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MACQUARIE ASSET MANAGEMENT

Opportunity in a volatile world

Outlook 2023

December 2022

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A letter to investors

> The global economy faces diverse and complex challenges, but we can play a key role in presenting opportunities to our clients that will generate positive impact for everyone."
>
> – Ben Way

By many measures, 2022 was difficult: global inflation, the end of easy monetary policy, supply chain disruptions and an unprovoked war that, among other things, drove Europe to prioritise energy supply over energy transition. These events set global markets on a downward path, and the challenges they presented persist as we enter 2023.

It's not exactly the kind of environment that ordinarily inspires investor optimism – and yet, based on our experience and the views of our experts, we remain stubbornly optimistic. The global economy faces diverse and complex challenges, but we can play a key role in presenting opportunities to our clients that will generate positive impact for everyone.

When volatility and uncertainty abound and the cost of capital is not zero, it is especially important to be an active investor. To use the analogy of buying a home, our clients want to partner with asset managers who know more than which neighbourhood to move into. We need to find the right neighbourhood, but also the right house, on the right street, to unlock the most potential value – both for investors and for the community.

The work ahead won't be easy. We will remain patient and focused as we put our ideas, expertise and resources to work. We believe leadership is defined by those with deep expertise and networks, who think long term and collaborate to make a meaningful impact on major challenges, such as climate change and the energy transition, while ensuring all impacted communities are supported.

The year 2022 was punctuated by shocks to global systems that once seemed resilient and steadfast. Supply chains grew in size, scale and suppleness over decades. Energy and food markets, always subject to market factors, were reliable. Globalisation was an inexorable trend – and we believed monetary policy had prevailed over inflation.

These assumptions were challenged fundamentally in 2022. *What are the implications for 2023?*

In this Outlook, we take the view that recessions will cast a pall over global growth in the first half of 2023 – especially in Europe and the UK, but also in the US. But with China's economy likely to accelerate steadily throughout the year as policy easing steps up gear, and developed world growth set to improve in the second half of the year, the global economic landscape should be much improved towards the end of 2023.

We also expect many of the 2022 market disruptions to ease: supply chains will stabilize and improve, commodity markets will realign, and inflation will moderate (although not to central bank target levels of ~2%).

The outlook for energy is mixed. This winter will likely test but not break Europe's energy security. And we believe the transition to renewables and more sustainable energy will continue. It must. The case for more sustainable power on both environmental and security grounds has only strengthened, and many markets will make meaningful investments to lessen their dependency on fossil fuels.

Strategically, this outlook strengthens our investment thesis across four major dimensions:

- **Alternatives must play an active role in portfolios.** Many investors, especially qualified individual investors, underallocate to private markets, meaning they are missing opportunities to diversify and protect portfolios against inflation – once a non-event and now a top concern among our clients.
- **Infrastructure will lead investment priorities.** There is strong global appetite to invest in infrastructure, particularly renewable energy. We anticipate $US2 trillion in global inflows over the next five years. Further, governments are driving significant climate policy initiatives. For example, Australia's government recently passed major climate change legislation, and the US has set aside $US369 billion for climate investment. We applaud this leadership.
- **Energy security and carbon reduction are no longer opposite goals.** For years, the argument was that you could have either energy security or sustainability, not both. Now we see that these two priorities must be met simultaneously, often in concert with each other.
- **Yield has returned.** After more than a decade of next-to-zero yields for all but the riskiest fixed income securities, there's now an array of attractive risk-adjusted return opportunities. However, serious risks must be considered, including the risks of recession, rising unemployment, monetary policy, and other geopolitical developments that will continue to impact all our clients' portfolios.

For most investors, public equities represent a large share of their portfolios. Considering how stocks and bonds have performed, 2022 was clearly consequential. But as we move into 2023, we see many opportunities in various equities across several sectors, including energy and infrastructure, and in large-caps.

With our outlook – and our investment methodology and experience – we remain focused on providing ways for investors to participate in the energy transition, perhaps the largest investment opportunity of our lifetimes. We are developing more than 85 gigawatts[1] of new green energy capacity, recently launched an electric vehicle (EV) infrastructure business, and have invested in a global sustainability-focused real estate developer. And now, with the Green Investment Group fully integrated into Macquarie Asset Management, we are able to apply more than a decade of experience handling an array of sustainable infrastructure projects to unlock energy transition opportunities for investors across our Private Markets platform.

And when it comes to Public Investments, we are focused on engagement, working with companies across sectors to understand the specific actions they are taking to improve environmental and social outcomes through stewardship.

These investments, and our approach, form the foundation of portfolios that endure because of their long-term value and contribution to a more sustainable world. We feel strongly that there is no dichotomy between a great investment and a sustainable one. The best companies and the best investments will be sustainable.

We expect – and hope – to work with others. We manage nearly $A800 billion[2] in a world of many trillions of dollars in investable capital. This means we must cooperate, share best practices, and build incrementally towards the scale that we need to solve challenges such as climate change.

This isn't about a singular asset manager being the leader. Rather, given the magnitude of our challenges and opportunities, we need many leaders bringing innovative ideas to clients and broader stakeholders. This is how we are going to live up to our ambition to invest to deliver positive impact for everyone.

Stay safe and well.

Ben Way
Group Head, Macquarie Asset Management

1. As at September 2022. Gigawatts (GW) of green energy assets in development. Reflects 100 percent generating capacity of each asset, not the proportion owned/managed by Macquarie.
2. Assets under management as at September 2022

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The road ahead

A new macroeconomic regime and the implications for investors

Daniel McCormack | Head of Thought Leadership

In last year's outlook (Outlook 2022: Pivoting to a new era) we discussed the idea that the world was entering a new macroeconomic regime after three decades in which globalisation and the technology revolution drove rapid growth in the supply side of the global economy. This in turn created benign economic conditions (low inflation, falling interest rates, strong demand growth and long upswings) and positive market dynamics (strong corporate profits, consistently rising asset prices and a policy put option).

Events over the last 12 months have only heightened our conviction that the underlying dynamics at play in the global economy have changed in profound ways and that the relationships, behaviours and outcomes that have guided investors since the 1990s no longer apply.

The key point here is that the rate of growth in the supply side of the global economy has downshifted. It has downshifted because globalisation is slowing or reversing, because demographics are now deteriorating rapidly, and because changes in political-economy preferences have caused productivity growth to slow across the developed world (DW). None of these factors are likely to reverse course with any alacrity. They have been building for years and, by their very nature, have considerable inherent inertia. It is this that gives us confidence we have entered a new macroeconomic regime, fundamentally different from the last.

Within that structural context there is still an economic cycle to be navigated that, as always, has significant implications for returns and asset allocation. We think it likely that both the UK (as of 3Q22) and the Euro area (starting 4Q22) are already in recession. For the US, we think recession risks are high enough for it to be considered our base case, although we don't expect one to start until 1H23. These recessions are likely to be relatively mild, however, with peak-to-trough falls in gross domestic product (GDP) ranging from -1.5% in the US to -2.5% in the UK. China should see a steady acceleration in growth over the course of 2023 if policy easing steps up a gear, as seems likely.

In terms of the implications for investors, while in the aggregate we still see downside to global listed equities due to earnings risks, there are opportunities in various sectors. US large-caps have been remarkably good performers in recent times, while as globalisation slows and onshoring becomes a major theme we think construction and engineering firms, railroads, and consumer discretionary-related companies will benefit.

Yield is back in global debt markets and with central bank tightening expectations starting to peak, this creates an array of attractive risk-adjusted return opportunities. DW sovereigns in particular offer attractive entry points and strong protection levels. Credit fundamentals in both investment grade and high yield markets are currently strong. Defensive positioning is warranted though, in our view, given the potential for recessions and inflation to undermine this strong starting point. We are more cautious on emerging markets debt, where underlying fundamentals are more mixed and likely to be stressed further in 2023.

In real assets, infrastructure is a standout. In 2023 investors are likely to be chasing equity investments that are defensive, have high yields, and offer inflation protection. Infrastructure has all these traits in spades. It also offers exposure to structural growth drivers in the form of digitalisation, demographics, and the energy transition. In a world where there is a dearth of cyclical growth, assets with structural growth drivers could start to attract a premium. Agriculture's stable return profile and inflation hedge characteristics, along with its exposure to new revenue opportunities from the growing demand for nature-based solutions, also make it a relatively attractive place to be at the current macroeconomic juncture.

In real estate, rising interest rates are having an impact on transaction volumes in some markets as bid-ask spreads widen and residential prices come under pressure, particularly in the more highly levered geographies. But in many instances fundamentals remain solid. High-quality buildings with strong cash flows and premium tenants, and property assets in locations where there are supply-demand imbalances, should perform solidly through the cycle, as they have done historically. Higher replacement costs – driven by elevated construction prices – may also help protect pricing, or at least provide a floor for prime valuations. Widening discounts for Grade B and Grade C assets,[3] and those buildings with leasing risk and/or high and rising capital expenditure (capex) requirements, should also create repositioning and repurposing opportunities.

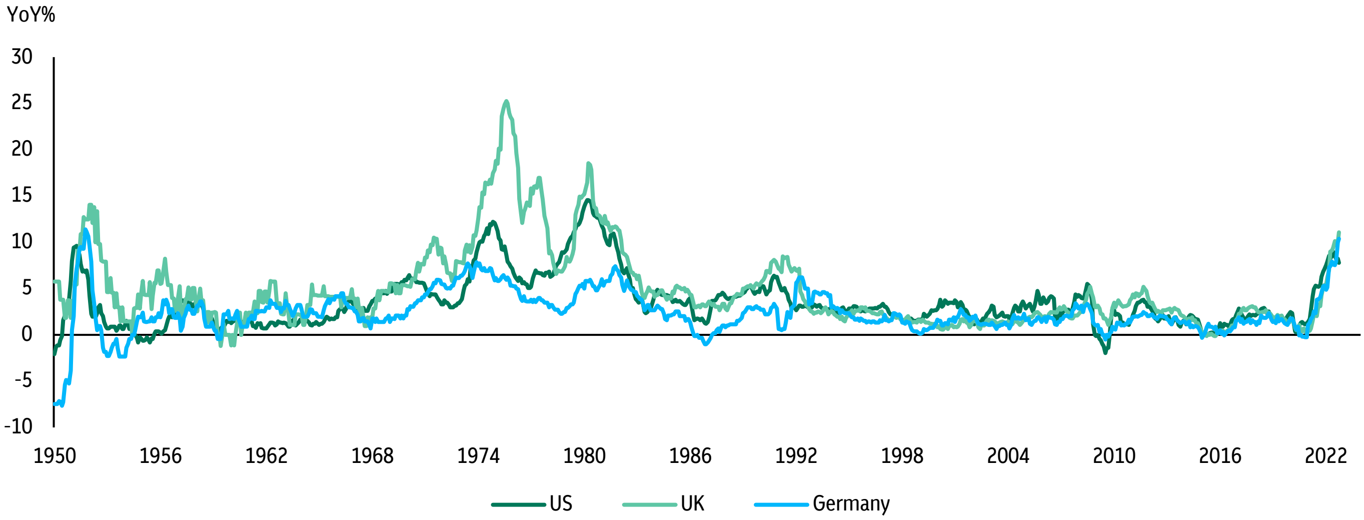
The first part of this paper examines the three aspects of the macro environment that we believe are most relevant for investors. The first theme focuses on supply-side dynamics, both short and longer-term. It lays out some of the key structural dynamics at play in the global economy, how they are changing, and what that means for the next cycle. The second examines the cyclical outlook and presents our view on the contours of global growth for 2023. The final theme analyses recent developments in energy markets, their impact on the cyclical outlook, and what these developments mean for the energy transition.

The second part of the paper focuses on the implications of our macroeconomic views for listed equity markets, fixed income, and real assets. For 2023, we are most positive on infrastructure, fixed income and agriculture. Listed equities and real estate face more headwinds in the near term, but there are still thematic opportunities in both asset classes and cyclical opportunities will present themselves as the downturns unfold and morph into recoveries.

Supply-side dynamics: Cyclical versus structural change

Aggregate demand recovered strongly from the COVID-19 recession in 2020, fuelled by an unprecedented easing of monetary and fiscal policy. But supply chain disruption, combined with the fact that many workers didn't return to work quickly following the pandemic, meant that aggregate supply did not recover with the same speed nor to the same extent. The result was inflation, which was exacerbated by the energy crisis stemming from the invasion of Ukraine (Figure 1).

Figure 1:
Headline inflation is now at its highest level since the Great Inflation of the 1970s

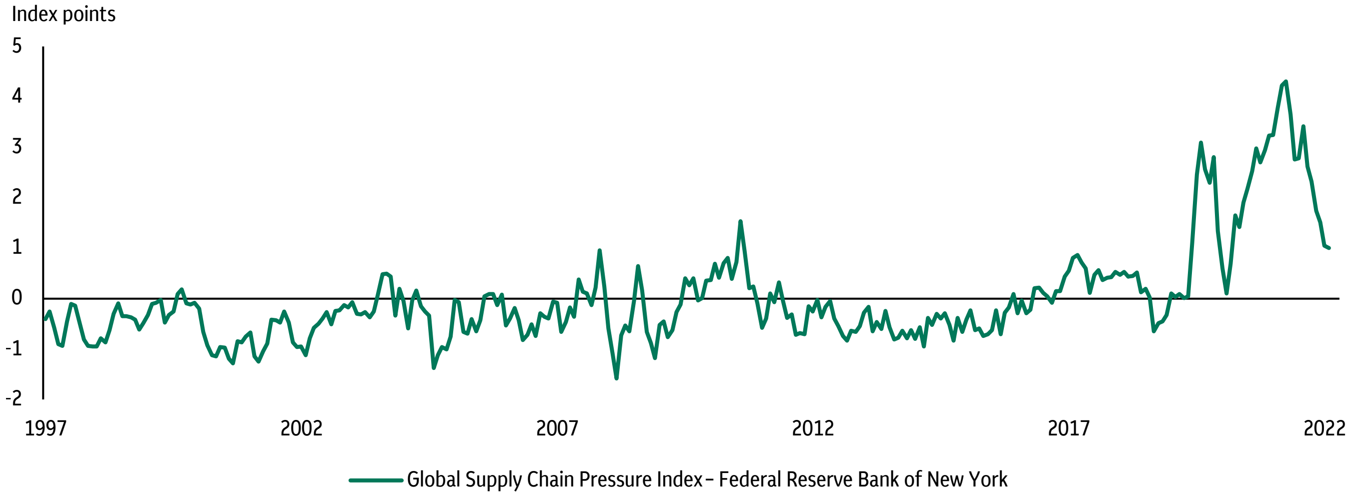


Source: Macrobond (November 2022).

These pressures are starting to ease, however. Global supply chain disruption, neatly captured by the Federal Reserve Bank of New York's Global Supply Chain Pressure Index, has been falling for ten months now and is down 77% from its peak (Figure 2). Energy prices, particularly natural gas prices, have also fallen sharply recently, with UK and European gas prices down 53% and 63%, respectively, from their late August highs (see Figure 21 on page 20).

3. Grade B space refers to a property that has been previously occupied, has lower standard fixtures and fittings, and cheaper rent than a Grade A asset. Generally, Grade B assets have lower energy efficiency ratings. Class C space is the lowest specification available. This usually refers to buildings that are 20+ years old and are found in less desirable locations.

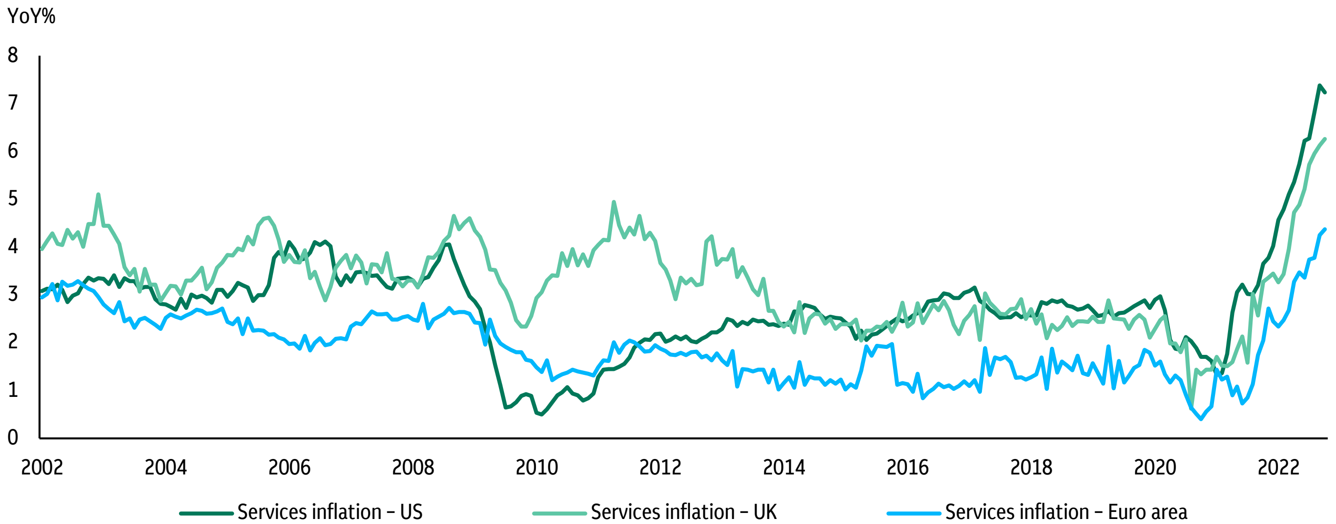
Figure 2:
Supply chain pressures have eased



Source: Macrobond (November 2022).

As we move into 2023, there is an argument that inflation could fall sharply as supply corrects at the same time that demand retreats as the DW economies go into recession. We see this as a real and non-trivial risk, but not a base case. Aside from the structural supply issues that we believe the world is grappling with (more detail on this below), a more proximate reason for why we view it as a risk and not a base case is what is happening with services inflation. While goods inflation may be peaking in many countries, services inflation – which is driven more by domestic wage growth – is now picking up (Figure 3). In other words, the reduced contribution to inflation from the goods sector due to normalising supply chains and the rebalancing of global commodity markets may be at least partially countered by accelerating services inflation, as the lagged effects of wage gains over the past 12 months work their way through to consumer prices.

Figure 3:
Services inflation is gathering speed across the DW



Source: Macrobond (November 2022).

> Our base case is that inflation falls during 2023 as aggregate demand weakens, supply chain pressures ease, and food and energy inflation moderates, but it does not return to central bank targets."

