INSIGHT

QUARTERLY MARKET REVIEW

Q3 2022

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PODCAST

Turbulent times

OVERVIEW

Deflation to inflation, recovery to recession, globalisation to autarky

US

Cooling a hot economy

SWITZERLAND

The end of an era of negative rates

SPECIAL FOCUS

Energy self-sufficiency and the green agenda

The transition to the post-Covid world economy has hit turbulence. Inflation rates have soared; recovery may turn to recession; and globalisation to autarky. Those concerns will not quickly fade.

A polycrisis

The major advanced economies are seeing the third spike in inflation since the 1970s (see Figure 1). Inflation rates close to, or above 10% are expected in the second half of the year. Central banks are fighting the trend with higher interest rates but that means the anticipated recovery in economies has been transformed into fear of recession. The deflationary forces of globalisation are in retreat. Self-sufficiency is the aim in areas from energy to food and semiconductors. Trust in many western political leaders, never high, has reached new lows. And the ability of 'strongman' leaders to guide economies is in question:[1] China has extended its zero-Covid policy to 2027; Russia continues to fight its war in Ukraine; new strongmen in Latin America have quickly fallen out of favour. Questions are being raised about the credibility and, indeed, independence of central banks. In these turbulent conditions financial market valuations have been hit and diversification has been hard to find: safe as well as risky assets have suffered. In short, the world faces a 'polycrisis'.[2]

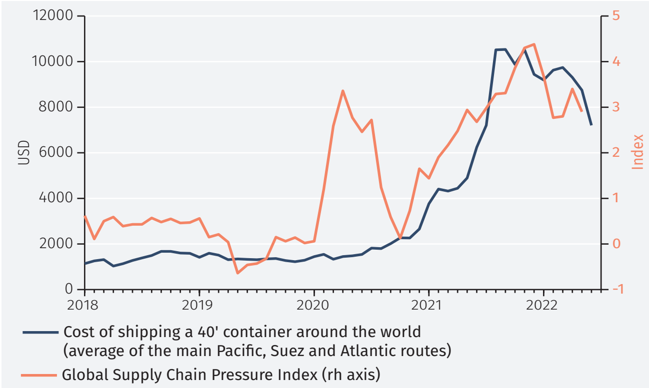
1. G7 inflation rate

Source: Refinitiv. Data as at 1 July 2022.

Lessons from the 1970s and 1980s

The darkest day is, as is often said, before the dawn. And, indeed, financial markets have regained some composure as we have moved into the second half of the year. Supply chain pressures and shipping costs have eased (see Figure 2). Oil and agricultural commodity prices have fallen back. Inventory shortages have, in some cases, quickly been transformed into excess stocks and liquidation sales. Even so, the potential for inflation becoming ingrained remains. The words used to describe the issues: 'price cap', 'embargo', 'escrow account' and 'wage-price spiral' comes straight from a 1970s Thesaurus. In the US, perhaps the key lesson from that period is that hesitant action on tightening monetary policy risks being ineffective in controlling inflation. In

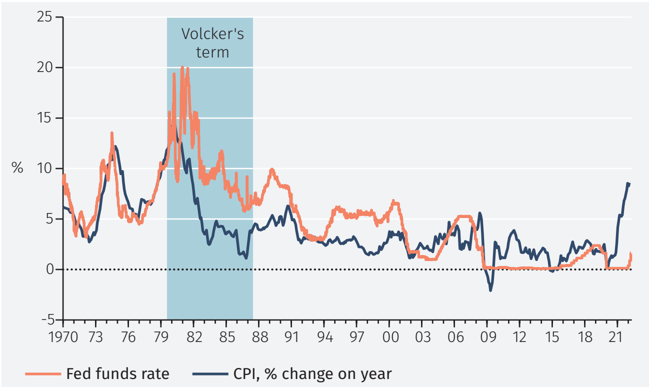
2. Freight rates and supply chain pressures



Sources: Freightos and New York Fed via Refinitiv. Data as at 1 July 2022.

the US, inflation started to rise, under the influence of expansionary monetary and fiscal policies, from the late 1960s onwards. US interest rates, however, barely kept pace with inflation throughout the 1970s. Real rates were often negative. It was not until the monetary tightening of Fed Chairman Volcker that inflation was brought back under control (see Figure 3).[3]

3. Volcker's Fed



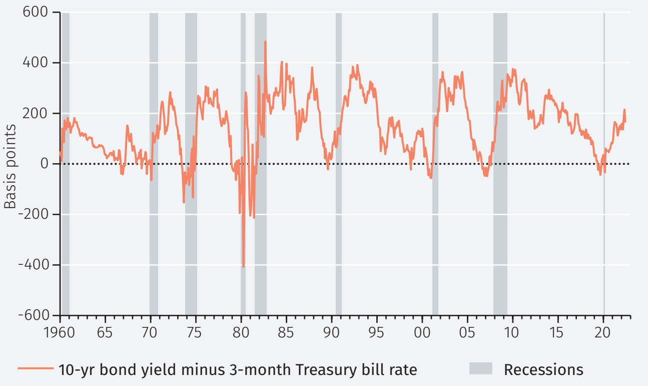
Source: Refinitiv. Data as at 1 July 2022.

Stagflation and a bear market

The US Fed does seem to be on a path to higher rates but there are two concerns stemming from that. First, that such action leads to an inversion of the yield curve which, in turn, presages recession (see Figure 4). Hence, concern about recession (or slow growth) before inflation has been brought under control – stagflation – has surfaced. Second, higher interest rates and bond yields, by raising the discount rate used to value long-term assets, adversely affect the equity market. In the 1970s, with two oil shocks, large cap US

[1] See Gideon Rachman, *The Age of The Strongman*, for an appraisal.
[2] The term coined by Adam Tooze.
[3] For a detailed description see https://tinyurl.com/bdd9w7vf

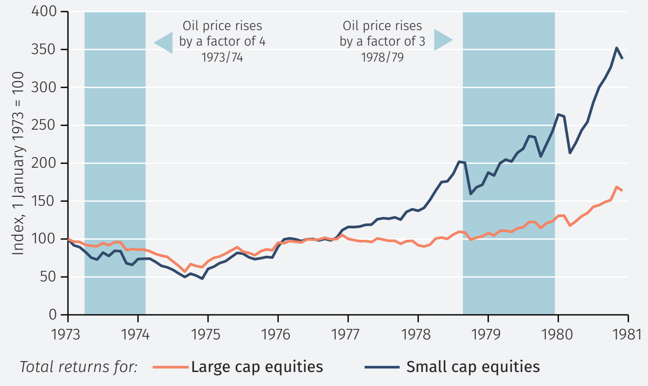
4. US yield curve slope and recessions



Source: Refinitiv. Data as at 1 July 2022.

equities essentially traded sideways as growing earnings were undermined by lower multiples. This period, however, saw the discovery of the 'small cap phenomenon'. Such companies, typically more flexible and innovative, did well (see Figure 5).

