INVESTING IN AN AGE OF TRANSFORMATION

Please note that this document may contain technical language. For this reason, it is not recommended to readers without professional investment experience.

THE INVESTMENT OUTLOOK FOR 2023

BNP PARIBAS ASSET MANAGEMENT

The sustainable investor for a changing world

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Letter to investors

We have become accustomed to uncertain times. Nonetheless, 2022 was an extremely challenging year in financial markets. The investment rationale for the classic 60% stocks / 40% bonds portfolio is that it will deliver solid if not spectacular returns. As of October, the 60/40 portfolio was on track to match its worst year for performance since the Second World War.

Sharply rising bond yields were a key reason. They weighed on ultra-long duration assets like equities, with the Nasdaq down almost 30% year-to-date. Beyond 60/40, we saw major rotations in style with value stocks bucking the trend of recent years and outperforming growth. In currency markets, the US dollar surged and the Japanese yen had a year to forget.

Navigating geopolitical tensions has increasingly become an occupational hazard for investors. The conflict in Ukraine has had a profound impact on global commodity prices, amplifying inflation, and forcing Europe to re-think its energy policies. This will have major implications for industry structure and living standards for years to come. Meanwhile, markets are watching Sino-US relations closely, fearful that tensions over Taiwan could escalate.

No doubt 2023 will bring fresh sources of volatility. But that volatility should be seen as an opportunity for an active manager. It is our job to make sense of the evolving macroeconomic landscape, position accordingly, and translate the market moves into strong performance for our clients. We remain convinced that a relentless focus on sustainability is an essential ingredient within that investment process and we do not accept that there is a conflict between delivering strong performance for clients and embedding sustainability in everything we do. On the contrary, we view sustainable investing as an opportunity, rather than a constraint. We have just published *Committed to climate: Our net zero roadmap* which spells out how we will align our portfolios with the goal of reaching net zero emissions. I hope that you will remain partners with us on the journey to net zero investing.

Executive summary

In our 2023 Investment Outlook, we seek to guide investors at a pivotal moment for the global economy. We live in an age of transformation, with surging inflation and fundamental geopolitical shifts leading to rising demands on governments.

A sustainable recovery

In the terms of the progressing green transformation, we believe that, as investors, we must continue to focus our resources on sustainable long-term growth. We see opportunities in the shift leading to, for example, green hydrogen, restoring natural capital or building green infrastructure.

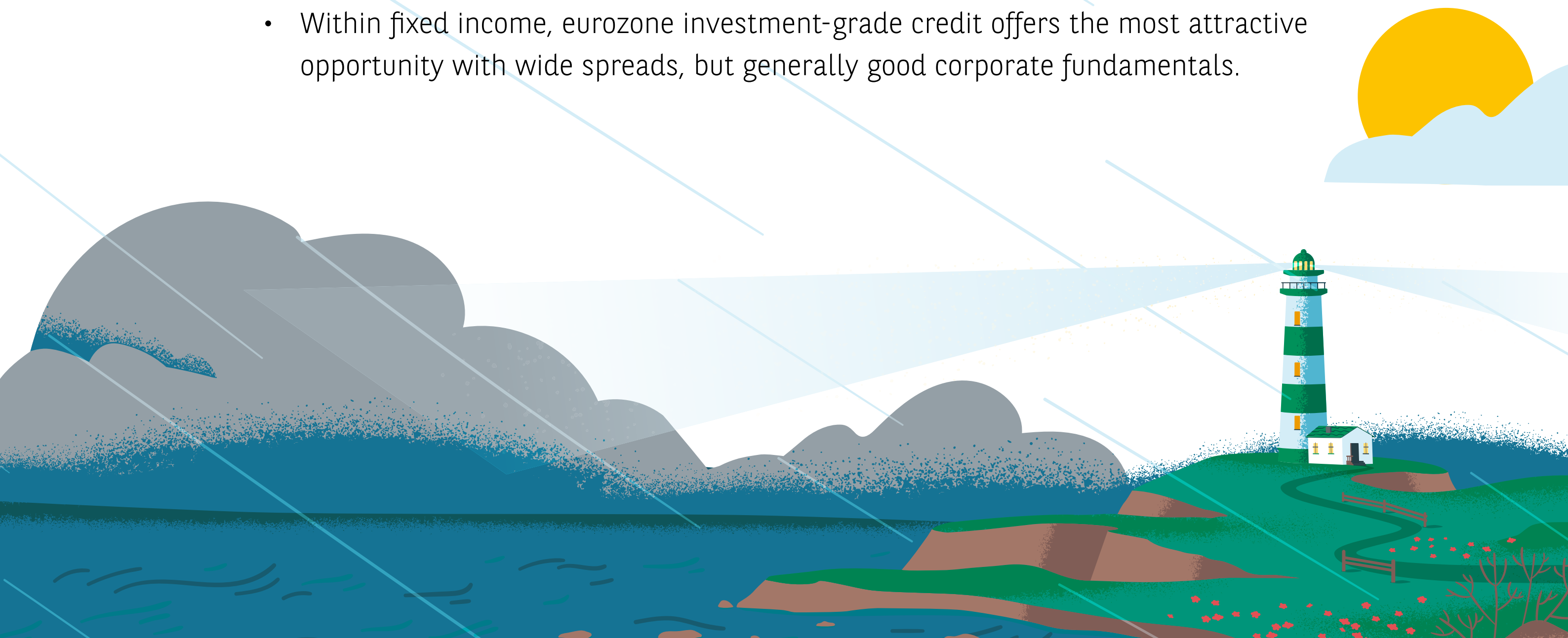
Investment themes for the long run

Our themes have both a sustainable angle – energy transition and environmental sustainability – and a focus on enduring trends. These trends include innovation and disruption via new technology, the appeal of private markets and the emergence of China. While any significant re-rating of China A-shares may be unlikely now, valuations appear attractive and argue for strategic positioning. Opportunities include consumption upgrading and hard-tech development.

Macroeconomics and markets

These sections highlight that:

- The global economy is on the brink of recession as policy rates shoot higher, Europe faces an energy shock, and China struggles with zero-Covid policies and fragile property markets.
- The Chinese government has scope to stimulate growth, but in the West, government measures to aid households and companies may undermine central bank inflation-busting.
- Equities face a struggle to generate above-average returns, even as the disconnect between still relatively optimistic corporate earnings expectations and economic reality narrows. We are neutral, with deep caution in Europe offset by optimism for US growth stocks.
- Within fixed income, eurozone investment-grade credit offers the most attractive opportunity with wide spreads, but generally good corporate fundamentals.



MACRO OUTLOOK

DANIEL MORRIS
Chief market strategist

The recession march

The global economy seems on an inevitable march towards recession. The causes are well-known: central banks aggressively raising policy rates to reduce inflation, an energy shock in Europe, and zero-Covid policies (ZCP) and a shaky property market in China.

Much of Europe is already in recession. We expect one to begin in the US in the third quarter of 2023, and while China's growth will likely not turn negative, it will be below historic levels.

One can easily think of ways in which the situation could yet worsen: a breakdown in a key financial market due to the rapid rise in interest rates, a cold winter and blackouts in Europe, or a flare-up in geopolitical tensions between the US and China.

US

Given the strength of the US labour market, reflected not only in a low unemployment rate, but also in high (nominal) wage gains, declines in non-farm payrolls in 2023 will likely be necessary. Consumer demand will weaken, even though households still have a large amount of 'excess' savings. These savings are falling and, we should note, are concentrated among high-income/low-consumption households.

A deterioration of the labour market will be key to bringing services inflation under control. Goods inflation should drop thanks to base effects and lower demand, while shelter costs will eventually reflect the ongoing slowdown in the housing market. We anticipate core personal consumption expenditures (PCE) inflation will fall below 3% by the end of 2023.