In short, our base case is that inflation falls during 2023 as aggregate demand weakens, supply chain pressures ease, and food and energy inflation moderates, but it does not return to central bank targets (~2%). Rather, it remains stubbornly above target (most likely in the 3-5% range), constraining central banks' ability to use monetary policy countercyclically, something that in turn limits the vivacity of the recovery and makes it less robust than an extrapolation from recent history would imply.

Arguably more important, and more interesting than developments 12-18 months from now, is what is happening in a structural sense to the supply side of the global economy. In our view, supply growth has slowed markedly, and there are three main drivers of this deterioration:

- **Deglobalisation**. Reshoring as a result of rising costs in the emerging world (EW) is one aspect of it. But deglobalisation runs far deeper than that. Geopolitical tensions, particularly between China and the West, are one key driver. Heightened concern about the reliability and security of supply chains in the aftermath of COVID-19 is another. But arguably most fundamental is the political backlash in the West from those groups hurt or left behind by globalisation and by those who believe that policies and political decisions should be made at the national level, rather than at the supranational level or by multilateral institutions.
- **Demographics.** Ageing is now intense enough that it is starting to bite on economic growth, particularly in key economies such as China's.
- **Weaker DW productivity growth.** A range of reasons have been put forward to explain the slowdown in productivity growth over the past decade or so. The important practical question is the durability of the change. The root cause of much of the change is, in our view, a shift in political economy preferences. Developed over long periods by slow-moving forces, these usually take quite some time to shift back to a more pro-growth agenda.

Deglobalisation

The period from 1989 to very recently was one of intense globalisation ("hyper-globalisation"). Globalisation was a boon to global supply because it:

- Added huge amounts of idle resources, particularly labour, to the global economy (the labour forces of first Eastern Europe and later China and India)
- Provided an expanded market for innovators to sell into and thereby incentivised more innovation
- Supported technological and informational diffusion around the world, helping to bring countries behind the technological frontier closer to it, and those with weak institutions and substandard policy frameworks closer to world's best practice
- Intensified competition globally, which added to productivity growth.

But in recent years the process has slowed and possibly gone into reverse. This pullback can be seen in a range of data – from growth in global trade relative to global GDP (Figure 4) to measures of globalisation by think tanks (Figure 5) to the rise in tariff rates between the US and China,[4] the world's two largest trading nations.

Figure 4:
Global trade-to-GDP has flattened out over the past decade

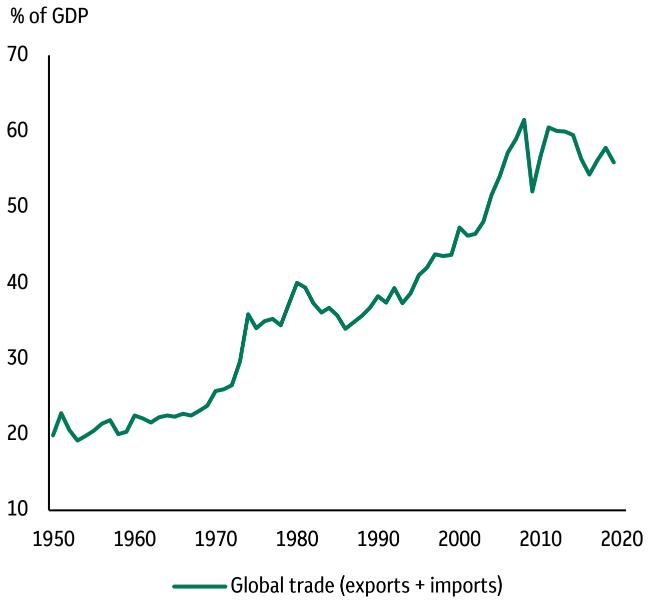
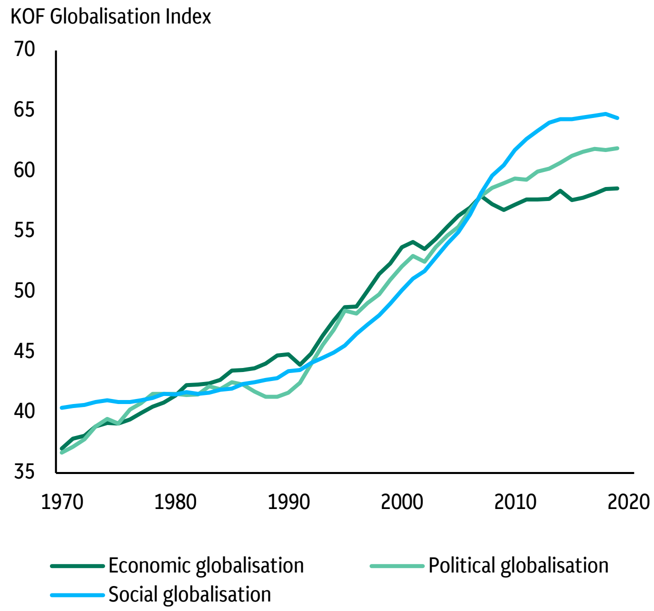


Figure 5:
Measures of globalisation show a plateau



Sources: Our World in Data, Macrobond (November 2022).

In a fundamental and durable sense, globalisation has been undermined by two main developments: first, the virtually inevitable increase in tension between the rising power (China) and the incumbent (the US)[5]; second, a political backlash against globalisation, which comes both from the groups that lost out, or gained less, from globalisation, and from groups that oppose multilateral institutions on national sovereignty grounds.

Layered on top of these forces is a narrowing cost advantage for China and the EW in general, an acceleration in automation in manufacturing[6] and, following COVID-19, an increased concern about the security and reliability of supply chains and a potential drive for autarky in certain goods or sectors. In this sense the pandemic accelerated an already existing trend towards slower, or less, globalisation.

These factors are unlikely to disappear, or fade, anytime soon and indeed many may intensify in the years ahead. The implication is that deglobalisation is a trend that is here to stay, at least in the near to medium term.

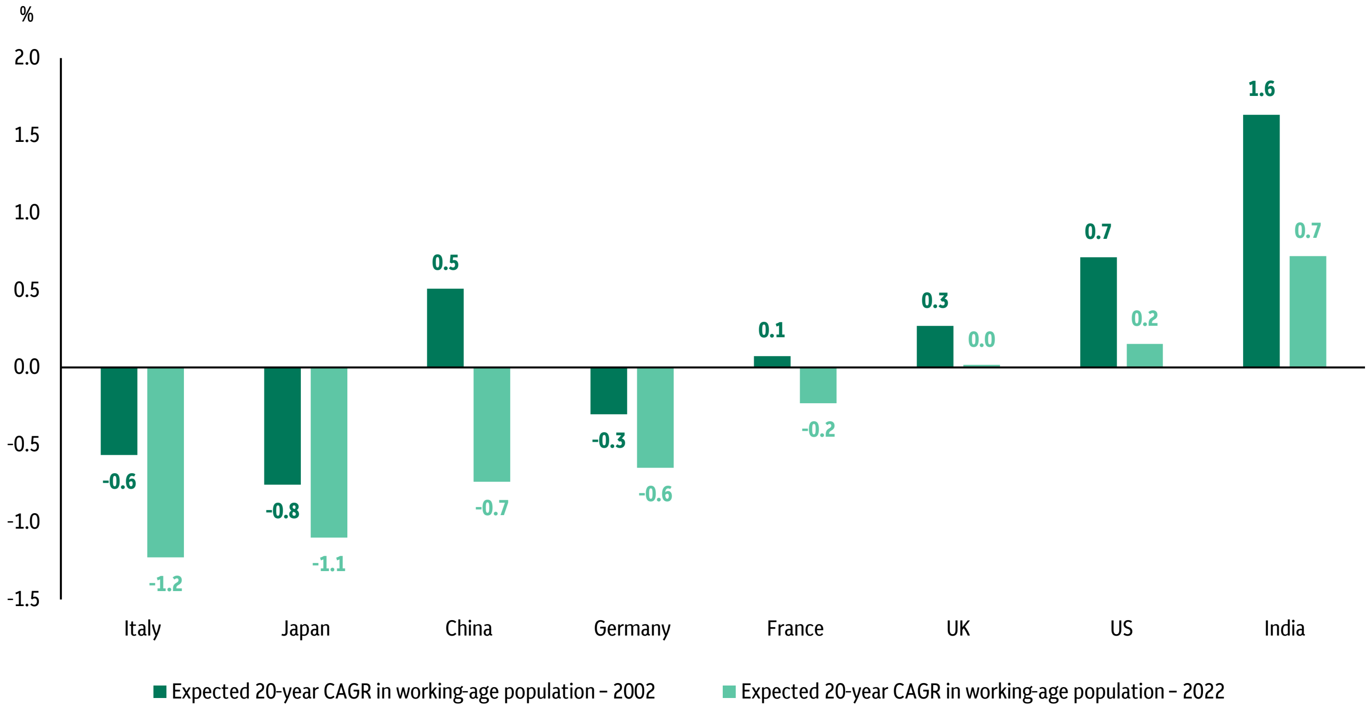
4. According to the Peterson Institute between the start of 2018 and now US tariffs on Chinese exports have risen from 3.1% to 19.3% and China's tariffs on US exports have risen from 8% to 21.2%.
5. That they are different political systems, with different values, only made the increase in tension more likely and more pronounced.
6. The cost of capital diverges less globally than the cost of labour.

Demographics

The demographic outlook for the world's major economies has deteriorated markedly in the past 20 years. The change has been particularly stark for China. Recently released population projections from the United Nations have China's working-age population[7] contracting 0.7% per year for the next 20 years, whereas in 2002 it was expected to grow 0.5% per year for the subsequent 20 years (Figure 6).

The deterioration in the demographic outlook has occurred for all the world's major economies, but China's is particularly concerning for two reasons: first, it is the world's second largest economy, and second, it has limited scope to "fix" a demographic problem with increased migration.

Figure 6:
Demographics: 2002 versus 2022



Source: United Nations (November 2022). CAGR = compound annual growth rate.

To be sure, rising life expectancy and the associated increase in labour force participation rates for older cohorts in much of the DW can be an offset here, but quantitatively the impact is relatively small.

7. Aged 15-64 years.

DW productivity growth slowdown

Productivity growth has been slowing across the DW for some time now (Figure 7). Indeed, for the G7 as a whole, labour productivity growth has slowed from 2.1% in the second half of the 1990s to 0.7% since 2015.[8] The slowdown has sparked an intense debate among economists about its cause. Some of the main explanations include:

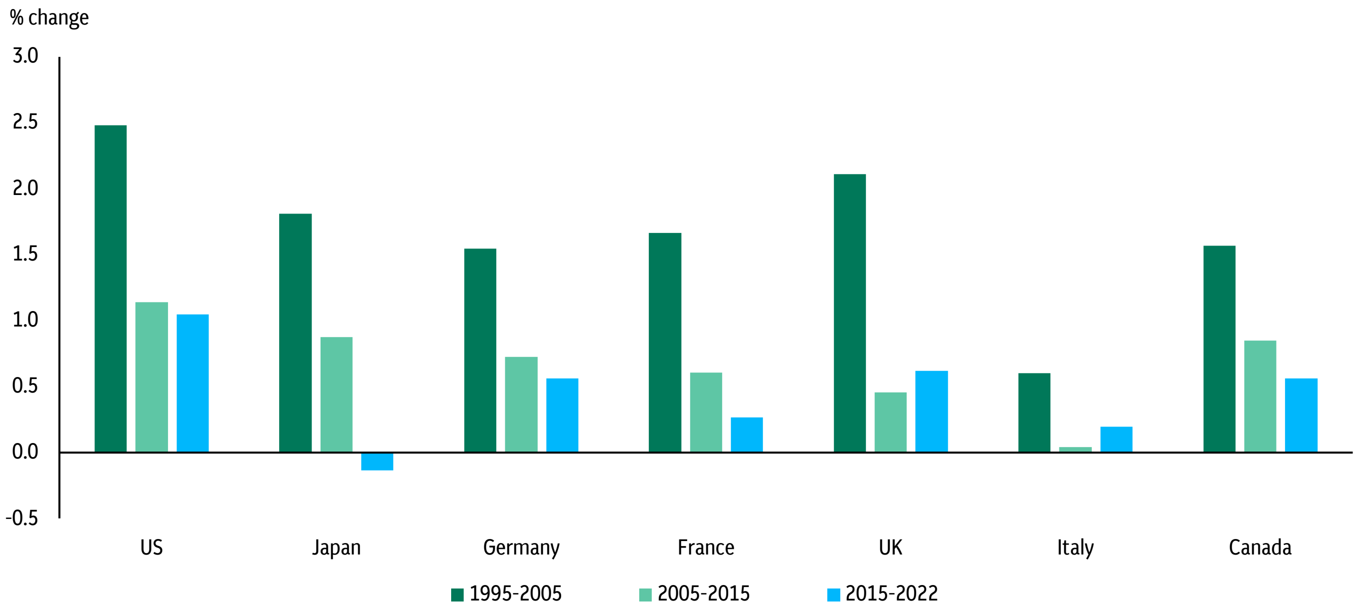
- **Slower technological advancement.** The most famous advocate of this position is Professor Robert Gordon who argues that the technologies of today don't have as broad applicability, and are not as powerful for lifting output, as those of the second industrial revolution.

- **Weaker growth in global trade.** By exposing firms to new technologies, new products, and new management practices, trade tends to boost productivity growth. The slowdown in trade growth in recent years as a result of the pullback from globalisation may also be impacting productivity.

- **Secular stagnation.** The idea, recently promoted by Larry Summers,[9] that a higher propensity to save and a lower propensity to invest is dragging down demand and lowering real interest rates and GDP growth. Companies are returning money to shareholders rather than investing in capital and innovation.

- **Rise of zombie firms.** In the post-GFC[10] world, non-viable or "zombie" firms have been kept alive by bank forbearance, prolonged monetary stimulus, and the continuation of crisis-induced support policies.[11] These zombie firms are not only directly affecting productivity growth through their poor performance. They also clog up markets, limiting the expansion of dynamic firms and increasing barriers to entry to new, more competitive companies. In part this is a story about policy or political economy choices weakening "creative destruction," that dynamic process that lies at the core of capitalist economies and is so crucial to innovation, productivity, and growth.

Figure 7:
Labour productivity growth has slowed across the DW



Source: Macrobond (November 2022).

8. Purchasing power parity GDP-weighted.
9. It was originally coined by Alvin Hansen in his 1938 American Economic Association presidential address.
10. Global financial crisis.
11. See "The walking dead? Zombie firms and productivity performance in OECD countries" OECD working paper 1371, January 2017, for a good summary.

> …all these major trends – deglobalisation, demographics, and weaker DW productivity growth – are durable and will take time to turn around."

We would make two additional points here. First, while the argument made by Professor Gordon about today's technologies being less productivity-enhancing than those in the past is well made, extremely interesting,[12] and may well have some applicability to recent years, it can be argued both ways. Indeed, on balance we tend to side with the techno-optimists (such as Professor Joel Mokyr) and see the future as pregnant with technological potential. Indeed, there are several potentially powerful all-purpose technologies – artificial intelligence and robotics, just to name two – that could drive the technology frontier forward rapidly and have a "step change" impact on productivity. That said, the timing of the impact of these technologies is uncertain and there can be very long lags between the invention of a technology and its broad economic application.[13] But if our call about a new macroeconomic paradigm of weaker productivity and supply-side growth ultimately proves to be wrong, we think it is most likely to be wrong because of a rapid expansion in the technological frontier.

Second, we think the argument about zombie firms, poor micro-level sector dynamics, and a resulting weakening in the productivity growth of firms not at the cutting edge of the technological frontier is a fascinating one. To us, it speaks to a possible shift in political economy to one where government support during downturns, or to failing firms and industries, is expected and delivered in democracies. Redistribution concerns dominate in such a world, prospects for structural reform that involve short-term pain for longer-term gain wither, and the gale of creative destruction that once blasted its way through economies fades to a gentle breeze. Political economy beliefs don't change quickly, or painlessly. It usually takes quite a lot of time and relative economic deterioration to shift the paradigm to one of economic reform, reduced government interference, and sharpened incentives.[14]

In sum, all these major trends – deglobalisation, demographics, and weaker DW productivity growth – are durable and will take time to turn around. Slower supply growth is here to stay. For investors this means that the new macroeconomic regime is likely to be one where:

- Inflation is higher, stickier at higher levels, and returns more quickly when demand surges.
- Interest rates are higher across the cycle and across the curve, and the term premium returns to a level more consistent with the pre-2000 period than the past decade.
- GDP growth is more stop-start and economic upswings are shorter. Recessions are more frequent, although they may also be milder.
- Policymakers will sometimes be constrained in terms of the extent to which they can act countercyclically – monetary policymakers by inflation and governments by debt dynamics and interest costs.
- Wage growth will be stronger, labour's bargaining position improved, and it will take back some share of the economic pie.

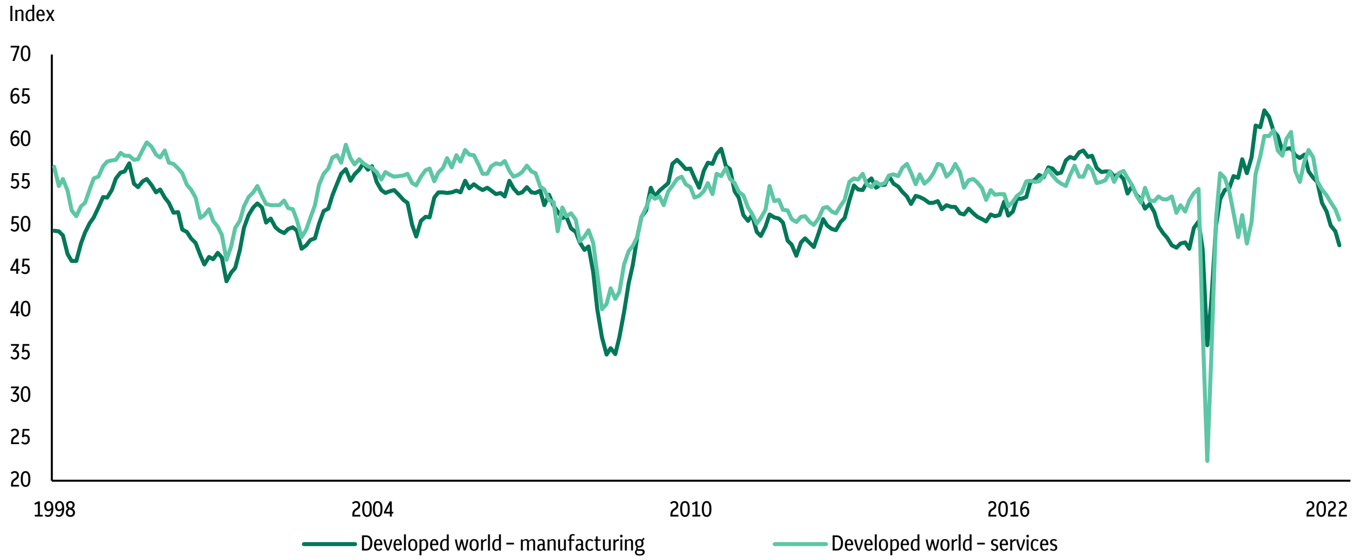
12. See his book, "The Rise and Fall of American Growth", for those interested.
13. Electricity is a great example – invented in 1879, it wasn't until the 1920s and 1930s, when its price fell to a level that enabled broad-based use, that its impact on productivity and growth occurred.
14. For evidence of this and an excellent summary of the swings over the 20th century, see "One hundred years of socialism: The West European left in the twentieth century" by Donald Sassoon.

