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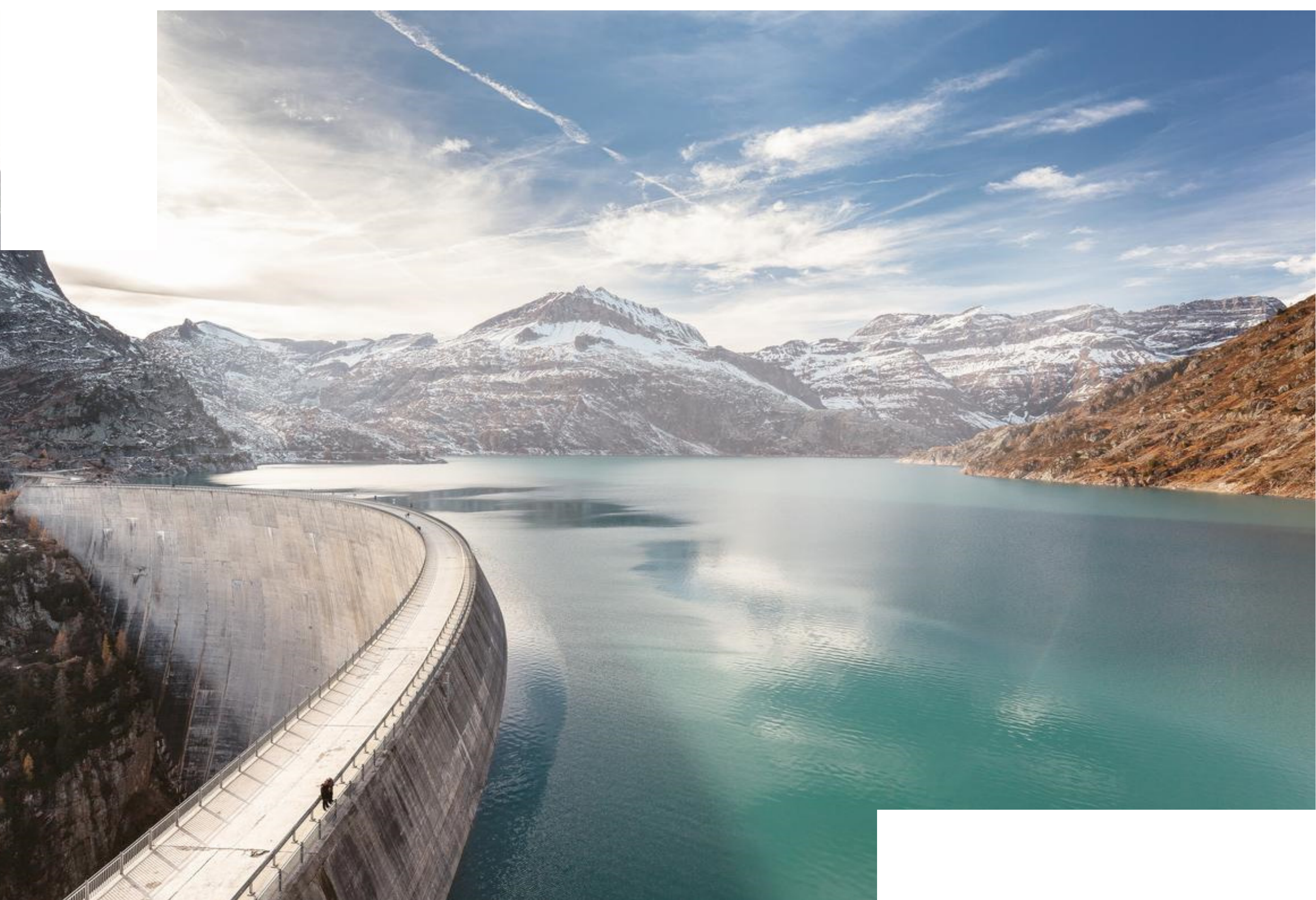
A regime shift for fixed income assets

Capital Market Assumptions. Five-year outlook | October 2022



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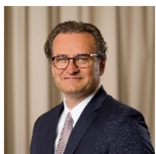


Philipp Lisibach

Daniel Imhof

Dear reader,

Each year, we perform a comprehensive review of our long-term return forecasts for over 80 asset classes and markets to guide our strategic asset allocation. In this publication, we share with you the results of the latest review and the thoughts guiding our results.

After a long period of relative calm in markets, the past few years have been significantly more turbulent. Especially over the last 2.5 years, extreme shocks hit financial markets, including the global pandemic and this year's energy crisis caused by the war in Ukraine. Reopening of Western economies after the pandemic and supply chain issues due to COVID-related production halts in Asia, followed by a surge in commodity and energy prices, have contributed to a global spike in inflation. This, in turn, triggered unprecedented, sharp monetary tightening by the US Federal Reserve, which forcefully reaffirmed the global dominance of the USD. As sharp central bank rate hikes have driven up bond yields across the maturity spectrum, global equities have had to re-price to reflect changes in the expected rates at which to discount companies' future cash flows. We have therefore seen two equity bear markets in just three years, the first in 2020 due to the COVID pandemic, the second in 2022 due to high inflation and sharply rising interest rates.

A key message from this year's update of our Capital Market Assumptions (CMAs) thus relates to fixed income markets, where we expect that increases in yields across the maturity spectrum herald a lasting regime change away from the low interest rate environment that dominated since the Great Financial Crisis in 2008/09. Central banks are unlikely to shift rates back to such low levels any time soon, as doing so would risk entrenching inflation above their targets. In terms of asset allocation, the higher yields mean that fixed income markets have become attractive again.

We remain convinced that a well-founded view on the long-run attractiveness of markets is key to making sound asset allocation decisions, especially in times of high uncertainty and market gyrations. This has been our experience after the sharp downturns in 2020, and we are confident that it will stay true in the coming years.

In this year's CMAs, we again include several special contributions. On the topic of sustainable investing, we provide an update on last year's discussion of the potential impact of climate change and related policy action on economic growth, inflation and central bank policy rates. In a second contribution, we look at the merits of taking climate change into account when building portfolios.

We hope that this publication provides valuable guidance for your investment decisions.

Michael Strobaek
Chief Investment Officer

Philipp Lisibach
Chief Global Strategist

Daniel Imhof
Global Head of Investment Management

A regime shift for fixed income assets

- The very low interest rates of the past implied low to negative expected returns on bond investments in recent years.
- Over the next five years, however, longer-term expected returns for fixed income markets are significantly higher as a result of central banks' swift and forceful interest rate hikes to combat inflation.

Regime change to higher interest rates

Over the past few years, a much-discussed theme in strategic asset allocation has been the extremely low interest rates and thus low to even negative expected returns for bond investments. Combined with changed correlation patterns of bonds and equities, this raised the question of bonds' diversification merits and whether bonds should remain a major part of multi-asset portfolios. With the surge in inflation this year and the risk of inflation becoming entrenched above central banks' targets, a rather swift regime change has occurred. The major central banks, led by the US Federal Reserve (Fed), have changed course, implementing swift rate hikes. The Bank of Japan is the notable exception in this context, which has put enormous pressure on the JPY. In our macroeconomic outlook underlying our longer-term asset market return expectations (CMAs), we forecast that central banks remain committed to rein in inflation and return it to target levels. However, we also foresee that this will take time and that central banks are likely to keep policy rates markedly higher than what we experienced since the Great Financial Crisis more than a decade ago.

Much higher returns expected in fixed income markets

In a nutshell, the changed macroeconomic environment has triggered a level shift in interest rates across the maturity spectrum, prompting us to significantly increase the longer-term expected returns for fixed income markets compared with our forecasts last year. For example, for the medium-term US government bond benchmark, the five-year return forecast has moved from 0.8% to 4.2%, a change mirrored to varying degrees in other bond markets. This does not mean that our five-year forecasts last year were wrong, but the extreme price declines as yields have surged caused a frontloading of the expected weakness in longer-term returns. For inflation-linked bonds, the outlook has improved markedly as well. While last year the real yield for US 10-year inflation-linked bonds mostly hovered around -1%, it had moved up to above 1.5% by end-September this year. Those bonds now offer an attractive way to invest with a built-in inflation hedge.

The attractiveness of fixed income markets has also sharply improved relative to other asset classes, first and foremost equities. We have increased our expected returns for equity markets as well, but far less than for bonds. For the developed market equity benchmark, we have lifted our expected return by 0.6 percentage points to 7.4%. Several factors have caused this adjustment, with one being the sharp downturn in equity markets experienced this year as a result of the changed macro environment and rising geopolitical tensions. Buying at lower prices itself should improve the outlook, all else being equal. However, in the near term, high energy prices and much tighter financial conditions are weighing on economic growth. We expect a recession in Europe

and very weak growth in the USA, both of which are negative for companies' earnings outlook. China is currently in a growth recession. More importantly, part of this year's market downturn appears to have been due to a valuation adjustment, as persistently higher interest rates imply that companies' future cash flows need to be discounted more heavily.

Emerging market hard currency bonds stand out

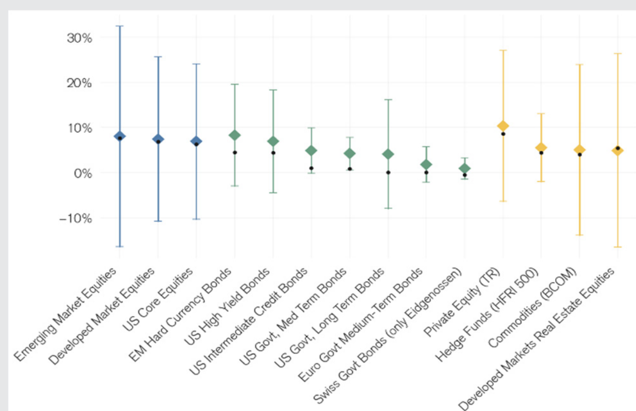
The upward revisions to return expectations for bonds compared to equities appear even more impressive when taking into account that bond market volatility is normally much lower than equity market volatility. In our calculations, we assume a volatility of 3.7% for the medium-term USD bond benchmark, for example, whereas the forecast volatility for US equities is about five times as high at 17.2%. Sharpe ratios (excess returns over cash return divided by volatility) for bonds have also improved substantially. For medium-term USD government bonds, they are now even slightly above the Sharpe ratio for US equities. Our updated CMAs thus clearly indicate that lower-risk bonds have become more attractive again in multi-asset portfolios. For longer-duration bond indexes as well as other regions, however, Sharpe ratios are still significantly lower. Within the fixed income universe, emerging market hard currency bonds (denominated in USD) stand out with an expected return of more than 8% per year, resulting in a Sharpe ratio above equities. US high yield bonds show a lower Sharpe ratio, but still above US equities.

Highest expected returns for UK equities

UK equities show the highest expected returns within our developed market equity universe, underpinned by a high dividend yield of above 4%. They also rank well in terms of Sharpe ratio. Emerging market equities are expected to deliver somewhat higher returns than developed markets as a whole, though developed markets fare somewhat better in terms of Sharpe ratio. Within alternative assets, private equity (PE) is forecast to earn a total return of 10.3%, which should allow for a roughly fair premium above public equities, mainly a reflection of the low liquidity of the asset class. The Sharpe ratio for the HFRI 500 Hedge Fund Index has also improved somewhat, ranking between US high yield and and US medium-term government bonds.

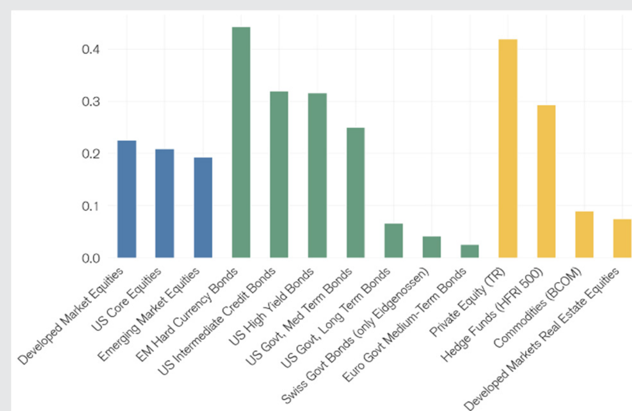
Long-term expected returns for bonds higher than before

Long-term expected returns*



Source: Credit Suisse; * 5-year annualized expected compound returns

Sharpe ratios*



Source: Credit Suisse; * 5-year expected excess returns over cash divided by volatility

Capital Market Assumptions are no guarantee for future performance and there is no certainty that the expected returns/volatilities will be reached.

