-term yields[32] through:

a) **Forward guidance** – a commitment to maintain low rates for a period of time or until a condition is met. Forward guidance (if credible) can push down longer rates (and flatten the yield curve) and thus provide further accommodation.

b) **Large scale asset purchases commonly called Quantitative Easing or QE** which could work through a number of channels including signalling (monetary policy options beyond the ELB), portfolio rebalancing and exchange rate effects. Quantitative Easing (QE) added "portfolio rebalancing" to the transmission channel—where central bank bond purchases would push investors along the risk spectrum—which, together with liquidity and policy signalling, worked to push up risk asset prices and weaken exchange rates and thus support aggregate demand.

[32] Making explicit the definition of price stability by the Fed in 2012 and the BOJ in 2013 (as discussed above) were used to help anchor expectations (which were deflationary at the time).

Figure 7: Balance Sheets of the Fed, ECB and BOJ (index=100 in Jan 2003)



Source: FRED Database

QE was already in use by BOJ since March 2001 in the context of their balance sheet recession and monetary policy already at the ZLB. This QE was in a relatively modest scale compared to their Quantitative and Qualitative Easing or QQE from 2013. The quantitative aspect referred to the purchase of Japanese government bonds (JGBs) and the qualitative element referred to purchases by BOJ of risk assets such as ETFs and J-REITs to influence premia on risk assets (as well as bond yields). Since 2013, BOJ's balance sheet has expanded dramatically (Figure 7), and it adopted a policy of yield curve control (YCC) in 2016 to target 0% yields on 10-year JGBs (while the target short-term rate was -0.1 percent).[33]

In the US and UK, centrals banks adopted QE after hitting the ZLB.

c) US QE is often categorised into three separate stages purchasing US Treasuries and mortgage-backed securities, starting in November 2008 and tapering of purchases were announced in June (starting in September) 2013 (see Figure 7).

d) The BOE began its QE programme in March 2009, but employing certain constraints (such as not buying more than 70% of any issue of government debt and only traditional government debt with more than 3-year maturity).

The ECB engaged in large-scale purchases of covered bonds from May 2009 but resistance to QE from important members of the EA meant that the ECB would not "admit" to QE until much later. In January 2015, the ECB President (Draghi) announced an expanded asset purchase programme (a dramatic and long-awaited change in policy to more forceful and effective use of the ECB balance sheet to ease monetary conditions).

[33] Despite the dramatic rise in policy rates in other major countries, BOJ's policy rate remains unchanged (at the time of writing in October 2023) at -0.1% and the YCC was eased in July to allow 10-year JGBs to reach 1%.

With inflation in the post-COVID period reaching multi-decade highs, the major central banks – with the exception of BOJ - have moved to quantitative tightening (QT) and have hiked policy rates dramatically starting in December 2021 with BOE (see Figures 7 and 5 respectively). Inflation and monetary policy in the post-COVID period is discussed in Section 3.

Financial stability frameworks post-GFC

Financial stability frameworks (FSFs), including the choice and implementation of policy instruments, have converged less clearly than monetary policy frameworks in the major economies. Financial stability mandates (FSMs) also seemed to have played a secondary role within major central banks pre GFC.[34] Indeed, during the pre-GFC period, financial stability, and monetary policy – during "normal" times – were often seen as separable, with financial regulation and supervision being done outside of (or moved out of) central banks. Under conditions of financial stresses or crises, central banks have typically provided liquidity and other support, and eased monetary conditions to temper the impact of a financial crisis on the real economy. Yet the scale of the GFC required unprecedented policies by central banks[35] and governments and pointed to large scale and systematic failures of national (and international) frameworks for financial stability.

Key research questions on FSFs/FSMs include:

- Should the primary financial stability mandate be within the central bank or in a separate agency (such as a consolidated financial supervisory agency)?

- What should be the primary instruments of a FSF (e.g., macroprudential, microprudential, exchange rate intervention, and capital flow management tools)?

- What weaknesses/issues within the pre-GFC FSFs/FSMs in major economies contributed to the GFC outcome? Are the post-GFC FSFs fit for purpose?

- How should we define financial stability and what are the trade-offs between financial stability, price stability and employment?

- What is the role of monetary policy in the context of financial stability – should monetary policy "lean" against the formation of asset bubbles or should it help "clean" in the post-bubble aftermath.

- Should the central bank consider monetary and financial stability in a more integrated framework and if so, how?

[34] Toniolo, G. and White E.N., (2014), "The Evolution Of The Financial Stability Mandate: From Its Origins To The Present Day", Working Paper 20844, http://www.nber.org/papers/w20844

[35] ECB President Mario Draghi was seen by many as turning around the euro crisis with the "whatever it takes" commitment (to Europe and the euro area) in the context of the debt crisis.

Below we provide a brief review of the key elements of FSFs adopted post-GFC and some of the important ways monetary policy and FSFs interact (including how monetary and macroprudential policies have been, or should be, used together).

During the Great Moderation, a focus of monetary policy on price stability (together with other structural factors) reduced inflation levels/volatility but perhaps at the price of neglect of financial stability. In the aftermath of the GFC, the importance of FSFs was clear and resulted in major changes in approaches, instruments and institutions. Development of macroprudential (focused on the financial system) in addition to micro-prudential (focused on soundness of individual institutions) policies was given considerable attention.

One feature of the post-GFC landscape was greater collaboration through international agencies including via the establishment (by the G20) of the Financial Stability Board (FSB) in 2009 to "promote international financial stability…by coordinating national financial authorities and international standard-setting bodies as they work toward developing strong regulation, supervision and other financial sector policies".[36] Enhanced standards were also developed by international standard setters including the Basel III capital adequacy framework. Monitoring was enhanced through the FSB, BCBS, and IMF (surveillance and FSAPs). Attempts to address too-big-to-fail included implementation of Total Loss-Absorbing Capacity (TLAC) and more intensive supervision of globally systemically important banks (GSIBs).

Responses in the major economies had some common features:

a) Restructuring of FSFs. The number of Financial Stability Committees (formal or de facto), went from 11 in 2008 to 47 a decade later (with the vast majority including their finance ministries, central banks, and prudential regulator in these committees)[37]

b) The regulation of systemically important financial institutions (SIFIs) including via levies on large banks.

c) Adoption of Basel III capital requirements

d) Miscellaneous other improvements including accounting reforms; enhanced risk management; improved transparency and reporting; improved resolution frameworks; stress testing; and improved liquidity management.

By far, the most distinctive new tool in the policy toolkit used to reconcile price and financial stability has been the use of macroprudential measures in both advanced and emerging markets (Figure 8).[38] Macro-prudential measures now commonly used include: loan-to-

[36] https://www.fsb.org/about/

[37] Edge, R. and Liang, N. (2019), "New Financial Stability Governance Structures and Central Banks," Finance and Economics Discussion Series 2019-019. Washington: Board of Governors of the Federal Reserve System, https://doi.org/10.17016/FEDS.2019.019

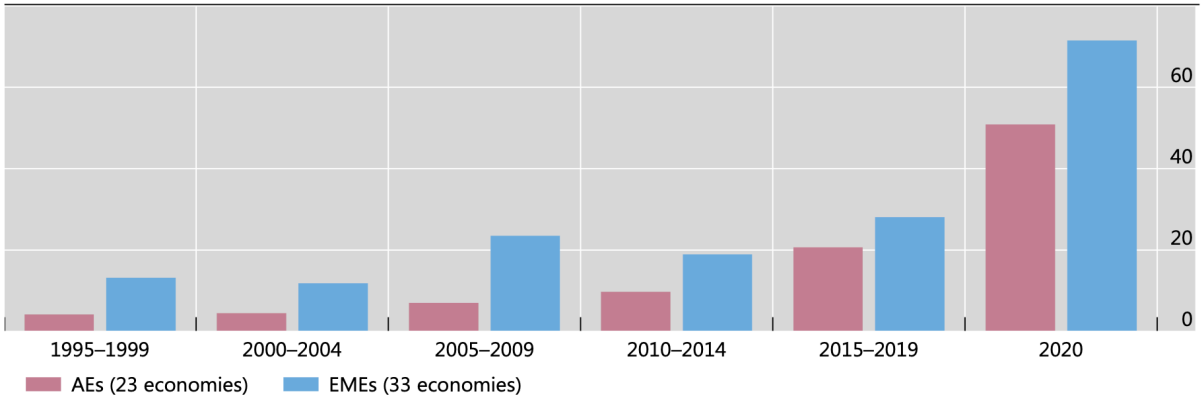
[38] Borio, C., Shim, I., and Shin, H. (2022), "Macro-financial stability frameworks: experience and challenges", BIS Working Paper No. 1057, Dec 2022.

value ratios; debt service-to-income ratios; debt-to-income ratios; systemic risk surcharges; housing taxes; reserve requirements (FX, domestic currency and credit-growth based); limits on FX open positions; and countercyclical capital buffers. Liquidity requirements include the minimum liquidity coverage ratio, the minimum net stable funding ratio, the minimum liquid asset ratio and the maximum loan-to-deposit ratio.

Figure 8: Macroprudential Measures in Advanced Economics and Emerging Markets[39]

Increased use of macroprudential measures

Average number of actions per year per 10 countries — Graph 3



Sources: Budnik and Kleibl (2018); Reinhardt and Sowerbutts (2016); Shim et al (2013); FSB Covid-19 policy action database; IMF, Integrated Macroprudential Policy (iMaPP) Database, originally constructed by Alam et al (2019); national data; authors' calculations.

A common (if not consensus) view is that macroprudential policies are the primary tool for addressing FSMs while monetary policy should focus on the inflation mandate. The reasoning behind this view is that macroprudential tools can be used in a targeted way to lean against the wind or support a specific segment where a bubble bursts (e.g., sector-specific LTVs or capital requirements). In contrast, monetary policy is broad brush and thus less efficient if the financial vulnerability is narrow; and cannot help to build resilience in the same way as say high bank capital requirements.[40]

Those favouring a non-separable approach between monetary and financial stability policy stress the limitation of macroprudential policy, for example, to regulated segments or stress the problem of whack-a-mole (where macroprudential rules may push the problem into unregulated sectors). Further, they argue monetary policy imposes costs on all segments and so does not involve introducing distortions between segments. Finally, monetary and macroprudential policies have similar transmission channels to the real sector so affect each other.[41]

[39] Ibid.
[40] Adrian, T. and Liang, N. (2016), "Monetary Policy, Financial Conditions, and Financial Stability", Federal Reserve Bank of New York, Staff Report No. 690, Dec 2016.
[41] Ibid.