One open question is whether wage inflation can be reduced without a large increase in unemployment. The number of job vacancies relative to the size of the labour force is still about twice the long-run average[1], meaning companies are forced to raise wages to attract workers (see Exhibit 1). Historically, vacancies only decline significantly when the unemployment rate rises. The US Federal Reserve believes that the currently high number of vacancies reflects the reorganisation of the labour market and the economy following the pandemic. As that process ends, vacancies could fall without the unemployment rate necessarily rising.

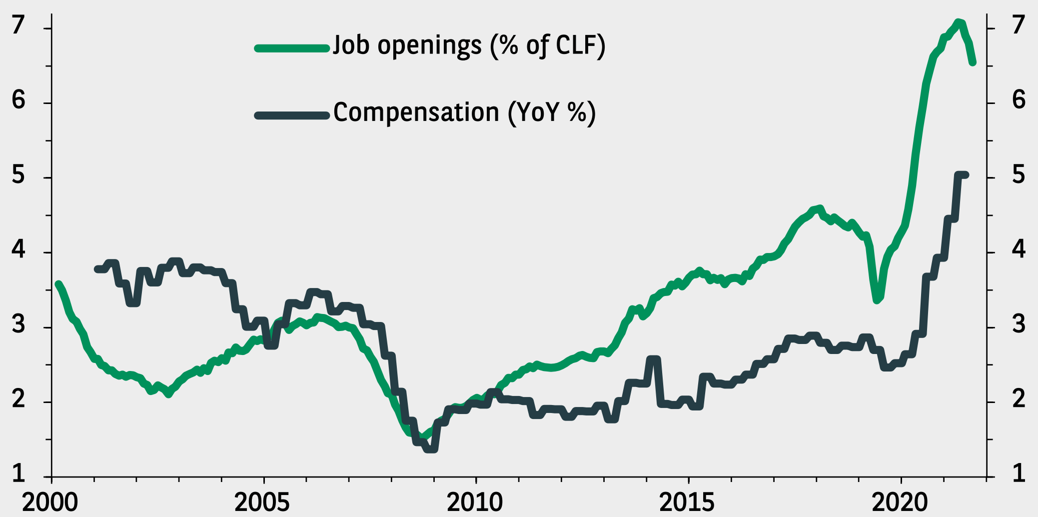
There is another reason to believe the unemployment rate may not rise very much. US companies have learned from the lockdown recession that firing employees may reduce costs in the short term, but it creates problems later on. They may move towards a more European model, where employees are kept on the payroll through a recession, allowing for a swifter and smoother recovery later.

Offsetting the drag from higher policy rates will be the ongoing investments triggered by the Infrastructure Investment and Jobs Act, and the Inflation Reduction Act, which will direct nearly USD 400 billion in tax credits and subsidies for numerous clean energy programmes.

1. As of November 2022

Exhibit 1: Wage gains will only slow once job openings fall

Openings as % of civilian labour force (CLF) and employment cost index



Data as at August 2022. Sources: FactSet, BNP Paribas Asset Management.

Eurozone

Europe is facing an energy shock unlike anything the region has seen since the OPEC price increases in the 1970s (see Exhibit 2). Even though gas prices have moderated of late, they are still 10 times higher than the average in 2019.

Inflation is in double digits in some countries, consumer sentiment has collapsed, and demand is weakening along with disposable income. Nonetheless, we believe headline inflation has peaked and will return to the ECB's 2% target in 2024.

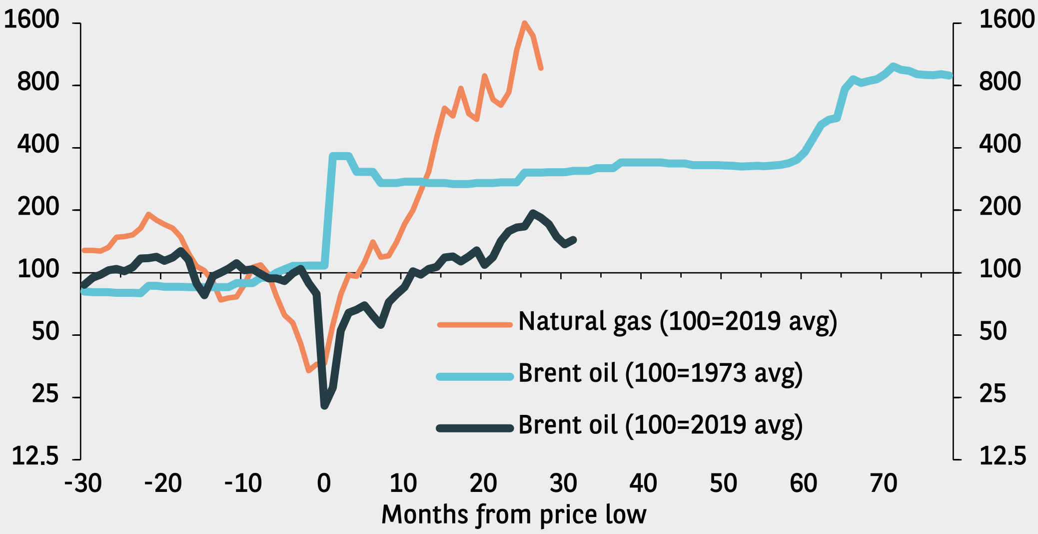
The response of governments to economic shocks has changed since the pandemic. Instead of counting on automatic stabilisers such as unemployment insurance to tide households through the downturn, governments have resorted to more direct support to mitigate any decline in income (or corporate profits).

This strategy was comparatively easy during the pandemic as policy rates and inflation were low and central banks were purchasing government debt. The recent experience of the UK, however, shows the limits of these policies now that inflation is well above target and central banks are looking to reduce the size of their balance sheets. While Germany can afford a EUR 200 billion support package, other countries may not. When Italian government bond yields were above 4% prior to the global financial crisis, the country's debt was a few percentage points less than its GDP. It is now 40% greater. In 2022, debt-GDP ratios nonetheless improved, but in 2023, they will likely see a deterioration. Governments will need to ensure further expenditure is targeted to avoid a countervailing response to any stimulus from the ECB.

The EUR 2 trillion NextGenerationEU recovery plan (the largest EU stimulus package ever) will be key to creating a "greener, more digital and more resilient Europe".

Exhibit 2: Energy shock is on par with OPEC crisis in the 1970s

Indexed energy prices relative to month of lowest price, log scale



Data as at 21 Oct. 2022. Sources: Bloomberg, BNP Paribas Asset Management

China

The two factors that were dragging on Chinese growth in 2022 — its zero-Covid policies and an unsteady property market — should moderate in 2023, allowing the economy to rebound, though growth will likely remain below pre-pandemic levels.

Covid infections in China have spiked again. Nevertheless, the government has reiterated its commitment to ZCP. At the same time, work on an mRNA vaccine is progressing and it should eventually be rolled out. We now know from experience that economic activity can rebound quickly once restrictions are lifted.

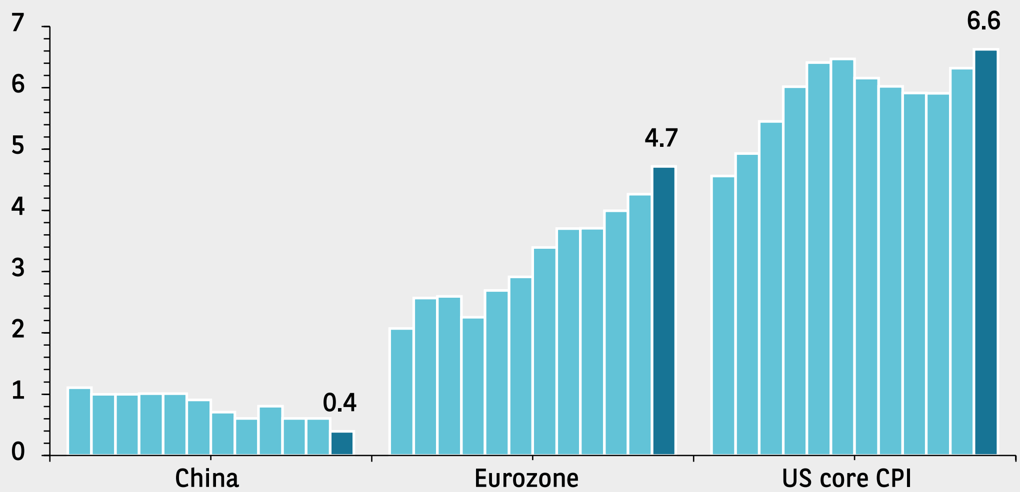
The problems in the property market will likely take longer to address. The recent Communist Party Congress signalled there would be longer-term policies to develop a housing system that ensures supply from multiple sources and the development of both rental and property sales markets. In the near term, the government is looking to targeted policies to support the recovery of the sector.