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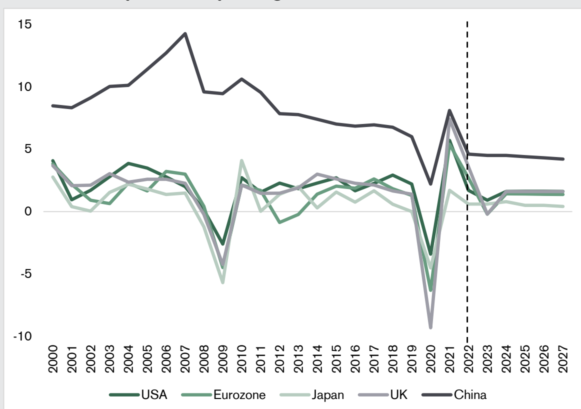
Slower growth, higher interest rates

- The recessions and very weak growth of 2023 should give way to a period of recovery from 2024 that pushes growth slightly above potential.
- Potential growth has been revised down in key regions, including the USA and China. Inflation should drift back to central banks' targets, though this comes with continued elevated interest rates.

Russia's invasion of Ukraine and a growth recession in China have stalled last year's nascent global recovery from the pandemic. The Russian invasion and a related escalation in sanctions from the West have caused an energy crisis in Europe, as the West has embargoed Russian oil and Russia has cut off gas flows to Europe. As a result, Europe now appears to be in recession. China has been hit by several unfavorable policy measures such as regulatory measures impacting formerly fast-growing companies in the private sector and a very restrictive COVID-19 policy. These measures have come at a time when the economy was already struggling from weak consumption and a slump in the property sector. Given the sharp increase in inflation, the US central bank (Fed) has been forced to rapidly raise interest rates and thus financing costs in the economy, the effects of which have been reverberating across the globe. As a result, US growth is also weak so the economy is risking recession.

GDP projections for the major economies

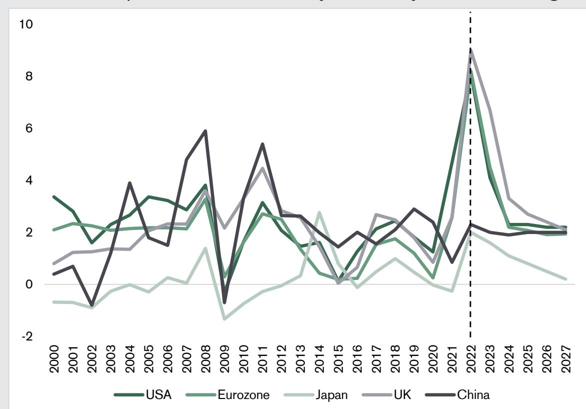
Real GDP, year-on-year growth rate, in %



Source: IMF, Haver Analytics©, Credit Suisse estimates

Inflation projections for the major economies

Consumer price index (CPI), year-on-year % change



Source: IMF, Haver Analytics©, Credit Suisse estimates

Although we expect this downturn to end and recovery to resume in 2024, we also see lasting damage to economic structures as a result of the pandemic, the lasting fallout from Russia's invasion and standoff with the West, as well as the change of fortunes in China. This has led us to cut our longer-term growth forecasts for all of the major economies from what we projected last year and raise our forecasts for trend interest rate levels. For the USA, we forecast an average real GDP growth rate of 1.5% over our five-year forecast horizon, significantly below the average growth over the last ten years. For the Eurozone, we forecast a 1.1% average growth rate and for China growth of 4.4%.

Central banks focused on returning inflation back to target

The consolation in our forecasts is that the regime change we have observed in terms of the relationship between growth and interest rates appears in large part to reflect the major central banks' commitment to returning inflation rates close to their targets. For next year, we forecast US inflation to be at about 4% on average, but inflation is expected to decline already rather close to the Fed's target of 2% over the following years. In the Eurozone, a similar path is expected. However, in contrast to the USA, this implies that also over the longer term inflation is seen to show a significant level-shift relative to previous trends. In the UK, inflation is expected to decline somewhat more slowly, but to finally also align with the Bank of England's target. For Japan, inflation is assumed to stay positive but trend back to close to zero.

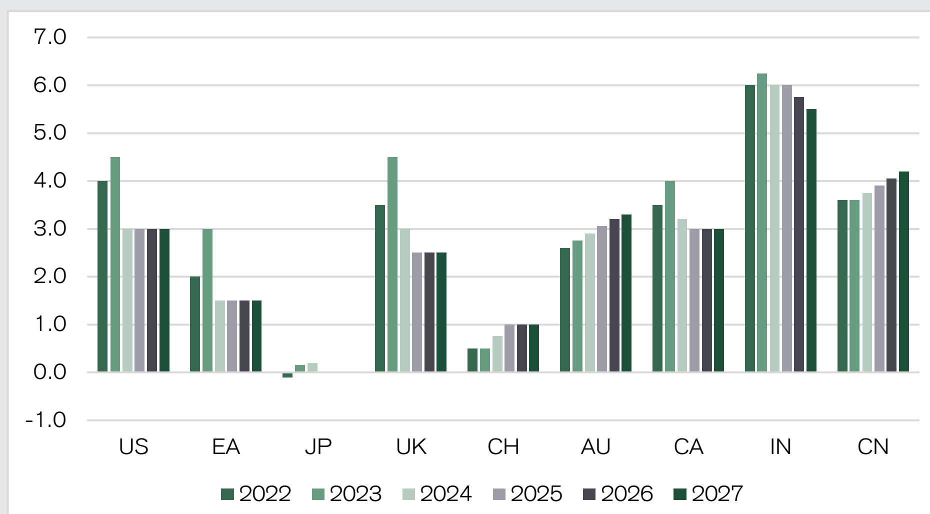
Estimates for sources of growth revised lower

Most of the weaker growth we project further out stems from downgrades to our estimates of all of the sources of potential growth. Updates to demographic projections show a faster aging of labor forces, particularly in China. Worsening matters, the pandemic seems to have done lasting damage to labor force participation, particularly among the older working age cohort. At the same time, political measures in response to social stresses are restricting immigration flows into developed economies, further limiting labor supply as a source of growth. These developments also make central banks' task to reduce inflation more challenging.

The investment contribution to growth also looks set to be weaker. One aspect of this is that Russia's invasion of Ukraine has pushed Europe into recession and created a new level of uncertainty that investment decisions in the private sector need to overcome. However, the refocusing of government priorities due to security issues, including energy security, as well as the need for investments to address climate change should provide offsetting factors over the longer term. In China, the bursting of the property bubble has combined with a shift in Chinese policy back in favor of central plans and a less friendly environment for private firms, which sharply weakens private investment growth in the world's second largest economy.

Slower trend productivity growth

Taken together, this mix of damage to labor markets and prolonged weaker business investment points to slower trend productivity growth across the major economies. We think this implies a higher path for interest rates for longer. Tight labor markets and a weaker-than-expected supply response to recovery from the pandemic have created a larger, more persistent inflation problem. We expect developed market central banks to win this fight and return inflation to close to their targets by 2024. However, the cost of keeping inflation low in a structurally more inflationary environment will be a persistently higher level of interest rates than we expected last year and that prevailed before the pandemic. For the USA, this implies that we now project an average level of the monetary policy rate of slightly above 3% over our five-year forecast horizon. Rates are expected to peak next year and then move to what we consider a neutral rate of 3%, given the inflation path we forecast. For the Eurozone, the average short rate is forecast to be 1.70%; for the UK, we forecast a higher rate trajectory given higher inflation pressure, leading to an average rate of close to 3%.



Source: IMF, Haver Analytics, Credit Suisse estimates

Economic forecasts, 2023-27

	Annual real GDP growth, 5Y mean	Annual CPI inflation, 5Y mean	Cash returns, 5Y CAGR	10Y government bond yield, 5Y avg.
USA	1.5	2.6	3.3	3.7
Eurozone	1.1	2.5	1.7	2.4
Japan	0.6	0.8	0.0	0.4
UK	1.2	3.4	3.0	3.5
Switzerland	1.2	1.0	0.8	1.6
Australia	2.4	2.5	3.0	3.7
Canada	2.0	2.5	3.5	3.5
India	6.3	4.3	6.5	6.7
China	4.4	2.0	2.5	3.3
Singapore	2.6	2.4	3.4	3.7

Source: Credit Suisse

How we take climate risks into account in our CMAs

Our climate CMA framework allows us to systematically monitor the policy progress and the likelihood of further climate-related policy action. We conduct a structured qualitative assessment of the climate impact on the key macroeconomic CMA inputs, based on the information available to date. The insights feed into our baseline estimates for growth and inflation. Overall, the aggregate impact of climate change as well as climate policy appears rather small to materially alter the five-year mean of these variables. That is either because no ambitious climate agenda is expected for a country over the next five years; or because other factors are likely to dominate in the short to medium term – e.g., the supply shock from the energy crisis in the case of Europe. To account for risks beyond the five-year forecast horizon, we conduct a separate analysis (page 26). We explore long-term growth and inflation trajectories for various transition scenarios and evaluate the likelihood of policy actions that would accelerate the climate transition region by region.

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Cash

- Central banks have raised interest rates substantially this year and are expected to maintain a tight stance to rein in inflation. The expected short rate paths for the major central banks are therefore much higher than last year.
- Expected cash returns are positive in all markets except Japan. However, in real terms, the outlook differs by country. Real cash returns are slightly positive in the USA, Canada, Australia and emerging markets, but slightly negative in Europe and Japan.

Fast rate hikes due to inflation

With inflation numbers rising to very high levels, central banks have had to adapt their stance sharply. Their highly expansionary monetary policies, including the negative interest rate regimes in Europe, have come to an end. In the near term, central banks remain focused on bringing down inflation quickly, which increases the risks of an adverse impact on financial markets and economic growth. Elevated uncertainty about monetary policy has been characteristic of 2022, and cash rates could remain rather dynamic after being kept very stable for many years.

US rates among the highest in developed markets

Almost all central banks in developed markets are forecast to maintain higher rates well into 2023. The US Federal Reserve (Fed) as well as most other central banks should reach a peak next year, and eventually return toward somewhat lower long-term equilibrium levels over our five-year forecast horizon. The Fed remains among the developed markets with the highest expected average policy rate over the next five years. Despite having increased as well, rates in the Eurozone and Switzerland should remain significantly lower than in the USA, as long-term equilibrium estimates for these countries are also lower. In terms of monetary policy direction, Japan is expected to be an exception, avoiding a meaningful tightening of monetary conditions by keeping policy rates close to zero. In emerging markets, central banks started to hike earlier than in developed markets, reducing the need for further rate hikes and creating a more stable outlook for policy rates in these regions.

Cash returns compensate for inflation in some but not all markets

Expected cash returns over the next five years should be positive in all major markets except Japan. USD cash returns are expected to be 3.3%, while EUR cash should produce an average return of 1.7%. JPY cash returns are forecast to remain low at 0%. In real terms, the situation differs from region to region. Real cash returns are expected to average +0.7% in USD, and they are also expected to be positive for Australia and Canada. On average, EUR real cash returns are still expected to be negative over the five-year horizon. The same holds true for Japan. The UK and Switzerland are also expected to have slightly negative real cash returns. In emerging markets, nominal cash returns in China, India and Singapore are expected to compensate for inflation, with India expected to show the highest average real cash return of +2.2%.

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Fixed income

- We expect significantly higher returns for government bonds in most developed markets over our five-year forecast horizon than last year.
- Corporate bonds are expected to outperform government bonds. Emerging market hard currency (USD) sovereign bonds should offer the best return potential in fixed income, also when taking account of risk.

Government bond yields have risen, driven by central bank tightening

This year has been characterized by sharp central bank tightening in response to elevated inflation. Short-term yields have been most affected as yield curves have shifted higher across maturities. Short rates are expected to peak next year and later decline over our five-year forecast horizon, as inflation falls back toward central bank targets. We forecast significantly higher average yields over the next five years compared to the last CMA update, except for Japan. We expect the US 10-year government bond yield to average 3.7%, while the UK benchmark yield should average 3.5% over the next five years. For the Eurozone and Switzerland, we forecast benchmark yield averages of 2.4% and 1.6%. For Japan, the 10-year government bond yield is expected to average 0.4%.

Sovereign bonds with improved return outlook

Total return expectations for government bond indices for the next five years have markedly increased compared to low or even negative return expectations in last year's CMAs. Due to the strong sell-off in government bonds since then, yields have reached levels that, together with our view on economic growth and inflation, suggest a positive return outlook for the next five years. Higher coupon payments will help generate increased income, especially in markets that have seen stronger yield moves such as the USA or the UK.

In the USA, the total return for the medium-term US Treasuries index has jumped to 4.2% (vs. 0.8% last year). This means that the expected real return should be also positive. The long-term (10-year+) US Treasuries Index is forecast to have a modestly lower average return of 4.1%.