The Fed[42], ECB[43] and BOE[44] might be well characterised by the view that monetary policy should remain focused on price stability and other tools – macroprudential and microprudential policies – should address financial stability. The BOJ might see more of a role for monetary policy over the medium term and also consider the build-up of bubbles, given Japan's experience with the prolonged aftermath of bubbles bursting.[45]

Advanced countries, in the post GFC period, have increasingly combined monetary and macroprudential policies. In particular, the loose monetary policy for the post-GFC and pre-COVID period was combined with tightening macroprudential policies (Figure 9).[46] During this period, large output gaps and low/stable inflation and some concerns about deflation, required accommodative monetary policy which was thus constrained from "leaning" against financial imbalances; the use of macroprudential measures consequently rose, particularly the use of risk-related capital buffers and housing/credit market focused measures such as loan-to-value ratios and debt-service-to-income limits.[47] With the onset of COVID, interest rates and macroprudential measures both eased sharply (Figure 9).

While macroprudential measures are the increasingly deployed instruments of the standard FSF, there are limitations to their effectiveness and the links between monetary policy and financial stability are clear. Borio et al. (2022, previously cited) note:

> There is a consensus that keeping interest rates low for long contributes to risk-taking and the build-up of financial vulnerabilities as well as having broader side effects. And it is becoming increasingly clear that the issue is not so much "leaning against the wind" once signs of financial imbalances become apparent – by then it is too late – but adopting a policy that takes financial factors systematically into account.

The challenge is how systematically to integrate consideration of financial stability into existing monetary policy frameworks. Flexibility in the horizon of the price stability mandate (e.g., with the Fed move to average inflation targeting and Japan's adoption of a long run inflation target) seems to be one dimension of providing increased degrees of freedom.

There is also increasing research considering the interaction of monetary and macroprudential policies (with differing evidence on the complementary or substitutability),

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[42] "…focusing monetary policy decisions on macroeconomic objectives and using other tools for financial stability is likely the most prudent path.", speech by Michael Barr (Fed Vice Chair for Supervision), *Monetary Policy and Financial Stability*, October 2, 2023. https://www.federalreserve.gov/newsevents/speech/barr20231002a.htm

[43] See ECB monetary policy strategy review cited earlier, or speech by Isabel Schnabel (Executive Board of ECB), *Monetary and financial stability – can they be separated?*, 19 May 2023. https://www.ecb.europa.eu/press/key/date/2023/html/ecb.sp230519~de2f790b1c.en.html

[44] See Speech by Sarah Breeden (BOE Financial Policy Committee), "Two sides of the same coin – delivering monetary and financial stability timelessly", 9 March 2023. https://www.bankofengland.co.uk/speech/2023/march/sarah-breeden-speech-on-macro-prudential-monetary-policy-interactions-at-leeds-university

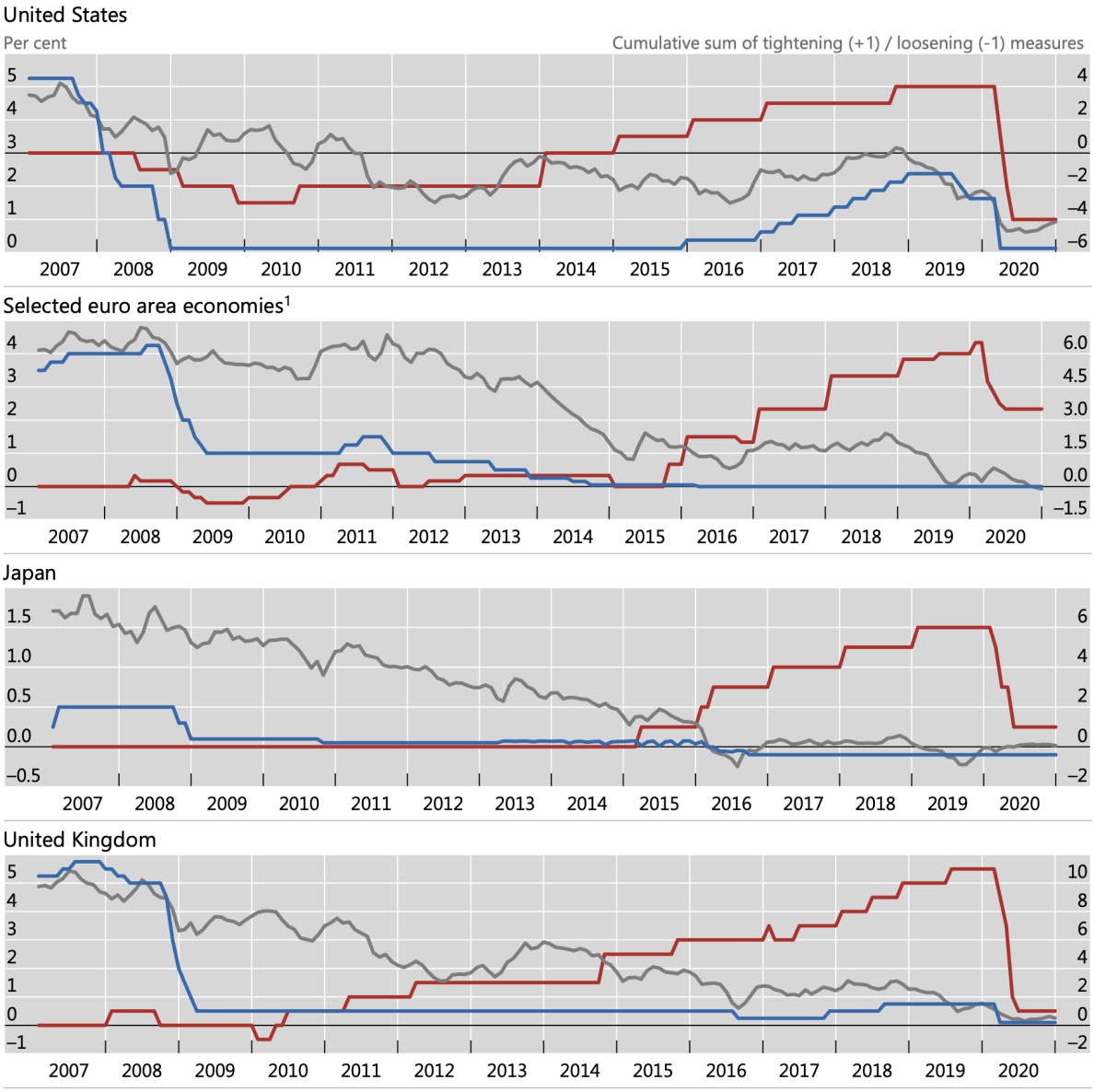
[45] Miyao, R. (2011), "A Macroprudential Perspective in the Conduct of Monetary Policy", Speech by Miyao (Member of the Policy Board) at Asian Economic Policy Conference, November 2011. https://www.boj.or.jp/en/about/press/koen_2011/data/ko111202a.pdf

[46] Borio et al (2022) cited above.

[47] Ibid.

including recent empirical evidence that effectiveness of macroprudential policies may be enhanced in an inflation targeting regime.[48]

Figure 9: Policy Rates, Bond Yields and Macroprudential Measures in Advanced Economies



Lhs: — Policy rate; — 10-year government bond yield.
Rhs — Cumulative macroprudential policy action[2]
Notes: 1. Simple average of DE, ES, FR and IT; 2. Cumulative sum of tightening (+1) and loosening (–1) actions For the four euro area countries, the average value of the cumulative sum for each country.

Source: From Borio et al (2022), previously cited.

[48] Belkhir. M, et al (2023), "Macroprudential Policy and Bank Systemic Risk: Does Inflation Targeting Matter?", IMF Working Paper WP/23/119, June 2023.

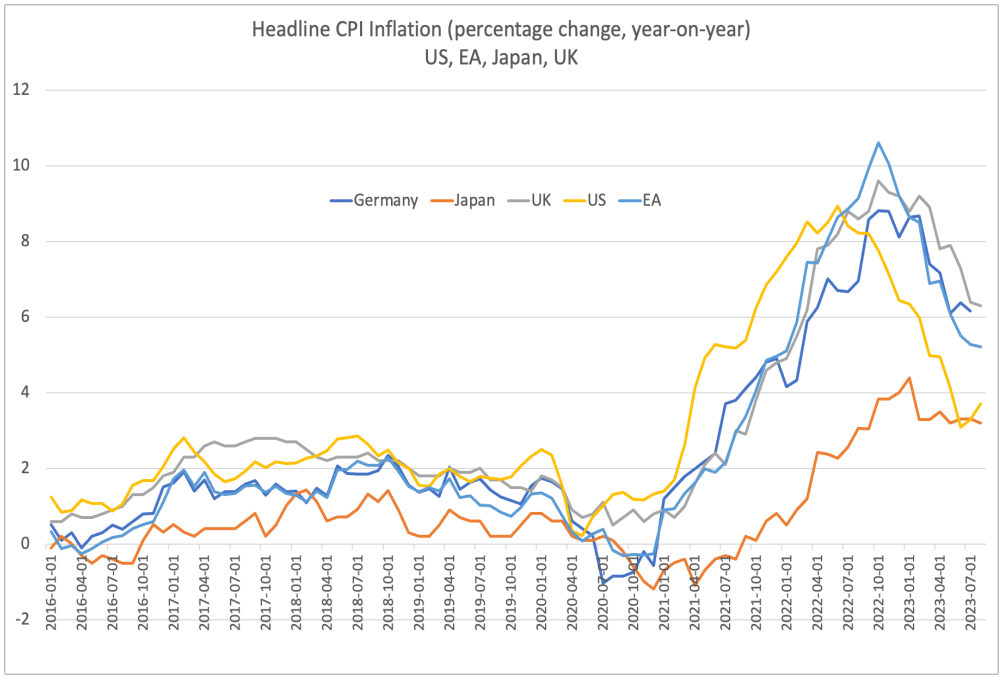
Section 3: The global inflation shock of 2021-23

In this section we describe the main causes of the global inflation shock over the period 2021-23, the response from central banks in the major western economies, and how this has been subsequently critiqued. We also discuss some of the lessons the whole experience may hold for the design and operation of the consensus monetary and financial stability frameworks set out above.

Ways of viewing the causes of the shock

Figure 10 below shows the consumer inflation rates in the US, eurozone, Japan and UK over the period of the pandemic. Initially inflation remained very low, but from early 2021 in the US and mid 2021 in the other countries it picked up rapidly.

Figure 10: Headline CPI Inflation – Germany, Japan, UK, US, EA



Source: FRED database; World Bank Inflation Database; Bank of Japan

There are a number of ways to view the causes of this sudden inflation surge. While these essentially describe the same set of events and underlying processes, the different perspectives may give insights as to the authorities' response and any underlying policy errors.