Global growth, recessions, and the recovery

The global economy recovered strongly from the COVID-19 pandemic, supported by the release of pent-up demand as movement restrictions were scaled back, as well as huge amounts of fiscal and monetary support. But it is now being buffeted by two major shocks: high inflation (which is eroding real incomes) and rising interest rates.

Growth in the major DW economies has been slowing since the middle of 2021 (Figure 8) and with inflation still high (in month-over-month (MoM) as well as year-over-year (YoY) terms), and interest rates continuing to push higher, this slowdown in momentum has further to run, in our view.

Figure 8:
Developed world Purchasing Managers' Indices (PMIs)[15] peaked in the middle of 2021



Source: Macrobond (November 2022).

The probability of recession for each of the US, UK and Euro area is high enough for it to be considered a base case, in our view. This blanket statement masks some important nuance, however. The energy crisis, although global, is more severe in Europe and the UK, where parts of industry cannot afford to operate at recent price levels, cannot get enough supply, or the recent volatility in pricing and markets has caused them financial difficulties. Beyond some of the energy companies that have been under severe stress recently, examples include fertiliser producers; steel and aluminium works; food processors; and manufacturers of glass, cement, and ceramics. In time, prices will adjust to enable markets to clear at higher output, but there is industry disruption on the path to that higher price equilibrium.

The impact of the energy crisis on the US is somewhat less, primarily due to its ample supplies of domestic energy and its partial isolation from global gas markets due to limited export capacities.[16] But the hit to real incomes, combined with the sharp rise in interest rates, is likely to be enough to see the US enter recession in early 1H23. The recession is likely to be mild and short, however, by both recent and longer-run historical standards.

China has seen a sharp slowdown in growth in 2022 on the back of the downturn in the property sector and its zero-COVID policy. But it could it could see a steady acceleration in growth in 2023 if the pace of policy easing is stepped up, as seems likely.

15. Our DW PMIs are an average of the US, Euro area, and UK PMIs.
16. The progressive increase in liquefied natural gas (LNG) export capacity will increase the global natural gas market link and thus tend to increase US domestic gas prices through arbitrage with overseas markets.

US economy: A garden variety, interest-rate-driven recession

Recessions have multifaceted causes, but as a simple statement of empirical reality they are very often preceded by a sharp tightening of monetary conditions (Figure 9). To be sure, this kind of tightening doesn't always lead to a recession – there are false signals, such as the rise in the federal funds rate in early 1984 and the soft landing executed by Alan Greenspan in the mid-1990s. But the clear lesson from history is that when interest rates rise rapidly, recession risks are high.

The US isn't the only country experiencing a tightening of monetary conditions. It is happening across the DW and across the curve – as Figure 10 shows, this is the sharpest increase in 10-year bond yields the DW has experienced in more than 40 years. Moreover, by virtue of the propagating mechanisms in the global financial system and global economy, it is also spreading to the EW where central banks are being forced to tighten monetary policy to defend their currencies and prevent capital outflows.

Figure 9:
Federal funds rate and recessions

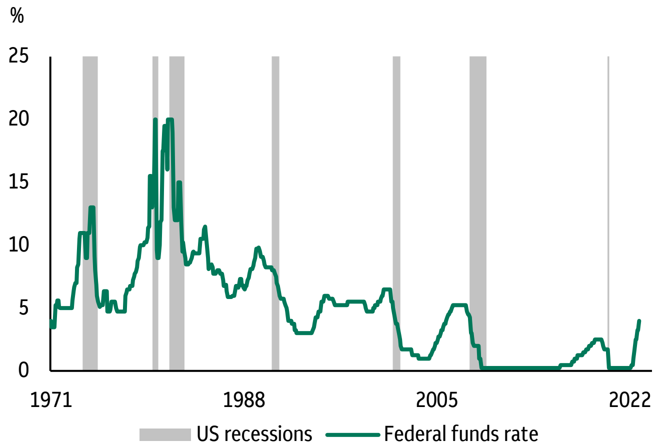
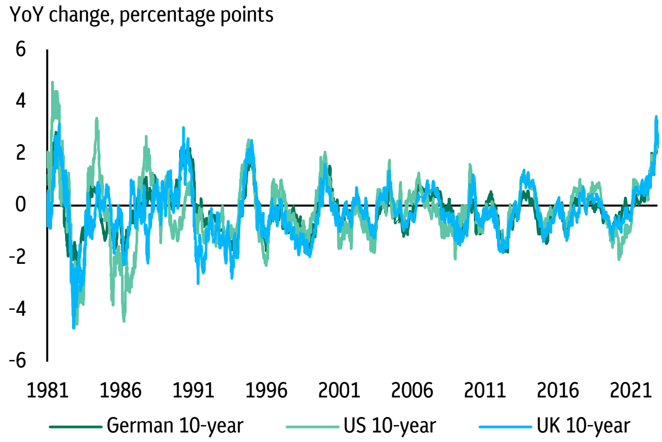


Figure 10:
DW 10-year bond yields by country



Source: Macrobond (November 2022).

The US Federal Reserve kicked off this tightening cycle in March, but yields at the long end of the curve started their ascent in late 2021, meaning monetary conditions have been tightening for roughly a year now. There is an already substantial, and growing, body of evidence that higher interest rates are doing what they are designed to do – slow demand and activity in interest-rate-sensitive sectors. Housing has slowed – sales, pricing, and construction activity have all turned down – and the more interest-rate-sensitive components of consumer spending have been weak.

While the stimulus cheques sent out in March 2021 complicate the picture somewhat, spending on goods has been much weaker than services spending, and durable goods has been weakening in a trend sense since at least January (Figure 11). And within durables it is the big-ticket, more interest-rate-sensitive components such as autos and household furnishings, that have seen the most material slowdown (Figure 12).

Figure 11:
Consumer spending by category: Goods spending has been much weaker than services

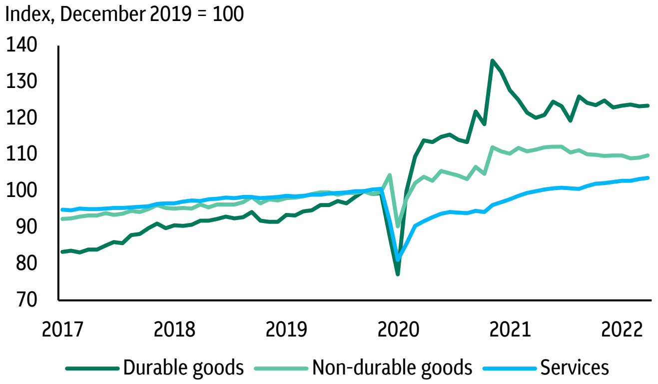
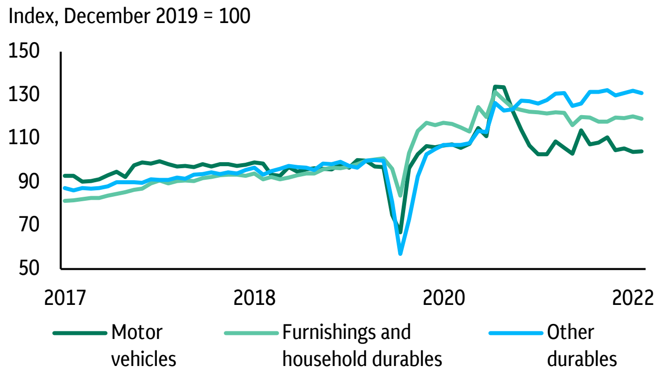


Figure 12:
Durable goods spending: The interest rate sensitive big-ticket items are slowing



Source: Macrobond (November 2022).

These effects take time to work their way through fully (monetary policy's famous long and variable lags). As 2023 progresses we expect further weakness in housing and the most interest-rate-sensitive components of consumer spending, and for this to then spread to consumption more broadly and to other areas of the economy courtesy of the knock-on effects on income, employment, profitability, and asset prices. In short, we expect a garden variety interest-rate-driven recession for the US in 2023.

China: Policy to drive a turnaround

After contracting in 2Q22, weighed down by the zero-COVID policy-related restrictions and the funk in the property market, China's GDP rebounded solidly in 3Q22 (Figure 13). Still, China is expected to miss its growth target (of 5.5%) this year, the first time it has done so since 2015.

Looking ahead to 2023, policy is key to a turnaround in housing and the economy more broadly. By the standards of the past two decades, policy support has been tepid in this downturn, most likely due to the extent of leverage in China's economy. The perceived success of the zero-COVID policy has also been a factor in the reluctance to move away from it.

Figure 13:
China's GDP growth has been weak in 2022

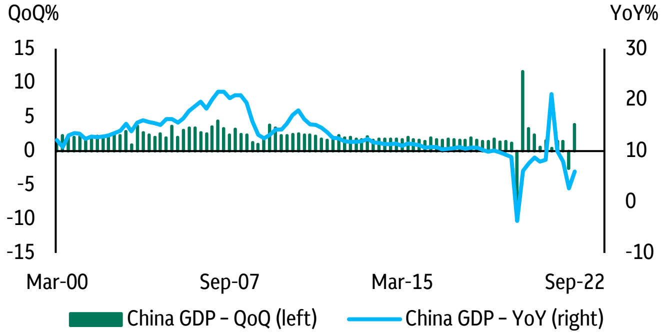
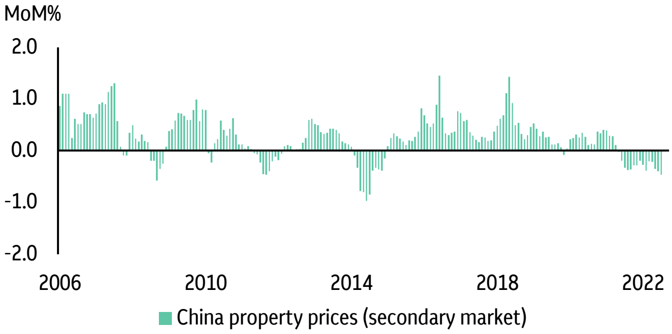


Figure 14:
China's housing market is in the midst of a major downturn



Source: Macrobond (November 2022).

But we expect to see an increased pace of easing from the Chinese authorities in the months ahead. Specifically, we could see:

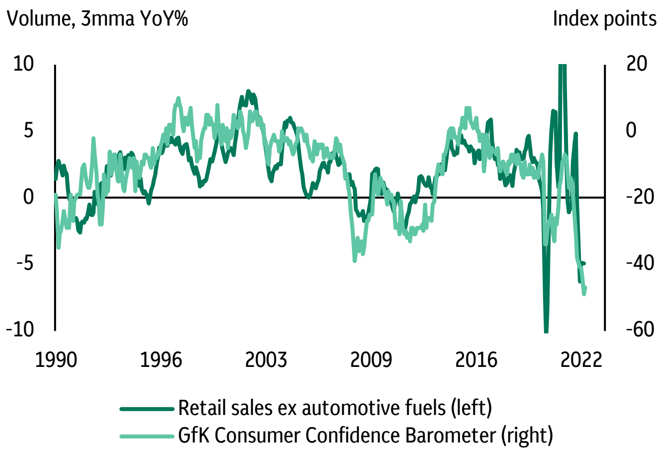
- cuts to the 5-year loan prime rate
- reductions in the banks' reserve requirement ratio
- increases in the special bond quota for local governments
- reductions in the mortgage down-payment ratio.

If the pace of policy easing does pick up, China's economy should accelerate from its low base in 2022. In early 2023 it may, therefore, provide some important ballast to a global economy heavily buffeted by recessions in the major DW economies.

UK and Euro area: In, or close to, recession already

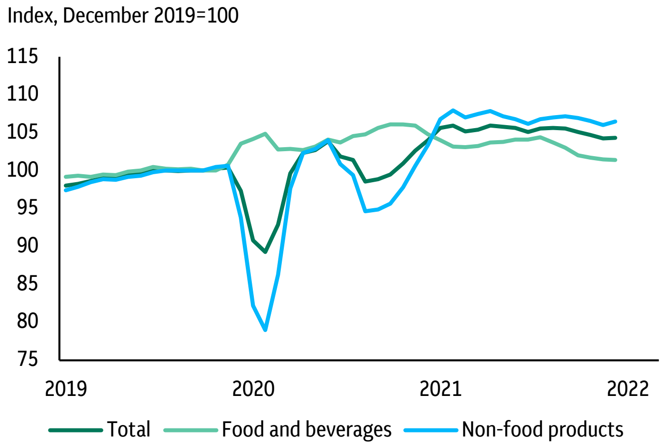
The Euro area and UK economies have been hit by a number of shocks recently, including COVID-19-related supply chain and labour market disruptions, the energy crisis, high inflation more generally and, in the case of the UK, a political crisis. The energy crisis and inflation have severely impacted real incomes and by extension consumer sentiment and spending. In the UK consumer sentiment is now at a three-decade low and consumer spending is collapsing (Figure 15), while in the Euro area it looks as though consumer spending peaked in November (Figure 16).

Figure 15:
The UK consumer is depressed and spending has collapsed



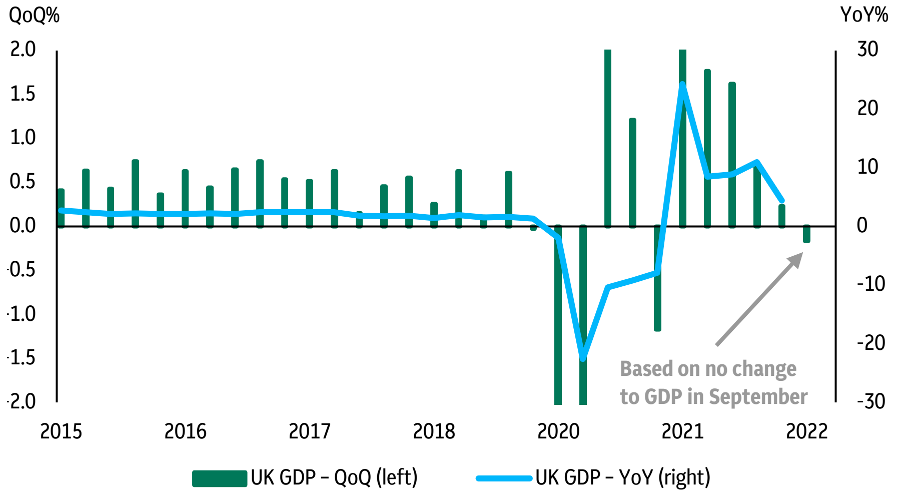
Source: Macrobond (November 2022). 3mma = 3-month moving average.

Figure 16:
Euro area retail sales: Declining real incomes are eating into consumer spending



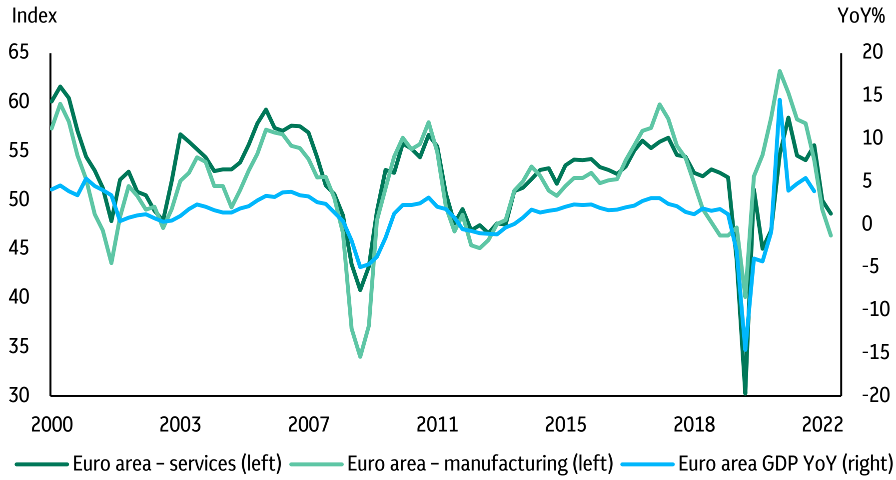
Indeed, both the UK and Euro area may already be in a recession. UK GDP declined 0.2% quarter over quarter (QoQ) in 3Q22 (Figure 17) and survey data as well as the monthly GDP data suggest another decline is likely in 4Q22. Euro area GDP increased in 3Q22, but it is likely that a recession began in 4Q22. The manufacturing and services PMIs have averaged 47.5 so far in 4Q22 (Figure 18) and when that average is less than 49, as seems likely for 4Q22, there is a 69% chance that GDP declined based on history.

Figure 17:
UK GDP: The UK likely entered recession in 3Q22



Source: Macrobond (November 2022).

Figure 18:
Euro area PMIs are now in recessionary territory



Source: Macrobond (November 2022).

Size of the downturns and strength of the recoveries

While we believe that the odds of recessions are high enough to have them as our base case, we also expect the downturns to be relatively mild, not just by recent historical standards but even by long-run standards. We also expect that they will be relatively short-lived.

In the US there have been 12 recessions since the end of World War II, with an average peak-to-trough decline in GDP of 2.8% and a median decline of 2.4%.[17] The two largest recessions have been the two most recent – the COVID-19 recession and the GFC in 2008-2009 – with most of the others having been in the 1-3% range (Figure 19). The UK, by contrast, has had fewer but more severe recessions, while Germany has had a similar number to the US, but they are slightly milder on average (Figure 20).