5. US equities in the 1970s

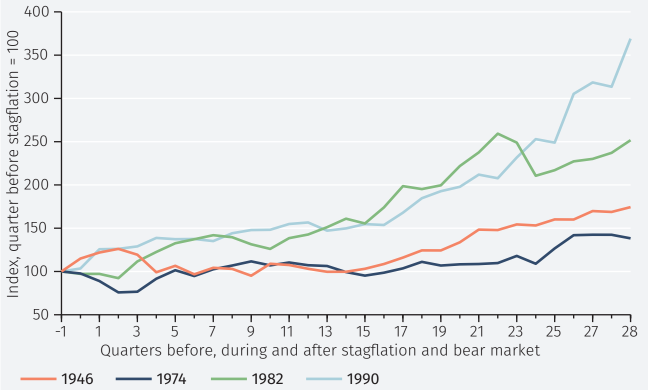


Source: Fama-French database. Data as at 1 July 2022.

The combination of stagflation and a weak equity market is certainly not one which provides a benign scenario for financial markets. The sell-off in crypto assets and the worldwide wobble in real estate is notable in this respect. The decline in the overall value of crypto assets (some USD 2trillion) is on a par with the decline in value of dotcom companies when that boom turned to bust in the early 2000s, and with the losses in the US subprime crisis.

Periods of stagflation coupled with an equity bear market are, thankfully, rare. Four such periods can be identified since 1945 (see Figure 6). They have all been short – lasting just one or two quarters. And all four have seen strong equity market returns in the subsequent years. In three of those

6. S&P 500 after stagflation and a bear market



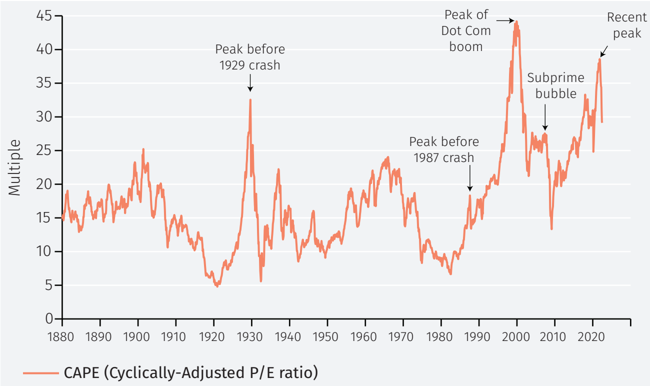
Sources: Robert Gordon and Refinitiv. Data as at 1 July 2022.

four periods – after 1946, 1982 and 1990 – inflation proved to be temporary. They produced the best returns. That historic experience suggests that central bank resistance to higher inflation is to be welcomed, not feared in financial markets.

Reassessing fundamental valuations

However, this rests alongside the concern that overall equity valuations are, on some measures, still too high. The cyclically-adjusted price/earnings ratio for the S&P 500 index is still at an elevated level (see Figure 7). Such a high valuation can be sustained if interest rates and bond yields are also held at low levels. And that, of course, depends on inflation returning to a lower level. This is not necessarily the sub-2% rate which was the persistent 'problem' of the pre-Covid era. A rate modestly above central banks' target of 2% would, we think, be sufficient for financial markets to regain their poise. That will not be achieved in 2022. But it looks a more realistic prospect for next year.

7. S&P 500 index CAPE



Source: Robert Shiller data from multpl.com. Data as at 1 July 2022.

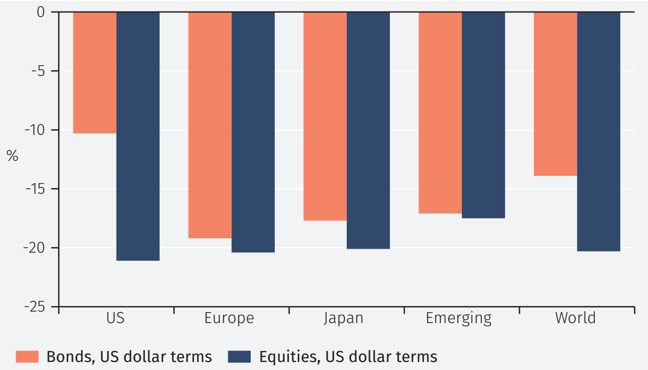
ASSET MARKET PERFORMANCE

There was no hiding place in the first half of the year, with bond and equity returns both negative. The common cause was higher inflation leading to higher policy interest rates and bond yields. The US dollar strengthened against most currencies.

Asset market performance

Global bond market returns were substantially negative in the first half of 2022, at -13.9% on the basis of the Bloomberg Barclays Global Aggregate Index (see Figure 8).[4] Rising inflation and actual and expected increases in policy interest rates pushed up bond yields around the world, with a consequent fall in bond prices. Even in those markets where bond yields were more stable (notably Japan) returns in US dollar terms were undermined by currency weakness.