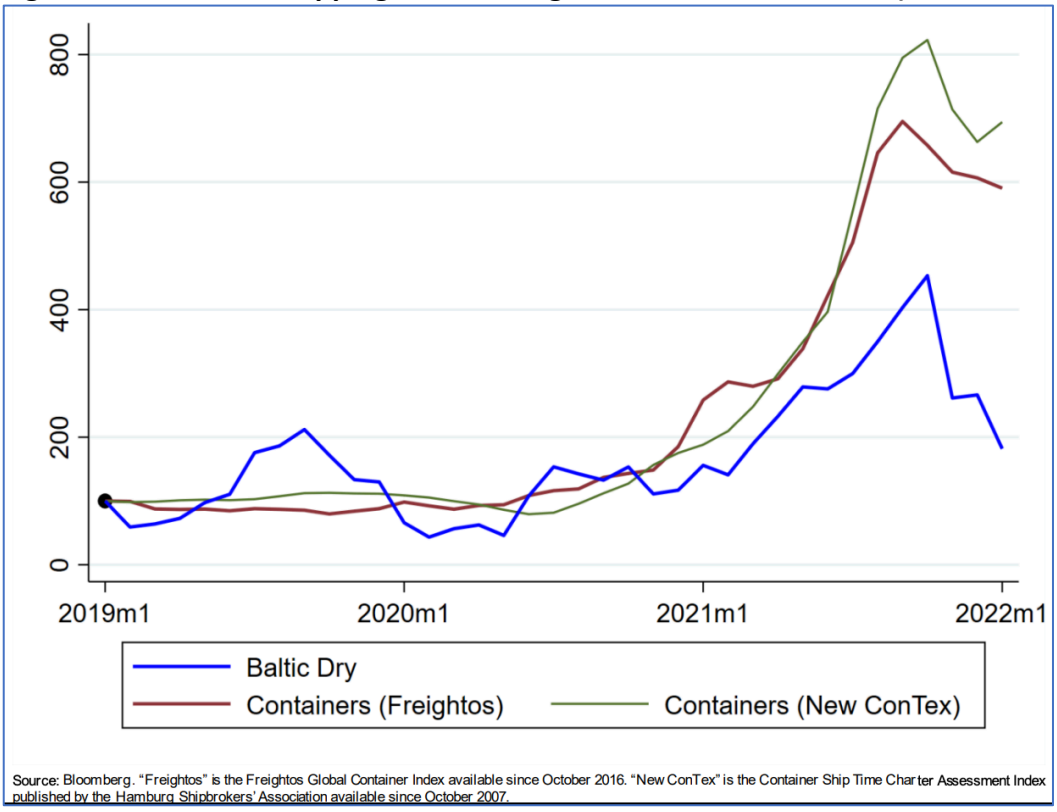
Unexpectedly strong demand and constrained supply

The combination of higher-than-expected demand with unexpected constraints on supply is perhaps the most popular and straight forward way to explain the post-pandemic inflation shock.

On the demand side, a key driver of inflation was the way consumers, whose income during lock down was maintained by unprecedented government fiscal packages, switched consumption spending from services (where they were constrained by Covid-19 restrictions) to goods.

The resulting impact on prices was amplified by further shifts in the composition of demand (e.g., to electric vehicles), new economic security-driven supply restrictions (e.g., on the sale of advanced chips to China) and other inefficiencies in global supply chains as they recovered from pro-longed shutdowns due to Covid-19. (These are illustrated in Figure 11 by the very sharp rise in shipping costs between the start of 2021 and the start of 2022.)

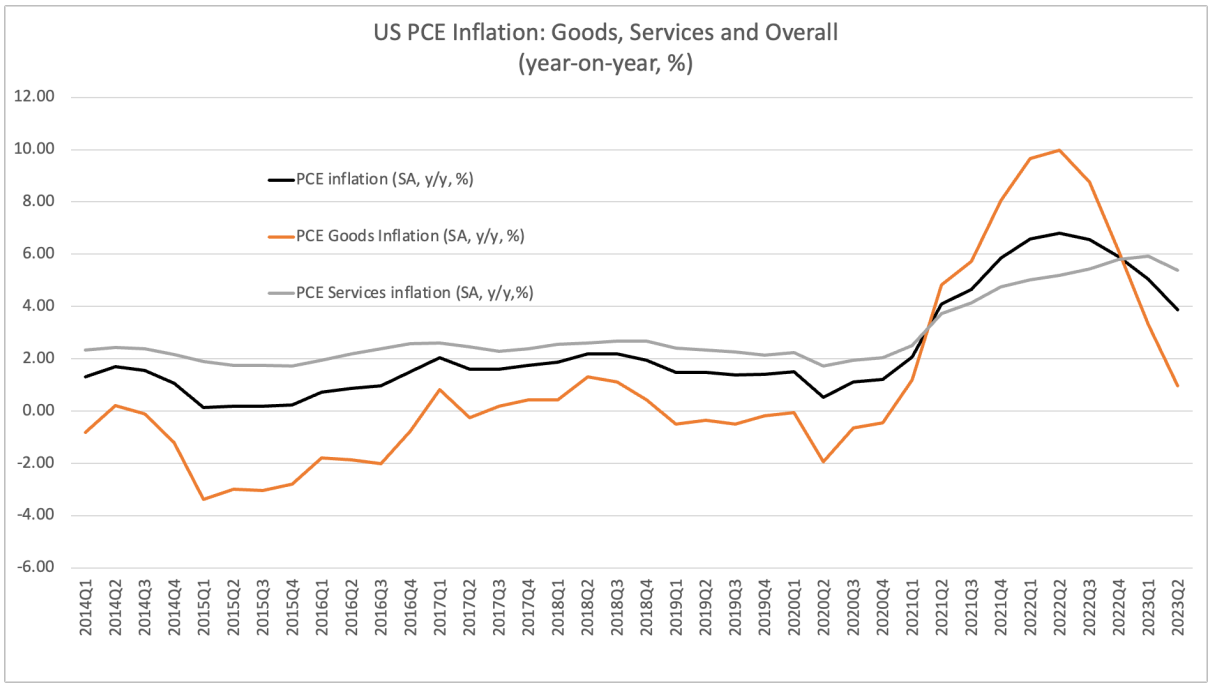
Figure 11: Indices of Shipping Costs During the COVID-19 Pandemic (Jan 2019=100)



Source: Carriere, Y. et al. (2022), IMF Working Paper WP/22/61

The combined result was a sharp rise in goods inflation which peaked in the US in Q1 of 2022.

Figure 12: US PCE Inflation – Goods, Services and Overall



Source: US Bureau of Economic Analysis

A further demand-side factor, especially in the US, was the boost to demand caused by a series of very large fiscal stimulus packages. The first of these took place in 2020, but they were renewed several times, amounting to $5tn over the period of the pandemic as a whole, and including some $1.9tn of direct payments to individuals and families.[49]

On the supply side, Covid 19-linked deaths and long-term illness had a major effect on labour supply in some countries over varying periods. For example, by autumn 2022, nearly 0.5 million people were thought to be "missing" from the US labour market.[50] Meanwhile in the UK, the number of economically inactive workers was estimated to have increased by 400,000 at the start of 2022 compared with before the pandemic.[51] The latter situation continues.

Constraints on energy supply have also played a major role in the inflation shock. Prices were boosted by a pick-up in international crude oil and natural gas prices in the second half of 2021 linked to fears of supply constraints underpinned by tensions between Ukraine and Russia as well as increasing prospects for economic recovery.

[49] Parlapiano, A., Solomon, D., Ngo, M., Cowley, S. (2022) 'Where $5 trillion in Pandemic Stimulus Money Went', *New York Times, 11 March 2022,* https://www.nytimes.com/interactive/2022/03/11/us/how-covid-stimulus-money-was-spent.html

[50] Luscombe, R. (2022) 'Covid caused huge shortages in US labor market, study shows ', *The Guardian, 13 September 2022,* https://www.theguardian.com/us-news/2022/sep/13/us-labor-shortage-long-covid . The labour force participation rate fell from 63.3 percent in January 2020, to a nadir of 60.1 percent in April 2020 and has been increasing since but still only reached 62.8 percent in September 2023 (US Bureau of Labor Statistics).

[51] BBC News (2022), 'Where are Britain's missing million workers', 28 January 2022, https://www.bbc.co.uk/news/business-60039923

Then from late February 2022, inflation in Europe received a further very strong boost following Russia's attack on Ukraine and the subsequent 80% cut in supplies of Russian natural gas to the European market in retaliation for G7 economic and financial sanctions.

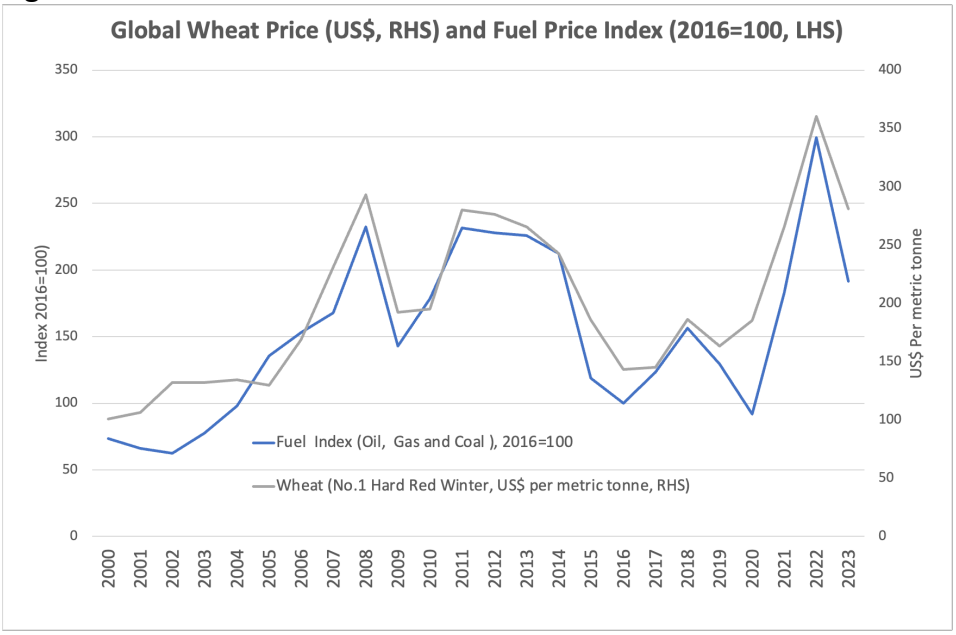
The Dutch TTF gas futures price peaked at euros 277 per megawatt hour on 22 August 2022. This was nearly four times its level just before Russia's full-scale invasion of Ukraine, and more than 15 times its level at the start of 2021.[52]

Although, the Russian cut-backs in gas supply were limited to the European market (Russia did not for example impose constraints on supplies to Japan) and some of the supply that had previously gone to Europe was diverted to India and China, there was nonetheless a ripple effect on global gas prices around the world as European consumers sought to make up some of the shortfall from alternative suppliers.