In Europe, EMU government bond return expectations are also higher than last year because of increased yield levels and changes to the outlook for central banks, growth and inflation. The expected total return of the EMU medium-term bond index has been increased to 1.8% from 0.0% last year, which is significantly above the expected return for the EMU long-term bond index of 0.6% (-1.3% last year), as we still expect a rather negative duration effect.

Strong shifts are also observed for the UK market, where the medium-term government bond index has a total return expectation of 3.6% (from 0.2%), as well as for Australia (3.5% from 0.6%). The exception to the higher shift in returns is the expected return for the Japanese bond index, where the five-year average remained similar to last year (0.2% from 0.4%), as the central bank outlook remains the most dovish in developed markets.

Similar return expectations for inflation-linked bonds

Return expectations for inflation-linked bonds (ILBs) are positive and comparable to those of nominal bonds. Breakeven inflation rates are expected to be range bound as a big repricing has occurred in the last two years, while real yields have increased significantly over the past year and are now expected to move more in parallel to nominal yields. For US ILBs, total return expectations are 4.2% compared to 0.9% last year. The situation is very similar for UK ILBs,

where return expectations are 3.6% (from 0.4%). For the Eurozone, return expectations are 1.8% (from 0.4%), again comparable to the number for the corresponding nominal bond index.

US investment grade credit expected to outperform

In the corporate bond space, we increase return expectations for both investment grade (IG) and high yield (HY) bonds. Wider spreads and higher coupons should support higher returns and provide some buffer against the risk of default due to lower economic growth, particularly in the USA. We expect US intermediate corporate credit (+4.9%) to outperform European (+2.9%) and Swiss (+2.6%) credit indices thanks to stronger US coupon returns accruing over time. Expected returns for green bonds have also been increased from 0.7% last year to 2.5%, with green bonds expected to perform less strongly than developed market IG corporates but do better than EU government bonds. Green bonds remain an interesting alternative to help obtain exposure to a good mix of ESG-compliant high-quality bonds in developed markets. The International Energy Agency (IEA) estimates that getting the world on track to limit global warming to 1.5°C requires a surge in annual investment in clean energy projects and infrastructure to nearly USD 4.3 trn by 2030, more than three times the current rate of USD 1.4 trn (average investment annually from 2016 to 2020). As the risk around rising capital expenditures and costs associated with the energy transition increases especially for the metals, energy and utility sectors, green bonds are likely to provide relative safety. Finally, in our corporate bonds universe, we expect emerging market corporate bonds to deliver the highest returns (+7.7%) over the next five years, helped by a substantial increase in coupon returns compared to last year's update.

US HY expected to marginally outperform US senior loans

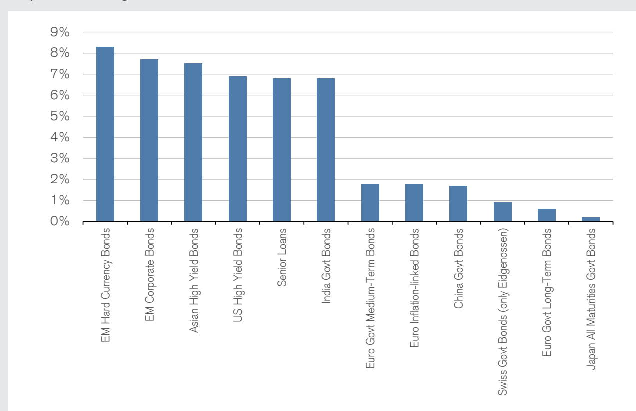
In the lower-quality segment of developed market credit, we expect US high yield (HY, +6.9%) to marginally outperform US senior loans (+6.8%). European high yield bonds are expected to return +6.3%, reflecting a lower cash rate and thus financing costs in the Eurozone than the USA. Senior loans are less vulnerable in a rising default rate environment and should benefit from higher core government yields, although US HY should offer higher coupons on average. Overall, we expect diversified high yield exposure to provide resilient performance. Although we expect a rising default cycle in coming years, we expect default rates to remain much more contained compared to past periods of cyclically rising defaults.

EM hard currency sovereign bonds offer highest potential in fixed income

We have increased our five-year forecast for emerging market hard currency (EM HC) sovereign bonds to 8.3%. This improvement mostly reflects higher coupons, both from higher current US Treasury yield and EM sovereign spread levels. Over time, we expect spread levels to partly normalize to the historical average. Total return expectations for the EM sovereign local currency (LC) bond index have also been raised to 6.6% due to increased yield levels. We forecast a total return for Asian LC sovereign bonds of 3.1%. The marked divergence in returns between the overall EM LC bond index and Asian LC bonds is mainly due to a weighting effect. China has a greater weight in the Asian aggregate and drags return expectations down due to markedly lower yields. For China we have a total return expectation of just 1.7%. For India, we have increased the expected return to 6.8%.

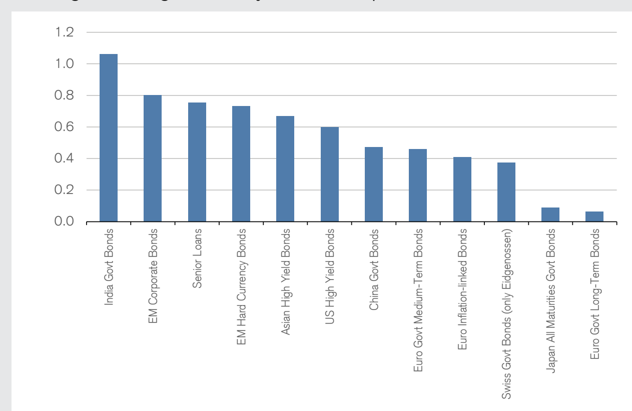
Fixed income return expectations

Expected long-term fixed income returns*



Source: Credit Suisse; * 5-year annualized expected compound returns

Ranking according to risk-adjusted return profile*



Source: Credit Suisse; * 5-year expected returns divided by volatility

Equities

- We expect global equities to deliver mid-to-high single-digit returns over our five-year forecast horizon. Our forecasts are somewhat higher than last year following a significant de-rating in 2022 due to rising bond yields and a worsening growth outlook. Earnings and dividends are expected to be the main return drivers.
- The valuation impact is assumed to play a less prominent role for long-term returns on average given the recent re-pricing of equities in response to the changed macro environment and much increased interest rates.

Returns in the mid-to-high single-digit range

Sharply higher benchmark yields across the maturity spectrum and a related correction in equity valuations over the course of 2022 have prompted us to moderately raise the return outlook of global equities over our five-year horizon, with earnings and dividends the main return drivers. Despite near-term challenges caused by the current tightening of monetary conditions and potential repercussions for economic and earnings growth, equity markets should be able to deliver returns in the mid-to-high single-digit range as conditions normalize. For the MSCI AC World Index, we forecast a total nominal return of 7.4% p.a. on average over the coming five years. Even though earnings are likely to come under pressure in coming quarters as economies struggle with rising energy prices and tightening financial conditions, over our five-year horizon, we expect earnings growth to be close to historical averages and thus a key return driver along with somewhat higher dividend yields than last year. We forecast limited continued headwinds in terms of valuation.

Eurozone expected to perform in line with DM equities

We expect Eurozone equities to perform in line with the average of developed market (DM) equities over the next five years, returning 7.4% p.a. We forecast earnings growth to be the main return driver, though some slight P/E multiples expansion is expected in the years ahead.

USA likely to trail other DMs

US equities are expected to somewhat trail other DM equities, with returns forecast at 6.9% p.a. Similarly, expected earnings growth is the main driver of total returns, while a minor expected multiples contraction is offset by the dividend yield, which remains the lowest in DM at 1.9%.

UK likely to outperform in DM

We expect UK equities to outperform other developed equity markets, with returns of 8.4% p.a. Here, although the earnings growth we expect for UK equities is lower than of the broader developed markets, we expect multiples expansion to be more beneficial. Furthermore, UK equities offer the highest expected dividend yield at 4.1%.

Japan, Singapore and Switzerland as return laggards

Our return expectations for Japanese equities are 5.8% p.a., while we forecast Singapore and Swiss equities to both return 6.1% p.a., respectively. This represents the lowest absolute returns in home currency within the markets in our scope. Earnings in Japan are expected to grow more slowly than in other DM, whereas Singapore and Swiss equities are expected to show a larger

multiples contraction than the broader index. Low volatility in Switzerland provides some offsetting support in risk-adjusted terms.

EM equities expected to outperform DM

Emerging market (EM) equities are expected to outperform their DM peers, with an expected return averaging 8% p.a. We expect earnings growth to be stronger than for developed markets. For Indian equities, we forecast a slightly higher return of 8.3% p.a., while Chinese equities are expected to perform in line with the broad EM index at 8% p.a. For Chinese equities, we see some scope for a further de-rating of multiples.

ESG is expected to offer higher returns over the longer term

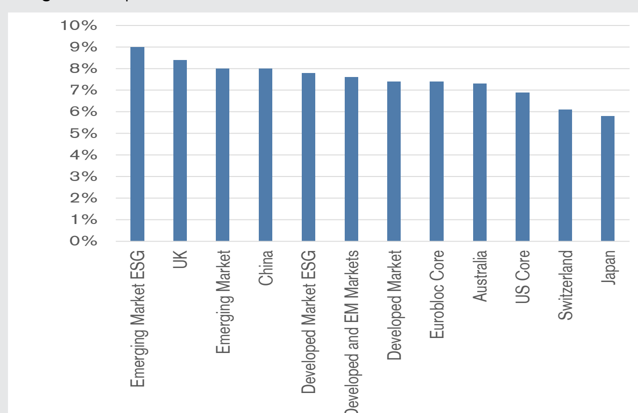
Our five-year return forecast for the ESG equity index in developed markets is at 7.8% p.a., with an expected excess return of 0.4% compared to developed markets. The underperformance of ESG indexes in 2022 has largely been due to sector effects, especially the outperformance of the energy sector, along with an embedded growth and quality tilt of the ESG benchmarks. Given our more muted outlook for the commodity and energy complex going forward, we assume that those aspects should tend to play in favor of ESG in the longer term. Similarly, after the sharp increase in interest rates, which affected growth companies negatively, the growth tilt should not be a longer-term drag. We expect the ESG equity index for emerging markets to return 9% p.a. over the next five years, with an expected excess return of 1.0% over the emerging markets parent index. In our view, over the longer term, the tilt of the ESG benchmark to better quality, especially due to governance considerations, should enable a renewed outperformance such as we saw before this year's energy shock and sharply rising yields. The expected excess return is primarily driven by a higher earnings-per-share growth profile.

UK and Australia rank highest taking volatility into consideration

Due to the higher volatility of EM equities, we continue to forecast better returns per unit of risk (volatility) for DM than for EM. Within our equity market universe, UK and Australia rank best when risk is taken into account, followed by Swiss and US equities. Despite our higher return expectations in absolute terms, EM equities have a lower relative ranking in terms of information ratio, as their expected returns are accompanied by higher expected risk. For both DM and EM, the ESG indexes show moderately lower volatility than their respective parent indexes.

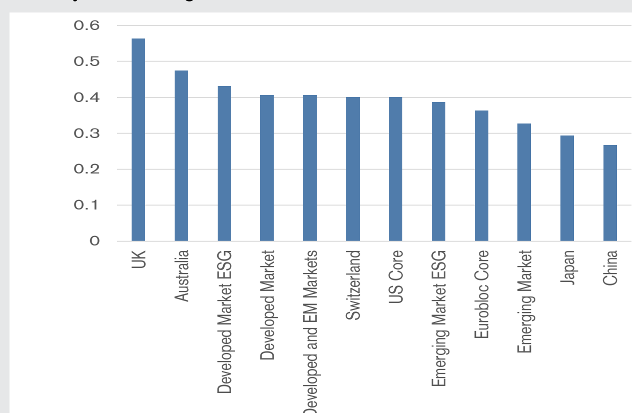
Equities forecast to deliver returns in the mid-to-high-single digits

Long-term expected returns*



Source: Credit Suisse; * 5-year annualized expected compound returns

Risk-adjusted ranking*



Source: Credit Suisse; *5-year expected returns divided by volatility

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Commodities and gold

- Commodities have experienced multiple shocks, translating into strong performance and diversification benefits. Returns should moderate as supply pressures ease and growth slows, but the longer-term prospects for the asset class stay positive.

- Decarbonization efforts are spurring raw material demand and high capex needs. Index selection matters in terms of ESG considerations. Carbon overlays and customization could be used to address such aspects. Active implementations are favored over passive ones.

Commodities are cyclical, but provide inflation and geopolitical hedges

Commodities are cyclical assets, driven by capacity investments and structural demand trends (long term), business cycles (medium term) and inventory shifts (short term). Commodity spot prices are less forward looking than equity prices since commodity markets must clear today's physical supply/demand situation. Commodity futures, however, reflect storage and financing costs, which contain a forward-looking element, i.e. a market-based assessment of expected inventory developments. This is relevant for roll returns. Our analysis shows that commodities provide a hedge against inflation as well as geopolitical surprises. These elements can make commodities a useful diversifier.