8. Asset market performance

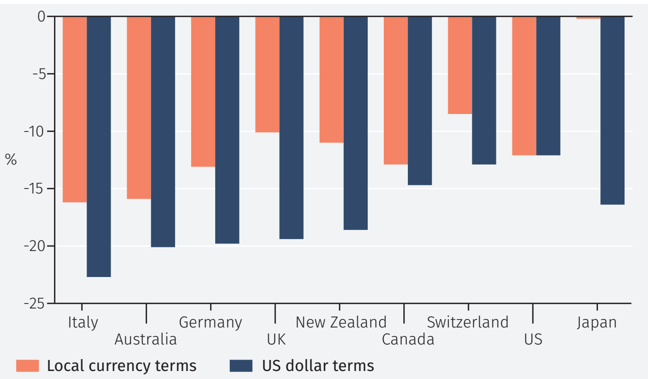


Sources: Barclays Bloomberg (bonds); MSCI (equities). Data for year to date as at 30 June 2022.
Past performance is not necessarily a guide to the future.

Bond markets

The general rise in longer-dated bond yields – and consequent decline in prices – which started in 2021 continued in the first half of 2022. US 10-year government bond yields doubled, from 1.5% to 3%. Most other markets saw a similar, to slightly larger, rise in bond yields. 10-year yields in Italy, Canada, Australia and New Zealand were all over 3% on 30 June 2022. Most major bond markets registered substantially negative local currency returns (see Figure 9). Japan the notable exception to that trend: with the Bank of Japan was continuing to buy ‘unlimited’ quantities of government bonds, 10-year yields stayed close to zero but the marked weakness of the yen undermined returns in US dollar terms.

9. Bond market returns



Source: Refinitiv. 10-year benchmark bond total returns. Data for year to date as at 30 June 2022.
Past performance is not necessarily a guide to the future.

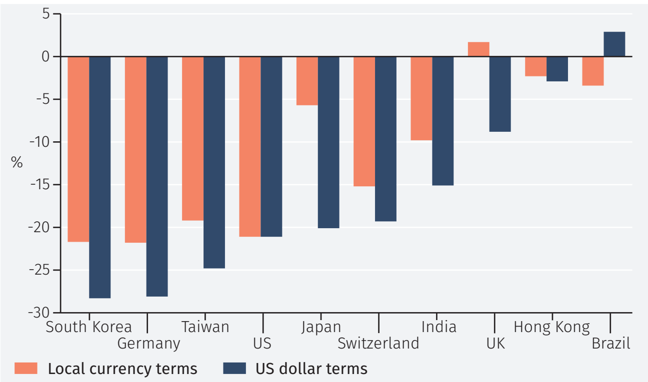
The decline in prices for some very long-term bonds was particularly marked: Austria’s 100-year government bond, issued at EUR 100 in 2017, rose to a peak price of EUR 234 in early 2020 but now trades around EUR 80. It shows the adverse of effects of very long duration exposure in a rising yield environment. Global high yield corporate bonds produced negative total returns of 17% in the first half of the year.

Equity markets

In the major developed markets, UK equities were alone in producing positive local currency returns (see Figure 10). Sterling’s weakness against the US dollar meant, however, this translated into negative returns in dollar terms.

The US market itself produced negative returns of around 20%, with weakness seen across all sectors but particularly concentrated in technology stocks. The major European equity markets all produced negative returns of around -20% in US dollar terms. Brazil was the strongest of the emerging markets, benefiting from stronger commodity prices.

10. Equity market returns



Source: MSCI. Data for year to date as at 30 June 2022.
Past performance is not necessarily a guide to the future.

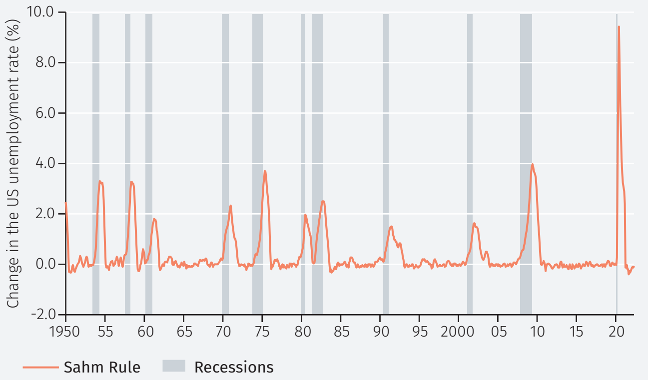
[4] The Bloomberg Barclays Global Aggregate Bond Index is a benchmark of government and investment grade corporate debt from developed and emerging markets issuers in 24 countries.

Two economic developments will be closely watched in the final half of 2022: whether there is any sign of the US entering recession; and progress on reducing inflation.

Sahm rule

The Sahm indicator, named after its inventor, is a timely tool for spotting the onset of recession (see Figure 11). It is based on the unemployment rate compared to its recent lowest rate. Just a small rise in the rate (0.3 percentage points) coincided perfectly with the onset of recessions in 2001 and 2007. A recession has always started within 4 months of the Sahm rule indicating its onset. Moreover, that indication has come much quicker than confirmation from the NBER, which provides the most widely used dating of US recessions.[5] For now, the Sahm indicator provides no cause for concern. If, however, the unemployment rate were to rise to 3.9% that would be the signal that a recession has started.

11. Recession indicator: no warning sign



Source: Fred database. Data as at 1 July 2022.

US wage growth and inflation expectations

Wage inflation, reflecting that tight labour market, has started to rise. Two of the best indicators (see Figure 12), show it now running at rates last seen in the year 2000, just before the US entered a mild recession.

12. US wage growth

Sources: Atlanta Fed and BLS via Refinitiv. Data as at 1 July 2022.

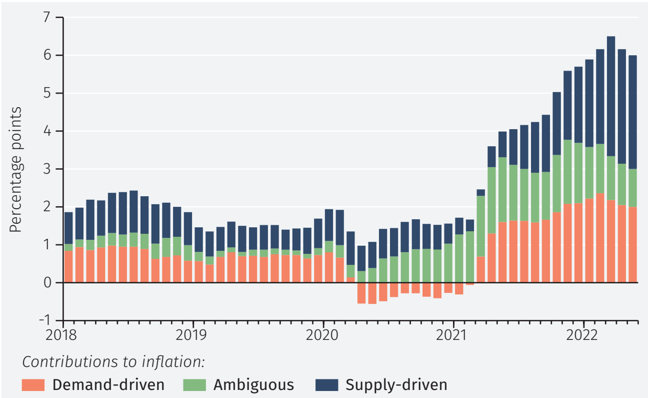
However, alarm over rising long-run inflation expectations may be overdone. Fed chair Powell noted the increase in 5-year inflation expectations (see Figure 13) when announcing the May 2022 75 basis point Fed rate increase. That rise has, however, has now been revised away.[6]

13. Rising inflation expectations

Sources: University of Michigan and Refinitiv. Data as at 1 July 2022.