Many advanced governments softened the immediate impact of these price rises on their domestic consumers, and to some extent commercial consumers, through large fiscal subsidies, the resulting feed through into consumer prices was nonetheless a substantial boost to inflation over 2022.

The war in Ukraine also had a major impact on world food prices. Wheat prices nearly doubled in the immediate aftermath of the invasion and stayed high until an agreement was reached to open an export corridor to allow some of the grain trapped by the war to move to the rest of the world.

Figure 13: Global Wheat and Fuel Prices



Source IMF World Economic Outlook Database, October 2023

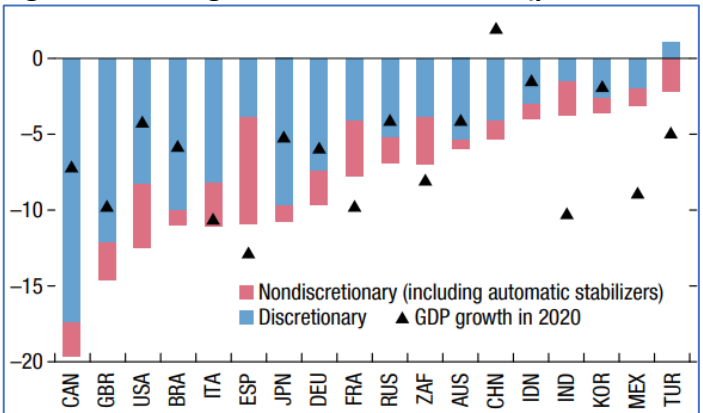
[52]Statista (2023), 'Dutch TTF gas futures at the beginning of each week from January 4 2021 to August 28 2023', https://www.statista.com/statistics/1267202/weekly-dutch-ttf-gas-futures/#:~:text=Dutch%20TTF%20is%20seen%20as%20a%20Europe-wide%20natural,hour%20following%20the%20outbreak%20of%20the%20Russia-Ukraine%20war.

This mix of demand and supply factors can plausibly explain the strong inflationary pressures building in 2021-22. However there remains the question of why central banks did not intervene to limit the size of the inflationary shock that emerged from these factors.

Excessive monetary growth

Another way to look at the cause of the inflation shock is to view it as a monetary phenomenon.

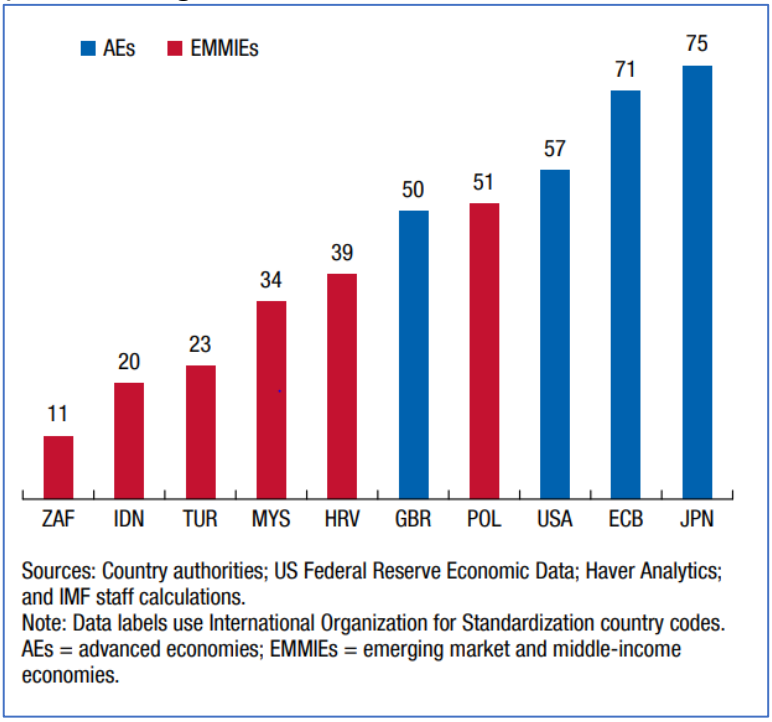
Figure 14: Change in G20 Deficits, 2020 (percent of GDP)



Sources: IMF, World Economic Outlook database; and IMF staff estimates.
Note: Discretionary fiscal support is measured as the change in the cyclically adjusted primary balance; nondiscretionary fiscal support is the residual. The allocation between discretionary and nondiscretionary measures should be considered indicative because output gap estimates, which are used to derive the cyclically adjusted primary balance, are subject to a high degree of uncertainty. Argentina and Saudi Arabia are excluded because of data limitations; Spain is a permanent invitee. Data labels use International Organization for Standardization country codes. G20 = Group of Twenty.

According to this view, the massive deficits run by the major developed economies during 2020 (see Figure 14) resulted in huge funding requirements that were substantially met by central banks buying government bonds and other assets (Figure 7 and Figure 15).

Figure 15: Central Bank Purchases of Government Debt during 2008-2020 (% of central government marketable securities or debt issued since 2020)



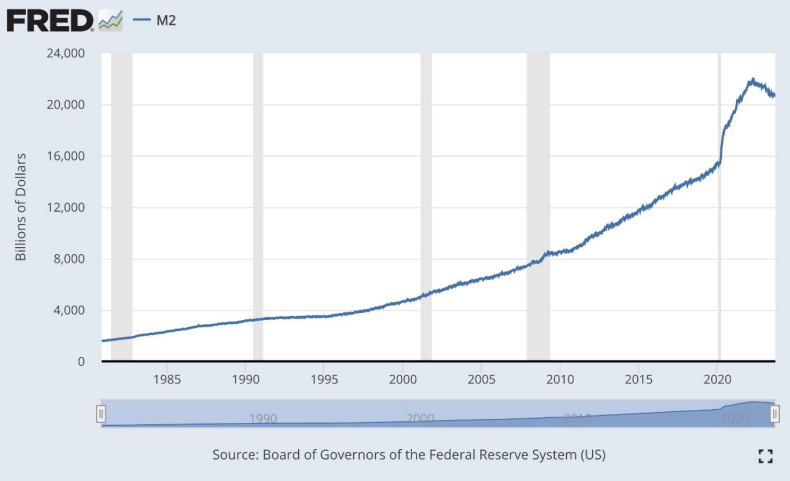
Sources: Country authorities; US Federal Reserve Economic Data; Haver Analytics; and IMF staff calculations.
Note: Data labels use International Organization for Standardization country codes. AEs = advanced economies; EMMIEs = emerging market and middle-income economies.

This was done under the labels of QE and liquidity support. But such purchases of government bonds were observationally equivalent to debt monetisation, or printing money; the main difference was the intent of the purchases, namely monetary easing versus debt financing. (Some emerging economy central banks also undertook asset purchases, through they were not typically at the ZLB/ELB at the time, suggesting that the motivation was more public financing than monetary easing.)

A key difference in the way QE took place during the pandemic, as compared to the experience of the GFC or Japan (post 2000), was the very rapid pace of bond purchases and the extent of broad money growth associated with this. The US saw unprecedented M2 growth at the start of the pandemic in early 2020 (Figure 16).[53] The UK, Euro Area and Japan also saw a sharp pick up in M2 growth at that time.

[53] Post GFC, the growth in the monetary base did not translate into growth in broader money as banks and the private sector de-leveraged and strengthened balances sheets, but in 2020 we did see both reserve money and M2 expand rapidly as credit was needed by the private sector to survive and the financial sector was in much better shape to support credit expansion.

Figure 16: US M2



It is also notable that central banks continued with QE even after inflation began to rise. In the UK bond purchases continued to the end of 2021 by which time inflation was already well above target at over 4%. Similarly the US Federal Reserve undertook its last round of QE in March 2022, by which time headline inflation was approaching its peak of 8%.

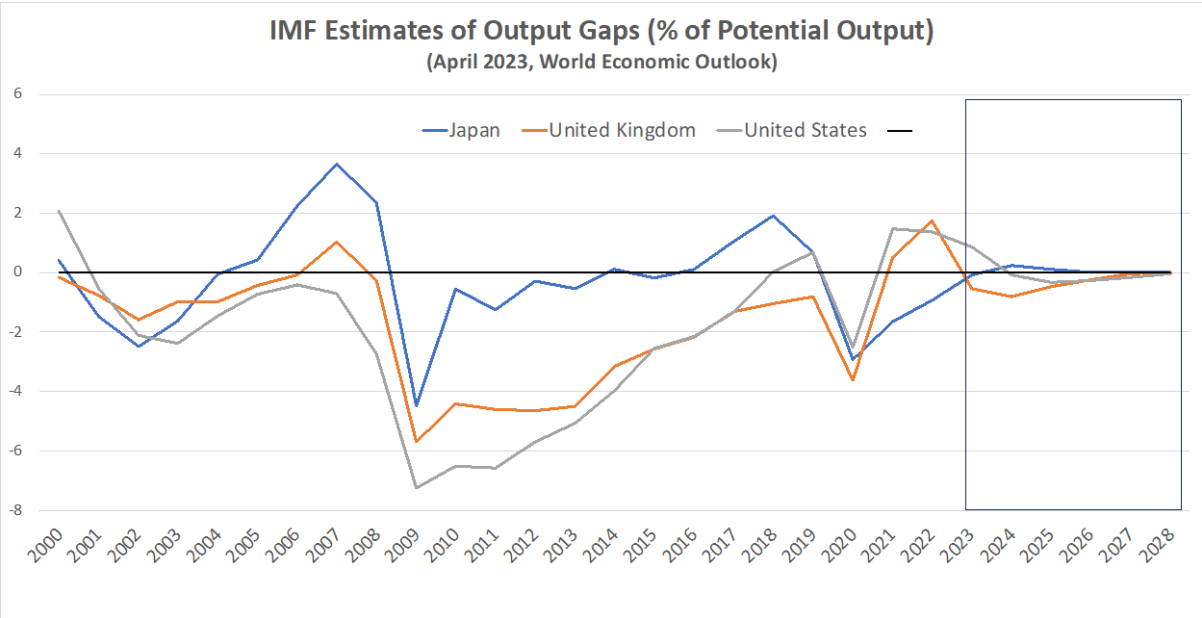
In hindsight it is seems highly likely that this very rapid monetary growth contributed to the inflation shock and that the QE was continued for too long.