Figure 19:
US post-World War II recessions[18]

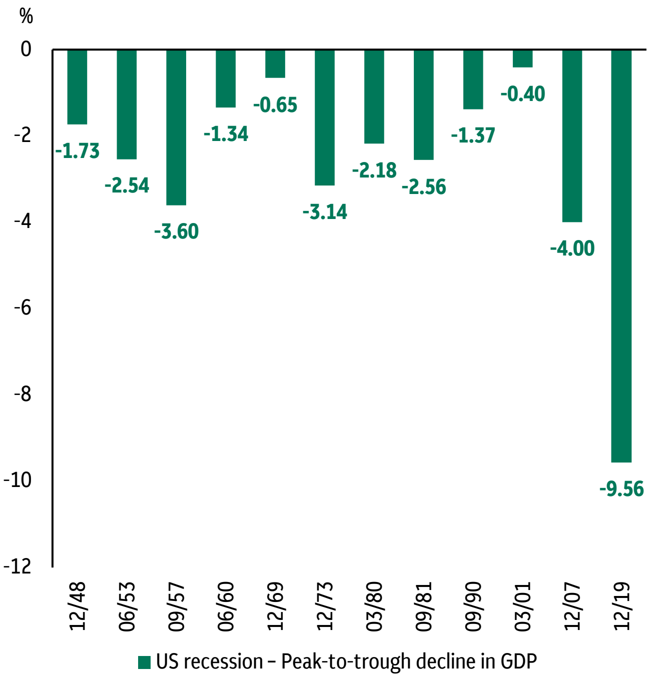
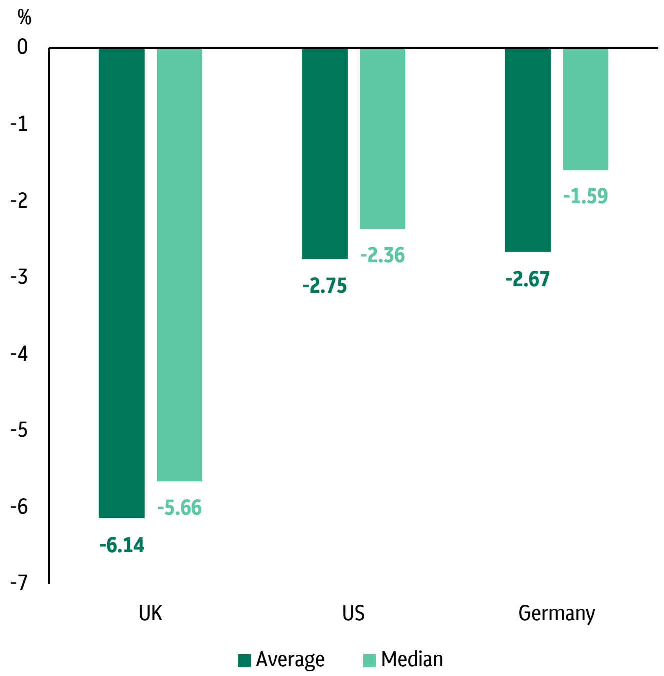


Figure 20:
DW recession averages



Source: Macrobond (November 2022).

We expect peak-to-trough declines of roughly -1.5% in the US, -2.0% in Germany and the Euro area, and -2.5% in the UK. Moreover, with recessions underway now, or starting soon, they should be over by mid-2023.

17. This is based on the average (or median) of the peak in GDP to the trough in GDP for each recession. Taking the actual periods specified as the peak and trough by the National Bureau of Economic Research (NBER) will give you different numbers as there is sometimes a positive GDP quarter between their peak and trough dates, which makes their peak-to-trough moves smaller.
18. Recessions are referenced by the quarter in which economic activity peaked according to the NBER.

Energy security and the energy transition

The current energy crisis is global in nature, although there is some variation by geography. It is most acute in Europe and the UK, where the sharp reduction in pipeline supply from Russia has driven natural gas and electricity prices to unheard-of levels – so far in 2022 the Dutch and UK natural gas prices (Figure 21) have averaged €125.1/MWh and £2.60/Therm, compared with just €20.81/MWh and £0.54/Therm over 2016-2021 (inclusive), although they have come down substantially in recent weeks. The 2022 peaks[19] were €322/MWh and £6.4/Therm, respectively.

Electricity prices, which are closely linked to natural gas prices given the fuel's importance as the marginal supplier have also surged, averaging in 2022 around five times their 2016-2021 average on wholesale markets (Figure 22).

Figure 21:
European energy prices have been very high in 2022

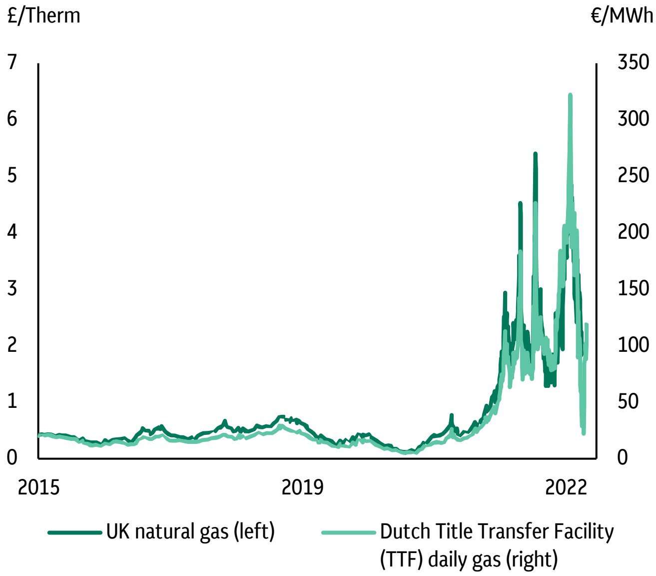
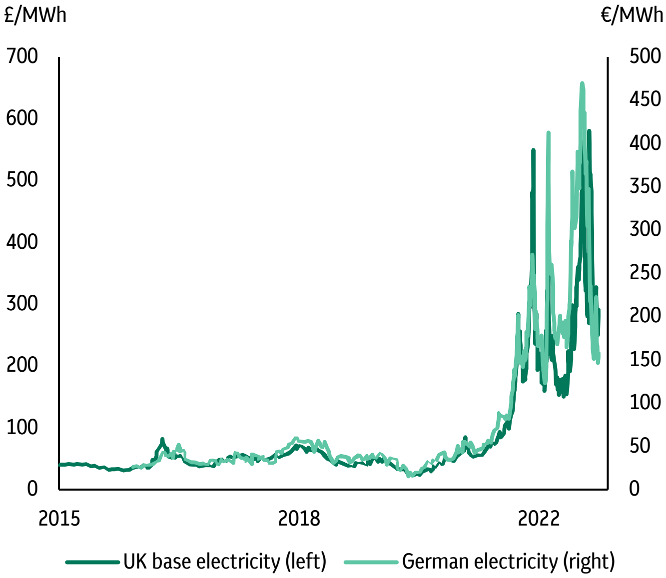


Figure 22:
European wholesale electricity prices have been heavily influenced by natural gas prices



Source: Macrobond (November 2022).

For other DW economies such as the US, Canada, and Australia, their lower exposure to Russian supply and the availability of their own domestic sources of energy have insulated them to a degree. That said, prices in these countries have still increased markedly, something that arguably reinforces just how globally connected these markets ultimately are despite some prima facie regional segmentation in natural gas and electricity markets.[20]

19. Peaks of the daily base price, not the intraday peaks.
20. It's impact on emerging markets depends critically on the pricing, regulatory regimes and strength of the government's finances in each market.

Capex declines and underinvestment

Many believe there has been underinvestment in oil and gas supply in recent years and that this is both driving prices higher and increasing their sensitivity to shocks. The evidence often cited to support this theory is the declining capex of the major energy companies globally.

One problem with this argument is that a decline in nominal investment is not evidence of underinvestment per se. Investment is a forward-looking concept – the required amount of investment depends on future, not historical, demand. If demand is expected to decline, lower nominal investment may be perfectly optimal and not reflective of underinvestment.

But Figures 23 and 24 below suggest that investment may still be too low, even relative to the outlook. Under various path to net zero scenarios the estimated average capex need from now until 2030 ranges between $US400 billion and $US600 billion per year (Figure 23). Achieving net zero in 2050 would be a positive outcome from an energy transition perspective and so those estimates probably represent a minimum requirement from an oil and gas investment perspective. Figure 24 shows that the average investment in the sector since 2016 has been $US433 billion, which is right at the bottom end of the range shown in Figure 23. This suggests there may indeed have been underinvestment in recent years.

Figure 23:
Expected investment in fossil fuel supply in various net zero scenarios

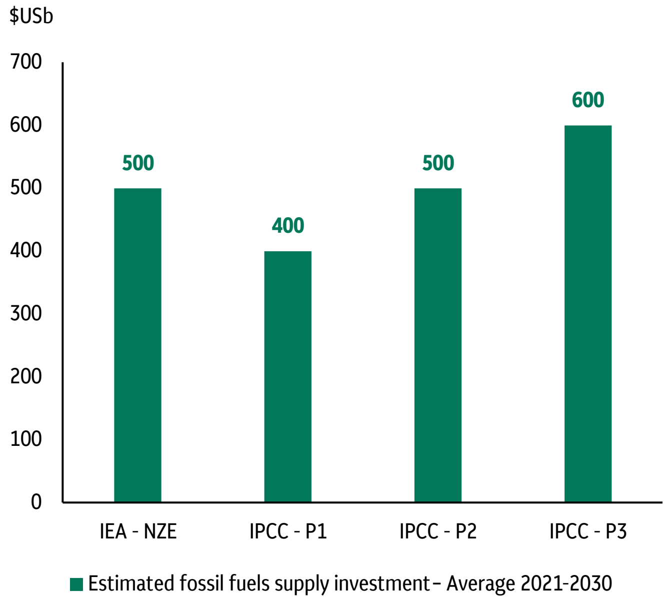
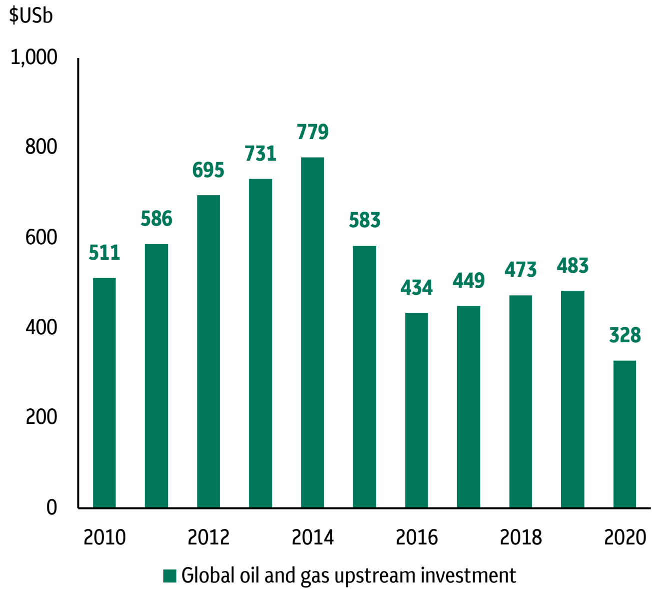
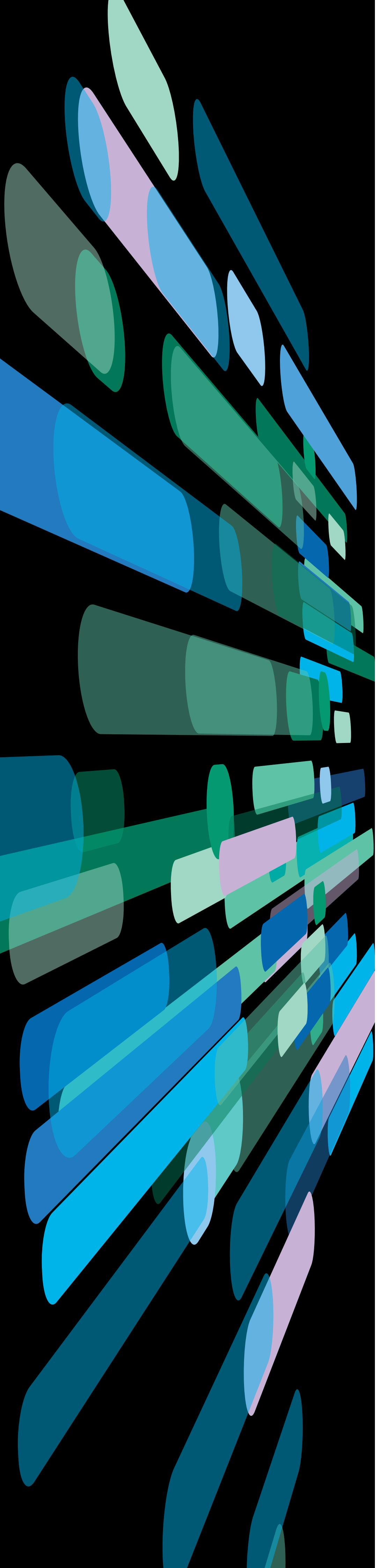


Figure 24:
Nominal oil and gas investment has been low in the last 5 years

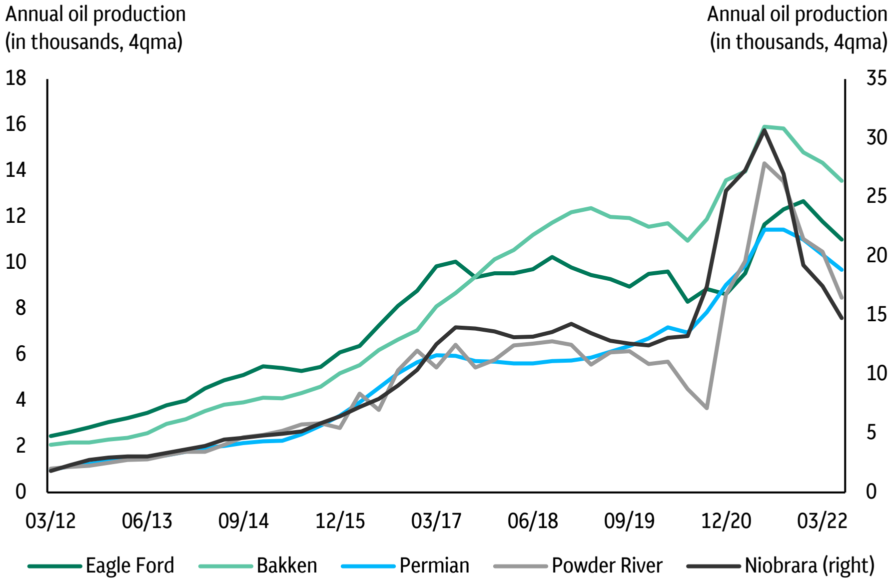


Source: International Energy Agency (IEA) (2020). IPCC = Intergovernmental Panel on Climate Change.



But there is also evidence that the efficiency of investment has improved, particularly in the oil sector. For example, in 2012 one shale rig in the Permian basin[21] produced 1,375 barrels of oil per year, whereas by 2021 that number had risen to 11,018, a more than eight-fold increase (Figure 25). The lower level of nominal investment may, at least in part, be due to more productive capex and not actually represent underinvestment in any equilibrium or forward-looking sense.

Figure 25:
Oil rigs are producing much greater output than in the past



Source: Macquarie Macro Strategy (November 2022). 4qma = four-quarter moving average.

There also hasn't been a major shift in pricing. If part of the concern from corporates and investors in the sector is windfall taxes, they can arguably pass this on to consumers by limiting investment to push up prices. But in real terms[22] prices in the past few years haven't been particularly high by historical standards. For oil the average real price (in 1983 prices) since 1957 has been $US19.4 per barrel, and in the last three years it has averaged $US23.4. Moreover, in the 2000s and the 2010s the real price was higher still ($US25.3 and $US30.5), highlighting that the recent real price, although slightly above the long-run average, is well within historical norms.

For natural gas[23] the situation is even more stark – in the past three years the real price has been $US1.4/MMBtu, lower than its long-run average of $US1.7/MMBtu. Put simply, it is hard to identify a level shift up in pricing, in either natural gas or oil. This leads us to the conclusion that while the underinvestment thesis has considerable intuitive appeal, the evidence in support of it is mixed. More efficient capital may account for a significant proportion of the lower nominal investment observed in recent years.

21. Broadly representative as it accounts for over half of all shale oil rigs.
22. In 1983 prices.
23. Here we are referring to US Henry Hub natural gas spot prices.

Figure 26:
Real oil price by decade: No obvious level shift up from prior decades

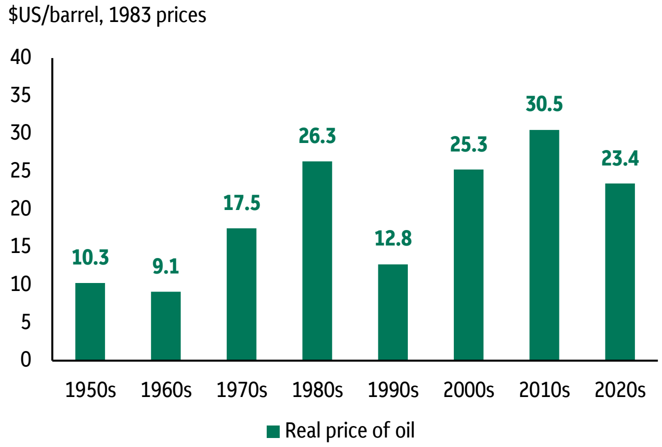
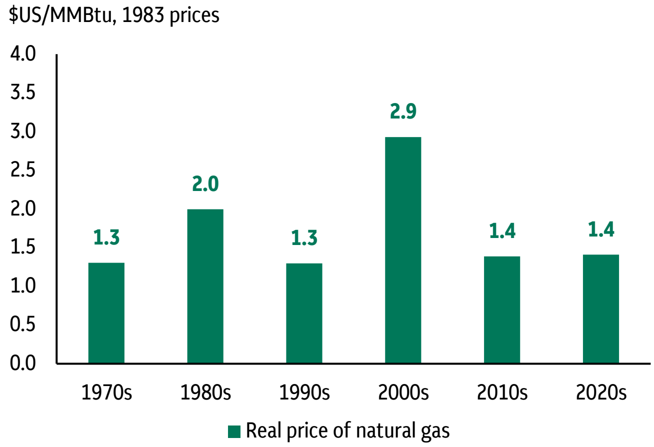


Figure 27:
The real natural gas price hasn't been particularly high in the 2020s



Source: Macrobond (November 2022).