One other key focus will be any change in the factors driving PCE (personal consumer expenditure) inflation. Demand driven inflation is currently running at 2% year-on-year; the rest is due largely to supply-driven factors. Any easing of such pressures will be particularly welcome.

14. Supply and demand influences on PCE inflation



Source: Federal Reserve Bank of San Francisco. Data as at 1 July 2022.

[5] The NBER identified the start of the 2008/9 recession 12 months after it began; and the start of the 2001 recession only after it had finished. See: http://www.nber.org/cycles/cyclesmain.html

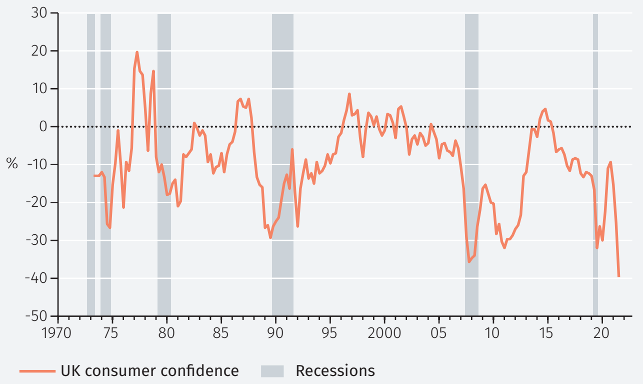
[6] The 5-year expected inflation rate increased to 3.3% in May from 3.0% in April in the initial survey release. It was subsequently revised down to 3.1%, the same rate as in January 2022.

UK consumer confidence has hit record lows, despite a strong labour market. Approval ratings for the government are dire and inflation is likely to exceed 10%. Things, maybe, can only get better.

UK consumer confidence at rock bottom

UK consumer confidence is at its lowest ever level (see Figure 15). Lower, even, than in the 1970s when oil prices soared and fuel shortages led to a three-day week. With the UK making a good recovery from Covid, many households eager to spend accumulated savings and a low unemployment rate (see Figure 16) why is that the case? There are three main reasons.

15. UK consumer confidence



Source: GFK via Refinitiv. Data as at 1 July 2022.

16. UK unemployment rate lowest for 50 years

Source: Refinitiv. Data as at 1 July 2022.

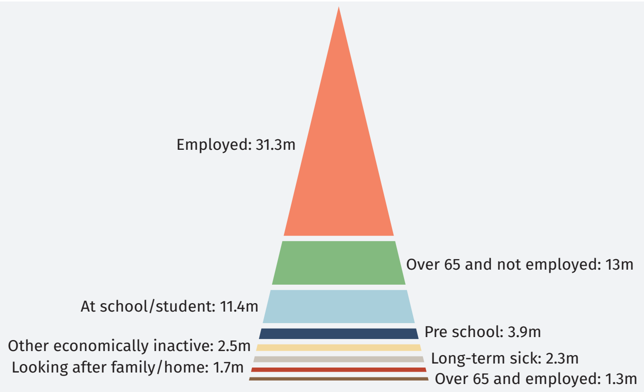
Government unpopularity

First, the approval ratings of the government have reached new lows. According to a YouGov poll in late June, 60% of voters disapprove of the government's record to date. The net disapproval (22% do think the government is doing a good job) is greater than during Covid and close to the levels during the protracted and difficult Brexit negotiations of Theresa May's 2016-2018 government. But that can only be a partial explanation: UK governments are very rarely popular.

Demographics, technology and the labour market

The second explanation lies in the UK's demographics. Although unemployment is low (1.2 million people), almost one million people in employment are on zero hours contracts; and many others have limited job security. There are more people not working because they are looking after family or the home (1.7 million) or because of long-term sickness, (2.3 million) than there are unemployed. 13 million people are retired and not working and over 11 million are in education.

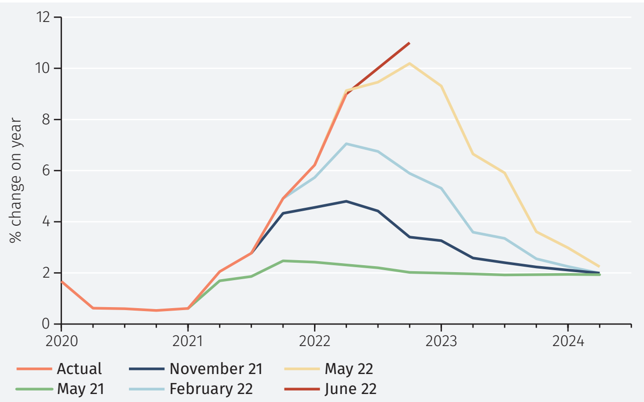
17. What do people in the UK do?



Source: Refinitiv. Data as at 1 July 2022.

High inflation affects these different groups in different ways. Those working often find it hard to achieve wage increases that keep pace with inflation, especially as it heads above 10% (see Figure 18). Widespread strike action looks set to return. There is clearly a risk of a 'wage-price spiral'. Meanwhile, those retired people drawing a state pension find this increasing with inflation thanks to the 'triple lock'. The UK's reputation for economic flexibility will be tested in coming months.