President Xi's Party Congress speech was also notable for its emphasis on speeding up the transition to green development and meeting carbon emissions goals. This should be another source of long-term demand for companies in the relevant industries.

A key distinction between China and the US and Europe is the scope the government has to stimulate the economy, through either fiscal or monetary measures. While core inflation is at over 4% in the eurozone and over 6% in the US, in China, it is at just 0.4% (see Exhibit 3).[2]

2. As of November 2022

Exhibit 3: Core inflation in China far lower than in the US or eurozone
Core CPI, year-on-year change



Data as at Sept. 2022. Sources: Haver, BNP Paribas Asset Management.

MARKETS OUTLOOK

MAYA BHANDARI
Global head of multi-asset

Taking stock

2022 has been an extraordinary year, marking the end of an extraordinary decade and a half since the Global Financial Crisis (GFC). A sharp and swift rise in real discount rates caused bruising losses across asset classes, ending the panacea that 'lower for longer' interest rates delivered for risky assets over many decades. For example, an investor in a portfolio of 60% global equities and 40% government bonds had lost an eye-watering 20% by late October. That is a far cry from the 9-10% she or he would have grown accustomed to making over the last 50-odd years. These losses were the steepest incurred in a generation – including 2008, which saw losses of 'just' 14%.

We, as others, had seen this steep rise in real yields as the chief risk facing financial markets in 2022. Our multi-asset portfolios were short duration, neutral equities (through a combination of long Asia and short Europe), and long commodities for much of 2022. Yet, as sovereign bond yields, particularly real yields, quickly approached post-GFC highs, we took profits on our long-standing short in government bonds.

One of the biggest questions for 2023 is how soon central banks will pause, or even reverse, their discount rate increases and what impact this will have on the value of cash flows across asset classes. Certainly in 2022, the bulk of asset market moves can be explained by changes in the discount rate.

We are now turning more constructive on corporate credit, particularly higher-grade credit in Europe. Here, we believe low valuations (that is, high spreads), do not accurately reflect what we believe are favourable fundamentals. We are not yet ready to add more broadly to riskier assets such as equities. We are still concerned over greater downside to both growth and earnings, and continued geopolitical uncertainty could weigh further on cash flow projections. At the same time, we acknowledge that areas including long-duration US tech companies are starting to look interesting as 2022 draws to a close.

Every risk has its price

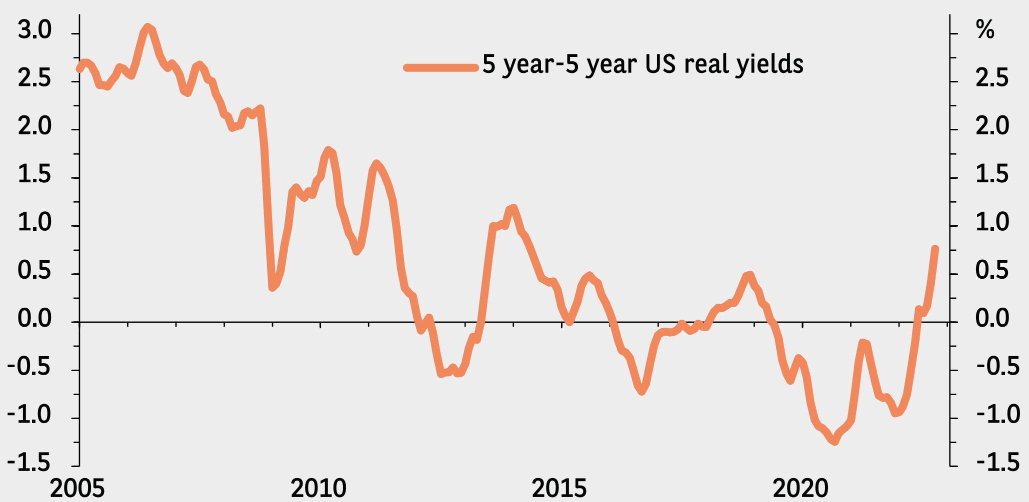
There are usually a handful of key judgements upon which one's investment views ultimately rest. Today, there are three particular questions that matter enormously for return prospects in 2023.

1. When will the US Federal Reserve and other major central banks pivot towards lowering policy rates?
2. How deep will the growth and earnings correction be?
3. (The biggest unknown) How great will geopolitical disruption from China, Russia-Ukraine, the US, and Europe (including the UK) be in 2023?

The Fed has so far delivered the sharpest speed of policy tightening ever

The Fed has so far delivered the sharpest speed of policy tightening ever delivered. When will they pause and to allow effects of the increases to work their way through the system, avoiding the policy error of pushing on the brakes too hard? On balance, our judgment is that the odds of a quicker, sharper policy pivot are mounting, and prospectively quite fast.

Exhibit 1: Real interest rates have moved significantly
Three-month moving average



Data as at 25 Oct. 2022. Sources: Bloomberg, BNP Paribas Asset Management.

Interest rates, both real and nominal, both current and implied, increased dramatically in major economies in 2022. While the increase occurred across the curve, it was particularly sharp at the short end. The 500bp rise in 2-year real rates since March was has been remarkable, as was the move in the expected level of fed funds in three years from 1.5% to 5% in just six months. Five-year real rates (measured five years ahead), that many view as a long-term guide for 'neutral' policy rates, have soared from 50-year to levels last seen prior to the GFC. They stood at just -85bp in the US and -1.4% in Europe a year ago, whereas at the time of writing they were 1.50% and 1.25%, respectively. There are good reasons for those levels, including a significant shift in the fiscal-monetary mix, a turn in structural trends such as globalisation that had preserved the downtrend in government bonds, and favourable demographics. But there are good reasons, too, for them to pause for breath, with mounting headwinds for both inflation and growth.

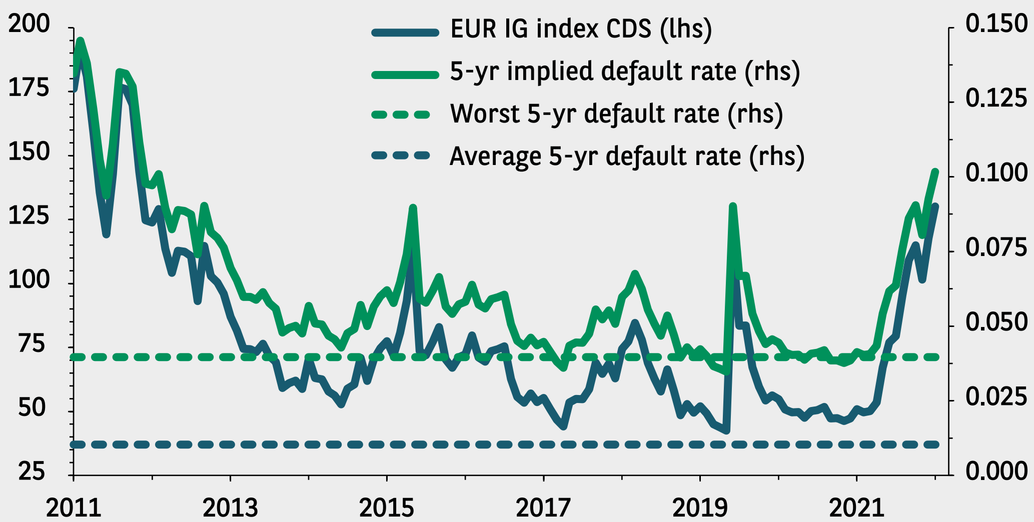
Persistently high inflation has tested central bank credibility

Persistently high inflation has tested central bank credibility, forcing them to set interest rates in the 'rear view mirror'. But effective policy rates are now priced to reach a fairly restrictive 5.0-5.5% in the US[1] and 2.25% in Europe by mid-2023, just as growth and inflation weaken from the tightening already feeding through the system. We believe a pause in the rate hikes (which have been the dominant driver of weakness in asset prices in 2022), could offer some respite for risk assets. The question is how much.