Energy security and the impact on the energy transition

Beyond the consequential impact on real incomes and consumer spending, the recent energy crisis has also brought the issue of energy security to the forefront of consumers' and governments' minds. There are two critical questions at the current juncture:

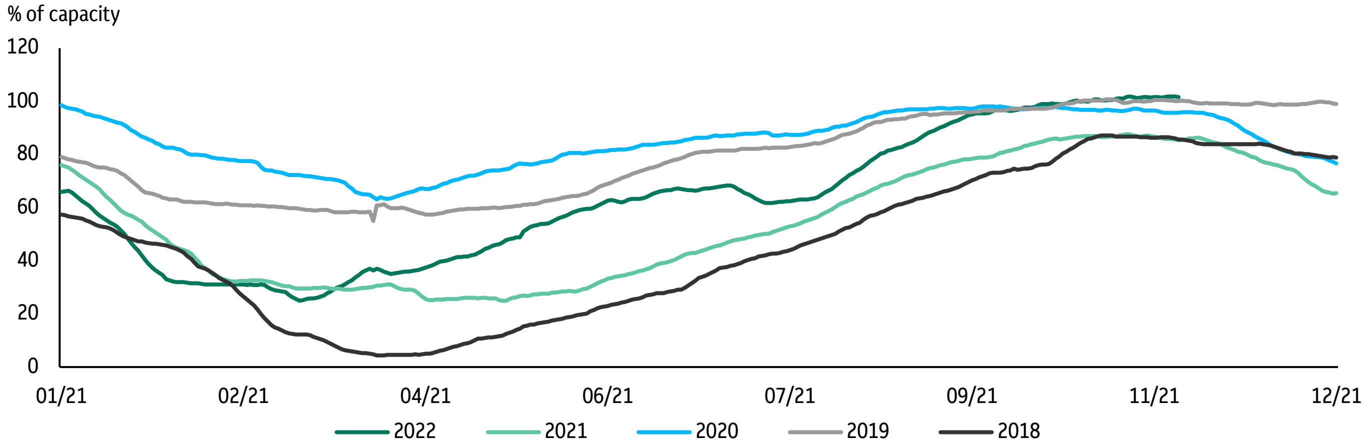
1. How does Europe resolve the current crisis?

2. What does this mean for the energy transition? Does it slow the speed of the progression towards net zero?

In 2021 the EU imported 155 billion cubic metres (bcm) of gas from Russia, which is around 40% of total consumption of 397 bcm. In the near term, a combination of increased liquefied natural gas (LNG) imports, demand destruction, high levels of storage (Figure 28), and increased use of other fuel sources (coal and nuclear in the main) should be enough to see Europe through the coming winter. The main risk is winter temperatures – if it is an especially cold winter Europe could face challenges. But at the moment, long-range forecasters are expecting it to be a warmer-than-average winter.

The bigger challenge will arguably come next year. LNG capacities remain limited and if piped imports from Russia don't resume, as seems likely, the continent won't have access to the same amount of supply in the storage building warmer months, increasing the risk of inadequate amounts of gas in the winter if alternative supplies, such as US LNG shipments, aren't enough to make up for the shortfall. But Europe has another 14 months to find a way to solve this problem and the recent evidence is that when prices are high, significant volumes can be directed to Europe to fill its reserves.

Figure 28:
German gas storage[24] is at very high levels

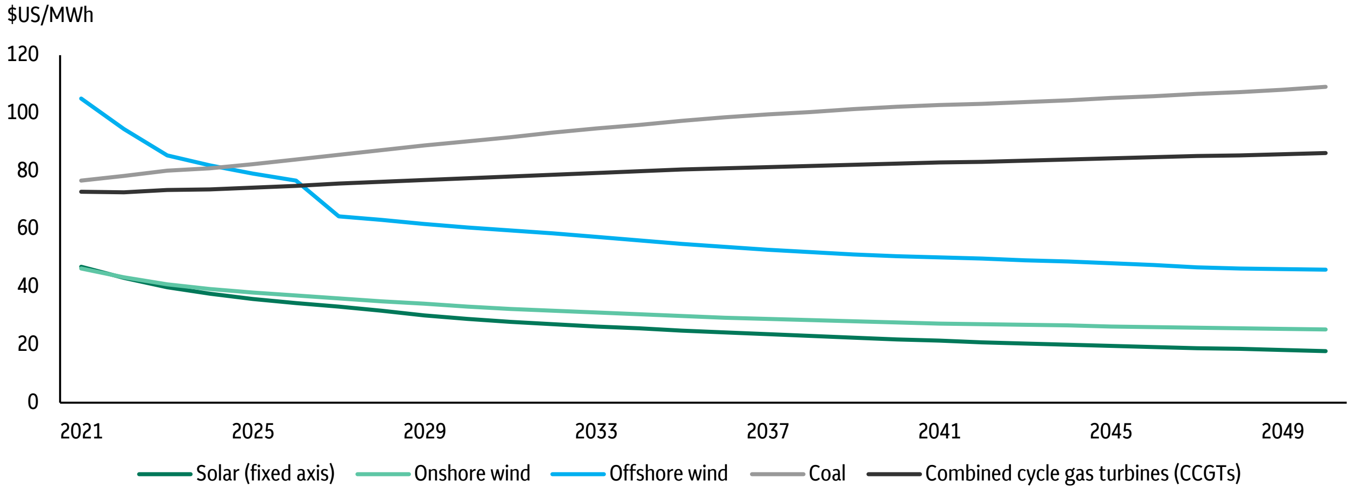


Source: Macrobond (November 2022).

In terms of security, an energy system powered by domestically sourced renewable power will inevitably be more secure and less susceptible to geopolitical or foreign policy risks than one that is critically dependent on supply from a foreign power, particularly if that foreign power is of limited political alignment. In other words, the greater emphasis on energy security following the war in Ukraine should serve to reinforce the push towards a renewables-based energy and power system.

The critical question is: will it be cheaper? Straight-up analysis of the cost of power generation by technology, captured in levelized cost of electricity (LCOE) analysis, shows that wind and solar are already much cheaper than coal and gas – globally both solar and wind are currently around 64% of the cost of gas.[25] And that cost advantage is likely to grow over time. Indeed by 2050 solar is expected to be one-sixth the cost of coal and one-fifth the cost of gas (Figure 29).

Figure 29:
Global LCOE by technology



Source: BloombergNEF (November 2022).

24. This is a weighted average of UGS Etzel ESE and VGS Storage Hub.
25. These are global numbers and there is substantial variation by country and region.

The challenge with this analysis is that it does not take into account the costs that solar and wind place on the system as a whole (often labelled "system costs"). These costs fall into two main categories:

1. **Intermittency costs.** Solar panels and wind turbines only produce power when the sun is shining and the wind is blowing. For these sources to supply power 24 hours a day, 365 days a year, daily and seasonal storage as well as some amount of overbuild is likely to be required.

2. **Grid upgrade costs.** Renewables-based power plants are more decentralised and the emplacement of the larger capacities is often driven by resource availability (wind projects are preferably built in the windiest regions of a country, for example). This can lead to longer transmission distances between generation and user. The intermittency also results in a single customer being served by a larger number of power plants than is traditionally the case, resulting in more network upgrades to manage the changing nature of the power flows.

The other important consideration is the upfront investment required to affect the transition. The cost of coal- and gas-fired power plants is dominated by the fuel costs. By contrast, the costs of renewable power plants are dominated by capex. The LCOE analysis ignores the fact that the cash flows necessary to transition to renewable energies are front-loaded, which increases demand for savings and so can increase the cost of capital generally.

The cost of having a purely renewables-based electricity system will depend on a range of known unknowns, such as the cost evolution of wind, solar and battery storage, the grid upgrades and new builds that are required, and the progression of other technologies such as hydrogen and carbon capture in terms of development and cost. It will also vary by geography. A full assessment of the literature on this topic is beyond the scope of this paper. However, a recent study for the US[26] found that at 95% renewables penetration, system costs relative to a least cost buildout scenario range between $US30 and $US36/megawatt hour (MWh) and at 100% penetration they arise to $US39MWh. This compares to an average electricity price in 2021 of around $US56.2/MWh. There is, of course, a huge amount of uncertainty in estimates such as these. What is clear is that system costs rise in a non-linear fashion with penetration. For example, the same study finds that CO_2 abatement costs at 100% renewables penetration is $US61/tonne. But the incremental abatement costs from going from 99% penetration to 100% penetration are $US930/tonne. This obviously raises the possibility that other technologies may be cheaper at the tail end of carbon elimination.

The other important point is that the shift to a renewables-based power system changes the fundamental nature of the sector to one that is overwhelmingly fixed-cost based. When a large proportion of supply is effectively zero marginal cost, having price and remuneration of critical dispatchable capacity determined by marginal cost (as is the case in most markets) can create suboptimal outcomes. The implication is that market structures and mechanisms, and the regulatory frameworks that shape them, are likely to change over the next decade or two.

26. See "Quantifying the challenge of reaching a 100% renewable energy power system for the United States," July 2021.

Conclusion

Most investors deploying capital today have only known a world in which inflation was low and stable, cyclical upswings were long, and policymakers rode to the rescue at the first sign of economic trouble or market turbulence. Disentangling how much of the recent economic volatility is due to temporary factors, and how much is due to more permanent changes in the economic landscape is arguably the most difficult and most consequential challenge for today's capital allocators.

In the three themes in this paper we have laid out our view, which is that while there are cyclical or temporary pressures impacting inflation, growth, and policy, a structural shift is also taking place. The drivers of this change – deglobalisation, a change in underlying political economy preferences in the West, and demographics – have been building for some time. They have now reached the point at which they are economically consequential and it will take quite some time before they can be turned around or offset by other changes.

As we look ahead to 2023, the supply problems created by the COVID-19-related dislocation in global supply chains and labour markets will fade. So will the effects of the energy crisis as markets work their recalibrating magic. The result is that inflation will moderate – faster in the US than in the UK and Europe, where greater union power, a higher prevalence of wage indexation, and more underlying economic rigidities will give inflation more (but not unstoppable) inertia. Interest rate expectations are, by extension, likely to be peaking out, particularly in the US.

It is too late to prevent recessions – the economic damage has already been done and is now simply coming down the pipe. The procyclical nature of policy at the moment (something that is itself a result of the structural changes and temporary shocks described above) could give rise to some bearish prognoses in the months ahead. The Bank of England may be one of the first horses out of the gate in this regard, recently forecasting that if interest rates rise to the levels markets expect the UK economy will contract for eight quarters in a row, making it the longest recession in the post-World War II period. The UK economy undoubtedly faces headwinds. But the expectation that the recession will be longer than the one that prevailed from 2Q79 to 1Q81 – when inflation exceeded 18% YoY, the 10-year yield peaked at just over 14% (3.1% today), and the policy rate hit 17% (versus 3% today) – is excessive, in our view.

Our expectation is that the recessions in the world's major DW economies will end around mid-2023 and the second half of the year will see a steady, but synchronised, recovery in growth. With China likely to accelerate steadily over the course of the year as policy provides increasing amounts of support to the economy, and the property sector works its way out of its current funk, the global economy is likely to be in much better shape towards the end of the year.

We now turn to the implications of this outlook for listed equities, debt markets, and real assets. Most listed markets had a tough 2022 and relationships that investors have relied on for portfolio construction for years were drawn into question. The year 2023 is likely to have its share of economic turbulence, but from an asset price perspective it should be materially better than 2022. With inflation set to moderate and recessions either underway or on the horizon, it could be a good year for fixed income and infrastructure, both of which offer defensiveness and high yields. Infrastructure offers the additional benefit of being a good hedge against inflation. Agriculture's steady return profile and attractive yield should also hold it in good stead next year. The outlooks for listed equities and real estate are more nuanced, but both offer thematic and cyclical opportunities.

Global equity markets: Steering a middle course between optimism and caution

Markets face multiple headwinds, but there are some bright spots

John Leonard | Global Head of Equities

When we wrote our 2022 outlook late last year, the major concerns were the effects of snarl-ups in the global supply chain, and the implications of worsening trade relations between the US and China. We did not anticipate the war in Ukraine, which would lead to the energy crisis[27] that is currently gripping Europe and the UK and spikes in the prices of agricultural products. Since the Russian invasion in mid-February 2022, global equity markets have confronted a series of geopolitical and economic shocks and have generally responded by reducing the prices of risky assets.

In retrospect, it seems clear that many analysts and politicians were complacent about the extent to which many European economies were dependent on a steady supply of oil and gas from Russia. From the end of 2021 to the end of September 2022, major equity market indices around the world have declined, but US large-caps are still showing positive returns over the full period since before the COVID-19 pandemic, whereas the cumulative returns for developed markets ex-US and emerging markets over the same timespan are negative (Figure 30).

Figure 30:
Total returns of broad equity indices: US large-caps have been a strong performer through the recent volatility

Total returns in $US (%)	31 Dec 2021 to 30 Sept 2022	31 Dec 2019 to 30 Sept 2022	31 Dec 2019 to 30 Sept 2022 (annualised)
S&P 500 Index	-23.9	16.0	5.6
MSCI EAFE (Europe, Australasia, Far East) Index (net)	-27.1	-12.5	-4.8
MSCI Emerging Markets Index (net)	-27.2	-16.0	-6.2

Sources: Standard & Poor's, MSCI, Macquarie Asset Management (November 2022).

27. See "Energy security and the energy transition" for more details and for an overview of some of our key views on the impact of recent developments on the transition to a low carbon energy system.

When looking at equity valuations, we generally look at forward price-to-earnings (P/E) ratios over a long period. At the end of 2021, equities were trading at relatively high levels in terms of forward P/E ratios. It is therefore not surprising that equity prices would fall after investors started to worry in February and March 2022 about the potential impact of the conflict in Europe, and also about the likelihood that central bank actions might cause a global economic slowdown. But even after these declines, equities still do not look particularly cheap. If we look at forward P/E ratios from the end of 2005 up to September 2022, US equities are still above their median levels, while developed markets ex-US and emerging markets are roughly in line with their median levels (Figure 31).

Figure 31:
Historical and current equity valuations: US equities still above long-run average P/E ratios

Sources and notes: MSCI, FactSet, Macquarie Asset Management (November 2022). US represented by MSCI USA Index; developed markets ex-US by MSCI EAFE Index; emerging markets by MSCI Emerging Markets Index. Graphs show 5th to 95th percentiles of weighted medians for price to consensus FY1 earnings from 31 December 2005 to 30 September 2022, with additional breakpoints at 25th, 50th, and 75th percentiles.

It is also worth noting that forward-looking multiples are based on consensus expectations for individual companies. Many investors, including ourselves, now expect recessionary conditions in Europe, the UK and North America,[28] which could lead to a decline in earnings and further potential declines in equity markets, even if multiples remain unchanged. We think there is scope for further declines in equity markets, although we don't see much likelihood of a repeat of the conditions that prevailed during the GFC in late 2008 and early 2009.

Deglobalisation: A reversal of the past 30 years?

Perhaps the most important economic theme of the past three decades was the steady expansion of global supply chains, as firms in many countries began relying on inputs produced hundreds or even thousands of kilometres away, delivered with high reliability and for modest costs by modern logistics. The COVID-19 pandemic revealed that even modest hiccups in those global supply chains could lead to big problems for downstream users. Moreover, as wages in emerging markets have risen, the argument for continuing to move production of goods and services from developed markets to emerging markets has become less compelling. In response, many firms have started looking more seriously at the idea of relying more heavily on goods and services produced within their own national borders, or at least within the context of a customs union.

Onshoring will not be immediate and will require years of sustained investment. There will be transitory costs associated with new capex, workforce retraining, inventory build-up, and the development of new networks for sourcing raw materials and supplying end users. But the end result is likely to be more resilient production processes, at least for large DW economic units such as the US, EU, and Japan, all of which have sufficient domestic demand and domestic supply to engage in onshoring. Conversely, any movement towards widespread onshoring will have negative implications for countries such as China that have benefited from foreign direct investment, and also for the UK, which since Brexit no longer has easy access to customers and suppliers in continental Europe.

28. See "Global growth, recessions and recovery" above for more details.

The energy transition: A multidecade trend

Governments and firms around the world are in the process of moving towards a goal of net zero carbon emissions. An increasing proportion of energy is coming from renewable sources such as solar, wind, and hydroelectric generation. Indeed, recent estimates suggest that renewable energy sources are now cheaper than traditional sources such as oil, gas, and nuclear power. As we outlined in our "Energy security and the energy transition" section, we believe that this trend is now unlikely to reverse, and could even accelerate in some regions, although select individual governments at the national or provincial level are seeking to retain a major role for suppliers of "brown" energy sources to help meet near-term energy needs.

However, as with onshoring, the energy transition will take many years to accomplish, and there is a large capital investment need to create new generating capabilities.[29] Also, some of these energy sources are inherently intermittent, so it will be necessary to develop forms of energy storage that can be used when generating capacity is insufficient to meet demand. In this light, we believe there will continue to be a place for more traditional sources of energy for a while yet.

Inflation: Where to next?

Part of the reason for the negative year-to-date performance of equity markets is concern about inflation. Over the period from 2010 to early 2019, inflation in the US and most other DW economies was generally around 1% to 2% per year. However, the economic stimulus provided during the COVID-19 pandemic, and the effects of Russia's invasion of Ukraine, have pushed inflation to levels more reminiscent of the late 1970s.

Generally speaking, firms in non-regulated industries should be able to pass through price increases to their customers, so equities should offer a better hedge against inflationary pressures than other asset classes where this potential to offset cost increases through the revenue line is not present or is less reliable. However, it is reasonable for investors to worry that central banks may push the global economy into a sustained recession by continuing to raise interest rates to bring inflation under control.

As we lay out in our section "Supply-side dynamics – Cyclical versus structural change," inflation is likely to moderate in 2023, in our view, as supply improves while demand moderates. Indeed, the peak for headline inflation may already be in, with the US YoY rate having eased for four months in a row now and the base effects in the months ahead conducive to further declines – in the five months from November 2021 to March 2022, the US Consumer Price Index (CPI) averaged a monthly gain of 0.8% (Figure 32). The recent monthly data have also been quite weak – Figure 33 ranks all the MoM gains in the CPI since January 2010 by size of increase, with the last three data points being generally subdued, suggesting headline inflation may be losing some momentum.

29. See our recent Pathways paper "Decarbonisation of electricity generation: The foundation stone for achieving net zero" from June 2022 in which we estimate that $US54.3 trillion will be needed to transition the electricity sector to net zero by 2050.