18. UK inflation and Bank of England projections



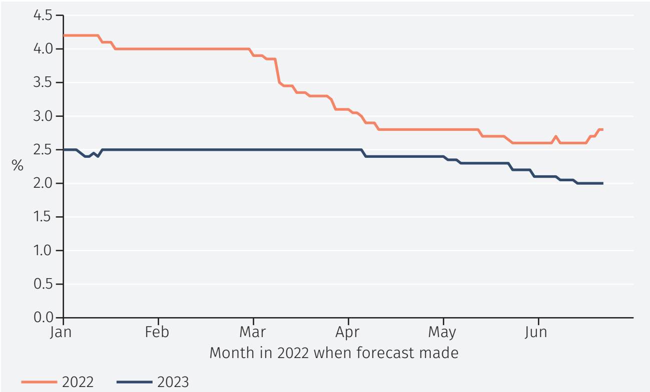
Sources: Bank of England and Refinitiv. Data as at 1 July 2022.

The eurozone economy has not been as adversely affected by the Russia-Ukraine war as many expected, but external and internal vulnerabilities remain.

Eurozone vulnerabilities

The eurozone is often seen as more vulnerable to external shocks than other regions. Foreign shocks and global supply chain bottlenecks have played an outsized role in explaining higher eurozone inflation, according to a recent study.[7] And the eurozone has a greater reliance on trade with Russia than other regions. However, real GDP growth forecasts for 2022 and 2023, see Figure 19, have been revised down by no more in the eurozone than in the US since the start of the year.

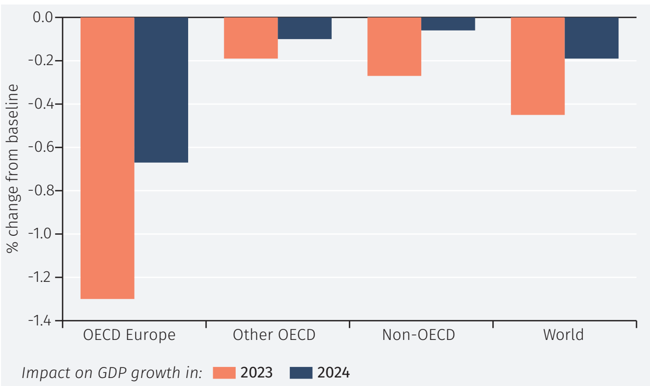
19. Forecasts for eurozone GDP growth



Sources: Bloomberg consensus forecasts. Data as at 1 July 2022.

This reflects a number of developments: the ECB has not yet started to raise interest rates and withdraw asset purchases, whereas the US Fed has; consequently, the euro has weakened against the US dollar, helping eurozone competitiveness; and supply chain bottlenecks – especially in sectors which are important for the eurozone, such as car manufacturing, seem to have been resolved relatively quickly. Nevertheless, there are clear external and internal challenges ahead. Just as in the US, there is an increased chance of a recession.

20. European embargo on Russian gas



Source: OECD. Data as at 1 July 2022.

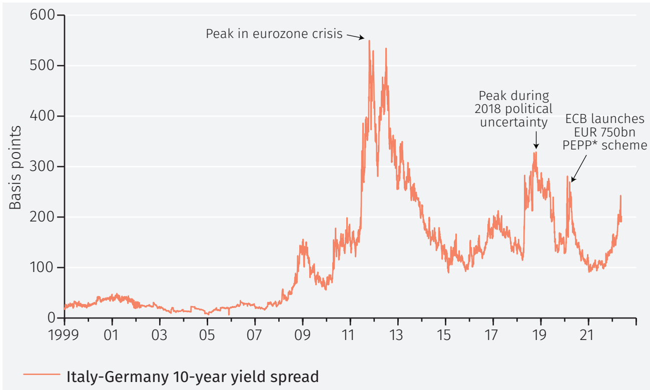
The clearest external threat relates to the Russia-Ukraine war. If this continues into late 2022 and beyond, there is an increased likelihood of an embargo on Russian gas imports. The OECD estimates that Europe would be affected to a much larger extent than the rest of the world (see Figure 20) by such a move.

Doom loop again?

Internally, a key concern is bond market 'fragmentation'. Specifically, that some bond yield spreads over Germany could widen out as ECB bond purchases are scaled back. Italy is at the centre of such concerns. Italian yield spreads over Germany have already widened out, as they have in past periods of stress (see Figure 21). The ECB has been reluctant to say what it would do to alleviate further stress. That is understandable, given that Germany could legally challenge any directed support programme. But the success with the PEPP (Pandemic Emergency Purchase Programme) in stabilising bond markets – notably because issuer limits on ECB purchases were not imposed – is, perhaps, an encouraging parallel.

Arguably, Italy's policies are more firmly grounded than they were in the eurozone crisis; and banks do not own as much sovereign debt, lessening the chance of a sovereign-bank 'doom loop'. But the reality is that Italy remains a source of discomfort for both eurozone policymakers and holders of eurozone assets.

21. Italy-Germany 10-year yield spread



*PEPP=Pandemic Emergency Purchase Programme. Source: Refinitiv. Data as at 1 July 2022.

[7] Şebnem Kalemli-Özcan, Julian di Giovanni, Álvaro Silva and Muhammed Yıldırım, *Global supply chain pressures, international trade and inflation.* Paper presented at the ECB Sintra conference, June 2022.

Switzerland has so far weathered relatively well the multiple shocks that have hit the global economy. As elsewhere, however, higher consumer price inflation clouds the outlook.

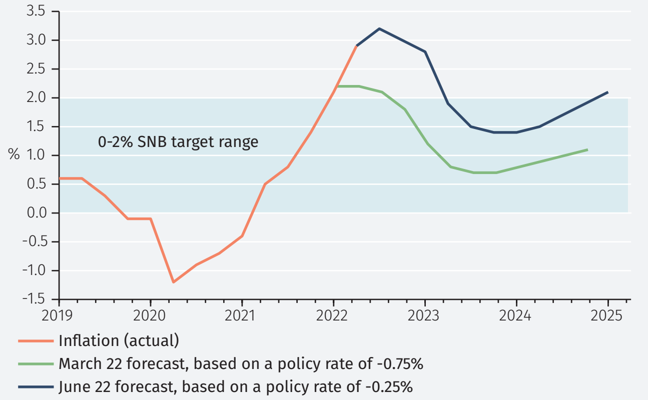
Swiss growth has held up...