1. 4.9% in OIS rates plus 50bp for balance sheet runoff using the Fed's own estimates

Exhibit 2: Implied default rates are high

Investment grade credit index spread and default rates



Data as at 24 Oct. 2022. Sources: MacroBond, BNP Paribas Asset Management

Staying long high-quality European corporate credit at fairly distressed valuations is one area that continues to look compelling to us. At the time of writing, spreads are at 2020 crisis levels for the best-rated European corporates, with an implied default rate of around 10%. That is more than twice the worst five-year rate and eight times the average. Furthermore, and unusually at this point in the cycle, leverage ratios at these companies are contained and falling, interest coverage is high and corporate balance sheets are firm. The pressure then on companies to de-lever, which is what tends to dent credit as economic cycles weaken, is conspicuously absent this time as companies enter a potential recession long cash and with longer duration debt.

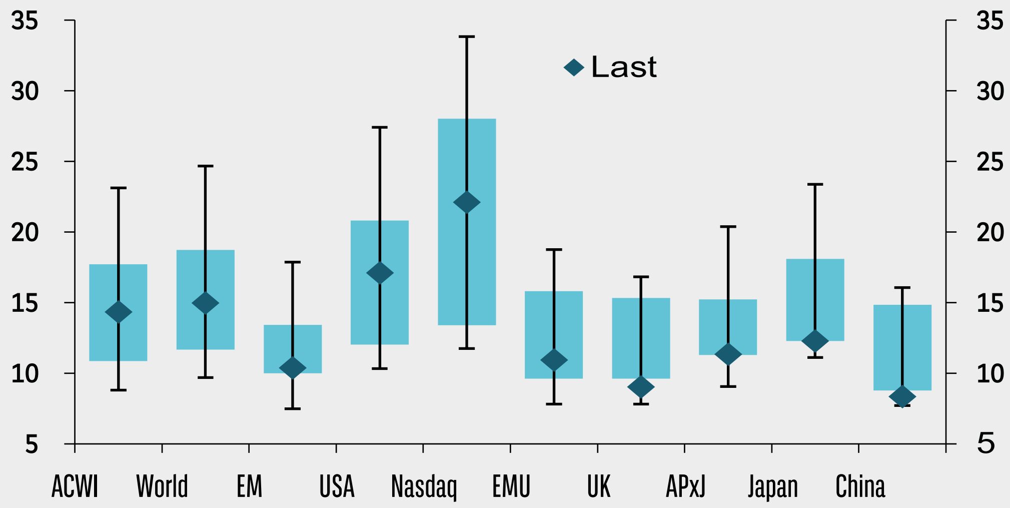
Our judgement here is cautious on what it means for earnings, or equity cash flows

This leads neatly to the second question raised above: the depth of the coming growth correction, and the state of household balance sheets, as 2022 draws to a close with double-digit inflation. This environment makes us more cautious, particularly as far as earnings are concerned. Consequently, we are leaning away from investing in assets lower down the capital structure, especially equities, in more challenged areas such as Europe.

Our economics team expects the US to lose three million jobs early in 2023, with payrolls falling by 300 000 or more. The housing market is expected to continue weakening. We see mortgage rates nearly 400bp higher than in the summer of 2021 and mortgage applications falling steeply. Europe's economic outlook is similarly poor, with greater downside risks from the war in Ukraine and the energy crisis, and households with a smaller savings buffer. We know from the GFC the impact of a

Exhibit 3: Equities are not cheap

Twelve-month forward PE ratio 10-90th percentile range (15 years)



Data as at 24 Oct. 2022. Sources: Bloomberg, BNP Paribas Asset Management.

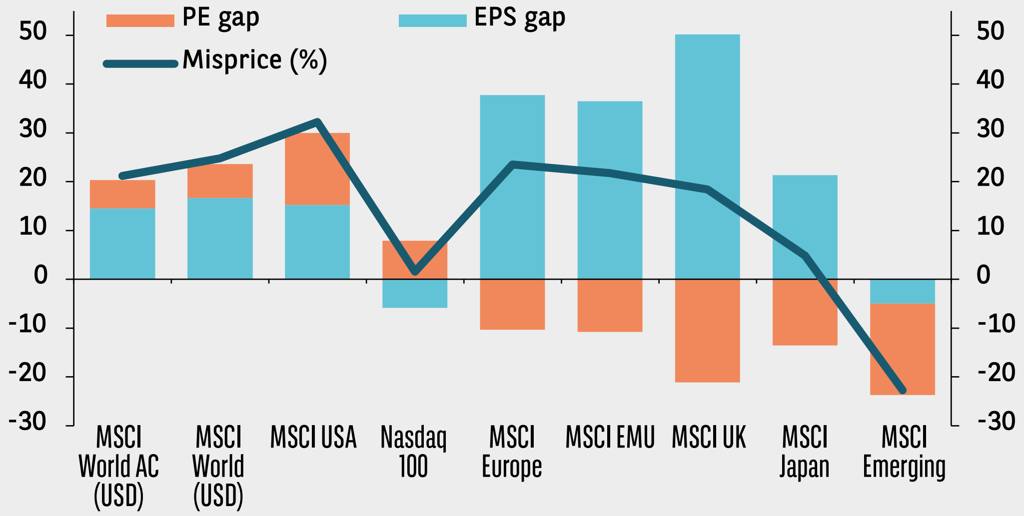
wilting housing market on growth, and we are now having the additional impact of sticky and rising housing rents on services inflation. This increasingly fragile macroeconomic environment seems profoundly disconnected with relatively optimistic corporate earnings expectations. As a result we are neutral on equities, but with a deeply cautious view on Europe balanced by more optimism towards China and Japan. While equites delivered double-digit total return losses in 2022, and valuations cheapened from January 2022's lofty highs, losses would have been steeper were it not for expectations of positive earnings growth for 2022 and 2023.

This increasingly fragile macroeconomic environment seems profoundly disconnected

Earnings expectations are at best a coincident indicator, but they are too high for the macroeconomic setting just described. We have several frameworks for thinking about where earnings and valuations should be at different points in the cycle. With the exception of Asia and, more recently the US Nasdaq index, our research points to further falls to come — from both lower valuations and earnings — before we reach fair value.

Lastly, geopolitical risks pepper the investment horizon. This is something we will monitor closely in 2023. The evolution of the Ukraine war and the energy crisis; China's approach to Taiwan and the reopening of its economy; trade wars and their impact on supply chains – each of these developments could alter the path of both cash flows and discount rates. With no quick resolution in sight, risks here are likely to remain elevated.

Exhibit 4: Some markets are very mispriced
Gap in EPS and PE vs. model



Data as at 24 Oct. 2022. Sources: Bloomberg, BNP Paribas Asset Management

Focus on fixed income - A new bond world

Fixed income bonds saw unprecedentedly poor returns in 2022, with all key sectors posting a negative performance (as at 10 November 2022) due to a normalisation of policy rates, recession hurting credit spreads, and liquidity shocks driving up volatility. After a more than 50-year bull market, a new bond world has emerged in which it is now possible to earn a positive absolute performance.