Looking at the behavior between business cycle and commodity prices, we find that performance tends to be positive during expansions but also during late-cycle phases including periods of low growth but high inflation (stagflation). That said, performance patterns shift negatively once the economy slips into recession, accentuating the challenge for investors of identifying turning points. Realized performance of the broad commodity benchmark, BCOM, proved volatile but has improved strongly since 2016, following an extended slump from 2011-2015 during which excess capacity weighed on the asset class.

Longer-term return prospects are positive for BCOM and gold

Commodity index returns consist of spot price changes, carry and collateral yields. Looking ahead, total returns are likely to moderate vs. the recent exceptionally strong pace of gains since price spikes help curb demand and incentivize more production. However, we still project positive returns for the BCOM over our five-year horizon, even somewhat higher than last year's forecasts. Higher inflation profiles, higher collateral yields (linked to short-term rates), stronger carry contributions (spreads are expected to normalize over time, but backwardations are currently greater than a year ago), and prospects of a sequential weakening of the USD more than offset the negative impact of a weaker profile for industrial production. Gold returns are now seen as similar to overall commodity estimates – unlike last year when we expected gold to trail the BCOM, which it did over the last twelve months.

Supply/demand shocks trigger price swings

The current environment has late-cycle characteristics as the post-COVID recovery is losing momentum and strong inflationary pressures have emerged. Strongly positive year-to-date performance is consistent with these observations. In addition, the world is in the midst of a major geopolitical shock amid Russia's war in Ukraine. Just when supply chains were starting to normalize following the pandemic, recent developments have upended commodities trading once

more as Western buyers shun Russian supplies. While markets seem to be adjusting quickly, forced by initial price spikes, reconfiguring global trade is a tremendous challenge as Russia has significant market share across commodities. This is accompanied by high volatility, which creates liquidity issues for physical market participants and complicates risk management for investors.

Structural shifts seen accelerating

Chronic underinvestment in capacity due to high capital costs and regulatory uncertainty remains a core driver of commodity performance. Natural decline rates explain significant investment needs. Long-dated prices, which are a key guide in this context, have risen lately and now appear sufficiently elevated to provide the necessary economic incentives. However, given long lead times of commodity projects, we might not see a meaningful loosening of physical market conditions soon. Moreover, decarbonization trends structurally raise demand profiles for a range of commodities such as base metals, which are key to electrification efforts. If anything, Russia's actions are likely to speed up plans to enhance Western energy independence. Fossil fuels still have to play a central role during the energy transition, with consumption only likely to start shrinking beyond our five-year time horizon.

Given commodity markets' cyclicality, central bank tightening to tackle inflation is now creating additional headwinds to performance. That said, even in the event of a growth slump, commodity prices may not fall (far) below production costs for an extended period to maintain capital investments given the structural needs described earlier.

Index selection matters for ESG considerations

These observations also help frame the discussion over commodities and environmental, social and governance (ESG) criteria, when considering the 'E'. In a first step one can choose an index with a smaller energy and larger metals weight; our BCOM benchmark fulfills this criterion as other benchmarks like the GSCI or the CRB have much larger energy weights. Importantly, annual index rebalancing exercises take structural shifts into account and adjust weights as production values (among other factors) change. Concretely, if metals demand rises and oil demand falls over time, index weights adjust accordingly. Investors could consider overlaying a faster re-weighting path, while some index providers have proposed carbon-based basket weights.

Besides index selection, investors might want to add carbon offsets to internalize carbon emissions of commodities production and consumption, though holding commodity futures does not mean a direct carbon footprint. Both voluntary and mandatory carbon offsets can be used and structured in various formats, with the latter offering more flexibility. Investor participation helps fund climate research and investments, and enhances market functioning/risk transfer by providing liquidity. Inflation hedging characteristics, a key motivation for taking commodity exposure, remain very much intact.

Active approach favored

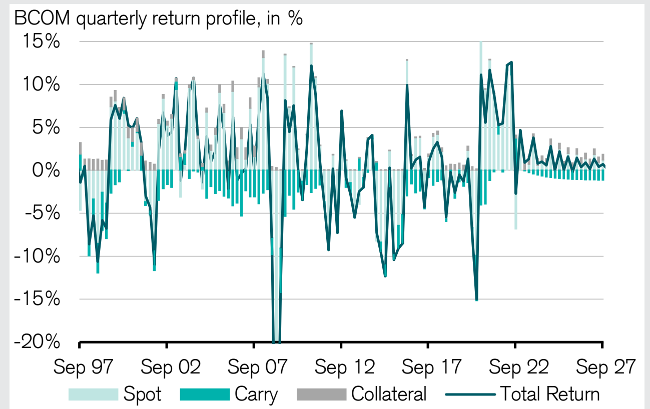
Where investors have strategic allocations, we would look for dynamic/active implementations (curve management) since passive benchmark exposure tends to be disproportionately vulnerable during downturns. This is because spot prices and the front end of futures curves have a higher beta than deferred contracts. Historical patterns suggest that considerable additional return (alpha) can be generated by extending maturities during economic downswings and moving back to the front end into recovery periods.

Commodities

BCOM return projection (total return index)

Last data point: 30/09/2022. Historical performance indications and financial market scenarios are not reliable indicators of current or future performance. Source: Bloomberg, Credit Suisse

BCOM return contribution profile



Last data point: 30/09/2022. Historical performance indications and financial market scenarios are not reliable indicators of current or future performance. Source: Bloomberg, Credit Suisse

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Private markets and hedge funds

- Within private markets, five-year return forecasts are 10.3% for private equity and 7.6% for private debt.
- The projected five-year return for the hedge fund indices we cover ranges from 3.5% for the passive benchmark (HFRX) to 5.5% for the HFRI 500 Index.

PE excess returns supported by better valuation levels

We expect economic growth to slow further, as policy rates rise to bring inflation close to central banks' targets, which is expected to take at least until 2024. This is going to leave asset valuations under pressure, though private market returns are – at least partially – shielded from elevated volatility by structural advantages (active return, control provisions, long-term horizon). Thus, for already invested capital, we expect further broad-based setbacks in the nearer term, though weakness should be significantly less pronounced than what we expect in public markets. For funds in the investment phase, the de-rating of public equities leads to better investment opportunities, while ample committed, but uninvested capital ("dry powder") provides flexibility to invest at lower valuations. Note that vintages deployed at lower points in the business cycle, such as after the Great Financial Crisis, tend to perform better than those deployed at higher points. This and structural drivers should enable private markets to outperform in the coming years.

PE offers attractive returns

We expect private equity (PE) to deliver an internal rate of return (IRR) of 12% p.a., higher than last year due to better vintage year conditions in 2022, but below the long-term average of 14.1% given the impact of a weaker exit environment on already invested funds' investments as well as a still competitive and highly volatile investment backdrop. Although the IRR is one of the typical performance metrics available for PE industry benchmarks, it is not fully comparable with the total return of traditional asset classes. To derive PE total return, we use an estimated investment quota (the ratio of capital deployed to total assets under management) of 80%, close to the long-term historical average. Combined with much higher USD cash rates forecast at 3.3% applied to 20% committed, but uninvested capital (dry powder), this results in a total return forecast of 10.3%. This is the highest total return within our asset universe, offering what we see as a fair premium of around 300 bp over public equities, which we attribute to the much lower liquidity of the asset class (liquidity premium). Our projections reflect PE funds with an average performance, but a historically large gap of over 20% p.a. between the top and the bottom performers indicates that diversification, differentiation and specialized expertise are essential.

Strong appetite for private debt

Private debt (PD) has seen significant growth as an asset class in recent years, with assets under management rising at an annualized rate of more than 17% over the past five years to more than USD 1.2 trn. Low interest rates, an inherent illiquidity premium and demand from risk-tolerant investors for fixed income solutions with some interest rate protection have been key demand drivers. IRR expectations for PD are supported by an increase in coupon rates due to higher short-term benchmark rates as well as higher risk premiums in middle-market companies due to the slower growth we expect. Especially in an environment of rising interest rates and increasing defaults, PD can be an interesting alternative to other fixed income investments. The largest PD component (approx. 40% of PD assets under management, Q1 2022), direct lending, has seen

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lower drawdowns than high yield bonds and senior loans amid rising default rates due to PE sponsorship, with its floating rate nature and seniority in the capital structure an advantage.

PD ranks better than PE on risk-adjusted basis

Some PD funds have a drawdown structure with a multi-year investment period followed by a harvest period. They thus have lower liquidity and generally investors demand a liquidity premium. A large share of PD assets, around 30%, is committed but not invested ("dry powder"). Therefore, we calculate total return assuming that capital deployed is invested at IRR, while the dry powder is assumed to be invested at the projected USD cash rate of 3.3%. We expect PD to deliver an annualized five-year return of 9.4% p.a in IRR terms, which implies a total return of 7.6% p.a. The IRR projection is a suitable benchmark for evergreen PD funds with low levels of dry powder.

Hedge fund returns still in the low-to-mid-single digits

Hedge fund (HF) returns have been improving over the past five years given higher rates, financial market volatility and greater dispersion among regions. Excess returns versus global equities and bonds have also risen, particularly against broader fixed income indices, where excess return is at a multi-decade high. We continue to expect HF to deliver low-to-mid-single-digit returns over the next five years, with the HFRI 500 Index, our preferred benchmark for the broader industry, expected to deliver a return of 5.5% p.a. compared to 4.4% projected last year. In contrast, the HFRX Global Index, a narrower benchmark of funds offering daily reporting, is expected to deliver a return that is nearly 200 bp lower, or 3.5% p.a.

Low-beta strategies expected to outperform cyclical ones

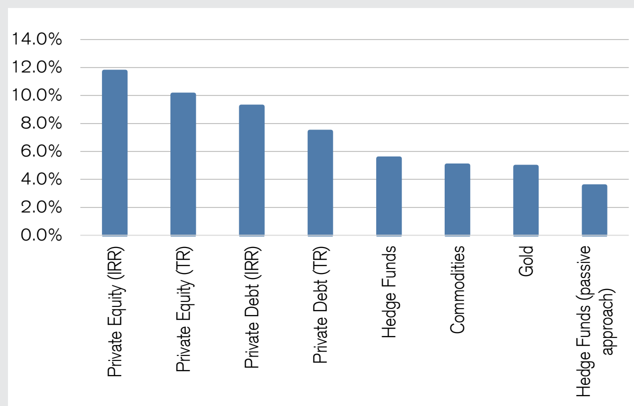
The projected macroeconomic environment of higher inflation and interest rates along with slower realized growth is expected to improve the return potential of alternative return sources such as volatility trading, mean reversion, momentum and carry. This improves the opportunity set for low-beta strategies within the HF universe, which typically offers more moderate premia. By contrast, a backdrop of more challenging growth and liquidity conditions leads to headwinds for HF strategies with a cyclical tilt. Such strategies, which include selected long-biased long-short equity or event-driven managers, may find a narrower opportunity set with limited scope for multiples expansion, while capital market activity is also likely to be weaker than when the COVID-19 pandemic hit financial markets and policy makers forcefully stepped in. As such, broader HF excess returns are modestly lower than last year.

Professional due diligence and fund selection remain key

Given the diverging outlook across various categories of hedge funds, professional due diligence and fund selection are critical, with a multi-strategy approach best suited to navigate the economic environment. As in private markets, return differentials between the top- and bottom-performing managers are large, while the rapid pace of monetary policy tightening in several advanced economies also results in greater liquidity risks. Consequently, we focus on managers with strong risk controls and track records. An allocation to strategies such as Global Macro should help stabilize portfolios, while allocations to strategies focusing on factors such as volatility, carry and deal risk premiums should provide uncorrelated returns compared to traditional assets.

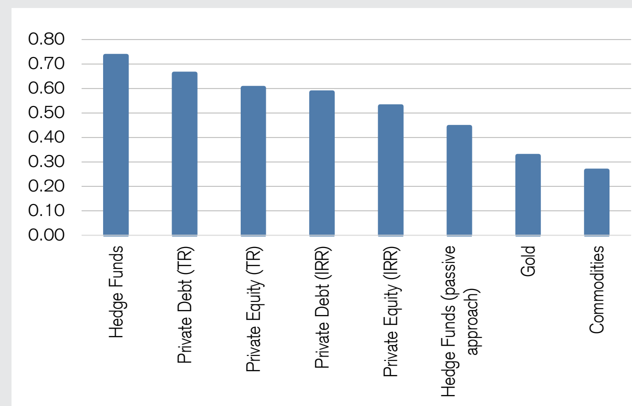
Alternative investments with very diverse return profiles

Long-term expected returns*



Source: Credit Suisse; *5-year annualized expected compound returns

Risk-adjusted ranking*



Source: Credit Suisse; *5-year expected returns divided by volatility

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Real estate

- Real estate faces headwinds as interest rates look to remain elevated over our forecast period and economic growth slows. But the asset class still offers hedging properties amid elevated inflation risk. We expect mid-single-digit returns over our five-year forecast period.
- Relatively robust economic growth should support real estate equities in Singapore and Australia. Swiss real estate funds offer the highest risk-adjusted returns.