In the first quarter of 2022, Swiss GDP was 4.4% higher than a year earlier. That reflected the favourable base effect (last year anti-Covid measures were in place). While GDP growth, notably supported by the service sector, has likely remained positive, purchasing mangers' and consumer surveys indicate a moderation.

...but the inflation outlook has worsened.

One factor that is clouding the outlook, as elsewhere, is rising consumer price inflation. This reached 2.9% year-on-year in May, a level unseen since before the Global Financial crisis. The main reason is higher prices of imported goods, including energy, food and cars. Net of food and energy, core inflation remains below 2%.

22. Switzerland: inflation forecasts



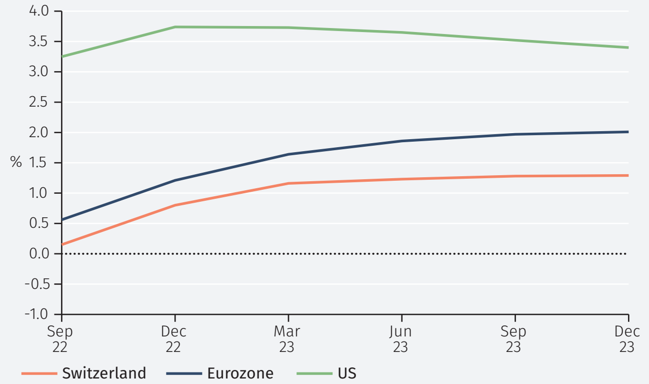
Sources: SNB and Refinitiv. Data as at 1 July 2022.

In response to the worsened inflation outlook, the SNB (Swiss National Bank) raised its policy rate by 0.5% in June, bringing it to -0.25%. The move was unexpected but soundly based: inflation is now seen peaking above 3% even after the interest rate rise (see Figure 22). Further interest rate increases are priced into futures markets (see Figure 23), although rates are expected to remain below those in the eurozone.

Swiss franc valuation

Interestingly, the SNB no longer refers to the exchange rate as "highly valued" and President Jordan has indicated that the central bank is ready to sell foreign currency reserves to support the franc if it weakens further. The SNB seems concerned the currency may depreciate (as other central banks raise rates aggressively to fight much higher inflation than in Switzerland) and that this will put upward pressure on the Swiss CPI. History suggests that concern is justified:

23. Interest rate futures: Switzerland, Eurozone and US



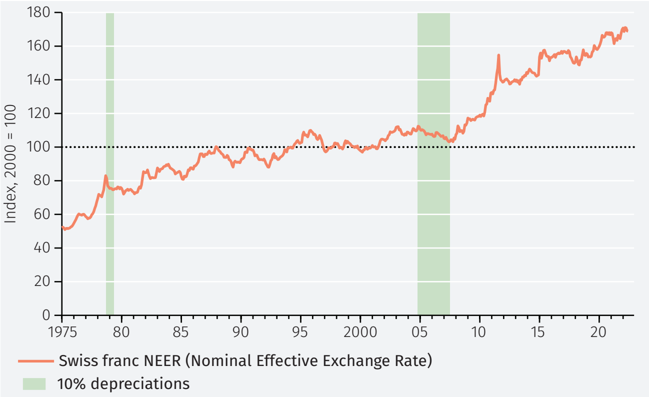
Source: Refinitiv. Data as at 1 July 2022.

previous episodes of tightening of foreign monetary policy following a shock to commodity prices have seen the Swiss franc weakening. Between 1978 and 1981, the Swiss franc lost almost 50% against the US dollar and in 2007 it reached an all-time low against the euro. On both occasions, the trade-weighted exchange rate of the franc fell by about 10% from peak to trough. The recent slide of the franc seems to follow the same template and is likely to have played a role in convincing the SNB to act sooner rather than later.

In so doing, the SNB also established its independence, undermining a common view that it passively responds to ECB policy. Furthermore, raising rates early and decisively may reduce the degree of policy tightening needed to rein in the current high inflation.

It is now clear that the days of negative Swiss interest rates are numbered.

24. Swiss franc exchange rate index



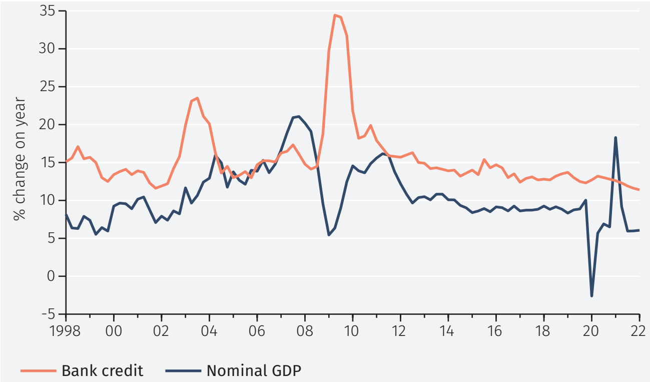
Sources: SNB and Refinitiv. Data as at 1 July 2022.

China's economy has weakened but strong policy support remains elusive. Several financial market trends across Asia have diverged from the pattern of the past.

China: calm in the storm?

In the global financial crisis of 2008/9 China 'saved the world' with a massive monetary and fiscal stimulus package. A RMB 4 trillion public investment plan (12% of GDP at the time) was announced in November 2008; and credit expansion was RMB 4 trillion in the first quarter of 2009 alone. China contributed half of global GDP growth in 2009 and 2010.

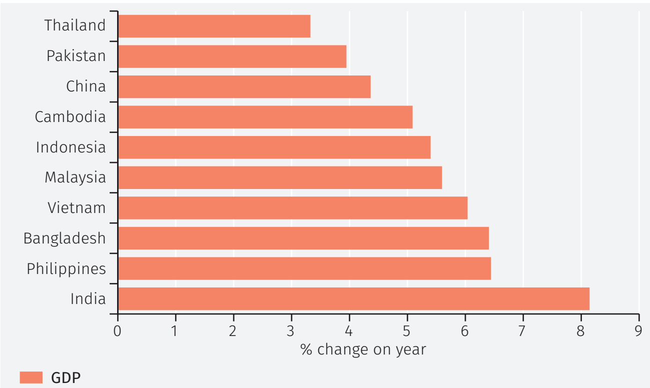
25. China: bank credit and GDP



Source: Refinitiv. Data as at 1 July 2022.