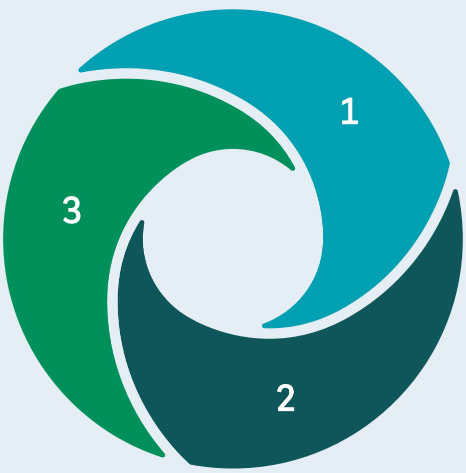
Central banks have managed to drive interest rates to normalised levels, meaning rates should not need to rise meaningfully from here. Five year-five year real yields in the US and the eurozone have returned to their post-Global Financial Crisis highs. Consequently, carry will be essential in generating returns in the future. Investors should recall that historically, carry accounts for the bulk of fixed i ncome total returns. The transition to the new world is not complete, however, meaning volatility will likely remain high and asset allocation is crucial. 2023 will see both growth and inflation decelerate and accelerate, calling for different allocations depending on the macroeconomic regime.

Any return to fixed income should focus on core assets such as money market instruments, government bonds and investment-grade credit, alongside diversifying satellite investments in flexible bonds, green bonds and emerging market debt.

Investing back in money markets is attractive as they offer visibility thanks to short duration, and now attractive yields given the substantial rise in short-term rates. We could see declines in US policy rates by the end of 2023, though this is less likely in the eurozone.

We believe eurozone investment-grade credit is attractive as spreads at the time of writing are commensurate with much higher default rates than we think will actually materialise.

Exhibit 1: Bond market themes for 2023



1 **Normalisation** is done
Central banks have normalised rates **(NEW WORLD)**

2 **Volatility** is possible
Allocation is crucial
(PERFORMANCE)

3 **Carry** is essential
Investors must capture yields
(RETURN)

Source: BNP Paribas Asset Management as of November 2022

SUSTAINABILITY

JANE AMBACHTSHEER
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ALEXANDER BERNHARDT
Global head of sustainability research

The evolution of sustainable finance

In early 2005, United Nations Secretary-General Kofi Annan invited a group of the world's largest institutional investors to help develop the Principles for Responsible Investment (PRI). Only a few years later, the excesses of a lightly regulated financial system would spark a global economic crisis while undermining many of the financial models used till then. In retrospect, this was an appropriate time for finance to begin to wake up to some of the excesses of corporate behaviour it was enabling. Since then, we have seen a *ten-fold* increase in sustainable investment related regulations. Here, we explore this evolution and the path that lies ahead.

The great financial crisis raised important questions about the role of finance. The industry has long interpreted its fiduciary duty to clients as a requirement to 'maximise' financial returns for 'beneficiaries', most often on a horizon of quarters or years.

Since 2005, the industry has rigorously debated the impact of integrating environmental, social and governance (ESG) criteria into this duty. The discussion has been buffeted by parallel debates over the timeframe across which return maximisation should be sought and for which beneficiaries.

In 2005, the research basis for understanding the financial impact of ESG considerations was relatively thin. Since then, our understanding of this topic has grown massively.

There is much to do to realise ESG integration with proper strength and accuracy across portfolios

ESG factors and investment outcomes

What we can now say with some certainty is that ESG integration – at corporate and fund levels – more often than not leads to better financial outcomes. Thanks largely to the efforts of the PRI and other industry groups, the fiduciary duty debate has largely been put to bed. Investors controlling more than USD 100 trillion in assets have agreed at the highest levels to this preface to the PRI's six principles:

> *"As institutional investors, we have a duty to act in the best long-term interests of our beneficiaries. In this fiduciary role, we believe that environmental, social, and corporate governance (ESG) issues can affect the performance of investment portfolios (to varying degrees across companies, sectors, regions, asset classes and through time). We also recognise that applying these Principles may better align investors with broader objectives of society."*

While the investment industry agrees in principle, much remains to be done to realise ESG integration with proper strength and accuracy across portfolios. The gap between ambition and actuality underlies much of the recent criticism of ESG (namely greenwashing) revolving around misleading claims by some investors and the messiness of ESG data. Regulators have stepped up their efforts to create clarity on the definition and application of 'sustainability'. Sustainable investment regulations have grown globally from below 50 in 2015 to more than 500.[1]

Tackling ESG criticism

Here, we explore some of the criticisms. Often, they go too far and warrant a closer look on the basis of the following:

- **ESG has been an attention grabber, not a distraction**. ESG integration efforts have highlighted issues such as climate risk and diversity. This has likely accelerated corporate and policy action rather than distracted from them.
- **What's your counterfactual?** Admittedly, many environmental and social indicators have worsened over the past 20 years. But would the environment and society be better off if the investment industry had ignored ESG as was largely the case before 2004? That is unlikely.
- **ESG is just data.** At the most basic level, ESG indicators convey dispassionate information about company management that can materially impact results. True, the data is often sparsely disclosed, rarely audited and diversely interpreted. For thoughtful investors, properly analysed data can convey important and tradable information which can lead to outperformance.

1. Source: PRI responsible investment regulation database, 2021
https://www.unpri.org/policy/regulation-database

- **Fees aren't the issue.** Some critics say the industry uses ESG as an excuse to charge more. While this may be the case for some passive funds and their ESG equivalents, the data does not support this claim for the bulk of actively managed ESG funds. For the most part, ESG funds are priced similarly to equivalent standard funds.
- **ESG is more than just emissions.** While climate change can be seen as the most important global systemic risk, it is not the only one. For instance, if we succeed in cutting emissions, but exacerbate inequality, we will be trading one systemic risk for another.

The ability to generate sustainable returns relies on a healthy planet and population

Necessary step to sustainable finance

Before ESG, there was Socially Responsible Investing. SRI was dedicated to the creation of a just and sustainable economic system. With the advent of the PRI, the focus shifted to ESG factors. This stripped away notions of responsibility and irresponsibility to focus on the bottom line and the financial risks and rewards of accounting for these factors.

The success of the ESG movement has set the table for broader discussions on the future of sustainable finance. We are coming full circle, moving away from a pure financial focus on integrating ESG factors towards recognising that investors have real impact on the world – and that their ability to generate sustainable returns relies on a healthy planet and population. More than 270 asset managers with some USD 61 trillion in assets under management have now committed to net zero portfolio emissions by 2050 by signing the Net Zero Asset Managers initiative.[2]

Without the efforts of the PRI and other industry groups, we would not now see ESG issues on the agendas in most boardrooms and policy action being taken to address ESG transparency and encourage investment in sustainability solutions.

We also see that the world has not made the required progress towards a low-carbon, environmentally sustainable and inclusive economy that we collectively require to ensure long-term returns. This means there is more to do. The astounding growth of the 'ESG industry' has forced a long overdue discussion on the intersection between societal well-being and investment. What was old is new again, and hopefully, just in time.

2. Net Zero Asset Managers initiative publishes initial targets for 43 signatories as the number of asset managers committing to net zero grows to 273 – The Net Zero Asset Managers initiative

ENVIRONMENTAL THEMATICS

ULRIK FUGMANN
Co-head environmental strategies group

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History can help assess the future

Understanding the drivers of past industrial revolutions can be invaluable when assessing long-term investment opportunities such as those presented by the effects of climate change and the current energy crisis. What the lessons can investors draw from economic history?