We expect real estate equities to deliver returns in a mid-single-digit range over the next five years. US direct real estate is at the lower end of the return range within the covered real estate asset universe, with a forecast return of 3.8% p.a., while Singapore real estate equities have the highest expected return of 6.4% p.a.

Real estate markets facing challenges

Global property markets face headwinds given higher interest rates and lower economic growth, though those factors are partially offset by their ability to provide a hedge against inflation. Higher interest rates increase the cost of financing and negatively impact property valuations via higher discount rates, while weaker economic activity weighs on tenant demand for space, especially in more cyclical segments such as office and retail. Nevertheless, rents can be indexed to inflation or are increased by fixed amounts during lease terms, providing a partial hedge against elevated inflation. With respect to listed real estate, the sector benefits from a favorable sector exposure. More than half of listed real estate companies are exposed to sectors with strong structural growth (logistics, data centers and communication towers) fueled by e-commerce, digitalization and working from home, or sectors that cater to basic human needs and are thus less dependent on the business cycle (residential and self-storage). While listed real estate has corrected year-to-date, prices in direct real estate markets have been resilient so far, though a near-term correction has to be expected given increased interest rates and slowing growth.

Despite those challenges, over the next five years, we expect listed real estate in developed markets to deliver a total return of 4.9% p.a. This is lower than last year and lower than our forecast of 7.4% for the broader global equity index. Because most investors hold property as an income-generating asset, valuations tend to react rather strongly to rising interest rates, contributing to the disadvantage of listed real estate relative to broader equities.

Mid-single-digit returns for US real estate

We expect US listed real estate to return 4.9% p.a., in line with developed market listed real estate. Valuation remains elevated and the high interest rate environment presents a headwind, in our view. Yet, a relatively large exposure to sectors underpinned by structural growth, such as logistics and data centers, is supportive. For US direct real estate, we forecast an average annual return of 3.8% over the five-year forecast period, lower than last year as we expect that the re-pricing in direct real estate markets has yet to come, reflecting the impact of higher interest rates.

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Muted outlook for Europe, while low leverage supports UK listed real estate

We expect Eurozone real estate equities to deliver a total return of 4.8% p.a. over the next five years, roughly in line with other developed markets but below our forecast of 7.4% for broader Eurozone equities. Although valuation is supportive, with multiples significantly below long-term averages, a large exposure to the German residential sector is likely to be a challenge given the sector's high sensitivity to higher interest rates due to elevated leverage ratios.

We expect UK listed real estate to return 5.1% p.a. over our forecast horizon, slightly higher than developed market real estate equities. Although higher interest rates and modest economic growth are likely to curtail returns, UK listed real estate should benefit from a relatively stronger recovery in underlying markets as property yields are higher than in Continental Europe, making them less vulnerable to interest rate increases. In addition, valuation multiples have declined from elevated levels since the beginning of 2022 and are now in line with long-term average values, while relatively low leverage should help mitigate the negative impact of a rising cost of debt. For Swiss real estate funds, we forecast an average return of 4.1% p.a. over our five-year forecast horizon, slightly higher than last year. Although higher interest rates are a risk, premia to net asset values have more than halved since early 2022 and are now below their long-term average. With our forecasts for Swiss long-term government bond yields among the lowest in developed markets, dividend yield spreads are likely to remain positive, supporting solid demand from institutional investors. In addition, recent data points to a continued recovery in the Swiss rental apartment market. Solid demand and lower construction activity have brought down vacancy rates, while positive growth in contractual rents supports returns of Swiss real estate funds.

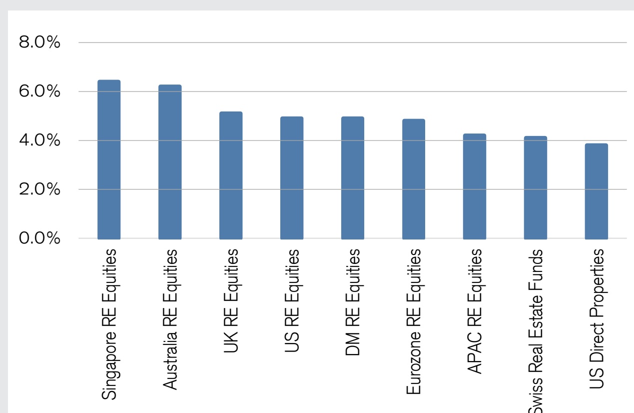
Singapore listed real estate expected to perform best

We expect real estate equities in the Asia Pacific region to return 4.2% p.a. over the next five years, significantly lower than last year as a weak outlook for the Chinese property market weighs on return prospects. Singapore real estate equities should fare best, with a forecast return of 6.4% p.a. over the period, benefitting from a solid outlook for underlying property markets and a relatively high dividend yield of 3.9%. We forecast a return of 6.2% p.a. for Australia real estate equities, underpinned by one of the highest economic growth projections among developed economies in our five-year forecasts. In addition, valuation multiples have decreased since the start of the year and are now in line with long-term average levels.

In terms of risk-adjusted returns, Swiss real estate funds rank favorably due to low volatility, followed by Australian real estate equities as well as US direct properties. It is important to note that we unsmooth the volatility of returns of less liquid assets such as direct real estate and real estate funds to allow for a better comparison with other, more liquid assets that feature market-based pricing, like listed real estate. Physical real estate and real estate funds tend to show more stable pricing patterns due to the use of forward-looking estimates of asset values rather than a mark-to-market approach.

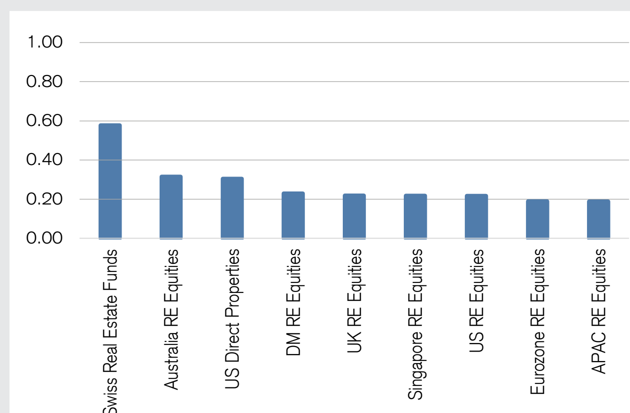
Real estate returns in the mid-single-digit range

Long-term expected returns*



Source: Credit Suisse; *5-year annualized expected compound returns

Risk-adjusted ranking*



Source: Credit Suisse; *5-year expected returns divided by volatility

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Foreign exchange

- After an extended period of strength, the USD has become overvalued against other major currencies. We expect the USD to depreciate moderately against the EUR and the GBP and weaken more meaningfully against the JPY.

- In emerging markets, we expect the CNY to moderately depreciate against the USD.

In the short to medium term, currencies are heavily affected by the economic cycle, interest rates, growth and inflation dynamics. These short-term dynamics continue to support the USD. Over a longer horizon, however, we broadly expect foreign exchange (FX) returns to trend toward what our fair value estimates suggest.

USD overshooting but seen depreciating longer term

The USD has strongly appreciated this year. As a result, its overvaluation has generally increased, including against the EUR. Yet, the USD should still display an interest rate advantage over the course of our forecast horizon, which is likely to prevent a sharper depreciation from overvalued levels. We expect EUR/USD to move closer to fair value (1.27) over the next five years and anticipate an average annual appreciation of the EUR by 1%.

So far this year, the GBP has depreciated strongly against the USD, leading to significant GBP undervaluation. Given this undervaluation, we expect an annual appreciation of the GBP against the USD of 0.7% over the next five years.

In 2022, the JPY has weakened the most across G10 currencies, further accentuating its undervaluation against the USD. As a result, we think the JPY should appreciate against the USD in the next five years, despite the USD's lasting rate advantage. This is supported by our view that the longer-term fundamentals of the JPY relative to the USD, including lower inflation and more solid current account balances, should remain favorable. We forecast the USD to depreciate against the JPY by an annual 3.5% over the next five years, which would roughly halve the level of undervaluation, according to our valuation analysis.

CHF should depreciate against EUR

Although the US interest rate path should provide some further modest support to the USD, the further strengthening of the USD this year has now brought USD/CHF closer to fair value and we expect the CHF to modestly appreciate (+0.2% p.a.) against the USD. The EUR is expected to gradually appreciate against the CHF over the next five years (by 0.8% p.a.). The sharp depreciation seen after the Russian invasion of Ukraine created additional EUR undervaluation, which should correct as the geopolitical context normalizes eventually.

Moderate depreciation of the CNY against USD

The AUD has substantially depreciated against the USD so far in 2022 and is now modestly undervalued, according to our metrics. Our anticipated depreciating path for the AUD in 2021 (-1.0%) has been entirely frontloaded, and we now expect the currency pair to be rather stable, with minor appreciation potential for the AUD on a long-term basis. We anticipate a moderate further depreciation of the CNY against the USD of 0.3% annually over the next five years. An expected structural decline in the Chinese current account surplus due to the long-term rebalancing of the economy toward domestic consumption and a declining natural rate of interest in China due to weakening growth potential should weigh on the Chinese currency. The SGD is expected to remain supported by strong current account balances.

Credit Suisse fair value estimates

The fair value estimates express the bilateral exchange rates for the currencies in row X and column Y. They are calculated as the price of one unit of the currency in row X in units of the currency in column Y. For example, the price of 1 EUR in CHF (written EUR/CHF) is found in row EUR and Column CHF and is 1.19.

	AUD	CAD	CHF	CNY	EUR	GBP	INR	JPY	MXN	NOK	NZD	SEK	SGD	USD
AUD		0.82	0.67	4.84	0.56	0.48	51.51	70.71	14.03	5.55	1.10	5.38	0.93	0.71
CAD	1.22		0.81	5.88	0.68	0.58	62.61	85.95	17.05	6.75	1.33	6.54	1.13	0.86
CHF	1.50	1.24		7.27	0.84	0.72	77.36	106.19	21.07	8.34	1.65	8.08	1.40	1.07
CNY	0.21	0.17	0.14		0.12	0.10	10.64	14.61	2.90	1.15	0.23	1.11	0.19	0.15
EUR	1.79	1.48	1.19	8.68		0.86	92.44	126.90	25.17	9.96	1.97	9.66	1.68	1.27
GBP	2.10	1.72	1.40	10.15	1.17		107.98	148.24	29.41	11.64	2.30	11.28	1.96	1.49
INR	0.02	0.02	0.01	0.09	0.01	0.01		1.37	0.27	0.11	0.02	0.10	0.02	0.01
JPY	0.01	0.01	0.01	0.07	0.01	0.01	0.73		0.20	0.08	0.02	0.08	0.01	0.01
MXN	0.07	0.06	0.05	0.35	0.04	0.03	3.67	5.04		0.40	0.08	0.38	0.07	0.05
NOK	0.18	0.15	0.12	0.87	0.10	0.09	9.28	12.74	2.53		0.20	0.97	0.17	0.13
NZD	0.91	0.75	0.61	4.41	0.51	0.44	46.98	64.50	12.79	5.06		4.91	0.85	0.65
SEK	0.19	0.15	0.12	0.90	0.10	0.09	9.57	13.14	2.61	1.03	0.20		0.17	0.13
SGD	1.07	0.88	0.71	5.18	0.60	0.51	55.16	75.72	15.02	5.94	1.17	5.76		0.76
USD	1.41	1.16	0.94	6.82	0.79	0.67	72.63	99.70	19.78	7.83	1.55	7.59	1.32	

Source: Credit Suisse; All estimates are calculated as the average of the last four quarters

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Volatility estimates

- Inflation and growth uncertainties have increased over the past year, impacting our long-run volatility estimates across asset classes and regions.
- Expected volatilities for equities are higher than last year for both developed and emerging markets.
- In fixed income, a shift up in yield curves and uncertainty about inflation and future monetary policy lead to higher volatility forecasts, particularly for UK and Eurozone government debt and, to a lesser extent, credit.

Higher expected volatilities across asset classes

The significantly altered macroeconomic backdrop compared to last year – characterized by higher inflation, lower expected growth and more hawkish central bank policy – comes along with increased uncertainty over the persistence of inflation and the severity of the expected growth shock. These elevated short- to medium-term uncertainties leave a mark on expected volatilities, despite the long-term nature of our forecasts.