We are not seeing such monetary and fiscal laxity now. Credit growth and nominal GDP growth (see Figure 25) have remained modest and stable. China has announced its intentions to take stimulus measures but in practice few have materialised. Meanwhile, China's zero Covid policy continues to be a drag on economic growth in 2022. In 2023, however, we expect a good recovery as stimulus measures start to take effect and excess consumer savings can once again be spent. Other smaller more flexible economies, notably Vietnam and the Philippines, have benefited as formerly Chinese production has been relocated.

26. Asian GDP growth in 2022



Source: Refinitiv. Data as at 1 July 2022.

(see Figure 26). But there have been some notable exceptions. Sri Lanka's economy has been particularly badly hit, notably because of the sharp rise in imported food and fuel costs. Foreign exchange reserves have been rapidly depleted and the government has defaulted on its external debt.

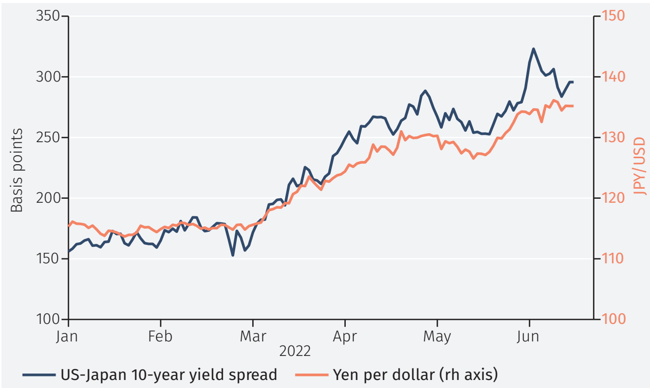
27. US and China 10-year bond yields

Source: Refinitiv. Data as at 1 July 2022.

Financial market trends

In financial markets, China's cautiousness is being rewarded in stable and low government bond yields. These are now below similar US rates (see Figure 27). Meanwhile, Japan has refrained from tightening monetary policy as inflation has risen to its long-elusive target rate of 2%. The large and widening yield differential with the US (see Figure 28) has led to persistent weakness of the yen. Estimates of the yen's purchasing power rate against the dollar suggest it should be much stronger: JPY 67-91/USD (on *The Economist* Big Mac and IMF measures, respectively). The yen, normally a safe haven in turbulent times, has not behaved as many thought it would.

28. Yen and US-Japan rate differential



Source: Refinitiv. Data as at 1 July 2022.

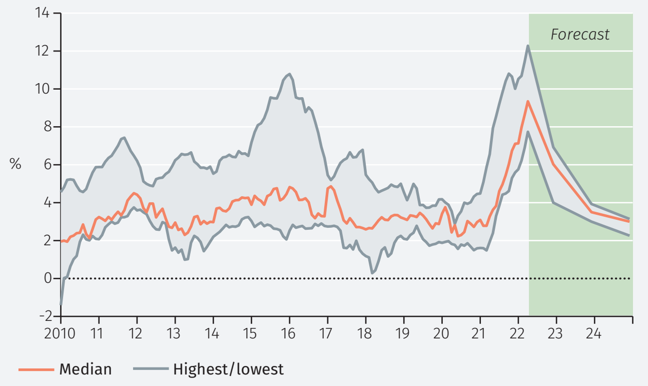
LATIN AMERICA

As a region with a history of high inflation, Latin America's reaction to the current inflation surge is particularly interesting. Will it be enough to bring it back on track?

Central bank independence

Latin America is experiencing, in common with the global trend, a surge in inflation. But in contrast to the rest of the world, this comes when very high inflation – indeed, hyperinflation – is still widely remembered in the region. Brazil and Peru had inflation rates above 1,000% p.a. in the late 1980s/early 1990s. Action was taken to curb this perennial weakness in the 1990s, with all countries in Latin America, except Brazil, giving their central banks independence and a price stability mandate.[8]

29. Latin America: CPI inflation rates



Source: Refinitiv. Data as at 1 July 2022.

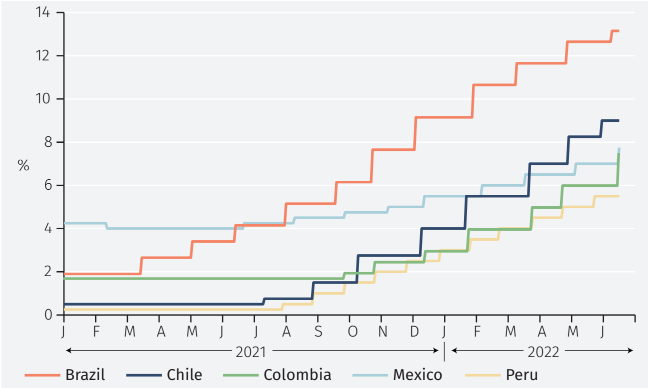
Rising to the challenge

The rise in Latin American inflation (see Figure 29), which started in 2021 has been the first major challenge facing the region's independent central banks. Inflation rates in the five major economies were between 2% and 4% in the early stages of the pandemic and rose to above 10% in Chile and Peru more recently. The IMF forecasts rates will return to around 6% at the end of 2022 and 3-4% at the end of 2023.

The one reason for being reasonably confident in that view is that Latin American central banks have reacted quickly and forcefully (see Figure 30). There have been 11 consecutive rate hikes in Brazil and Peru; 9 in Mexico; 8 in Chile and 7 in Colombia.