Even amid the headwinds from crises such as the food and energy supply stress and extreme climate phenomena, the world is on the cusp of a new industrial revolution – one that could allow capacity – and resources – to be used more efficiently and lead to a greener and more sustainable future.

'Industry 4.0' – involving such advances as the smart factory, autonomous systems, 3D printing and machine learning – promises to provide us with the tools for a replenished biosphere, greater energy and food security, and improved living standards and job opportunities.

It also looks set to usher in a sharing economy involving 'open source' approaches to information and innovation which can accelerate change including the energy transition. A practical example: in such a setting, people will more rarely own cars; they will simply hire a (probably autonomous electric) vehicle when they need to.

The road to industry 4.0

Such progress needs massive investment. However, assessing which will be the long-term winners and avoiding the short-term 'fads' can be a challenge. A look at previous revolutions can help.

The original industrial revolution, in England between 1760 and 1860, was driven by technological progress, education, and a growing capital stock. It turned the country into 'the workshop of the world' and brought about a sustained rise in real income per head.

The second industrial revolution, in the US from the 1850s, was driven by factors such as electrification, crude oil production, the rapid spread of telephony, and assembly-line vehicle production. These helped ignite the country's ascent to a global superpower.

By the early 2000s, the productivity potential of the infrastructure upon which the second industrial revolution was built had become exhausted. A new technological infrastructure emerged, driven by computers, IT networks and robotics. These sowed the seeds of Industry 4.0.

This latest revolution could be transformative, for economies, the environment, and the way societies are organised

This latest revolution could be transformative, for economies, the environment, and the way societies are organised. Technological advances will help reduce the cost

Exhibit 1: **The fourth industrial revolution has already begun**

1st 1760-1860 **Industrial revolution**
- Steam power, water power, mechanisation

2nd 1850s-1914 **Technological revolution**
- Electrification, mass production, division of labour

3rd 1969-2000s **Digital revolution**
- Computers, internet, automation

4th 2010s-present **Industry 4.0**
- physical systems, internet of things, robotisation

Source: visualcapitalist.com, BNP Paribas Asset Management.

of producing and delivering more and more goods and services to near zero (or a marginal amount).

Over the next decade, Industry 4.0 infrastructure looks set to expand to include, for example, self-driving cars using cheap renewable energy on smart transport 'internets'. This should allow people to share mobility, but also communication and energy.

Identifying themes and winners

How can we identify those companies that can survive and prosper for the next 10 to 20 years?

In our view, history has shown that the rate of technological change and cost declines have often surpassed projections. Just look at the share of electricity from renewable sources in total US power generation. Environmental solutions such as green hydrogen, solar energy or bio-plastics are disrupting manufacturing and supply chains and transforming global consumer behaviour.

Understanding this accelerating consumption transformation helps to inform our investment decisions

Understanding this accelerating transformation – and, importantly, its impact on the industries affected by it – helps to inform our investment decisions. We seek to benefit from the penetration of transformative technologies, the growth rates that this advance brings for industries and companies, and what this means for their lifecycles.

Finding winners takes research, an open mind, and the ability to examine challenges and opportunities from multiple perspectives. It also means having the conviction to strictly target positive environmental outcomes.

What is required is a wider understanding of the breadth – and, crucially, the inter-relatedness – of the challenges that, for example, the energy crisis presents and the opportunities it creates, such as an accelerated transition to renewable, locally produced sources of energy.

A thorough understanding of previous and current periods of disruption can help us identify the potential investment winners of the coming new carbon-free age. And we are convinced that active investment management is the key to identifying companies that can outperform.

DISRUPTIVE TECH

PAM HEGARTY
Portfolio manager

VINCENT NICHOLS
Investment specialist

Secular growth drivers dominate

The outlook for the technology sector in 2023 is difficult to assess, given the significant macroeconomic and geopolitical headwinds. However, we remain confident in the durability of the secular growth drivers that underpin our strategy – cloud computing, artificial intelligence, automation, and the Internet of Things – as well as the foundational technologies that enable these themes. We believe that the leaders and beneficiaries of digital transformation will deliver superior revenue growth, earnings, cash flows, and returns over a long-term investment horizon.

During most of 2022, the tech sector underperformed the broader market as interest rates rose. As a result, valuations have compressed, with little to no 'froth' left today, especially in the semiconductor and software industries.

While negative earnings revisions are likely as the economy slows, we see potential for the sector to outperform on a relative basis, given the historical resilience of tech profits during recessions. As growth becomes scarcer, investors may once again be willing to pay up for quality growth.

Opportunities as we head into 2023

1. The adoption of cloud computing, artificial intelligence (AI), automation, and the Internet of Things continue as companies strive to save costs and make better decisions.
2. The strategic importance of the digital transformation should provide resiliency to

corporate spending on information technology (IT). Gartner forecasts 5% growth in IT spending in 2023. Cybersecurity is one area that we expect to hold up well.

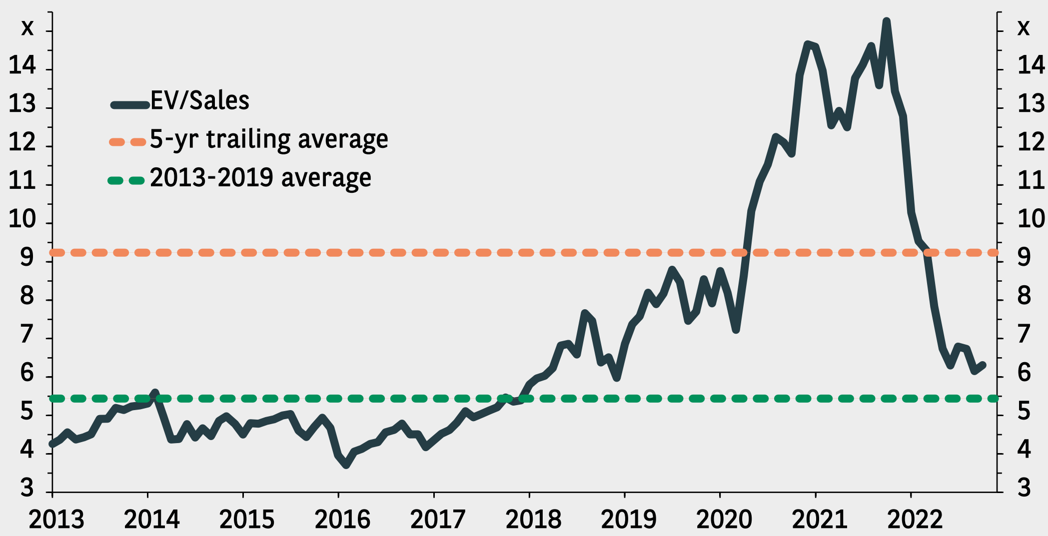
3. Semiconductor demand may prove resilient in end-markets including automotive (where electronic content is increasing and inventories remain low) and datacentre (depending on the resiliency of spending to support cloud and AI initiatives).
4. Valuations look compelling. We estimate the average enterprise value to next-twelve-month estimated sales ratio for North American software stocks to be nearly back to 6x. That is close to the 2013-2018 level and 32% below the most recent five-year average (see Exhibit 1).
5. Most semiconductor stocks are trading near (or below) our worst-case scenarios, as investors have priced in inventory corrections across all end-markets.
6. Longer duration real yields have arguably peaked. So even as the US Federal Reserve continues to raise rates, valuations should not necessarily decline further. Additionally, growth will again become scarce, likely leading investors to gravitate back towards quality growth.

IT spending and semiconductor demand should prove resilient, while valuations look compelling

What are the risks?:

1. Real interest rates could rise further, which would have a negative impact on the valuation of long duration assets.
2. Weakness in consumer spending on personal computers and low-end smartphones could spread to commercial and enterprise customers and other end-markets.

Exhibit 1: Software stock valuations have improved dramatically
Average EV-NTM sales ratio of North American software stocks



Data as at 25 Oct. 2022. Sources: FactSet, BNP Paribas Asset Management.