Rapidly closed output gap

A further way to view the 2021-23 inflation shock is as the outcome of an "output gap" economic model. In this case, inflationary pressures are correlated with the size of the output gap, which is defined as the difference between actual and potential economic output

IMF (October 2023 WEO) estimates suggest there was a large negative output gap in both the US and UK through much of the post-GFC period (Figure 17). This was in substantial part caused by the damage that the GFC caused to domestic financial systems. The negative output gaps gradually closed and by 2019 had almost disappeared.

Figure 17: Output Gaps



Source: IMF World Economic Outlook, October 2023

The pandemic saw a sharp re-opening of the gap, but the extent was much smaller than in 2010 reflecting the massive monetary and fiscal policy response and potentially the different nature of the shock. The gap then closed very quickly and became significantly positive in 2021 with the V-shaped recoveries associated with opening up and the release of pent-up demand and big savings buffers (including due to the fiscal transfers). The inflation shock might therefore reflect a situation in which the monetary authorities either overestimated the size of the gap caused by the pandemic, or underestimated the speed with which it closed.

The analysis above of the three ways of looking at the causes of the 2021-23 inflation shock seeks to provide a stylised response to the question "what caused the shock". However, it clearly does not capture some of the country-specific structural factors that determined the inflation picture in individual countries.

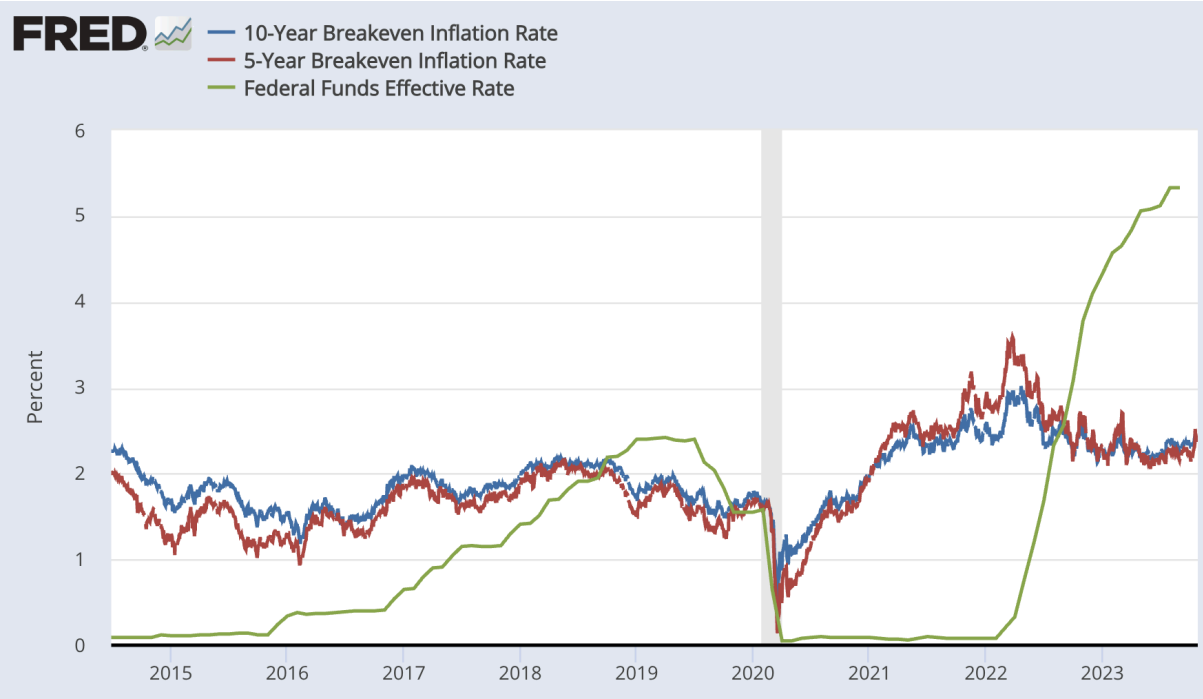
Thus Japan's "output gap" experience was very different to the US and the UK in so far as it did not have a strongly positive output gap in the post-GFC period (Figure 17). Moreover, the gap that opened up following the pandemic closed relatively slowly (according to IMF estimates). In addition, in contrast to the other countries, the UK faces continuing, and to some degree permanent constraints on its supply channels due to Brexit. Similarly, the fact that Germany is currently one of the weaker eurozone economies means that the risk of intra-eurozone financial strains during the rapid build-up in interest rates has been reduced.

The central bank response

Central banks typically did not begin raising their policy rates in response to the emerging inflationary pressures until 2022 despite long-term inflation expectations (in the form of 5-

year and 10-year breakeven inflation rates derived from inflation index linked debt) rising rapidly beforehand (Figure 18). Average inflation expectations over five years increased from around 1.7 percent pre-Covid to a peak of around 3.3 percent) in Spring 2022.

Figure 18 US Inflation Expectations and Fed Funds Rate



Source: FRED Database

Moreover central bank communications argued that the various shocks would be transitory well into summer 2022, with QE continuing beyond that

There are several possible explanations for the delay.

For example, some policy makers believed (not unreasonably) that the constraints on goods supply chains and energy price shock would be transitory. They also believed that consumer inflation expectations would be sticky following such a long period of price stability and near zero interest rates. In this case they thought they would be able to allow the first-round effects from the energy price rise, but did not need to raise rates simply in order to head off possible second round effects.

Other policy makers also focused on the impact of energy price rises (even after government subsidies) on disposable income and were concerned that this would depress wider economic activity, reducing the pass through from price rises, but also raising the risk that an excessively strong response to the price shock would push the economy into recession.

Against this background, **two main critiques** have been made of the approach taken by central banks in their approach to controlling inflation.

The first relates to their **handling of the pandemic shock itself**. There is no question that there was enormous uncertainty about the economic implications of the pandemic when it first hit in March 2020.

It was a completely unprecedented event, and the official response evolved rapidly. Central banks had to judge the impact on business and consumer confidence (depressing demand), and the effect of combining official measures to lock down activity (restricting supply and repressing demand) with massive public sector financial support to households (boosting demand). The scale of the latter programmes was much greater than in the GFC – equivalent to some 10% of GDP compared with 2%. There were potential effects on both the demand side and supply side of the economy. And it was initially far from clear what the net effect would be on employment, production and demand, and how these effects would be spread across different sectors.

Central banks also had to judge how effective in these circumstances their core policy instruments of short-term interest rates (which in most cases were already very close to the lower bound) and QE would be.

Given the very sharp initial falls in debt and equity prices when the crisis first hit, it was understandable that central banks chose in the short term to try and boost confidence by pushing interest rates as close possible to zero and stepping up QE.

But some commentators argue that central banks were at fault because they continued with these policies after it became clear what the main impacts of the pandemic would be, i.e. that consumers' ability and desire to spend would be maintained, but Covid restrictions would limit for a time their ability to do so because of supply restrictions on both services and goods. This led to a build-up of liquidity in the economy, and it should not, according to this view, have surprised central banks that this led to surging demand as soon as sectors began to re-open – initially goods, but subsequently also services, such as entertainment and travel.[54]

Other commentators accept that there was considerable uncertainty, even in late summer/autumn 2022, about the future course of inflation in advanced economies, but that central banks should have been much **more risk averse** about the possibility that transitory shocks could become embedded in inflation expectations. This was particularly so in the context of the pandemic which had made some of the most important data - such as the active work force - harder to interpret.

Linked to this, commentators have also criticised central bank **communications strategies**, suggesting that they have put too much weight on being seen to deliver on commitments made in previous communications statements and forward guidance, even though new circumstances had emerged that were not allowed for in the original framing of the statements.

[54] Instead, at least on central bank that had not yet implemented negative base rates was preparing the ground for this as late as spring 2022.

By way of illustration, in his Jackson Hole speech in August 2021,[55] Fed Chair Jerome Powell set out the historical experience of the disadvantages of responding to *all* transitory shocks, and also the fact that even transitory shocks could have permanent effects on inflation.

He also reiterated the Fed's forward guidance, namely

> We have said that we will continue to hold the target range for the federal funds rate at its current level until the economy reaches conditions consistent with maximum employment, and inflation has reached 2% and is on track to moderately exceed 2% for some time.

But he then said that it was too soon for the Fed to start tightening policy because the economy was well short of full employment and there was too much uncertainty over whether inflation would remain at permanently at or slightly above 2%. Arguably, however, the Fed's forward guidance should have been reframed to take account of the considerable upside inflation risks triggered by the war in Ukraine.

Similarly, one possible explanation for the Bank of England continuing QE up to the end of 2021, despite inflation reaching 5%, is that they did not want to contradict previous guidance to the effect that the Bank would undertake QE for the whole of 2021.

The second critique of central banks relates to the **period between the global financial crisis and the onset of the pandemic**.

Again, it is accepted that the initial response of central banks to the GFC in cutting interest rates very close to zero and beginning large-scale quantitative easing was justified by the scale and nature of the negative shock to demand caused by the financial crisis. Subsequently, central banks also had to factor in the research evidence that crises driven by the financial sector had prolonged effects. And they had to deal with the strong desire of the fiscal authorities in a number of economies (e.g., UK, Canada and Germany, though not US) as soon as the immediate crisis had passed to consolidate their current spending and reduce debt relative to GDP. This followed the sharp hike in debt/GDP ratios caused by the crisis as revenues were reduced and spending increased, in some cases linked to the costs of large financial rescues.

However, it is also argued that central banks then maintained ultra-lose monetary policy for substantially longer than was necessary and also did not take account of the likelihood that a number of structural factors in the global economy - which were limiting the impact of these very high levels of liquidity on prices - would not last indefinitely.

These included: the impact of US fracking and new Russian gas supplies in maintaining downward pressure on global energy prices; the very low private sector financing costs, in part sustained by QE; and low manufacturing labour costs brought about particularly by

[55] Powell, J. (2021), 'Opening Remarks: Monetary Policy in the Time of Covid', Kansas City Federal Reserve Board, https://www.kansascityfed.org/Jackson%20Hole/documents/8752/Powell_JH21.pdf

China's integration in the global economy following its WTO accession in 2001, but also the integration of other emerging economies with rapid population growth.

The partial reversal of these factors since 2015 meant that at the point new drivers of inflation began to build in late 2021, their impact on prices was further amplified by the cumulative effects of a decade of very loose monetary policy, and was not offset by previous disinflationary structural features in the global economy.

Some commentators argue that if central banks had been more alert to the way their very loose monetary policy had interacted with structural economic change, they would have acted quicker to prevent second round effects from price rises becoming embedded.

A **further critique** has been made of the overall approach of the authorities (central banks, finance ministries and financial regulators) to the financial stability issues that arose during the rapid build-up in short-term interest rates. This reflects a new situation created by the pandemic.