Figure 32:
YoY headline inflation peaked in June

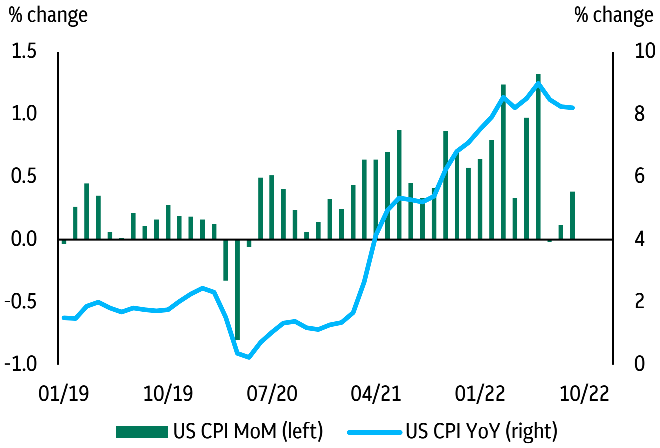
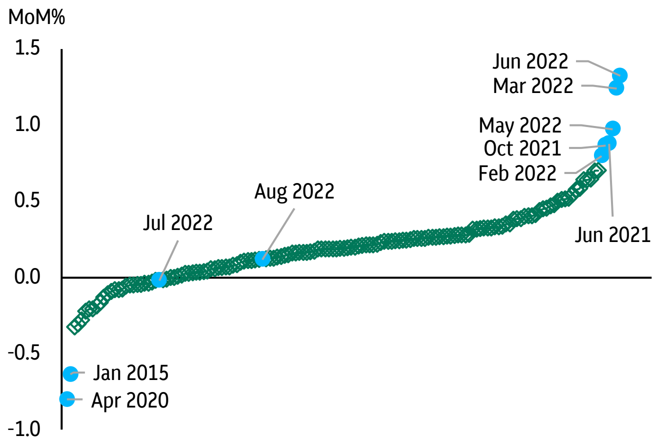


Figure 33:
Recent MoM gains have been mild



Sources: Macrobond (November 2022), US Bureau of Labor Statistics. Graph in Figure 33 shows one-month change in US consumer prices (CPI-U (all items, seasonally adjusted) from January 2010 to August 2022 (most recent available), ranked from most negative (deflationary) to most positive (inflationary).

Of course, it is possible that the data in subsequent months may give a different picture, but for now there are good reasons to believe that US headline inflation will moderate over the next 12 months or so.

Asset class implications

If onshoring does become a major theme, then we think the major beneficiaries will be construction and engineering firms, railroads, and consumer discretionary firms. Conversely, we think that onshoring would have generally negative implications for shipping companies, as well as for the broad network of service providers such as lawyers and accountants that has grown up to support these global supply chains.

The long-term nature of the transition to green energy means there will still be a need for traditional energy companies and the many ancillary industries that supply their needs for a while yet. Finally, if inflation does become a persistent challenge, then we believe this would have negative implications for regulated industries and also for highly leveraged firms that may struggle to refinance their debt as it matures. Conversely, if central banks are able to bring inflation under control relatively quickly, then we would expect that firms heavily exposed to consumer demand would be among the principal beneficiaries.

In general, equities offer a decent combination of transparency, liquidity, and growth potential. In the current market environment, at least for those who aren't willing to lock up all their money longer-term, we consider that most investors should be planning to keep a substantial role for equities in their portfolios during 2023.

Global debt markets: Opportunities abound

Yield returns as the global economy faces an inflection point

Brett Lewthwaite | Chief Investment Officer, Global Head of Fixed Income
Graham McDevitt | Global Fixed Income Strategist
Patrick Er | Senior Econometrician

The sharp repricing in global bond markets in 2022, prompted by the uncertain inflation outlook, has created an array of fixed income and credit opportunities for active and nimble investors. With the yields on offer in global fixed income and credit markets at the most attractive levels in a decade, fixed income as an asset class appears poised to garner considerable investor interest and inflows, delivering a relatively stable source of total returns for investment portfolios.

Stagflation and what comes next

Two years on from the COVID-19 supply shock, sizeable tracts of the global economy, especially the majority of DW economies, are experiencing stagflationary or near-stagflationary conditions. The emergence of a second negative supply shock from the war in Ukraine in early 2022, just as tentative signs were emerging that the impact of the pandemic shock was fading, has clearly exacerbated the situation.

Stagflation tends not to persist, however, because the instability that it brings naturally motivates households and businesses to react in ways that counter the adverse conditions. In addition, policymakers tend to enact measures in response to the forces that cause stagflation. So even though the second supply shock from the war in Ukraine caused stagflationary conditions to stick around for longer, the adjustment mechanism away from them remains intact.

Our analysis suggests that the outlook will be increasingly defined by the aggressive stance implemented by central banks globally aimed at taming the inflation component of the current stagflation situation. Based on our research of similar environments throughout history, stagflation is usually followed by a period of lower growth, and by association, recession.

Demand deceleration and supply recovery: A realignment

As we discuss in our section *"Supply-side dynamics – Cyclical versus structural change,"* there is growing evidence of a near-term realignment of the forces of demand and supply in a way that is consistent with a decline in inflation during 2023.

The constraints that led to the negative supply shocks are easing. While it is true that the process is slow and susceptible to setbacks, the forces that dictate this are set in motion and evidenced by a wide range of measures (see Figure 34 for some related to global shipping and logistics). Thus, unless an exceptionally severe supply-side event occurs (geopolitical in nature, for example), the momentum of supply recovery is likely to accelerate over the next 12 months.

In relation to demand, while the recovery was rapid and significant from the depths of the COVID-19 "sudden stop" in 2020, it is clearly running out of steam (Figure 35). At best, aggregate demand regained levels consistent with the immediate pre-COVID-19 growth trend, but failed to progress much beyond that. The end of fiscal support coupled with aggressive tightening of monetary policy in many countries also played a role in further moderating demand intentions. This has left demand in a more fragile state, on a path skewed towards moderation, and susceptible to contractionary events.

Figure 34:
Global shipping and logistics: Supply constraints are loosening

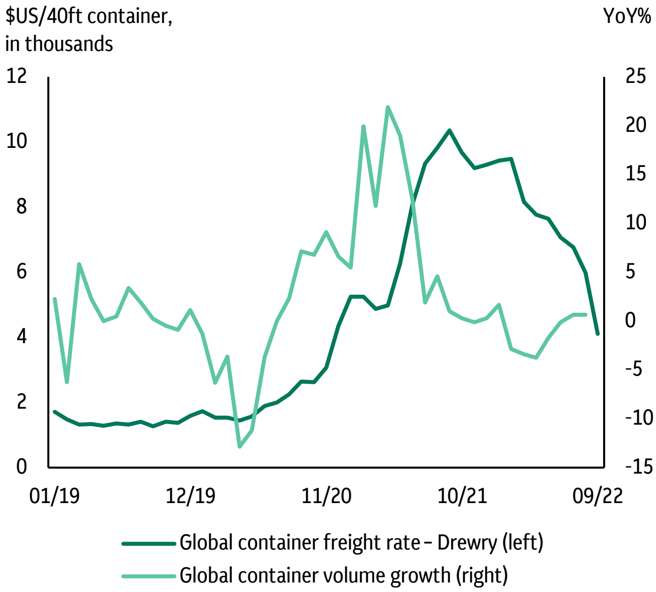
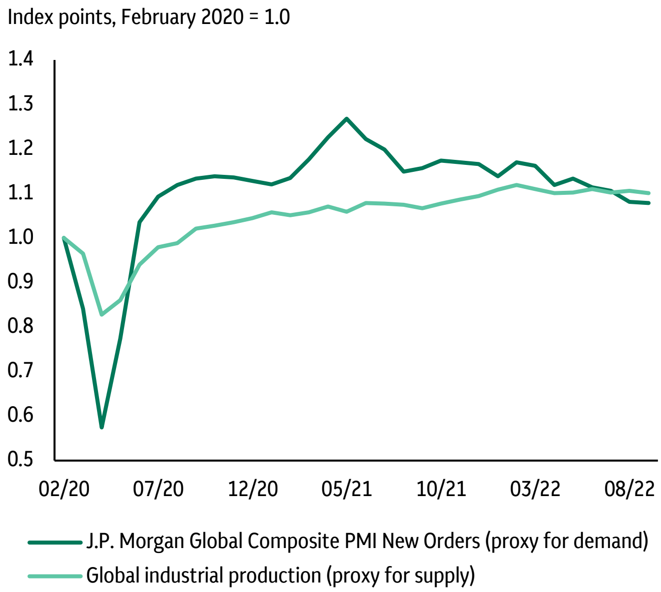


Figure 35:
Global demand and supply: Demand is decelerating while supply pressures are easing



Source: Macrobond (November 2022).

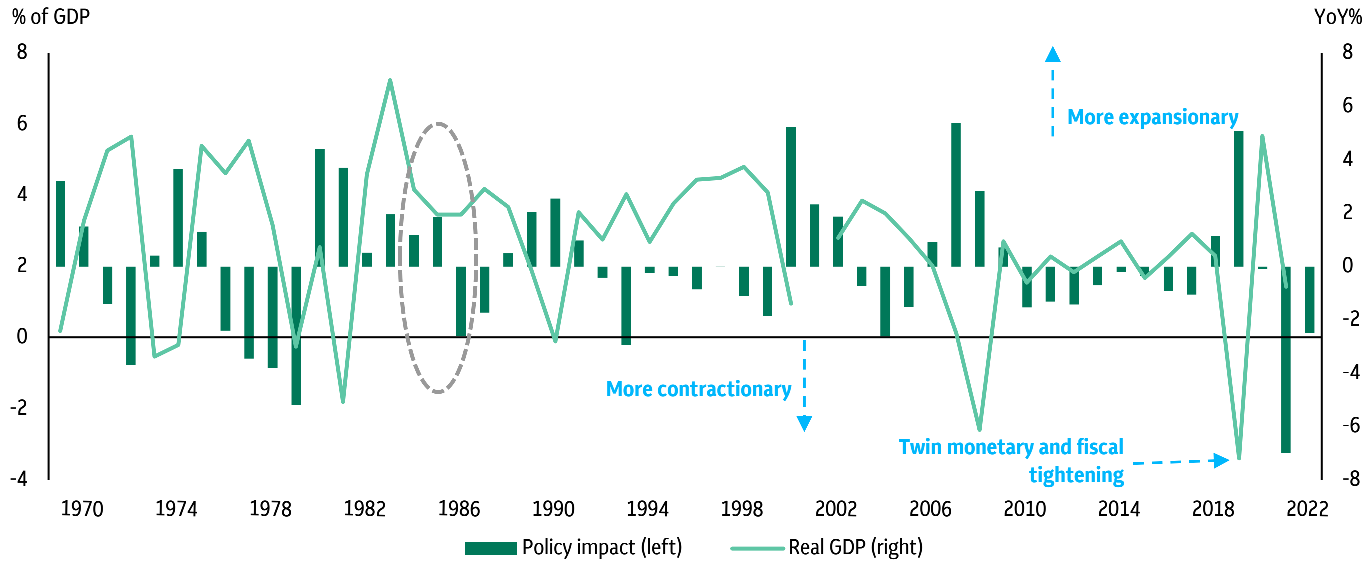
In short, two forces are emerging and realigning – supply recovery and demand deceleration – which are set in opposite directions. The trajectories of these two opposing forces suggests inflation should moderate over the next 12 months. However, the impact on economic growth will depend on the relative strength of the supply recovery and the demand deceleration. If the strength of the supply recovery exceeds that of demand deceleration, then a recession could be avoided. If the reverse occurs, as seems likely to us, then recessions become a base case. This outlook is likely to support returns from bond and credit markets.

This expected realignment of supply recovery and demand deceleration are naturally gradual processes. The emergence of another exogenous event would influence the outcome of this demand-supply interaction, and the global economy could return to an even worse stagflationary environment. For now, the risk, while not zero, is still low enough to be considered a tail-risk scenario.

A very aggressive tightening cycle: The fastest, broadest, and steepest in decades

A more likely factor that will impact this demand-supply realignment is the amount of policy tightening already coming down the pipe (Figure 36). The majority of central banks have tightened policy significantly with some, such as the Fed and the Bank of England doing so at a record pace, with this cycle being the most aggressive in post-World War II history. That one of the fastest, broadest, and most significant hiking cycles in almost 40 years is occurring is eye catching in and of itself. Further still, quantitative tightening (QT) is also underway and only just beginning. While the impacts of QT are not yet visible, liquidity is now being withdrawn from the system and is likely to continue at pace. This has been followed by further cutbacks – to various degrees – in fiscal policy by central governments, on top of the tightening that occurred with the ending of fiscal support initiatives in the past 12 months.

Figure 36:
The largest twin tightening of policy in the US since the late 1970s



Source: Macrobond (November 2022).

As we discuss in our section *"Global growth, recessions, and the recovery,"* these policy actions are likely, in our view, to see demand deceleration morph into outright demand destruction and recession. Unfortunately, policy does not have a similar impact on supply. In fact, if there is to be any policy impact all, it would likely impede the supply recovery as higher interest rates discourage producers from expanding production capacity.

Thus, even in the event of a recession, the above interaction of supply and demand adjustment going forward suggests that inflation's fall to central bank targets is unlikely to occur fast enough to satisfy policymakers (again see our section *"Supply-side dynamics – Cyclical versus structural change"* for more details). This could lead to a prolonged tight policy environment that further entrenches demand destruction and increases the risk of a more severe recession.

> The considerable rise in bond yields, to levels not seen in almost 15 years, offers attractive valuations and strong protection levels."

Structural forces and their impact on growth and inflation

Longer term, there are structural forces affecting growth and inflation that should re-exert their influences as inflation falls and we transition from the stagflationary conditions of 2022. Population and demographic patterns, together with lower trend productivity growth, are major trends that affect spending and production, and our past research suggests that their ultimate impact is likely to be higher structural inflation as production growth begins to lag structural demand growth.

The other major structural trend of rising income and wealth inequality is likely to have been strengthened by recent policy actions. This will also impact spending and production patterns in the same manner as outlined above, but with the added complication that these inequalities weaken the impact of economic policy. For example, if most financial assets are concentrated in the few, then interest rates will not have the same impact as when these assets are held by a larger and more diverse segment of the population.

Importantly, over the past decade financial markets have been conditioned by, and dependent on, the ongoing presence of quantitative easing (QE). The by-products of this endless QE environment were more and more debt and credit expansion, low volatility, higher and higher asset prices, and imbalances such as rising inequality. Given that we are now in a world of much higher interest rates and ongoing QT-driven liquidity reduction, many now face the uncomfortable reality of a higher cost of capital, higher volatility, greater uncertainty, and a likely unwinding of elevated asset prices. To be direct, and to use one of our favourite tag lines, "High debt levels and high bond yields are not natural dance partners – they do not and cannot co-exist."

Finally, the seemingly structural shift in geopolitics that appears to have taken place over recent years, and advanced by the recent invasion of Ukraine, has increased fear of a reversal of the past decades of globalisation.

Conclusion: Higher yields and wider spreads likely to capture investors' attention and allocations

In closing, we reiterate the view that in the short to medium term the realignment of demand and supply forces are the key factors shaping the macroeconomic landscape as we move into 2023. The intervening hand of central banks and governments in the form of the unprecedented tightening of monetary and fiscal policies will likely tip economies into recession in 2023. Inflation, as stated, should be lower, but most likely won't reach levels that would cause policy to be loosened. This could mean prolonged tightening, which could lead to an even more severe recession with the risk that the expected disinflation intensifies.

The impending macroeconomic landscape we have described justifies a significant reallocation into safe and high-quality assets, in our view, especially if the recessionary conditions turn out to be worse than anticipated. As such, the safe havens of cash and bonds are looking increasingly attractive. The considerable rise in bond yields, to levels not seen in almost 15 years, offers attractive valuations and strong protection levels. Within credit, fundamentals remain strong in both investment grade and high yield markets. However, we are entering an uncertain macroeconomic environment with the impact from inflationary cost pressures and deteriorating growth likely to lead to weaker fundamentals. Against this backdrop, we believe defensive positioning within high-quality credit is appropriate. We retain a cautious outlook for high yield and emerging markets debt, with a mixed picture for underlying fundamentals alongside varied region-specific impacts from the global macroeconomic environment, although we anticipate increased allocations at what are increasingly attractive valuations. Overall, we believe the current fixed income environment offers an array of opportunities, although it requires flexibility and agility to navigate.

Real assets: Attractive traits in difficult times

Interest rates drive some divergence

David Roberts | Global Real Estate Strategist
Aizhan Meldebek | Global Infrastructure Strategist

Real assets refer to investments that encompass physical assets such as real estate, infrastructure, and agriculture (e.g. farmland). There are several advantages of investing in real assets in the current macroeconomic environment. First, most have historically exhibited a low correlation to listed equities, a feature that is particularly attractive during periods of market volatility. Second, they typically provide a hedge against higher inflation through stronger income growth due to higher rental growth (in real estate), inflation-linked cash flows courtesy of regulation or long-term contracts (in infrastructure), and the high correlation between food commodity prices and inflation (in agriculture). Third, they offer a high yield, which in high inflation environments (such as the 1970s) becomes a disproportionate driver of total return. In short, in periods of rising inflation and market volatility, investors may increasingly turn to real assets for inflation protection, reliability of return delivery, yield, and portfolio diversification.

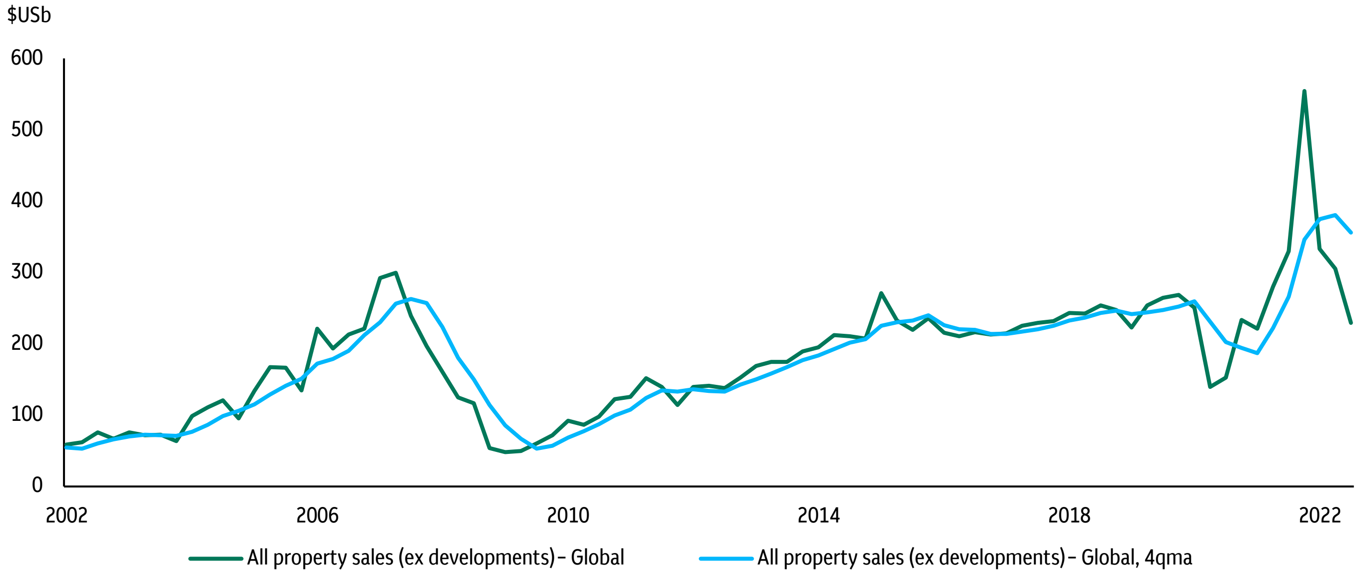
With interest rates having risen sharply over the past 12 months and recessions expected in the UK, Europe and the US, 2023 is likely to be a challenging year. The economic pressures may give rise to divergence in performance across real assets, with some asset classes and sectors proving more resilient than others to higher interest rates and weaker economic growth. At the same time, attractive long-term opportunities are likely to emerge in the next 12 months.