3. COVID beneficiaries such as the e-commerce sector might continue to underperform as growth reverts to pre-pandemic trend lines.
4. The Ukraine war, the Sino-US trade war, and authoritarian and nationalist movements, including supply chain nationalism, are creating uncertainty.
5. Regulation remains a risk.

Secular growth drivers should dominate short-term concerns over a three-plus year horizon

In summary

We believe bottom-up fundamental stock research, combined with portfolio construction discipline, is the best approach for navigating the uncertainty. We are revisiting each company-level financial model to stress-test it for recession scenarios and ensure our target prices are conservative.

We have analysed our holdings based on their revenue growth potential and stability over the next three years, and the strength of their 'moat', or their competitive positioning and balance sheet strength. We are invested in high-quality, stable-growth names with deep 'moats'. As for the more speculative growth stocks with longer duration cash flows, our positions are modest.

We are looking for stocks that have de-risked or have idiosyncratic drivers that will prove to be resilient in a recession. Examples include Micron Technology[1], where earnings revisions have fallen sharply and the stock is now trading at barely above book value, and First Solar[1], which has fully contracted all of its production for the next two years, while US tax credits should allow it to expand production capacity.

We are confident that secular growth drivers will dominate short-term cyclical concerns over a three-plus year investment horizon. We focus on owning sustainable leaders or beneficiaries of the digital transformation, with enduring competitive advantages, trading at compelling valuations.

1. These stocks are mentioned for illustrative purposes only. BNP Paribas Asset Management strategies may or may not hold positions in these stocks. The value of investments and the income they generate may go down as well as up and it is possible that investors will not recover their initial outlay. Past performance is no guarantee for future returns.

CHINA

CHI LO
Senior market strategist APAC

Deglobalisation in the context of 'China decoupling'

'Decouple-from-China' has been a market issue since the Sino-US trade war started in 2018, with some large developed countries pushing for reshoring their global production. This has led to concern about deglobalisation, or the breaking-up of supply chains and decelerating cross-border trade and investment. These developments have shaken the argument for investing in Asia, including China, which lies at the heart of many global supply chains.

Restrictions on technology transfers, among other trade-disrupting measures, are currently the biggest uncertainty for Asia; a third of its exports involve electronic and other tech products.

The Covid-19 crisis aggravated the concern over the outlook for manufacturing in Asia – disrupting global supply chains and creating shortages of everything from building materials and car parts to semiconductors.

Asia's supply chains shifting

Though these worries have driven some large companies to cut their sourcing from or manufacturing operations in Asia and to shift them elsewhere, we see no large-scale decoupling from either the region or from China.

Firstly, defying expectations that the trade war and the pandemic would crimp Sino-US bilateral trade, trade actually rose from an annualised USD 620 billion in June 2018 to USD 801 billion in August 2022. This was partly because US shipments to

China picked up, even though Chinese purchases fell short of the so-called Phase One deal signed in January 2020.

Secondly, rather than reducing their reliance on Asian supply chains, US importers have increased imports from the wider ASEAN region.[1]

Flows of foreign direct investment (FDI) to China have risen over the last six years (see Exhibit 1).

Buying more from ASEAN does not mean buying less or decoupling from China

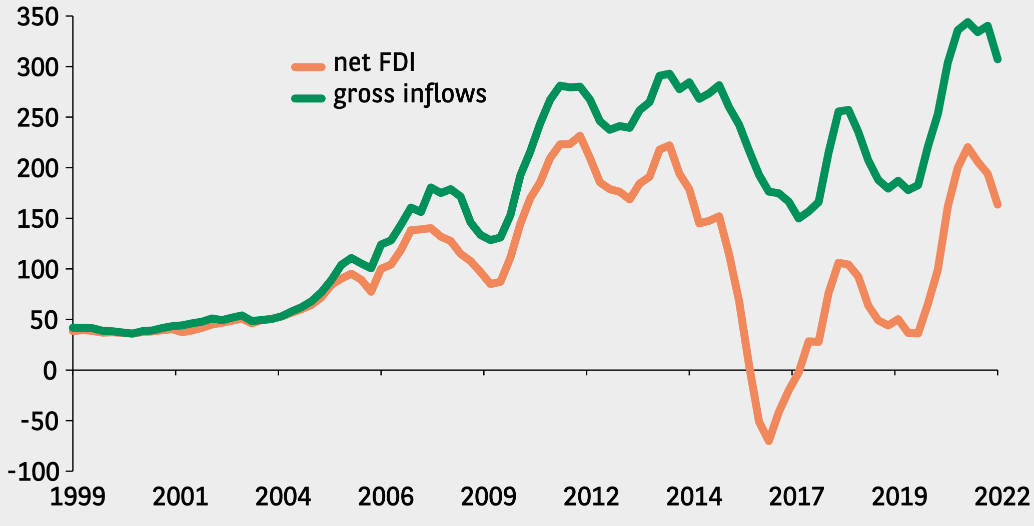
No decoupling

Buying more from ASEAN does not mean buying less or decoupling from China. Rather, this shift in the pattern of imports illustrates a so-called 'China + 1' strategy, in which companies keep producing in China for the local market while moving some capacity to ASEAN.

Relocation is a means to manage the supply chain disruption due to economic, political and, most recently, Covid-19 considerations. This is reflected in the rising flow of FDI to ASEAN (see Exhibit 2). The persistence of investment in China underscores our long-held 'Invest in China for China' view since the US shifted its China policy from constructive engagement to strategic competition in 2016.

1. The ASEAN member states include Brunei, Cambodia, Indonesia, Lao, Malaysia, Myanmar, Philippines, Singapore, Thailand and Vietnam.

Exhibit 1: Foreign direct investment flows to China have continued - no signs of decoupling (balance of payments data, USD bln, 4 quarter rolling sum)



Sources: CEIC, BNP Paribas Asset Management, data as of October.2022

Crucially, a large share of the FDI flows to ASEAN comes from China, which accounts for 40% of the total now as compared to only 10% a few years ago. This actually strengthens the supply-chain integration between ASEAN and China rather than weakening it. Components used to be shipped from ASEAN to China, which then sold them to the world markets. That made China the world's factory. Now the process appears to be reversing: China supplies ASEAN with products that power the region's exports to the world. This shift in the supply-chain integration process has expanded the world's factory to now include Asia.

The persistence of investment in China underscores our long-held 'Invest in China for China' view

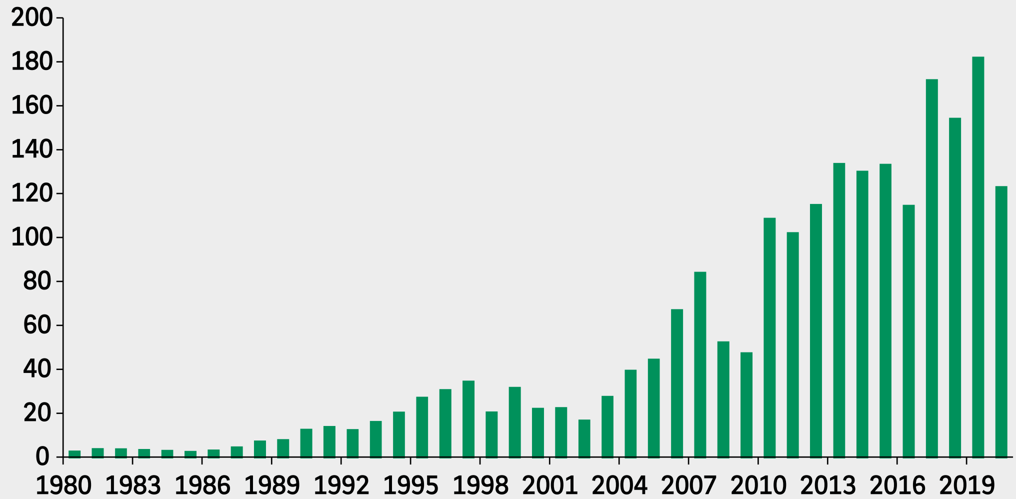
Implications

Asia's supply chain shift also reflects China's 'dual circulation' policy. Beijing aims to use its internal growth impetus to drive domestic and regional growth. This potential is a strong basis for long-term investment in emerging Asia and China.