At the outset of the pandemic, financial institutions would have faced enormous losses if governments had not stepped in to support the firms in lock down that they had lent to by paying salaries and providing loan guarantees etc. This was not surprising given the scale of the crisis and the enormous dead weight losses that would have occurred in the economy if governments had not intervened.

However, it left an unanswered question, as to exactly how far commercial banks should be required to prepare for massive shocks, such as the pandemic, through higher capital buffers and more conservative liquidity policies and other lending practices.

The assumption following the GFC was that financial regulation should aim for a situation in which private financial institutions either have sufficient capital of their own to withstand a shock, or could be wound down in such a way as to avoid a systemic crisis or losses to small depositors.

But the pandemic introduced a new type of scenario and one which it would be impossible to ask firms and their lenders to prepare for, because doing so would make their underlying businesses unviable. This new type of scenario was further demonstrated during the energy shock following Russia's attack on Ukraine. Governments across Europe stepped in with enormous potential subsidies - thereby indirectly protecting their financial systems - because the consequences of not doing so would have been catastrophic for the economy.

The need for greater clarity, however, is illustrated by the US Spring 2023 banking crisis. **Silicon Valley Bank (SVB)** SVB saw a large proportion of its capital base eliminated during the rapid rise in interest rates in autumn 2022 as a result of the maturity mismatch between long-term, but risk-free assets, and short-term deposits. The bank's plight was exacerbated by the speed with which its deposits moved once the news got out, reflecting their size (above deposit insurance level) and the connectedness of the depositors (heavily concentrated in Silicon Valley).

SVB's management made an extraordinary error in taking on the mismatched portfolio in the first place. And it is equally remarkable that the US regulatory system did not stop them from doing so.[56] However, a more fundamental issue has been raised by the response of the US regulators. It is hard to argue that the SVB case matches the new scenarios for public intervention defined by the pandemic and the European energy shock, and yet the US authorities chose to guarantee *all* the deposits in SVB, regardless of size, as well as those of another smaller bank, Signature Bank, which collapsed three days after SVB for broadly similar reasons.[57]

SVB's collapse was also partly responsible for the collapse and rescue of **Credit Suisse** a few days later. While Credit Suisse's circumstances were very different, it was SVB's collapse that led to additional scrutiny. After a long running series of management failures, the bank found, in the face of market pressures brought on by SVB's collapse, that it could not raise the additional capital it needed from its existing shareholders. This led to a run by wholesale depositors, leading the Swiss regulator and central bank to step in and force a merger with UBS. The rescue ensured that all deposits were protected, but also led to the perverse situation where holders of subordinated debt faced losses before shareholders were completely wiped out.

The size, complexity and potentially systemic nature, of Credit Suisse means that there was potentially more justification to avoid wholesale deposit market losses than with SVB. But having a clearer framework within which such decisions are made would still be highly desirable.

[56] Board of Governors of the Federal Reserve System (2023), 'Federal Reserve Board announces the results from the review of the supervision and regulation of Silicon Valley Bank, led by Vice Chair for Supervision Barr', press release, 28 April 2023, https://www.federalreserve.gov/newsevents/pressreleases/bcreg20230428a.htm
[57] Federal Deposit Insurance Corporation (2023), 'FDIC Releases Report Detailing Supervision of the Former Signature Bank, New York, New York', press release, 28 April 2023, https://www.fdic.gov/news/press-releases/2023/pr23033.html

Section 4: Other factors that should be factored into a review of monetary policy frameworks

In the previous section we reviewed the experience of the 2021-23 global inflation shock and identified a number of possible areas in which the experience of the shock suggests a possible need for a change in the monetary policy framework and/or the way it is operated. These include; the need to reconsider the way forward guidance is framed and conditioned to ensure that it does not become a trap for policy makers; the possible need for central banks to be more risk averse about scenarios under which transitory price shocks may become embedded in long-term inflation expectations; and the need for greater clarity on the extent to which financial regulators should attempt to make financial institutions capable of dealing with economic "mega shocks" rather than relying on very large scale government intervention.

This section considers whether there are *other* issues on the horizon that should be considered at the same time.

The structure and behaviour of the world economy is constantly evolving and monetary policy makers respond to this by developing new forecasting models or updating existing ones, deploying new data sources and gradually changing their operating assumptions and guidelines based on research. Examples of the latter are the period over which the short-term interest rate is expected to have its primary effect on inflation, or the way in which the pass-through to inflation from external shocks will be handled (first-round and second-round effects). Certain trends, such as the growth of on-line retailing and the impact of the shift to working from home or changing demographics on the labour market[58] can be handled in this way as, perhaps, can the implications of rapid innovation in the financial system including development of new banking services through fintech.

However, there are four economic and political trends on the horizon – and in some cases already impacting the way the global economy functions - which we would argue require a different treatment. This is essentially because the impact they could have on the way the global economy functions, or on the political underpinning of the current monetary framework, is of such an order that a gradual evolution in operating methods of the type described above is unlikely to work. Instead, monetary authorities should research as far as possible the implications of these trends now and, if necessary, take action *now* to prepare their operating frameworks for the changes to come.

The four trends that we think should be treated in this way are:

- the trend to fragmentation in global markets for goods, services, capital and labour;
- the prospect of more frequent and much more extreme natural and man-made shocks;

[58] Goldberg, E. (2023) 'What We Know About the Effects of Remote Work', *The New York Times*, 17 October 2023, https://www.nytimes.com/2023/10/10/business/remote-work-effects.

- the need for very high levels of public investment to meet the needs of the net zero transition and other existential threats to mankind and their implications for public debt and debt distress;
- the impact of extremism and polarisation on the political underpinning for central bank independence.

The implications of these trends and the policy responses are closely inter-related. Below we consider each in turn and then attempt some overall conclusions.

Fragmentation in global markets

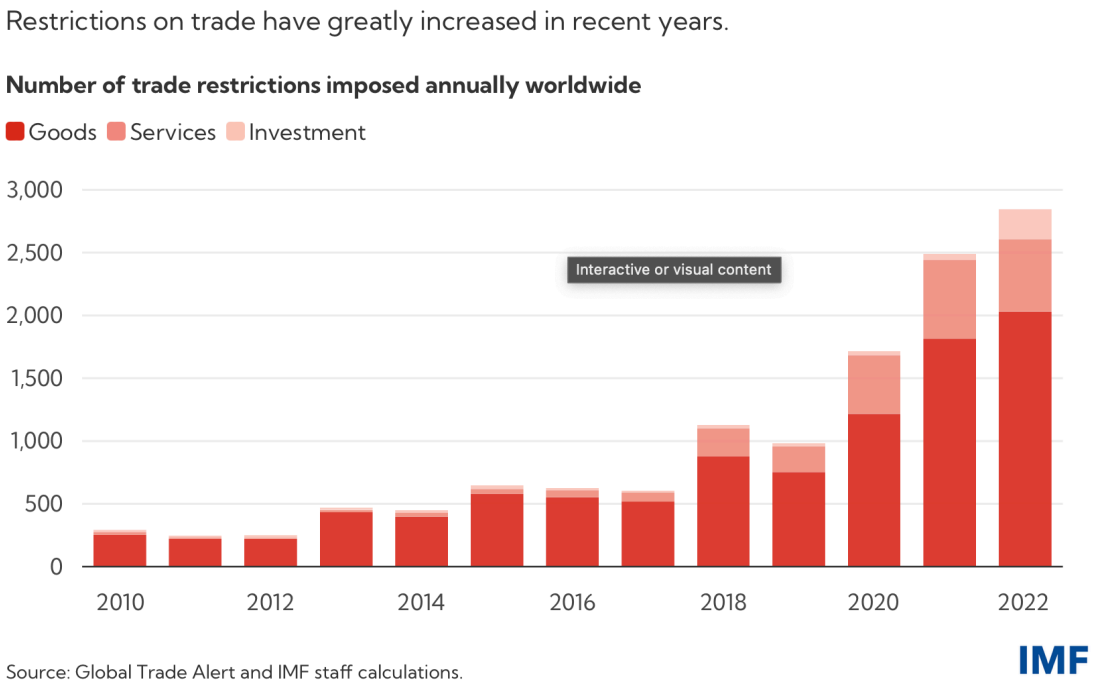
The past five years have seen a reversal in the long-standing trend towards increasing international integration of markets for goods, services, labour and capital. There are three main drivers for this.

Firstly, there is now a **more negative view in the west, and particularly in the US, of the economic impact of globalisation** and of China's 2001 accession to the WTO. President Trump responded to this mood by imposing 25% tariffs on $34bn of Chinese exports in July 2018. This followed an early decision in March to impose 25% tariffs on nearly all US steel imports (including Chinese)[59]. The Trump Administration also effectively paralysed the WTO's ability to settle trade disputes by refusing to approve replacement judges for its dispute settlement appellate body. President Biden has maintained - and in some instances strengthened - the Trump Administration's measures against China. It is also likely that the US is breaking WTO rules by offering, through the Inflation Reduction Act, very large subsidies to US (but not foreign) companies making "green" goods that will help deliver net zero.

Figure 19 shows the build-up in the annual volume of trade and investment restrictions worldwide since the GFC. The initial focus was almost entirely on trade in goods, but new restrictions on services trade and investment are becoming increasingly common.

[59] BBC News (2023), 'Trump puts 25% tariff on Chinese Goods', BBC News, 15 June 2028, https://www.bbc.co.uk/news/business-44498484

Figure 19: Trade Restrictions



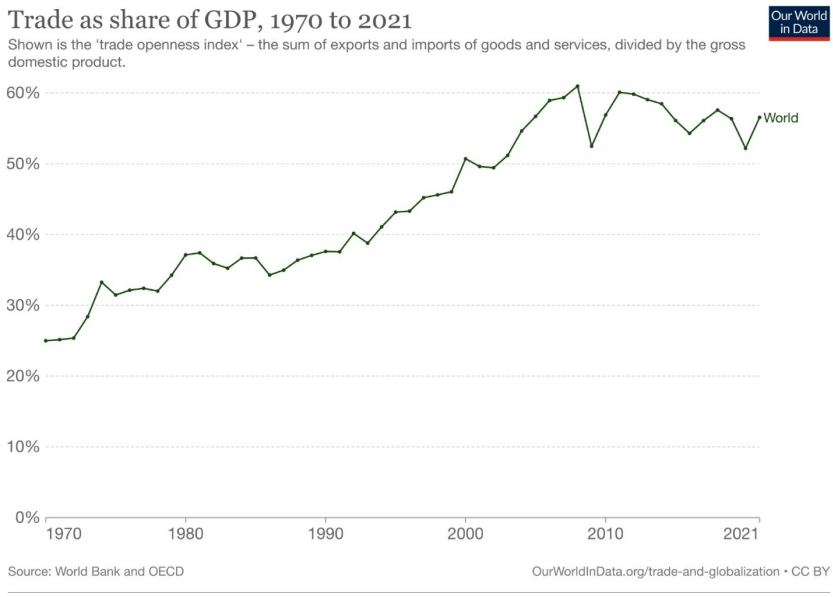
A second factor has been rising **geopolitical tensions** between the West and China. This has been driven by concern in the US over China's military build-up, China's military encroachment on Taiwan and China's support for Russia following its attack on Ukraine. It has been accompanied by a series of US moves to restrict the export of high-tech goods, particularly semiconductors, to China, as well as tighter restrictions on Chinese investment in the US and on US private equity capital flows to China.