Real estate: Market volatility and dislocation creates opportunities

The strong performance of global real estate markets over the past decade is now waning as higher risk-free rates and financing costs impact sentiment, although fundamentals are still generally solid. The pullback in transactional markets in 2H22 is particularly evident in Europe and the US where elevated inflation, interest rate uncertainty, and recessionary risks are impacting investor activity across sectors. While challenging, downturns often present opportunities, such as acquiring existing buildings that are trading at discounts to replacement costs and taking advantage of dislocation in public markets.

In the Asia-Pacific region, China's real estate downswing is more advanced, given soft GDP growth and tight financing conditions, despite some marginal policy easing this year. Japan's limited monetary tightening compared with other developed markets continues to support local commercial property pricing and returns given low financing costs and still positive cap rate spreads to 10-year bonds. The weaker currency also presents a potential upside for new investments into the Japanese market today, or at least minimises the downside for unhedged investors. Elsewhere in the region, Australia's commercial property pricing – at least in private markets – held up well in 2022, given ongoing capital flows from Asia, although these tend to lag global shifts.

Figure 37:
Global property sales have turned down as interest rates have risen



Source: Real Capital Analytics (November 2022).

Looking ahead, high-quality buildings with strong cash flows and premium tenants, and property assets in attractive locations where there are supply-demand imbalances, should perform solidly through the cycle, as they have done historically. Higher replacement costs – driven by higher construction prices – may also help protect pricing, or at least provide a floor for prime valuations.

Widening discounts for Grade B and Grade C assets and those buildings with leasing risk and/or high and rising capex requirements – related to increasing sustainability and energy efficient requirements of occupiers and the general shift to tech-enabled space – should create repositioning and repurposing opportunities. This is particularly the case in and around large urban markets where buildings can be converted for other uses. It is likely to be most obvious in the office sector where occupier shifts to newer space are becoming more pronounced. Looking beyond any near-term adjustment, history suggests that pricing is likely to start firming ahead of the low point for both global growth and real estate fundamentals, as investors take advantage of cheaper entry points.

Housing markets are exposed to higher mortgage rates

The broad pressure on residential markets, where prices are softening in the most levered markets such as Australia, Canada, and New Zealand, is likely to weigh on sales and housing starts over the next 12 months. In other developed markets, such as the UK and US, residential prices are now starting to come under pressure at a national level given that marginal buyers face much higher mortgage costs today than they did in late 2021. Existing owners – at least in the US – should be somewhat insulated given that many borrowers take out 30-year fixed-rate mortgages. The downside is that mobility may slow as households face the prospect of much higher financing costs if they sell and move somewhere else.

Softening housing markets may create opportunities to acquire development sites and land in less competitive processes and at lower prices. Longer term, the pullback in house prices and starts will only amplify the shortage of housing in key developed markets with growing populations, such as the US, UK, and Australia.

Rental housing owners and operators in public markets appear to have been caught up in this broader housing slowdown as higher mortgage rates impact new sales of home builders. At the same time, the underlying revenues of rental housing providers are being supported by stretched affordability for potential homebuyers and positive household formation rates as pandemic disruptions ease, including the normalisation of international migration.

Construction costs and development activity

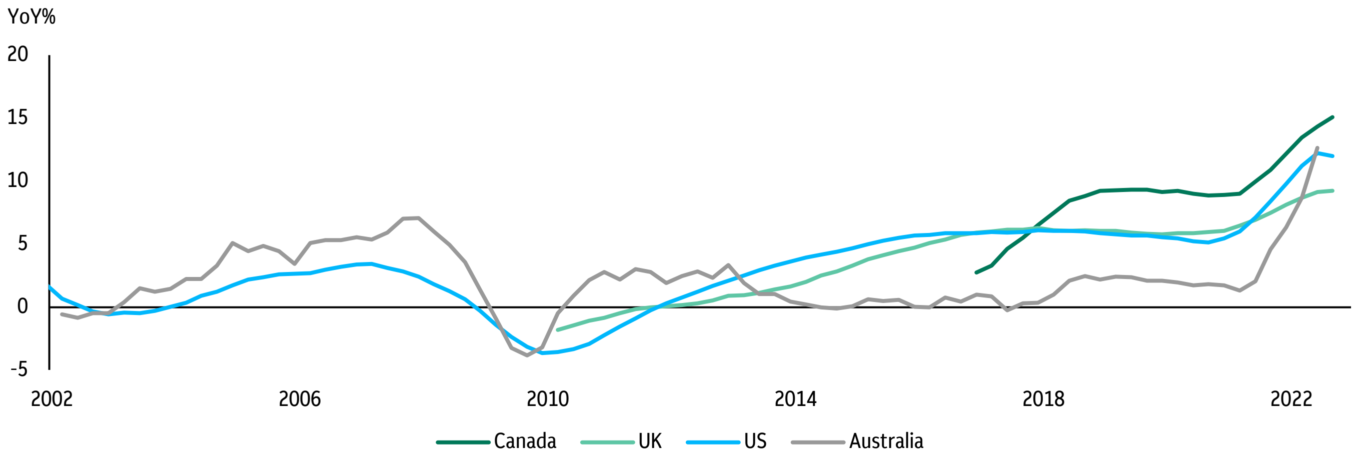
In the pre-COVID-19 world, building costs and tender prices in developed markets rose in line with consumer price inflation, at around 2-3% per year. Over the past 12-18 months, however, construction costs have jumped sharply around the world, driven by higher commodity prices and a general shortage of workers and higher wages. Cost inflation appears close to peaking though, and should fall back over the medium term, particularly if material prices and shipping costs slide further as global growth weakens. However, the shift back to pre-COVID-19 averages may be hampered by ongoing tight labour markets and high energy prices, which feed into the cost of building materials such as glass and cement.

Development margins have been maintained in markets and sectors with strong demand drivers and rental growth. This includes the logistics sector in locations around major metropolitan areas as well as key ports with tight vacancy rates, where higher construction costs can be passed on to tenants through higher rents. In other sectors and markets, if land prices remain firm higher construction costs may help to balance future demand-supply dynamics as development pipelines are pared back given tighter yield-on-cost metrics. This should help protect values of existing buildings, or at least provide a floor for pricing.

Focused real estate strategies

Elevated macroeconomic volatility tends to increase investors' focus on fundamentals and income growth profiles across sectors, markets, and product types. Higher-quality buildings and assets in attractive locations where there are supply-demand imbalances and landlords can pass on cost pressures to tenants are expected to perform better, including under a mild global recessionary scenario. Rental growth and cash flows are likely to remain relatively strong for industrial and rental housing, supported by tight vacancy rates. Smaller, still institutionalising sectors such as data centres that are less exposed to economic growth are also likely to see solid rental growth, although total returns are likely to be lower than in recent years as cap rates rise from recent lows.

Figure 38:
Industrial rental growth: Fundamentals remain healthy



Sources: CoStar, Jones Lang LaSalle (JLL), as at November 2022.

In the office sector, the divergence between prime and secondary markets is set to become more pronounced as corporates look to minimise costs, including shedding non-core and underutilised space. Larger discounts for secondary assets are expected to create repositioning and repurposing opportunities. Underlying drivers of the movement to high-quality space include the growing importance of technology in the workplace, the shift to hybrid working models, the intensifying need to attract and retain talent, and rising environmental, social, and governance (ESG) considerations as tenants and investors shift towards their long-term net zero targets.

Opportunities have appeared in public markets where implied cap rates have increased sharply relative to underlying private market values. Other cyclical opportunities may include debt and equity investments in developers and assets that are most exposed to the economic cycle and/or higher construction and financing costs. The residential sector is a prime example.

Infrastructure: Accelerated policy support and inflation as a tailwind

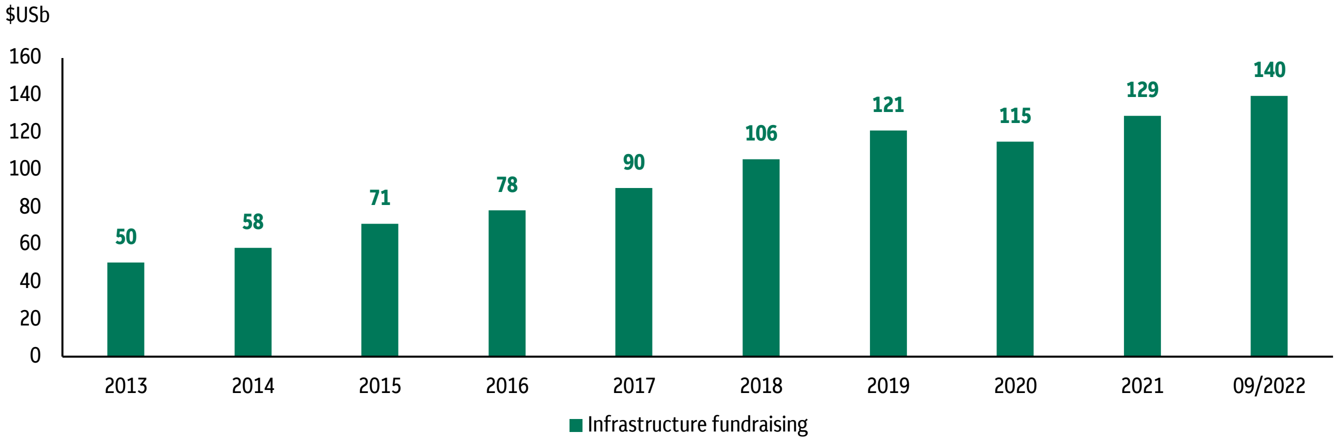
Infrastructure's growing popularity among institutional investors continued in 2022, as the asset class was increasingly recognised for the defensive and inflation-linked nature of its cash flows. Policymakers globally also continue to deliver vital stimulus packages to accelerate investment in energy transition sectors and technologies to achieve their carbon emissions reduction targets. While we expect the economic environment to be challenging over the next 12 months, infrastructure is well placed relative to most other asset classes due to its defensiveness, its high yield, and its inflation hedge properties.

Despite higher geopolitical risks in 2022, governments globally continued to deliver on their energy transition agendas. In the US, the Inflation Reduction Act (IRA), signed into law in August 2022, provides $US369 billion towards decarbonisation of power and transport, energy security, and climate change solutions over the next decade. In particular, the spending should help increase the share of clean power generation to up to 80% by 2030, and to achieve a zero-carbon power sector by 2035.[30] The legislation introduces a number of new tax credits[31] and is expected to accelerate the deployment of clean energy technologies by supporting their cost competitiveness. Together with the Infrastructure Investment and Jobs Act (IIJA) passed in 2021, the IRA is expected to unlock significant new opportunities in the US market.

In the EU, the war in Ukraine is spurring many governments to accelerate the transition to clean energy sources, while in the near term energy efficiency has become a key focus in the drive to energy independence and security. For example, the REPowerEU package aims to increase the 2030 target for renewables to 45% of the EU's overall energy mix, up from the previous 40%.[32] It also provides support for the further uptake of hydrogen[33] in industry and transport. In Germany, the government has made amendments[34] to its energy legislation, accelerating the expansion of renewables.[35] All this being said, the very near-term challenges and supply constraints in Europe may cause a temporary increase in the use of carbon-intensive energy sources.

Supported by government policies, infrastructure as an asset class continues to attract significant amounts of institutional capital. As of 3Q22, global infrastructure fundraising reached a record $US139.6 billion, above the $US128.9 billion raised for the full year of 2021 (Figure 39).[36] While the uncertain economic environment and the denominator effect may slow the fundraising processes in 1H23, we expect capital raising by infrastructure funds to stay healthy in 2023 and beyond, given the asset class's attractive fundamental traits in the current macroeconomic environment, and the critical role it is set to play in transitioning to a net zero world.

Figure 39:
Infrastructure funds continue to attract significant amounts of capital

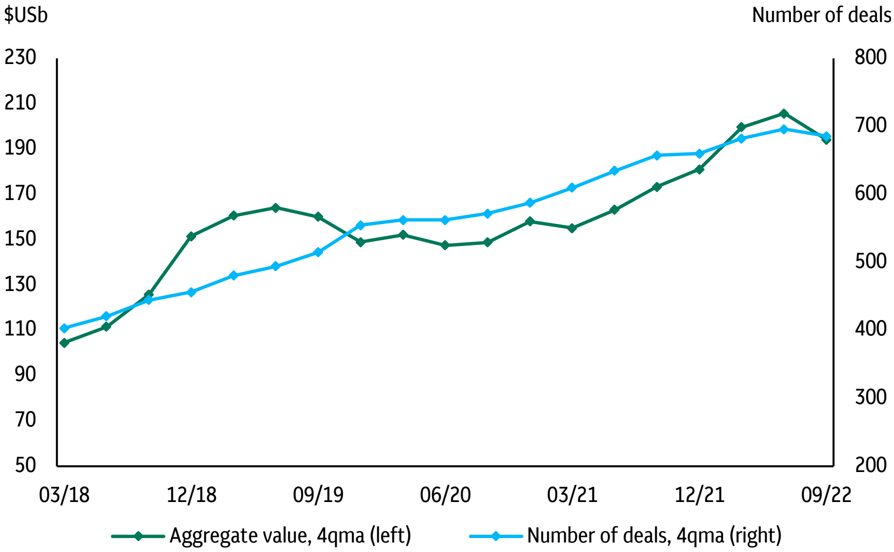


Source: Preqin (November 2022).

30. Compared with 38% in 2021, according to BCG, "US Inflation Reduction Act: Climate & Energy Features and Potential Implications" (August 2022).
31. A tax credit is an amount of money that taxpayers can subtract directly from the taxes they owe.
32. The 40% target for renewables share in the overall energy mix was proposed under the EU "Fit for 55" package in July 2022.
33. REPowerEU sets a target of 10 million tonnes of domestic renewable hydrogen production and 10 million tonnes of hydrogen imports by 2030.
34. The Federal Government of Germany, "Easter package for energy transition approved by the Bundesrat" (July 2022).
35. The share of renewable energy sources in gross electricity consumption is to increase to at least 80% by 2030.
36. Preqin database (3Q22).

Infrastructure deal activity recovered to pre-COVID-19 levels in 2021 and remained strong in 2022. As of 3Q22, infrastructure deal activity stood at around 72% of full-year 2021 in value terms, on track to be in line with the previous year (Figure 40).[37] In 2023, consistent with other periods of economic slowdown, we may see traditional merger and acquisition activity soften as price expectation gaps emerge between sellers and buyers. That said, we also anticipate increased levels of activity across all energy transition sectors, including the build-out of core renewable generation as well as new opportunities in areas such as battery storage, green hydrogen, and carbon capture, utilisation, and storage (CCUS). With access to liquidity being tighter than in recent years, we should also see an increase in partnerships between infrastructure funds and other market participants (corporates or governments) that require capital to deliver new sustainable solutions to meet their carbon reduction and climate impact goals.

Figure 40:
Deal activity recovered to pre-COVID-19 levels and remains robust

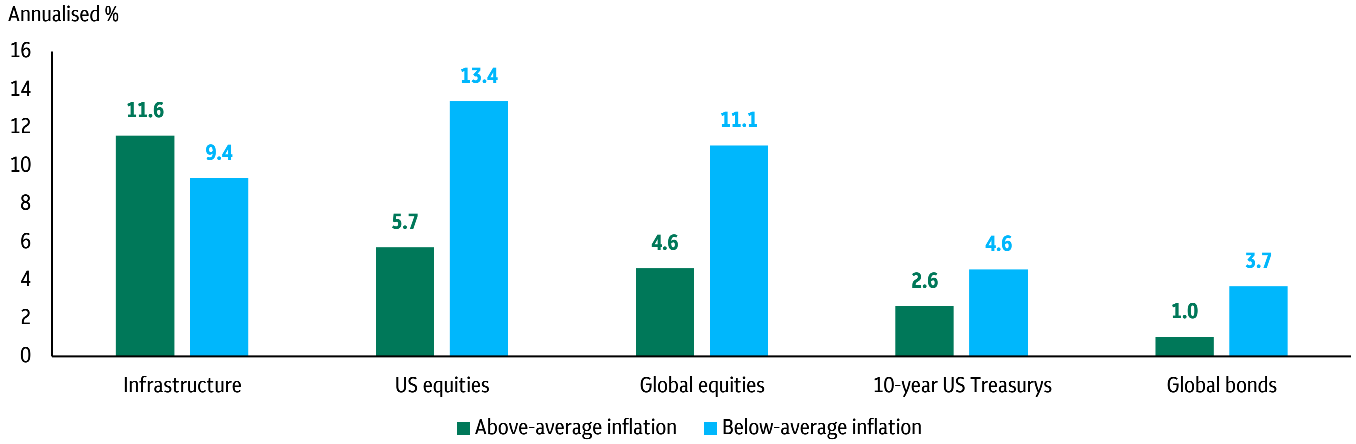


Source: Infralogic by Inframation deals database (3Q22). Figures include greenfield and M&A deals with the status "Financial Close", excluding energy upstream and downstream.

Despite a more volatile economic environment, infrastructure's performance is expected to remain healthy through 2023. As of 2Q22, private infrastructure total returns stood at 12.8% over the past 12 months, above the 11.0% annualised over the past decade.[38] Higher-than-average inflation tends to be a tailwind for infrastructure returns (Figure 45) and could be particularly beneficial for core and core plus infrastructure assets, given that for many of these assets the link between returns and inflation is tighter than for those higher up the risk spectrum.[39] Overall, we expect the headwind from higher interest rates to be at least partially offset by a tailwind in the form of higher inflation for these assets.[40]

37. Based on Inframation deals database (3Q22).
38. Cambridge Associates Infrastructure Index (2Q22).
39. It is worth noting that this is a generalisation, and the inflation hedge potential of any asset will depend upon its individual traits.
40. For more detail, see our Pathways report, "Core infrastructure: Its inflation hedge characteristics and the search for yield" (June 2021).