Emerging markets remain the riskiest region for equities

Expected volatility for aggregate developed market equities has risen to 18.2%, up from 17.3% last year. This increase is mirrored across the different developed market regions. We expect somewhat higher volatility for Euro bloc core equities (20.4%) compared to the USA (17.2%). At the lower end of the spectrum are UK and Swiss equities, with expected volatilities of around 15%.

With a volatility forecast of 24.4%, emerging market equities are perceived to be considerably riskier than developed market equities. Particularly high volatilities are projected for China and Latin America, both with forecasts at around 30%. However, we have revised lower our volatility forecast for Indian equities (25.2%) to acknowledge the structural shift toward larger, well-established brands with stronger corporate governance.

Concerning ESG, as defined by the inclusion criteria of the MSCI ESG Leaders Index, we do not, in aggregate, expect significantly lower risk for developed market equities. However, ESG can make a small difference in emerging markets, where the projected volatility is 1.1 percentage point lower than for the broader market-cap benchmark.

Most significant mark-up in euro and sterling fixed income volatilities

As central banks will have to calibrate their monetary policy response to the future path of inflation, we expect more volatility in yield curves and hence bond prices compared to the recent period of persistently low interest rates.

Expected volatilities for US medium-term and long-term government bonds are up 0.4 and 1.0 percentage points, now at 3.7% and 12.3%; longer-term bonds are significantly riskier. The

volatility forecast for US intermediate credit has increased to 5.0%, a plus of 0.5 percentage points compared to last year. The shift higher is more pronounced still for euro and sterling debt: Euro medium-term and long-term government bonds have an expected volatility of 3.9% and 9.2%, both up 1.1 percentage points from the previous year. Expected volatility for Sterling medium-term government debt is forecast at 4.5%, up 1.2 percentage points.

Swiss and Japanese government bonds remain among the least risky asset classes, with expected volatilities of 2.4% and 2.2%. The volatility forecast for Japanese bonds is almost unchanged from last year, given still muted inflation expectations for Japan.

Double-digit volatilities are expected for US (11.5%) and Euro high yield bonds (13.1%), even though the forecast for the latter has been revised lower as we expect an only moderately rising debt cycle. As a result of a benchmark change, we also forecast lower volatility for Asian high yield bonds of 11.2%.

The volatility forecast for EM hard currency sovereign bonds is 11.3%, lower than the volatility forecast for EM local currency bonds of 13.1%. Expected volatility for China government bonds is unchanged at 3.6%, a result of the fact that our economists project a rather accommodative monetary policy stance over the forecast horizon of five years.

Extended market coverage includes forecasts for private equity total return and private debt

In line with higher expected volatility for public equities and increased uncertainty over the future costs of financing leverage, the volatility forecast for the internal rate of return (IRR) of private equity is up 2 percentage points, now at 22.2%. In this year's publication, we include an expected volatility for private equity total return (TR) based on the assumption that an average of 20% of committed capital is held in cash. The corresponding volatility forecast is 16.7%. For private debt, we expect a volatility for the IRR of 17.3% and a volatility for the TR of 11.2%, which is based on an assumption of dry powder, committed but not invested capital, of 30%. Hedge fund volatility is only marginally changed compared to last year: the forecast for the broader benchmark HFRI is 7.5%, the expected volatility for the HRFX, representing passive funds, is 7.9%.

The pandemic and more recent geopolitical stress have contributed to high volatility of commodity markets over the past few years. Going forward, we expect that geopolitical tensions and increased macroeconomic uncertainty will likely keep volatility elevated. Accordingly, we have lifted our forecast for the broader commodity complex to 18.9% (+1.2 percentage points). Developed market real estate volatilities are higher, too, on the back of increased inflation and hence interest rate uncertainty. The aggregate developed market real estate forecast is at 21.4%. Expected volatility of emerging market real estate is at 30.3%.

Five-year volatility forecast of selected asset classes

Source: Bloomberg, Credit Suisse

Capital Market Assumptions are no guarantee for future performance and there is no certainty that the expected returns/volatilities will be reached.

A risk assessment for the macro economy

- Climate change is one of the defining challenges of the 21st century, with the year 2050 generally accepted to mark the point by which net emissions must be reduced to zero to avoid irreversible damage to living conditions in many regions of the world.
- Depending on policy action and the corresponding transition scenario, economic risks from climate change vary a lot. We assess potential outcomes and the factors for countries to act on the challenge.

Climate impact assessment based on transition and physical risks

The starting point is to incorporate a climate impact assessment in our macroeconomic projections. For that, we need to gain a comprehensive understanding of the risks that the broad climate change complex poses to our key macro variables. These are generally separated into two categories: physical risks stemming from changing climate and weather patterns themselves, and transition risks stemming from the economic transformation required to slow and limit global warming.

Net zero transition comes with costs

The transition risks of climate change originate from the fundamental economic changes that transitioning to a net zero-emissions world requires. Shifting consumer preferences, various policy interventions such as regulations or carbon pricing as well as technological innovation affect how capital is allocated, how energy is produced and how we consume goods and services. Rising carbon prices and energy supply frictions during the renewable energy roll-out will affect relative prices and will tend to exert upward pressure on the overall price level. Meanwhile, the value of oil and gas holdings and the capital stock invested in fossil fuel extraction and refining will gradually be eroded while technological progress and investment in carbon-efficient sectors advance. The resulting distributional consequences within and across economies can be considerable. Fiscal policy can play a mitigating role by supporting investment in renewables or by lowering other taxes, while monetary policy can accommodate or act against inflationary pressures. The overall impact on economic growth and inflation in individual economies depends heavily on the transition policy design.

Physical risks: Major impact likely to materialize later

Meanwhile, the physical risks of climate change originate from rising temperatures and sea levels as well as extreme weather events. Natural disasters cause disruption and destruction while global warming is likely to lower productivity in agriculture, as well as of labor and capital more generally. The extent of physical risks depends on the progress made in limiting and mitigating global warming. Initially, economic costs are set to increase gradually as climate change progresses, whereas the costs associated with mitigating transition costs accrue right away. This “Tragedy of the Horizon,” a term coined by former Bank of England Governor Mark Carney, explains why physical risks tend to be undervalued in today’s decisions of consumers, businesses and policy makers.

Despite the uncertainty surrounding climate change, there appears to be one foregone conclusion: One of the two risk categories will materialize. Avoiding physical risks requires fundamental adjustment of economic processes, but such a large-scale transition comes with its own risks and costs. Yet, if no adjustment takes place, transition risks will play no material role, but physical risks will increase substantially over time. And there is a third scenario: a situation where too little is done too late. Efforts would be insufficient to avert major physical damage, but belated transition efforts would still lead to, possibly even higher, economic costs.

Assessing transmission scenarios

Macro impact varies in different transition scenarios

The Network for Greening the Financial System (NGFS) – a group of central banks and supervisors from more than 70 countries – has defined various transition scenarios that build the base for research projects, policy decisions as well as climate stress testing. Using the NGFS work as a point of reference, we can gauge the macroeconomic backdrop for various climate transition scenarios[1]. The absolute forecasts in these simulations are subject to numerous assumptions on behavioral changes, technological progress or economic policy reactions, but the overall ranking of outcomes across scenarios is likely to be reasonably robust and should therefore provide useful insights for investors.

In the suite of NGFS scenarios, the “Below 2°C” scenario assumes an orderly climate transition where sufficient measures are phased in early and gradually strengthened over time. Accordingly, the world achieves the Paris Agreement goal of limiting global warming to well below 2 degrees and largely averts adverse physical climate effects. The “Current Policies” scenario assumes that climate policies do not evolve beyond their current scope and stringency, failing to reduce global emissions and leading to severe and irreversible physical damage in the long run – a “Hothouse World.” The “Delayed Transition” scenario is a mix between the two, where the world remains on the “Current Policies” path for the first decade but then abruptly takes more stringent climate action, triggering a disorderly transition with high uncertainty and risk premiums.

Up to 2050: Delayed transition as the most negative scenario for most countries

Figures 1 and 2 summarize the projected cumulative GDP and inflation effect by 2050.

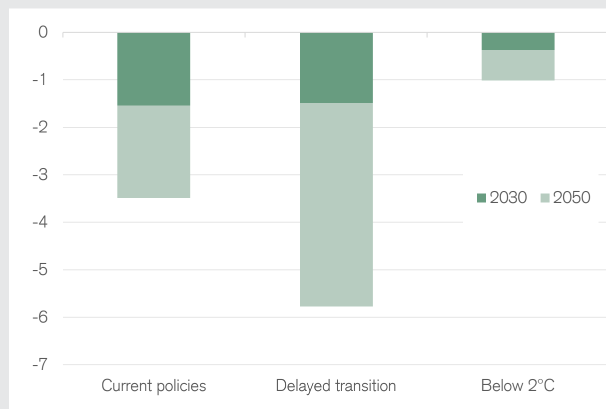
- “Below 2°C” represents an ideal scenario with the smallest cumulative inflation and GDP effect in the long run. That is because physical risks are minimized (albeit not eliminated) and the transition is orderly, i.e., gradual and well communicated so that economies can adapt. Moreover, fiscal policy is assumed to partially mitigate negative side effects by supporting private consumption. The trajectory over the first 15 years of this scenario serves as a good approximation for pure transition risks.
- The “Current Policies” scenario, in contrast, is a good approximation for pure physical risks. The countries most exposed to global warming, rising sea levels and extreme weather events see the highest GDP losses. Among our CMA countries, these are Australia, China, India and some Latin American countries (Figure 4).
- In “Delayed Transition,” both transition and physical risks materialize to some extent. Consequently, countries with a carbon-intensive economy and high exposure to global warming like China and India lose out the most.

Among the three scenarios, “Delayed Transition” produces the worst outcome by 2050. In contrast, the "Below 2°C" scenario can even be net positive for economies with a carbon-competitiveness advantage such as Singapore and Switzerland – provided the transition is orderly. Beyond 2050, the “Current Policies” scenario is likely to become most damaging, as the delayed response should still have a limiting effect on the physical impact of climate change over time.

[1] The NGFS scenarios use integrated assessment models (IAM) to determine climate damage in various emission and temperature scenarios. We base our analysis on the results of the REMIND-MAgPIE model, a general equilibrium model with intertemporal optimization and endogenous change under perfect foresight. The IAM model results are then used as inputs for the National Institute Global Econometric Model (NiGEM) to obtain more detailed macroeconomic information.

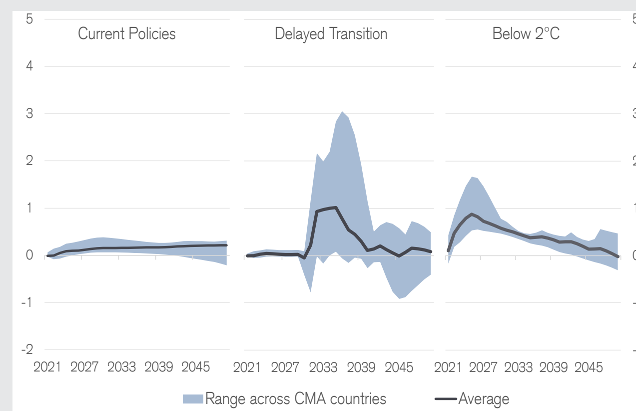
Figures 1 and 2: The benefits of orderly decarbonization efforts clearly outweigh the costs

Cumulative GDP impact, average across CMA countries, percentage point deviation from baseline



Source: NGFS, Credit Suisse

Cumulative inflation impact, percentage point deviation from baseline



Source: NGFS, Credit Suisse

Greenflation occurs during the transition phase

Figure 2 reveals that "Greenflation," i.e., inflation due to climate change, is mostly a transition story. The negative supply shock drives the general price level upward in the short to medium term, but the effect subsides in the long run as carbon-efficient supply adjusts. If no climate action was taken, the inflationary pressure would be very muted first and later driven by physical risks, as reflected in the "Current Policies" scenario and in the first decade of "Delayed Transition."