Thirdly, **Russia's attack on Ukraine** has led to considerable disruption in regional trade flows, but even more importantly, it led the G7 to undertake unprecedented economic and financial sanctions against Russia. The latter have been designed to weaken Russia's ability to continue the war by excluding it from the international financial system (including through such steps as excluding most Russian banks from the international payments system and freezing $300bn of Russian central bank reserves), by restricting its access to key business services and high technology goods, and by limiting the revenue it is able to raise from hydrocarbon exports through an "oil price cap" banning the provision of commercial services for oil shipments priced above $60 per barrel. While these measures were specifically targeted on Russia, they will have led other countries to be concerned that the same measures could be applied to them under certain circumstances; they will therefore have a broader effect on fragmentation.

There is some debate among experts over the extent to which there is already evidence of market fragmentation. For example, bilateral trade flows between the US and China

reached an all-time high of $690.6 in 2022.[60] However, Figure 20 shows that the trade intensity of world GDP appears to be trending down since the GFC. Moreover, a recent study by the WTO suggests that trade flows among politically aligned countries are now growing between 4-6% faster than those between non-aligned countries.[61]

Figure 20: Global Trade (% of GDP)



UNCTAD's latest World Investment Report also recorded a dramatic fall (of nearly 37%) in FDI received in developed economies in 2022 compared with 2021.[62] This follows a sharp rebound in total FDI in 2021 following the pandemic. But the latest figure would support the view of some experts that the forces driving fragmentation will have a bigger impact in global capital markets than on trade in goods and services.

In its spring WEO[63], the IMF estimated that barriers to the free flow of foreign direct investment linked to the fragmentation of the global economy into geopolitically aligned blocks could lead to a cumulative reduction in global output of 2%.

As mentioned earlier, the reversal in globalisation was arguably already one of the factors contributing to policy errors underpinning the 2021-23 inflation shock. But it is likely also to have significant consequences for monetary policy going forward.

First, by placing restrictions on the extent to which capital can move from one country to another, it will lead to a less efficient overall allocation of capital internationally and make

[60] World Trade Organisation (2023), *World Trade Report 2023: Re-globalisation for a secure, inclusive and sustainable future*, World Trade Organisation, https://www.wto.org/english/res_e/booksp_e/wtr23_e/wtr23_ch2_e.pdf
[61] Ibid.
[62] UNCTAD (2023), *World Investment Report 2023*, UNCTAD, https://unctad.org/publication/world-investment-report-2023
[63] International Monetary Fund (2023), *World Economic Outlook April 2023: A Rocky Recovery*, IMF, https://www.imf.org/en/Publications/WEO/Issues/2023/04/11/world-economic-outlook-april-2023

the global economy less resilient to major shocks. Second, it is likely to increase international investors' concerns that their existing assets may become stranded as a result of sudden shifts in government policy - such as the Trump Administration's tariffs on steel imports.

One of the net effects will be to reduce overall trend growth, which in itself might not require any anticipatory action by central banks. However, the prospect of sudden restrictions on capital flows linked to geopolitical developments may require central banks to develop new surveillance connections and capabilities and possibly even new lending facilities to enable them to target support on specific firms or sectors. The first step is to work through the most likely scenarios and scope out what might be needed.

Extreme Shocks

The global financial crisis (GFC), the pandemic, and Russia's attack on Ukraine have all in some respects been unprecedented and have had global economic consequences on an enormous scale. Extreme weather events linked to climate change, and agricultural shocks linked to biodiversity loss also appear to have the potential to cause global economic shocks on a similarly enormous scale in the near future.

Some of these shocks are essentially man made (such as the GFC and Ukraine war) and while it is possible that they may increase in scale and frequency in the future, there is no automatic reason why this should be the case. However, in the case of shocks caused by climate change, infectious disease and biodiversity loss, the science suggests that, in the absence of radical (and early) government intervention on a global scale, they will increase in both frequency and scale. This reflects both the underlying causes - such as accumulation of greenhouse gasses (GHGs) in the atmosphere, or human encroachment on animal habitats - but it may also be exacerbated by a growing disconnect between the outlook as seen by scientists and that seen by financial market participants.[64] Rather than adjusting gradually to the worsening scientific outlook, financial markets may adjust suddenly.

Monetary policy globally has already played a central role in response to the GFC and the pandemic and will be expected to do so again in response to future global economic shocks. While economic policy makers could wait until the shocks occur before formulating a response, it would clearly be better for them to think through in advance what might be required and if appropriate make the necessary facilitating changes in the monetary policy framework. The critique of monetary policy during the pandemic illustrates the dangers of having to deal with an entirely new situation without preparation, as well as the risk that policy makers will fall into a one size fits all response.

Key questions include:

- how frequent and how large are future "mega" shocks likely to be?

[64] Butler, C. (2023), 'Climate change threatens to cause the next economic mega-shock', Chatham House Expert Comment, 20 July 2023, https://www.chathamhouse.org/2023/07/climate-change-threatens-cause-next-economic-mega-shock

- what will be the optimal monetary policy response with respect to each type of shock, and how will this interact with complementary fiscal and prudential policy responses?
- are new approaches to coordinating monetary, fiscal and prudential policy required to deal with potential shocks?
- how might the central bank reaction function need to be modified to take account of the likelihood of sequential mega shocks. For example, will the authorities need to restore short-term interest rates to the long run average setting much sooner than they might otherwise wish to do (and notwithstanding underlying economic weakness in the economy) in order to maintain an effective policy response to new shocks? Or should the inflation target be increased (to reduce the risk of hitting the ELB) and should flexible average inflation targeting be adopted to provide greater flexibility in monetary policy.
- to what extent should economic policy makers require private individuals and firms to take pre-emptive actions, e.g., by limiting foreign currency public and private debt, by requiring sovereign debt to incorporate climate resilience clauses, or by imposing new (mandatory) climate risk disclosure policies?
- what kind of data, modelling and forecasting tools will be necessary to deal with these circumstances?
- are there any new instruments that central banks, fiscal authorities or financial regulators need to develop pre-emptively?

Research is already underway in universities[65] and some central banks and finance ministries on how to model an economy subject to repeated very large shocks. There is also growing evidence that some financial market participants - particularly in the insurance sector - are beginning to take decisive steps in response to the growing incidence of extreme weather events.[66]

However, the research needs to be speeded up with expanded scope and clear focus on the implications for policy instruments. Other potential steps include devising and applying more extreme stress tests. However, as discussed earlier, this will only make sense for very large shocks if there is first greater clarity on the role that governments will play and how much risk private financial institutions will be accepted to absorb.

Global investment gap

Estimates vary, but there is little doubt that the world, as a whole, faces an enormous investment gap. UNCTAD recently estimated that the financing gap to meet the Sustainable Development Goals (SDGs) had now reached $4tn pa (over 6% of world GDP) between now and 2030, up from $2.5tn pa when the goals were first launched in 2015.[67]

[65]Cohort 2040 (2023), 'How can we secure a better world even as environmental destabilisation grows?', https://www.cohort2040.org/

[66]Holder V. and Thomas N. (2023), 'How investors are underpricing climate risks', *The Financial Times*, 17 August 2023, https://www.ft.com/content/899472a8-e5e2-4fde-bc91-7e548ba35294

[67] UNCTAD (2023), 'SDG investment is growing, but too slowly', *SDG Investment Trends Monitor (Issue 4),* https://unctad.org/publication/sdg-investment-trends-monitor-issue-4

Some of this investment, while critical to the quality of life of millions of people, could in principle be delayed. But a significant proportion - notably that focused on action to stabilize the climate, prevent a future pandemic or control the spread of anti-microbial resistance – cannot be postponed as it is needed *now* to safeguard mankind's future existence. In particular, more than half of the total figure, or $2.2tn pa (3.5% of GDP), is required for the energy transition to net zero. And, given the nature of the investment needed, a substantial part of this can only be met by public finance, including from the multilateral development banks (MDBs) and other international sources.

The IMF's latest Fiscal Monitor[68] sets out the enormous challenge facing both advanced and developing economies in responding to the climate change challenge. The starting point is far from ideal. Average net debt in the G7 is currently 96% of GDP and is expected to rise to 103% of GDP over the next five years. The comparable figure in emerging and middle-income countries, is much lower, at 43% and 45%, but these countries typically have much weaker borrowing capability (either domestic or foreign) and are more vulnerable to debt distress.

The IMF argues that while some countries (i.e., the US) have chosen to try and speed up climate action by using public funds to incentivise green investment (through the Inflation Reduction Act), simply borrowing more to meet the existential threat from climate change is either unwise or likely to be impossible due to market constraints, for many countries.

Instead, the IMF proposes a mix of policies. These include *some* new public borrowing, but also new carbon taxes and other measures to increase public revenues, elimination of fuel subsidies (recently estimated to be worth $7tn per year), and measures to incentivise and improve the environment for private finance. The precise mix of policies would vary from country to country.

The IMF also highlights the cost of delay in tackling the net zero transition using the widespread introduction of carbon pricing as a specific proxy for effective policy making. Each year of delay in raising carbon prices is found to increase public debt by 0.8–2.0 percentage points of GDP in advanced economies.

However, while the IMF offers a balanced and pragmatic way forward, the likelihood of this policy mix being adopted in full, at least in the short term is very low. This then raises the question of what the mix of policies will actually look like, what this will mean for the way the global economy behaves, and how monetary authorities should prepare to deal with this.

There will be two main consequences of a failure to follow the IMF's recommendations:

First, delayed action on mitigation and adaptation leading to larger and more frequent extreme weather shocks, but also policy shocks as governments are ultimately forced to take radical action. The pandemic has illustrated how radical governments in advanced

[68] International Monetary Fund (2023), *Fiscal Monitor October 2023, Climate Crossroads: Fiscal Policies in a Warming World*, International Monetary Fund, https://www.imf.org/en/Publications/FM/Issues/2023/10/10/fiscal-monitor-october-2023

countries are willing to be when faced with a clear existential threat. We have discussed earlier the implications of this for monetary policy frameworks.