From a macroeconomic perspective, this development will likely lead to strong intra-regional economic linkages confounding the deglobalisation trend. With inflation concerns rising and companies facing higher input price pressures, the cost advantages of sourcing from Asia, whose supply chains have integrated further with China, are becoming more obvious.

Subtle shifts are underway to make Asia an emerging production hub for world markets. We see little evidence yet of global and regional decoupling from China. One can run, but not hide, from the Middle Kingdom.

Exhibit 2: Rising foreign direct investment inflows to ASEAN
(balance of payments data, USD bln)



Sources: CEIC, BNP Paribas Asset Management, data as of October.2022

PRIVATE MARKETS

KAREN AZOULAY
Head of infrastructure debt

Resilience in private markets - infrastructure debt

Almost USD 10 trillion has now been invested in these markets, in what has become a global and ever more diverse asset class spanning corporate loans, real assets, structured finance and other instruments. In this article, we focus on infrastructure debt.

Amid the search for yield and the need for portfolio quality, the private debt segment is becoming increasingly relevant. Having grown by 13-14% a year over the past decade, total private debt assets under management (AUM) now exceed well over USD 1 trillion.

As an asset class, private debt has been resilient across economic cycles. As an example, it was the only private markets asset class to have increased fundraising every year since 2011, including during the pandemic.

For investors willing to invest their money for longer periods, private debt can be a good portfolio diversifier, offering low volatility and a low correlation to listed markets. Other attractions include an appealing relative value, inflation-linked cash flows and an illiquidity premium over listed assets.

Floating rate instruments are part of the segment. They can be more attractive than vanilla bonds as their coupon is linked to a base rate, allowing it to increase amid rising market interest rates.

Recession-proof essential services

Historically, infrastructure debt has shown itself to be a haven. This segment offers a diverse range of exposures across many defensive sectors (see Exhibit 1) and risk-return profiles.

Overall, we believe the segment is well positioned for recession, for the same reasons that it navigated the pandemic better than other asset classes: many infrastructure projects involve essential services that are in demand in times of boom and times of bust. In other words, when times are tough, people will still need rail networks, energy to heat and light their homes, etc.

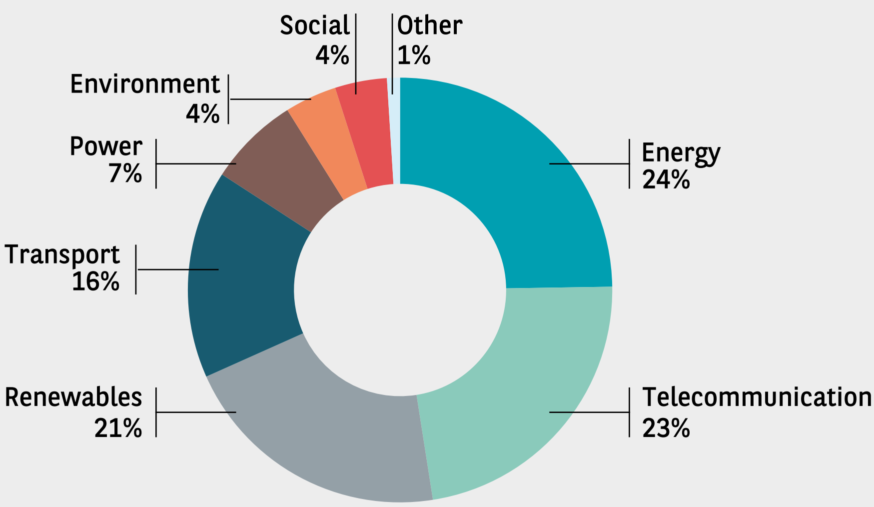
Infrastructure debt is well positioned for recession

As investments, infrastructure assets – from fibre optic networks and car parks to utilities and roads – are marked by high barriers to entry: projects cost large sums to complete, keeping competitors at bay. Often, they involve monopolistic market positions and regulated tariffs. Their long-dated cash flows across economic cycles offer stability to investors.

Green infrastructure

Infrastructure debt also has environmental, social, and governance (ESG) aspects. Many infrastructure assets are at the forefront of the energy transition and digitalisation, partly on the back of the European Union's objectives for decarbonisation and net zero by 2050.

Exhibit 1: Core infrastructure asset financing: European sector breakdown



Source: Infranews & Inframation, January 2022.

These goals are driving investment decisions: Along with the large sums for phasing out conventional energy in the utilities sector, more renewable energy infrastructure will need to be built over the next few decades, for example, for electrified fleets and the greater use of (green) hydrogen. As for the role of digitalisation in decarbonisation, data analytics can help improve (energy) efficiency.

In selecting investments, our proprietary ESG framework has been fully integrated in the investment process. It includes a comprehensive assessment by our Sustainability Centre, while an independent consultant assesses the impact of each investment based on induced and avoided emissions, the net environmental contribution and 'temperature alignment' with the Paris Accord.

Junior infrastructure debt, which delivers higher, equity-like returns, could be an attractive option

Junior debt to weather the storm

Over the past 10 years, infrastructure debt has offered consistently higher yields than listed bonds, partly due to the additional return investors receive for forgoing the flexibility of publicly traded markets. While infrastructure debt returns have remained fairly consistent, central bank rate rises have boosted yields on government and corporate bonds, sapping the yield premium.

For investors seeking a yield similar to equivalently rated corporate bonds, this has made the choice between these two asset classes less straightforward. However, we believe junior infrastructure debt, which delivers higher, equity-like returns while maintaining debt-like protections such as covenants, and contained risk, could be an attractive option.

We see growing opportunities in the telecoms space: glass fibre networks are rolled out in Europe, datacentres and telecom towers are needed for the explosion of data usage and new 5G technology. Overall, we expect infrastructure debt as a segment to expand further, not least as the need for financing around the energy transition and decarbonisation continues to grow.

ASSET CLASS OVERVIEW

PERFORMANCE: Total return in EUR (as of 31 October 2022)

	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Performance +	21.2%	32%	11.5%	15.6%	8.4%	0.1%	30%	6.7%	36.9%	14.1%
	6.5%	19.5%	10.4%	10.7%	7.5%	-0.2%	25.3%	6.3%	31.1%	-8.0%
	0%	8.4%	1%	10.1%	3.7%	-2.7%	13.3%	5.7%	25.6%	-14.4%
	-0.1%	7.5%	-0.5%	8.1%	0.3%	-3.8%	9.2%	4.8%	2.5%	-14.7%
	-0.1%	2.6%	-0.7%	4.6%	-0.2%	-4.1%	4.5%	-5.2%	-1.7%	-16.3%
Performance -	-9.8%	-17.8%	-25.9%	2.3%	-2.1%	-13.7%	4.3%	-15.8%	-3.1%	-18.8%

- Global government bonds (H)
- Global corporate bonds (H)
- Global corporate high-yield (H)
- Commodities (H)
- Developed equities (UH)
- Global real estate (UH)

H: hedged; UH: unhedged
Source: Bloomberg, Quant Research Group, BNP Paribas Asset Management
Indices used: global real estate (RNGL), developed equities (MSDEWIN), global government bonds (SBWGEC), global corporate bonds (LGCPTREH), global corporate high-yield (LG30TRUH), commodities (BCOMHET); Bloomberg ticker in brackets
Past performance or achievement is not indicative of current or future performance.

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VIEWPOINT

BNP PARIBAS
ASSET MANAGEMENT

The sustainable investor for a changing world