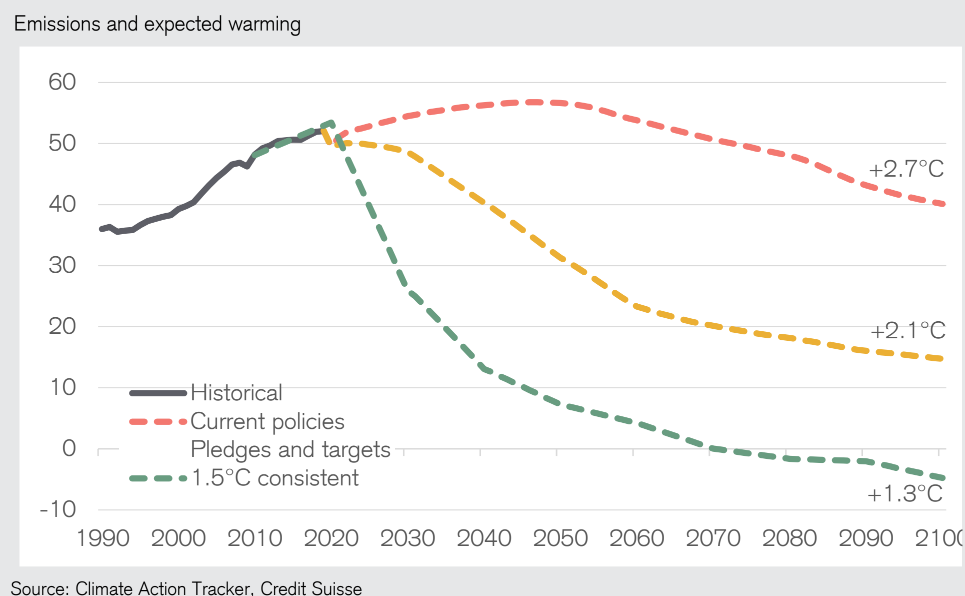
Smallest impact in a smooth transition

Generalizing these results, we can say that, on the margin, the climate transition represents a negative supply shock as the emission of greenhouse gases is made more costly or becomes outright constrained. This results in lower growth and higher inflation, with large distributional but moderate aggregate effects. Fiscal and monetary policy can mitigate or amplify the distributional effects, depending on policymakers' choices. The smoother the transition, the smaller the overall impact. A case in point is the European Union, where decarbonization efforts have been ongoing for a decade, without noticeable side effects. Consequently, the gradual phase-in of many of the European Green Deal policies is also unlikely to materially affect growth and inflation over the next five years (Table 1).

World currently on the path toward the "Hot-house world" sce-nario

Which of the three scenarios is most likely to materialize? Based on the climate policies in place, the world is currently on the trajectory to a "Hothouse world" (Figure 3). Even when considering targets and pledges, not just implemented measures, the projected temperature increase of 2.1°C would still fall short of the Paris Agreement goal of "well below 2°C, preferably 1.5°C." In this scenario, physical risks would be the dominant factor, as transition efforts would be insufficient. The macroeconomic projections we make for our CMAs cover the next five years. For the physical risks stemming from climate change, this is a rather short horizon. While in various regions, damage due to natural disasters or extreme weather events is likely to increase over the next five years, the isolated impact on our macro variables would likely be small and dominated by other factors. Hence, in this scenario, climate change should probably not impact our macroeconomic outcomes over our CMA horizon of five years in a material way.

Figure 3: Climate action is currently insufficient to keep global warming well below 2°C



Source: Climate Action Tracker, Credit Suisse

But it is far from a given that the world will remain on the "Hothouse world" trajectory. Some countries might meaningfully advance their climate actions within the next five years. Transition risks would then rise in the nearer term, and the impact of climate change on economies could be much more immediate. The two critical questions for our CMAs are therefore (1) how likely meaningful policy action to address climate change is over the coming years, and (2) what such policy action would mean for the economies we cover.

Heterogeneous macro impact of more forceful climate action

In previous research[2], we explored how more forceful climate action would affect economies around the world. We can thus answer question (2) by drawing on a combination of these results and the NGFS transition risk component. More forceful climate action could include a coordinated increase in the global carbon price and wider adoption or more stringent regulation of fossil fuel use, which raises fossil fuel costs and represents an indirect price for carbon. Europe, the United Kingdom and Switzerland are in a relatively good position to cope with such accelerated climate action. They have made progress toward the use of renewable energy and carbon efficiency. Conversely, rising carbon prices would prove more of a headwind to growth in China and broader Asia and many other emerging economies. Among the major countries, India, China and Russia would be most negatively affected, according to our estimates.

How likely is more forceful climate action?

The answer to question (1) – the likelihood of an accelerated transition and the shift to the "Below 2°C" scenario – is less straightforward and constantly changing. In last year's CMAs, we concluded that faster and more forceful action to reduce carbon emissions was possible in light of the Democrats' Senate majority in the USA, the Greens' major role in the new German government and high expectations of international cooperation heading into COP26 in Glasgow. Since then, the world has seen the outbreak of war in Europe and a further rise in geopolitical tensions between the USA and China. It has also suffered a massive energy shock, largely unrelated to the green transition but with major implications for climate policy.

2022 events have changed the probabilities

On the positive side, the global energy supply crunch has put energy independence considerations at the top of the agenda of many countries. This should increase the appetite for faster climate action, given that energy independence makes a strong case for going green and expanding renewable energy capacity. However, this will likely play out only in the medium to long term.

Over the next two to three years – thus more than half of our CMA forecast horizon – the negative side effects of the energy shock will likely dominate and delay transition efforts. The prospect of an energy crisis has put a higher priority on energy security than on the emission intensity of energy, as the reactivation of coal energy and the emission-intensive re-routing of global commodity flows show. While the strong increase in energy prices brings forward energy

[2] "Impact of greater political action to address climate change" in Capital Market Assumptions, October 2021; "The cost of carbon after COP26," Economics Alert, November 2021.

efficiency measures, it likely also reduces the political appetite for additional unpopular climate policies. Moreover, the geopolitical tensions with China might stand in the way of intensified international cooperation. Recent efforts to "friend-shore" supply chains and thus critical inputs are even curtailing the economic case for adopting solar and wind power by raising their costs.

Incremental transition progress remains base case

Hence, in our view, the most likely base case over the next few years is one of only incremental progress in addressing climate change. We expect to see more green investment and a gradual strengthening of measures rather than a sudden and dramatic policy shock. That said, the global developments since last year's COP26 in Glasgow have increased the risk that climate action will be uncoordinated across regions, possibly postponed and less effective. In other words, a disorderly and delayed transition has become more likely. But that may change again.

Assessing the likelihood of climate policy actions

Qualitative assessment combined with quantitative indicator

Indeed, rapid changes in the overall global backdrop suggest that one should avoid extrapolating recent developments. Instead, we try to assess the likelihood of accelerated climate action on a country-by-country basis. In a first instance, we rely on the knowledge of our regional economics teams on the ground – because making an assessment on the evolution of climate policy first and foremost requires forecasting domestic politics. Table 1 provides an overview of their assessment for the key economies. It underpins the base case of incremental progress.

In a second step, we develop a quantitative indicator – the Climate Action Index – that helps us capture the likelihood of shifts in public sentiment and politics. Whether countries implement meaningful climate action in the coming years depends on a variety of factors. The extent of transition and physical risks outlined earlier play a big role, as do domestic and international political pressure, the ambitiousness of national climate commitments, the preparedness for a low-carbon transition and the future orientation of policymaking. We evaluate various variables to capture these factors and combine them into a Climate Action Index. This index shows where we think the likelihood of accelerated climate action is highest.

Low transition and high physical risks make climate action more likely

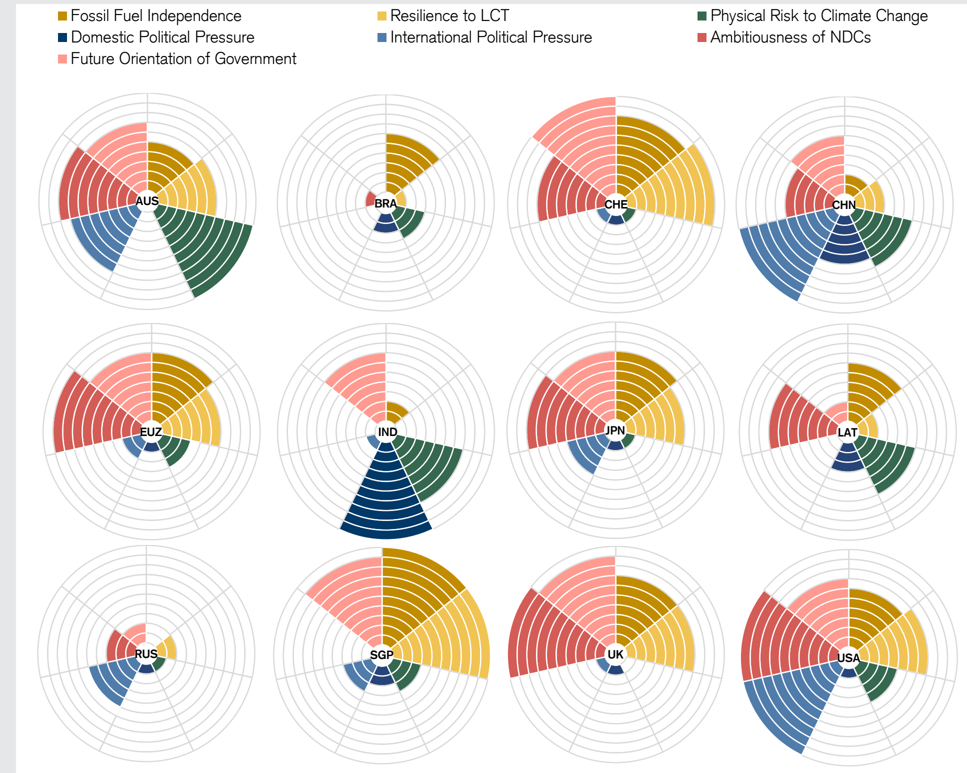
The first variable we look at is transition risk: the higher the expected economic damage from the low-carbon transition, the less likely a country is to embark on such a transition. We can approximate transition risks by evaluating a country's exposure and resilience, according to the "Preparedness for a low-carbon transition" Index of the International Monetary Fund. Fossil fuel dependence serves as a proxy for exposure, whereas strong institutions, stable markets and a dynamic business environment represent high resilience.

As a second variable, we include a country's vulnerability to the effects of climate change, i.e., physical risks based on Goujon et al. (2022)[3]. The higher the physical exposure, the more likely we consider climate action. Overall, the combination of high physical and low transition risks makes a strong case for climate policy, and vice versa.

[3] Goujon et al. (2022): The Physical Vulnerability to Climate Change Index computed at the sub-national level. FERDI Working Paper 305

Figure 4: Various sub-indicators show a differentiated picture for individual countries' likelihood of climate action

Areas are based on standardized values*, whereby a large area indicates a high indicator value relative to the other CMA countries, signaling a high likelihood of climate action. Preparedness indicator (yellow), physical risk (green), political pressure (blue), sustainability efforts of government (red)



* The Eurozone comprises Germany, Finland, France, Austria, Belgium, Ireland, Spain, Portugal, Italy and Greece. For the remaining Eurozone countries, the dataset was incomplete; Latin America includes Chile, Mexico, Colombia and Peru.
Source: International Monetary Fund, Goujon et al (2022), IQAir, Our World in Data, Climate Action Tracker, World Economic Forum, Credit Suisse

That said, countries may not perceive physical risks and transition risks equally. There is a temporal component influencing the weighting of these two factors – the "Tragedy of the horizon." The weight placed on transition risk is larger in the short term but decreases over time. As physical risks become more noticeable, governments will have a bigger incentive to act. We account for this by constructing the Climate Action Index with different weightings for three different time horizons – near, medium and distant future – but only use the near future version with a high transition risk weight for the CMAs.

Large gap between targets and implementation requires further action

Another useful predictor for climate action is the target vs. implementation gap between countries' nationally determined contributions (NDCs), i.e., the national climate commitment, and the policies already in place. We use Climate Action Tracker data to determine this gap. If the gap is large, countries will have to phase in further measures to deliver on their goals. This sub-indicator, however, is highly influenced by decisions of policymakers and therefore quite volatile even in the short run. In the USA, for instance, a shift toward less ambitious targets or a reversal of climate policies under a Republican presidency could mean that the ambitiousness sub-indicator and thus the Climate Action Index would decline.

International and domestic political pressure can trigger progress

International political pressure can also drive climate action. It is reasonable to argue that the countries facing scrutiny to reduce their ecological footprint tend to be the big polluters. By share of global emissions, China would have by far the highest international responsibility to take climate action ahead of the USA. When looking at emissions per capita, it would be Australia and the USA. However, in times of tensions between China and the USA, it is relatively unlikely that international political pressure would result in meaningful climate policies through this channel. We therefore place only a small weight on this sub-indicator in our overall Climate Action Indicator. In addition to international political pressure, we also include a sub-indicator for domestic political pressure. It is represented by air pollution, which lowers the quality of life for the domestic population, increases health expenditures and causes premature deaths.

Future orientation of government plays a role

While all these factors would logically contribute to ambitious climate policy, the reality may be vastly different. Many democracies face an additional burden in implementing climate measures: A mix of urgent problems, a short-term-focused electorate and election-oriented politicians create incentives for immediate results, leaving longer-term threats unaddressed at the expense of future generations. A lack of future orientation in policymaking therefore lowers the likelihood of a government taking early climate action. To control for this, we include the World Economic Forum's (WEF) future orientation of government index as a final sub-indicator.