Figure 41:
Infrastructure historically outperformed listed equities and bonds when inflation was above average



Sources: Macrobond, Cambridge Associates, Bloomberg Finance LP (June 2022). US equities: S&P 500 Index. Infrastructure: Cambridge Associates Infrastructure Index. Global equities: MSCI World Index. Global bonds: Bloomberg Global Aggregate Index. Analysis conducted from 4Q03 to 2Q22.

Key considerations for the main infrastructure sectors

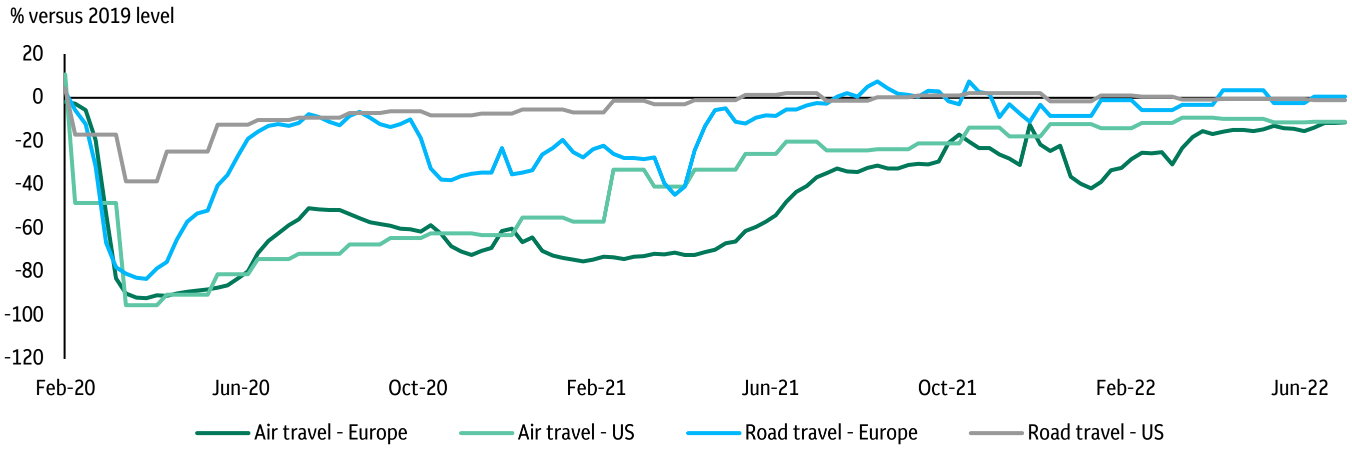
While it is hard to generalise by sector, regulated utilities (such as electricity transmission and distribution) are expected to perform solidly in 2023. For many of these utilities,[41] inflation is included directly in the regulated asset base (which is increased by the rate of inflation over time) or the return (owners being given a real return).[42] As a result, regulated utilities are well positioned in a high inflation environment. This said, with regulators being conscious of the rising cost of living and customer affordability, there could be a potential impact on net regulatory outcomes, although this risk is lower for assets in countries with a history of private infrastructure ownership and transparent legal frameworks.

The transport sector has been recovering strongly in 2022 on the back of the reopening of the global economy and strong pent-up demand for travel and leisure (Figure 42). As of August 2022, global air passenger volumes stood at 77.2% of their pre-pandemic level (in revenue passenger kilometres), with Latin America and North America leading the recovery at around 90% of the pre-pandemic level.[43] The recovery in the Asia-Pacific region has been lagging, but with major Asian markets (ex-China) reopening in 2H22, international traffic may accelerate in 2023 even though overall economic conditions are likely to be constrained by weak growth. This is somewhat true globally as well – the demand and supply disruption caused by COVID-19 means that the normal relationships between GDP growth and air travel volumes may be less reliable in 2023. With a large amount of pent-up demand still in the system, air travel volumes could be stronger than forecasts based on past relationships with GDP would suggest.

For roads, US traffic volumes (in vehicle miles travelled) have effectively recovered to their pre-pandemic level, reaching 98.8% of pre-COVID-19 levels as of August 2022.[44] In Europe, the road traffic recovery has also progressed well, with year-to-date traffic in some countries (e.g. France) back to 2019 levels, while traffic in others (e.g. Spain) is only slightly below pre-COVID-19 levels.[45]

41. There is some variation by region here, with these traits more common in the UK, Europe, and Australia than they are in the US.
42. There can be a time lag between inflation and revenue adjustment for regulated utilities.
43. International Air Transport Association (IATA), "Air Passenger Market Analysis: The strong positive trend continued in August" (August 2022).
44. Based on US Federal Highway Administration monthly vehicle miles travelled, seasonally adjusted data.
45. Based on Atlantia 2022 Monthly Traffic Performance (August 2022), measured in kilometres travelled.

Figure 42:
The transport sector is recovering solidly from the COVID-19 sudden stop



Sources: European Organisation for the Safety of Air Navigation (EUROCONTROL), Atlantia, US Department of Transportation (August 2022), US Bureau of Transportation Statistics (June 2022).

For ports, the outlook is varied depending on the volume mix and port location. The Centraal Planbureau (CPB) World Trade monitor suggests that global goods trade was up 6.0% YoY in July 2022[46] with consumer demand remaining strong in 1H22 despite rising inflation. However, goods consumption is likely to soften going forward as inflationary pressures erode households' real incomes, leading to lower growth in container volumes.

For digital infrastructure, long-term structural trends continue to drive demand for new and upgraded infrastructure. In Europe, €127 billion is dedicated to digital reforms and investments in the effort to reach gigabit[47] connectivity by 2030. Our previous analysis[48] shows that demand for digital infrastructure has proved resilient to economic downturns in the past, as fixed and mobile connectivity is essential for businesses and consumers. Core digital infrastructure such as tower operators in Europe are well positioned to pass through cost increases,[49] while assets with shorter contracts and weaker pricing power could come under pressure.

Conclusion and implications for investors

Overall, we expect infrastructure to be resilient in 2023 against what is likely to be a challenging macroeconomic backdrop. Assets in the core and core plus parts of the risk-return spectrum are likely to be particularly attractive to investors given their defensiveness, high yield, and reliable inflation hedge. That said, the headwinds of tight monetary policy and weaker economic growth may cause uncertainty for some assets at the higher end of the risk spectrum. Debt capital markets should remain open for infrastructure assets, but pricing could increase, particularly for assets with a non-investment-grade profile. A prudent approach to leverage and good access to liquidity will be increasingly important going forward.

46. CPB Netherlands Bureau for Economic Policy Analysis "World Trade Monitor" (July 2022).
47. Refers to at least 1,000 Mbps connectivity, as defined by the EU Digital Decade by 2030.
48. For more detail, see our Pathways report, "Digital infrastructure: Transmitting signals of growth" (May 2022).
49. Fitch Ratings, "European Mobile Tower Operators Well Placed to Weather Stagflation" (August 2022). For European tower operators, pricing for most such contracts is CPI linked, although the extent of indexation varies by operator and market and is often subject to floors and caps.

Agriculture: Steady return with inflation-hedge properties and diversification benefits

Despite heightened geopolitical uncertainty and the likelihood of DW recessions in 2023, agriculture retains a number of important elements that make it an attractive asset class, in our view.

We believe agriculture tends to have a relatively stable return profile.[50] Its land-rich asset composition and steady yield provide a solid base for returns and return stability.[51] It also provides a good hedge against higher inflation, a trait particularly desirable in the current macroeconomic environment.

Importantly, in an inflationary environment, margin management will continue to be key to better-than-average performance. Large, professionally managed farms are arguably well positioned in this regard, due to their scale benefits, professional management teams, input purchasing power, and ability to deploy productivity enhancing capital and technology.

Agriculture's inflation-linked properties can be seen in Figures 43 and 44 below, which show the strong correlation (0.71) between food prices and generalised inflation (Figure 43) and the positive relationship between the level of inflation and growth in broadacre land values (Figure 44).

Figure 43:
Food prices are closely correlated with G7 inflation

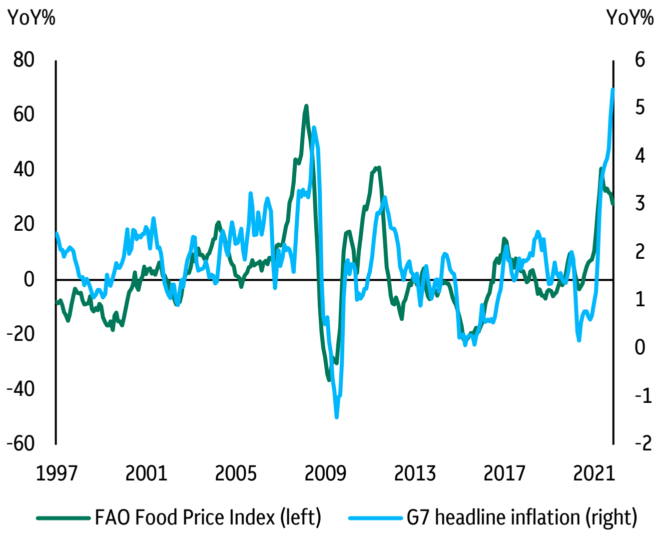
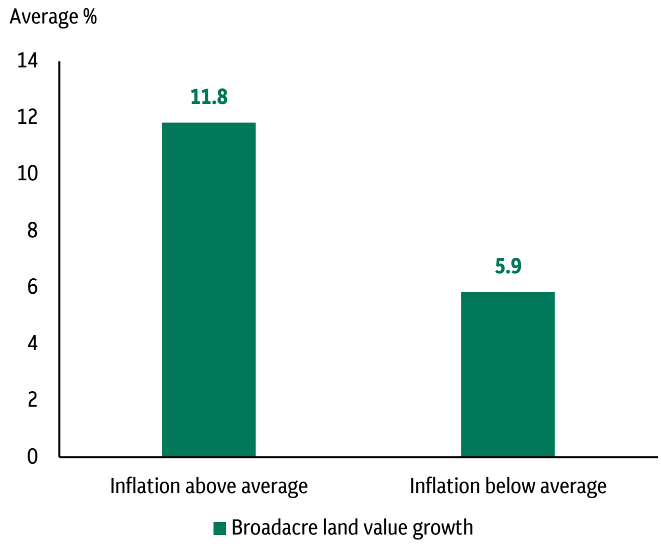


Figure 44:
Land values have historically risen faster when inflation is high



Sources: Food and Agriculture Organization (FAO) of the UN; Australian Bureau of Agricultural and Resource Economics and Sciences (ABARES); Macrobond (February 2022).

50. For more details, see our recent Pathways paper, "Agriculture: Demand tailwinds, risk-adjusted returns and its inflation hedge characteristics" (March 2022).
51. Yields are stronger for permanent cropping than for pastoral.

At the same time, agriculture has a low correlation with other asset classes (Figure 45) and has compelling long-run structural drivers in the form of rising protein demand globally as per-capita incomes increase while arable land per capita decreases. Further, the growing demand for nature-based climate solutions as governments and corporates set net zero targets will drive demand for landscapes that can support carbon offset production, potentially adding a new revenue stream to some farming sectors.

Figure 45:
Agriculture has low correlations with other asset classes

	Global equities	Global bonds	Global property	US equities	10-year US Treasury bond	Australian agriculture
Global equities	1.00	-0.10	0.53	0.91	-0.44	-0.06
Global bonds	-0.10	1.00	-0.27	0.01	0.62	0.00
Global property	0.53	-0.27	1.00	0.41	-0.25	0.26
US equities	0.91	0.01	0.41	1.00	-0.20	-0.12
10-year US Treasury bond	-0.44	0.62	-0.25	-0.20	1.00	-0.17
Australian agriculture	-0.06	0.00	0.26	-0.12	-0.17	1.00

Sources: Bloomberg, ABARES, National Council of Real Estate Investment Fiduciaries (NCREIF), US Department of Agriculture. Period from June 1991 to June 2020.

In short, in what is likely to be a difficult and volatile macroeconomic environment in 2023, we believe that agriculture's steady return profile, inflation hedge properties, high yield, and diversification benefits should see it continue to perform well relative to other asset classes.

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Macquarie Asset Management is part of Macquarie Group, a diversified financial group providing clients with asset management, finance, banking, advisory and risk and capital solutions across debt, equity, and commodities. Founded in 1969, Macquarie Group employs more than 19,000 people in 33 markets and is listed on the Australian Securities Exchange.

*As of 30 September 2022

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Prior to taking on his current responsibilities in April 2021, Ben was Head of the Global Alternatives division in Macquarie Asset Management and the CEO of Macquarie Group in Asia. Ben has held several other senior positions across Macquarie since joining in 2006.

*As of 30 September 2022

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International investments entail risks including fluctuation in currency values, differences in accounting principles, or economic or political instability. Investing in emerging markets can be riskier than investing in established foreign markets due to increased volatility, lower trading volume, and higher risk of market closures. In many emerging markets, there is substantially less publicly available information and the available information may be incomplete or misleading. Legal claims are generally more difficult to pursue.

Fixed income securities and bond funds can lose value, and investors can lose principal as interest rates rise. They also may be affected by economic conditions that hinder an issuer's ability to make interest and principal payments on its debt. This includes prepayment risk, the risk that the principal of a bond that is held by a portfolio will be prepaid prior to maturity at the time when interest rates are lower than what the bond was paying. A portfolio may then have to reinvest that money at a lower interest rate.

High yielding, non-investment-grade bonds (junk bonds) involve higher risk than investment grade bonds. The high yield secondary market is particularly susceptible to liquidity problems when institutional investors, such as mutual funds and certain other financial institutions, temporarily stop buying bonds for regulatory, financial, or other reasons. In addition, a less liquid secondary market makes it more difficult to obtain precise valuations of the high yield securities.

Investing in the real estate industry includes risks such as declines in real estate value, lack of availability of mortgage funds, overbuilding, extended vacancies, increases in property taxes, changes in zoning laws, costs from cleanup of environmental problems, uninsured damages, variations in rents, and changes in interest rates.

The risk that the value of a fund's shares will be affected by factors particular to Real Assets Securities and related industries or sectors (such as government regulation) and may fluctuate more widely than that of a fund that invests in a broad range of industries.

Investment strategies that hold securities issued by companies principally engaged in the infrastructure industry have greater exposure to the potential adverse economic, regulatory, political, and other changes affecting such entities.

Infrastructure companies are subject risks including increased costs associated with capital construction programs and environmental regulations, surplus capacity, increased competition, availability of fuel at reasonable prices, energy conservation policies, difficulty in raising capital, and increased susceptibility to terrorist acts or political actions.

A sector is a segment of the economy that includes companies providing the same types of products or services. Although companies within a sector tend to be reasonably consistent in their fundamentals, these fundamentals may differ substantially from one sector to another. For example, some sectors are cyclical, rising and falling with changes in the economy while others are defensive, maintaining their strength despite economic ups and downs.

Inflation is the rate at which the general level of prices for goods and services is rising, and, subsequently, purchasing power is falling. Central banks attempt to stop severe inflation, along with severe deflation, in an attempt to keep the excessive growth of prices to a minimum.

Stagflation occurs when persistent high inflation is combined with high unemployment and stagnant demand in a country's economy.

Quantitative tightening (QT) refers to monetary policies that contract, or reduce, the Federal Reserve System (Fed) balance sheet.

Quantitative easing (QE) is a form of monetary policy in which a central bank, like the US Federal Reserve, purchases securities from the open market to reduce interest rates and increase the money supply.

Gross domestic product (GDP) is a measure of all goods and services produced by a nation in a year. It is a measure of economic activity.

The Bloomberg Global Aggregate Index provides a broad-based measure of the global investment grade fixed-rate debt markets.

The Cambridge Associates LLC Infrastructure Index is a horizon calculation based on data compiled from 93 infrastructure funds, including fully liquidated partnerships, formed between 1993 and 2015. Private indexes are pooled horizon internal rate of return (IRR) calculations, net of fees, expenses, and carried interest.

The Consumer Price Index (CPI) is a measure of inflation representing changes in prices of goods and services purchased for consumption by households.

The FAO Food Price Index is a measure of the monthly change in international prices of a basket of food commodities. It consists of the average of five commodity group price indices weighted by the average export shares of each of the groups over 2014-2016.

The Federal Reserve Bank of New York's Global Supply Chain Pressure Index integrates transportation cost data and manufacturing indicators to provide a gauge of global supply chain conditions.

The GfK Consumer Confidence Barometer provides a snapshot of how UK consumers feel on the crucial economic topics today and their outlook for the next 12 months.

The JPM Global Composite PMI (The Cumulative PMI Index) reflects the monthly weighted average dynamics of two PMI indexes: service sectors and industry.

The KOF Globalisation Index measures the economic, social, and political dimensions of globalisation. Globalisation in the economic, social, and political fields has been on the rise since the 1970s, receiving a particular boost after the end of the Cold War.

The MSCI EAFE (Europe, Australasia, Far East) Index represents large- and mid-cap stocks across 21 developed markets, excluding the United States and Canada: Australia, Austria, Belgium, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, and the United Kingdom. The index covers approximately 85% of the free float-adjusted market capitalization in each country. Index "net" return approximates the minimum possible dividend reinvestment, after deduction of withholding tax at the highest possible rate.

The MSCI Emerging Markets Index represents large- and mid-cap stocks across 27 emerging market country indices: Argentina, Brazil, Chile, China, Colombia, Czech Republic, Egypt, Greece, Hungary, India, Indonesia, Korea, Kuwait, Malaysia, Mexico, Peru, The Philippines, Pakistan, Poland, Qatar, Russia, Saudi Arabia, South Africa, Taiwan, Thailand, Turkey, and the United Arab Emirates. The index covers approximately 85% of the free float-adjusted market capitalization in each country. Index "net" return approximates the minimum possible dividend reinvestment, after deduction of withholding tax at the highest possible rate.

The **MSCI USA Index** is designed to measure the performance of the large- and mid-cap segments of the US market. The index covers approximately 85% of the free float-adjusted market capitalization in the United States.

The **MSCI World Index** represents large- and mid-cap stocks across 23 developed market countries: Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Hong Kong, Ireland, Israel, Italy, Japan, the Netherlands, New Zealand, Norway, Portugal, Singapore, Spain, Sweden, Switzerland, the United Kingdom, and the United States. The index covers approximately 85% of the free float-adjusted market capitalization in each country.

The S&P 500 Index measures the performance of 500 mostly large-cap stocks weighted by market value, and is often used to represent performance of the US stock market.

The World Container Index assessed by Drewry reports actual spot container freight rates for major East West trade routes

Index performance returns do not reflect any management fees, transaction costs or expenses.

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