Second, governments in both advanced and developing economies are likely to borrow more than would be optimal. This will reflect the additional costs of delay in climate action, as set out by the IMF above. But it will also reflect the political obstacles they will face in raising new taxes, transforming existing ones and cutting subsidies. Borrowing more is a second best option, but it is also the most likely one to be adopted.

In these circumstances, central banks will need to think carefully about the appropriate monetary response, and in particular whether they view this type of borrowing as in some sense different from other drivers of demand.

The borrowing will primarily be used to fund new public investment with three aims: to accelerate the transition to net zero (primarily through investment in zero-GHG energy sources, but also increasingly in other areas that are key to achieving net zero, such as food production); to protect societies from the effects of climate change that is already certain to happen (flood defences, new building design, etc.); and to ameliorate the social and welfare costs of the above changes. This spending will partly take the form of subsidies (including tax expenditures) for private business, and partly direct spending by governments (particularly on adaptation which is harder to fund from the private sector).

The key judgement central banks will need to make is how far this spending will leave trend growth in a given economy unchanged, and how far it will improve it, e.g., because some of the new infrastructure does more than simply replace that which has had to be scrapped ahead of its previously expected life time due to its high carbon content, e.g., because it accelerates the introduction of new, more productive technology, or because it eliminates costs, such as pollution.

The relation between this investment and r* is complicated. On the one hand the additional public and private borrowing may push up r* in the short term relative to what it would otherwise have been. But, if the investment that results does fundamentally improve productivity, it could lead to a lower r* in the medium to long term.

Faced with this kind of uncertainty, the traditional approach of central banks would be to take a cautious approach and wait to see how the new borrowing evolved, both in terms of the type of investment and its impact on productivity. However, the situation the world faces over the next decade would arguably justify a different approach.

First, because of **the scale of new investment that is needed**, and hence the impact on public borrowing. The order of magnitude will vary from country to country, but even in advanced countries could be of the order of 2% of GDP pa on top of what would otherwise have been envisaged. This means that the way central banks interpret what is happening and the policy response they choose to make, will have a substantial effect on the outcome. If they assume the additional investment will have minimal, or no, impact on productive capacity, and set rates accordingly, this could unnecessarily choke off some of investment needed to meet the climate challenge. In contrast to such situations in the past, this would

have significant implications for the future of the planet. Equally, if they are over optimistic on the impact of this investment on productive capacity, it could lead to further inflation shock with all the consequences that entails. Either error has the scope to trigger a debt trap scenario.

A second reason why the response of independent central banks, along with other independent fiscal authorities, will be critical is that through their communications they will help determine to **how financial markets view the additional borrowing.**

The experience of the very short-lived Liz Truss government[69] in the UK in Sept-Oct 2022 illustrates this. Following a so called "mini budget" on 23 September which announced £45 bn pa in permanent unfunded tax cuts, the largest one-off tax boost in the UK for fifty years, a ferocious market reaction led initially to the resignation of the Chancellor, Kwasi Quarteng, and then a few weeks late to that of the Prime Minister herself. The budget had not been assessed by the independent Office of Budget Responsibility, nor had the Bank of England been consulted. At the same time as announcing the unfunded tax cuts, the government had also announced a much larger, but temporary, extension of support to households affected by the post Ukraine hike in natural gas prices. The cost of this was at the time estimated at £60bn, but attracted relatively little attention from the markets.

The US authorities have more freedom of action on borrowing due to the economy's size, strength and the reserve currency status of the dollar, although the polarisation of domestic policies and periodic fights over raising the federal debt limit complicates this. But - for the same reason - the decision they make will have a global impact. Keeping US short-term interest rates lower will enable other countries to do the same.

There are two further considerations that central banks will need to factor into their response to the global investment gap.

First is how they head off the **threat of a new period of fiscal dominance** in which monetary policy is formulated with a view to ensuring the country's solvency, ahead of inflation and growth targets. This might occur if the combination of high debt (above 100% of GDP), positive real interest rates (at or above the long-term growth rate) and a return to low inflation leads to rapid growth in the debt service burden. (Japan's debt service already accounts for nearly one quarter of expenditure.)

Second, they will also need to consider what changes are needed in the way **monetary, fiscal and regulatory authorities coordinate policy**. Central banks do not set monetary policy in isolation. Particularly at times of unprecedented and fast-moving shocks like the pandemic, they need to coordinate their actions to preserve monetary and financial stability closely with fiscal authorities and financial regulators (when they are independently constituted). They need to maintain sufficient independence and freedom of action to do what is required under their monetary policy mandates, while cooperating with other agencies to achieve wider goals for the economy as a whole.

[69] Partington, R. (2022), 'The mini-budget that broke Britain – and Liz Truss', *The Guardian*, 20 October 2022, https://www.theguardian.com/business/2022/oct/20/the-mini-budget-that-broke-britain-and-liz-truss

In view of the analysis above it will be important for central banks to work out - as far as possible in advance - how they would view additional net zero-linked borrowing and then factor the answer into their communications, short-term interest-rate setting as well as coordination discussions with the fiscal and regulatory authorities.

Political polarisation

In the aftermath of the global financial crisis there has been a growing trend towards political polarisation in some western and emerging economies. Examples include the election of President Trump in 2016, the UK's decision to leave the EU and the rise of the far right in France and Germany.

One driver was the impact of the crisis itself in reducing productivity growth and contributing to higher income disparities between metro areas and poorly connected regions within countries. Other factors include the impact of QE on asset prices, leading to higher wealth inequality; the impact of trade liberalisation on some industrial sectors; the role of social media in creating political echo chambers; large scale migration flows; opportunities for gerrymandering of electoral districts in the US; and, most recently, the disparate impact of the 2021-23 inflation shock.

This trend has already had some impact on the independence of monetary authorities, with, for example, Liz Truss calling for a review of the operational autonomy of the Bank of England in her campaign to be Conservative Party leader, while in summer 2019 President Trump put intense pressure on Jerome Powell to lower interest rates.[70] More recently, in September, the Polish central bank made a surprise 75bp cut in interest rates, despite continuing high inflation pressures, raising concerns that it was bowing to pressure to help the conservative government win upcoming polls.[71]

The constitutional arrangements underpinning central bank independence vary enormously from country to country, ranging from independence provisions enshrined in international treaty in the case of the ECB through to the Bank of England's operational autonomy statute that can be changed by a simple majority in parliament. However, in all cases a key determinant of continued independence will be the extent of public support.

Some commentators argue that the pressure from populist politics on central bank independence will not let up and could intensify in the years ahead driven by political developments (e.g., if Donald Trump wins the 2024 US Presidential election), but also by the

[70] Mason, J. (2023), 'Trump pressures Fed's Powell: Let's see what he does', Reuters, 19 June 2019, https://www.reuters.com/article/us-usa-fed-kudlow-powell-idUSKCN1TK0CX

[71] Gera, V. (2023), 'Poland's central bank surprises with sharp interest rate cuts despite double-digit inflation', Associated Press via ABC News, 6 September 2023, https://abcnews.go.com/International/wireStory/polands-central-bank-cuts-key-interest-rate-despite-102961049#:~:text=WARSAW%2C%20Poland%20--%20Poland%27s%20central%20bank%20lowered%20its,party%20ahead%20of%20parliamentary%20election%20s%20next%20month.

public's perception of continuing economic stress as well as the hit to central bank credibility from the 21-23 inflation shock.

While central banks will not - and should not - make the final decision on independence in democratic systems, there is much they can do to influence the debate in favour of continued independence. They should prioritise the following three areas:

First, **restoring their credibility** and reputation for competence by bringing current inflation pressures under control, including bringing inflation expectations back to target as speedily as possible.

Second, **stepping up transparency** by explaining the rationale for decisions, admitting mistakes, and being ready to change course when the facts change and communicate clearly the reasons for doing this. This will not be easy for some central banks and would run against arguments to the effect that central bank credibility can be re-enforced through a degree of inscrutability. This should also include a review of recent practice in forward guidance and may lead to a more risk averse or nuanced approach.

Third, engaging fully in academic and policy debates about the **optimum form and extent of policy coordination** between the monetary authorities and other parts of government in the face of the new challenges facing the global economy. This should cover in particular the essential features of policy coordination between central banks, financial regulators and fiscal authorities in preparing for and responding to extreme shocks and emerging economic security threats.

But it also needs to address the pros and cons of the different ways in which central banks can support government action on climate change.[72] And given the urgency and existential nature of the climate threat to mankind, it should also consider whether in any areas policy makers should be willing to trade off climate action vs the central banks' core mission of price stability.

[72] Couto, L. (2023), *How to boost international private climate finance*, Research Paper, London: Royal Institute of International Affairs, https://www.chathamhouse.org/2023/04/how-boost-international-private-climate-finance

Section 5: Implications for the consensus monetary policy framework and how it is operated

In this section, we summarise briefly the main implications of the preceding analysis for reform of the consensus monetary framework, considering both the lessons from the 2021-23 inflation shock and the need to anticipate key political and economic structural trends that are underway in the world economy.

It is generally not advisable to change a policy framework in the middle of a crisis unless it appears to be completely broken (which is not the case here). So the recommendations below are for adoption once the immediate crisis linked to the inflation surge subsides.

Operating the existing monetary and financial stability framework

Central banks should deepen their expertise in **geopolitical analysis** and in other factors that could underpin **massive economic shocks** in future (including extreme weather, biodiversity, global health threats). Moreover, this work should be moved beyond a research focus (e.g., in the NGFS) and be given an operational dimension.

More specifically, central banks should expand their ability to model highly complex shocks (such as the pandemic) and to monitor different dimensions to the shock on an on-going basis (e.g., through new data sources)

They should also make a renewed effort at avoiding group think by diversifying their models, decisions makers, and encouraging outside challenge.

Central banks should be more risk averse when considering the possibility of pass-through to core inflation of transitory shocks.

They should also review their approach to - and implementation of - forward guidance so as to avoid the risk of being trapped by conditionality that becomes out of date.

Changes to framework

Consideration should be given to setting out much more clearly the division of responsibility between public and private entities in the event of a massive shock and defining what this means for the financial stability framework. This work should also look at the role of monetary policy as a shock absorber vs that of the fiscal and regulatory authorities.

Consideration should also be given to how to manage the risks associated with a much larger share of the net zero transition being financed through public debt than might be ideal. This should include: determining how to minimise the threat of fiscal dominance; establishing what this should mean for the coordination mechanism between central banks, finance ministries and financial regulators; and looking at whether central banks may need to develop any new types of operational facility.