As inflation and interest rates have risen so have local currency bond yields (see Figure 31). With the exception of Chile these are now in the 8-13% region. If inflation does fall back quickly and then remains in a 2-4% range, such yields represent an interesting opportunity. Wary that currency depreciation can eat away from the returns when expressed in a hard currency, some will be cautious about holding such debt. However, according to one influential study they need

30. Latin America: Policy interest rates

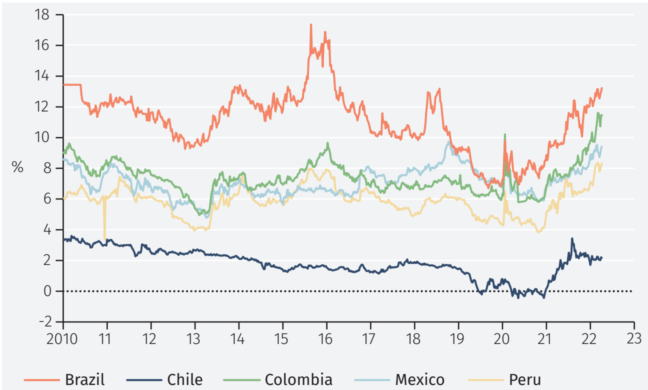


Sources: Central banks and Refinitiv. Data as at 1 July 2022.

not be too concerned. A database of foreign-currency denominated government bonds traded in London and New York between 1815 (the battle of Waterloo) and 2016 shows the returns have been sufficiently high to compensate for risk. Real ex-post returns have averaged more than 6% annually across two centuries, including default episodes, major wars, and global crises.[9]

Even so, many will prefer exposure to the region's hard currency debt (issued predominantly in US dollars). Interestingly, governments in the region look set to be among the first issuers of sustainability-linked sovereign hard currency bonds. If that is the case, the attitude towards Latin American debt may well change permanently.

31. Latin America: 10 year government bond yields (local currency)



Source: Refinitiv. Data as at 1 July 2022.

[8] Brazil's central bank was not given autonomy until 2021.
[9] 'Sovereign Bonds since Waterloo', Josefin Meyer, Carmen M. Reinhart & Christoph Trebesch *NBER Working Paper* 25543.

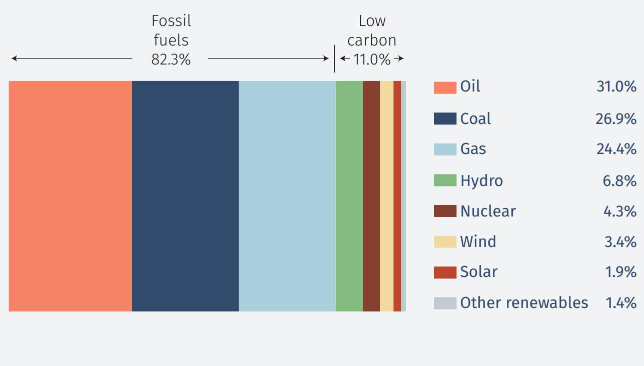
The Russia-Ukraine war has pushed the issue of energy security to the top of the political agenda. Can it be achieved at the same time as reducing carbon emissions and curbing energy prices?

If the challenge faced by central banks – bringing inflation back to target without generating a recession – looks difficult, it is straightforward when compared to the issues in the energy market. Western policymakers face a trilemma: they would like greater energy security – notably, a quick reduction in imports of fossil fuels from non-friendly nations; they are committed, in most cases, to a meaningful cut in carbon emissions; and they are under pressure to ease the 'cost of living crisis' by curbing energy prices. It seems very unlikely that all three can be achieved in the short-term; but it may be that current tensions actually help the required long-run adjustment.

World is still reliant on fossil fuels

The world still generates much more than half of its power from fossil fuels (see Figure 32). Lower carbon and renewable sources – nuclear, wind, solar, hydro power and biofuels – account for less than a fifth. Of course, the pattern varies from country to country. Ideally, countries would like to use low carbon sources and be energy self-sufficient. But the seven economies in the world where domestic energy production covers or exceeds domestic consumption are fossil-fuel rich economies (Norway, Australia, Russia, Colombia, Canada, Brazil and the US). That is not the model of self-sufficiency for the future.

32. World energy production

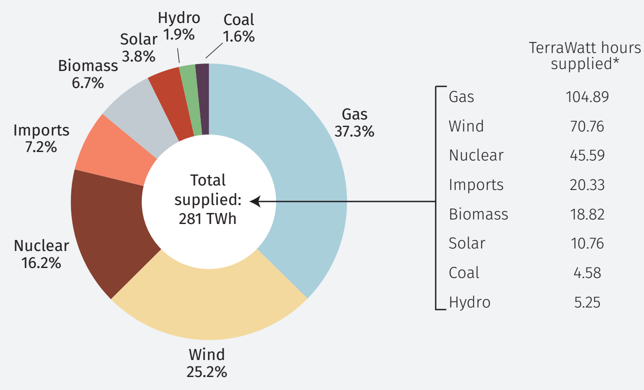


Source: BP *Statistical Review of World Energy*, June 2022.

The challenges of electrification

In that context, the UK is a leader. Half its electricity production comes from low carbon sources (see Figure 33) and the share is rising quickly. Wind power (onshore and offshore) produced a quarter of the UK's electricity in the 12 months to 30 June 2022. Offshore wind capacity is currently

33. Britain's electricity supply mix



*for the 12-month period to 30 June 2022. Source: electricinsights.co.uk

11GW (Gigawatts) and the government's intention is for this to reach 40GW. That is ambitious. It would mean erecting 3,000 new offshore wind turbines: one every working day for the next twelve years.

How far that takes the UK towards self-sufficiency in low carbon electricity remains to be seen. Currently, electricity accounts for only 15% of total UK energy consumption. As transport, heating and industrial processes become electrified, so the demand for renewable electricity will rise.

Steel is one particularly problematic area. The world steel industry currently accounts for 8% of global carbon dioxide emissions. Moving to low carbon steel production would be very electricity intensive. Decarbonising just the UK's relatively small domestic steel production (7 million tonnes per year) would require 30MW of electricity capacity (another 3,000 offshore wind turbines).[10] Ground source heating also requires large amounts of electricity. And, of course, there is the need for electric vehicle charging.

Once the new infrastructure is in place – hopefully, by 2050 but more likely later – the marginal costs of producing electricity will be low. That is the enticing prospect set out by Jeremy Rifkin in his book, *The Zero Marginal Cost Society*. Getting there will take time.

[10] EFGAM estimates based on UK CFA Certificate in Climate & Investing data.

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