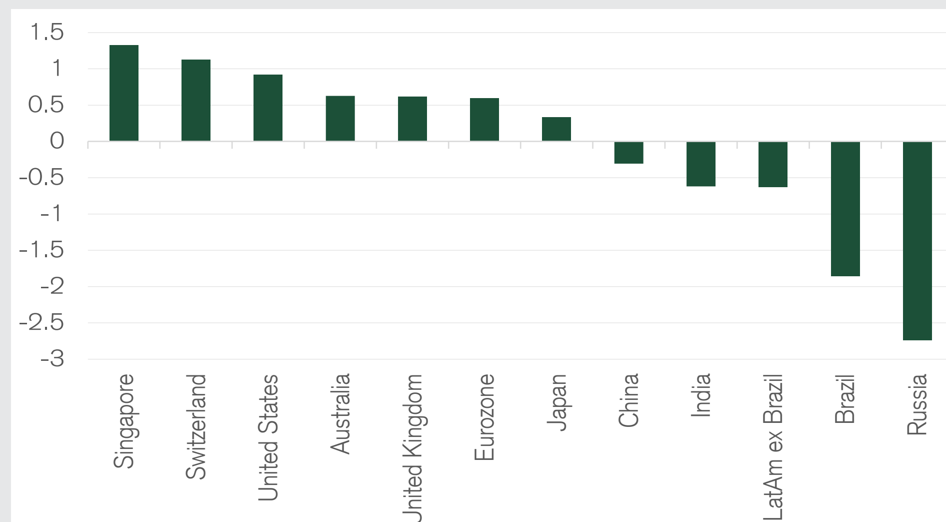
Based on the findings above, we construct the Climate Action Index (the Appendix gives details on the sub-indicators and weighting). A high score indicates an above-average likelihood of climate policy action.

More climate measures likely in Singapore and Switzerland

The Climate Action Index 2022 shows that climate policy measures are most likely to be implemented in Singapore and Switzerland (Figure 5). The two countries are fairly well-prepared for the transition to a low-carbon economy, with low vulnerability to climate policy measures and high resilience of their economies and institutions to the externalities of this transition. In third position is the USA, where the overall carbon intensity of the economy is below average despite a large fossil fuel sector, and where a very dynamic private sector would be able to harness the opportunities of a transition. The ambitious NDCs announced under the Biden administration are another factor increasing the probability of climate policies. However, as mentioned earlier and outlined in Table 1, a potential shift back to a Republican presidency in 2024 could reverse some of these sustainability efforts.

Figure 5: Likelihood of accelerated climate action is high in Singapore and Switzerland, low in Brazil and Russia

Climate Action Index, synthetic index, mean of our sample = 0



Source: Credit Suisse

Intra-regional heterogeneity in the Eurozone

The Eurozone can be found in the upper midfield of the ranking. While Germany is very well-equipped to harness the opportunities of the transition to a low-emission economy and would be only second to Singapore in the Climate Action Index if countries in the Eurozone were analyzed individually, other European countries like Greece rank significantly lower. Different starting points of the Eurozone members explain the region's medium position in the index. For the European Green Deal and further climate action to come through politically, it will be crucial to ensure intra-regional transfers to compensate for these different starting points.

No meaningful climate measures likely in Brazil and Russia

Over the next five years, climate policy measures are least likely to be implemented in Brazil and Russia. Both countries lack favorable conditions for a low-emission transition because of a relatively low resilience to the transition, rather low vulnerability to the physical effects of climate change, relatively little political pressure to take climate action, as well as limited sustainability efforts of the government. Russia's position is further hampered by its high economic reliance on fossil fuels.

Ongoing evaluation as transition risks and gains unfold

Our Climate Action Index hence suggests that more forceful climate action over the next few years is more likely in Singapore, Switzerland, the USA, Australia, the UK and the Eurozone. This means that the risk of a negative supply shock from the climate transition – on top of our baseline CMA estimates – is highest in these regions. That said, our analysis also shows that these countries are relatively well prepared for the transition, which reduces the expected impact. The USA is a special case: Fundamental factors would suggest more climate action, but political support may wane. That said, the private sector's relatively high preparedness for a low-carbon transition could mean that the economy might advance its transformation, even in the absence of broad federal climate measures.

How exactly the effects on growth and inflation will play out in all regions will depend on the specific actions taken. Our regional economics teams stand ready to evaluate the actual impact as climate policy evolves and to incorporate the effects into our baseline forecasts. Meanwhile, climate-aware investors can use the various dimensions of our Climate Action Index if they want to understand where to look out for more pronounced transition risks – or gains.

Table 1: Current state of climate policies in the key economies

USA	• Cap-and-trade programs in place in one-quarter of the states, focusing mostly on the power sector with the exception of the economy-wide program in California. Emission ceilings are not ambitious. • State-specific legislation more likely than federal regulations and legislation due to a foreseeable gridlock in Congress. • A broad-based carbon tax or carbon border adjustment tax are unlikely in the foreseeable future. • Policy rollbacks to be expected in case of a Republican victory in the 2024 election.
Eurozone	• Ambitious climate agenda with broad sector coverage in the "European Green Deal," but legislative adoption is still pending. • Many measures are scheduled to be phased in only toward the end of the forecast horizon (Carbon Border Adjustment Mechanism, extension of the Emission Trading System…). • The Russia-Ukraine war accelerates public investment in renewable energy infrastructure (REPowerEU plan), but slows down other transition efforts in the near term. • The surge in energy prices is considerably higher than any inflationary impact expected from a gradual climate transition (currently 10.2 pp increase in headline inflation within 24 months, compared to 0.7 pp within five years expected by NGFS in the "Below 2°C" scenario). • European emission allowances in the Emission Trading System have seen a 100% price surge since the beginning of 2021. This compares to a roughly 500% price surge for natural gas since early 2021. • The climate transition impact will thus likely be outweighed by the impact of the war-induced energy crisis throughout our CMA forecast horizon.
China	• Climate policy focuses on emission reduction targets for electricity generation and consumption. • Public investment in green infrastructure (renewable energy production, electricity grid updates, low-emission buildings…). • Fiscal subsidies will likely be deployed to keep electricity prices stable, limiting the inflation impact. • Positive GDP effect from renewable capital stock accumulation, negative GDP effect from higher costs for electricity producers, with the latter likely dominating.
India	• Fiscal response to the pandemic supported a "fossil-fuel recovery." • Commitment to accelerate renewable energy transition and reduce carbon emissions at COP26. • Tools include (i) public incentives for households and industry, (ii) renewable energy infrastructure investments partially financed by sovereign green bonds, (iii) targets for energy consumption reduction and (iv) minimum requirements for green energy use. • Introduction of an explicit and broad carbon tax is unlikely within the CMA forecast horizon.

Assessing the performance of climate-aware portfolios

- Portfolio managers (PMs) across financial institutions are faced with increasing demand for sustainable investments and ESG-integrated portfolios.
- In this text, we examine whether sustainable investing with a view on climate change can generate levels of risk-adjusted return on a par with traditional portfolios.

Exclusions – simple, but maybe not best

Exclusions are perhaps the simplest and most trackable way of reducing the carbon footprint of a portfolio. Many financial institutions have developed their own exclusion policies to limit their exposure to certain business activities. Among these exclusions, we often find controversial industries such as weapons manufacturing, tobacco, or thermal coal production. Looking at the MSCI World sectors (November 2021 composition) by median Scope 1, 2 and 3 greenhouse-gas (GHG)[1] intensities, the three most carbon-intensive sectors are energy, utilities and materials. One approach would be to outright exclude these sectors from the investable universe. While this would undoubtedly reduce the carbon footprint of a portfolio, it would also exacerbate the performance risk (tracking error) to the parent index. As of 19 November 2021, excluding these three sectors would have implied excluding about 10% of the MSCI World Index by market capitalization. In terms of economic rationale, companies in those sectors are very much needed in any transition toward a greener economy, as such a transition requires increased investments and thus a greater need for raw and industrial materials as well as energy.

Consequently, our approach does not exclude specific sectors; rather, we aim to keep the same industry composition and country exposure as the index and still select the most promising companies in terms of climate change profiles. We apply a quintile approach, computing the best and worst performing quintiles[2] of the MSCI World Index in terms of Scope 1 and 2 intensities, while keeping the country and industry composition fixed. Financial data in this study come from Bloomberg. The climate-related data come from MSCI.

We first analyze operational financial performance by looking at the distribution of some common profitability, valuation and growth ratios across the three portfolios. We focus on gross profits to assets (GPA) and five-year average adjusted[3] return on equity (ROE) as profitability ratios. Regarding valuation and growth ratios, we have chosen to use price-to-book (P/B) and sales growth, respectively.

[1] GHG intensity is derived from GHG emissions normalized by company revenue. It allows for a comparison of companies of different size. It is expressed in tons of carbon dioxide equivalent (CO2e) per USD 1 million of revenue.

[2] A quintile divides the population into five equal subsets, meaning that we consider the 20% best performing and 20% worst performing assets.

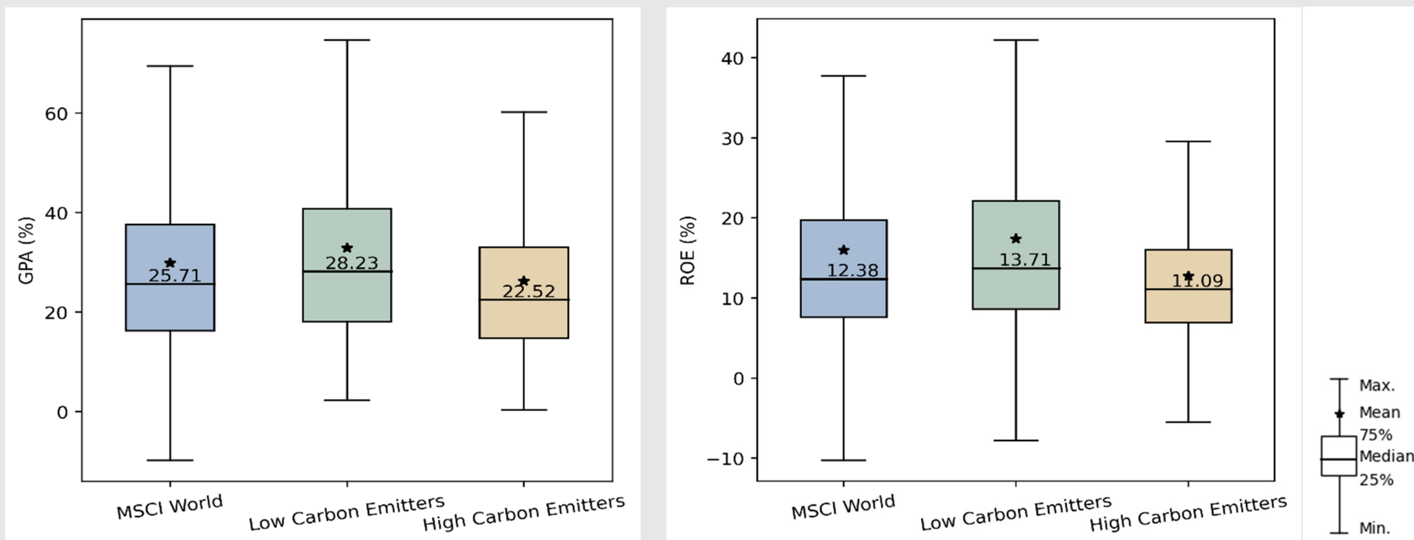
[3] Adjustments come from Bloomberg methodology of removing one-time events or abnormal expenses like legal settlements and restructuring costs reported in companies' financial statements that can distort the analysis of a company's financial performance.

Low carbon emitters tend to be more profitable

Exhibit 1 shows how the 20% of companies with the lowest carbon emissions compare in terms of profitability in 2021. It shows that low carbon emitters have been more profitable than the rest, especially compared to high carbon emitters. Our findings are in line with Mulder et al. (2020). They studied the relationship between carbon emissions and financial performance at the firm level and found that carbon efficiency is associated with higher profitability and lower systematic risk on average. There are several reasons why firms' carbon emissions' level may affect their profitability.

Although our intuition might lead us to believe that low carbon emitters divert from pure profit-maximizing behavior, the results suggest that the introduction of carbon pricing regulation in many industries has given them some form of competitive advantage. Furthermore, Mulder et al. (2020) argue that low carbon emissions often reflect better resource usage, which may translate into higher productivity at the firm level and ultimately affect the bottom line.

Exhibit 1: Gross profits to assets and five-year average adjusted return on equity distributions for MSCI World, low and high carbon emitters in 2021



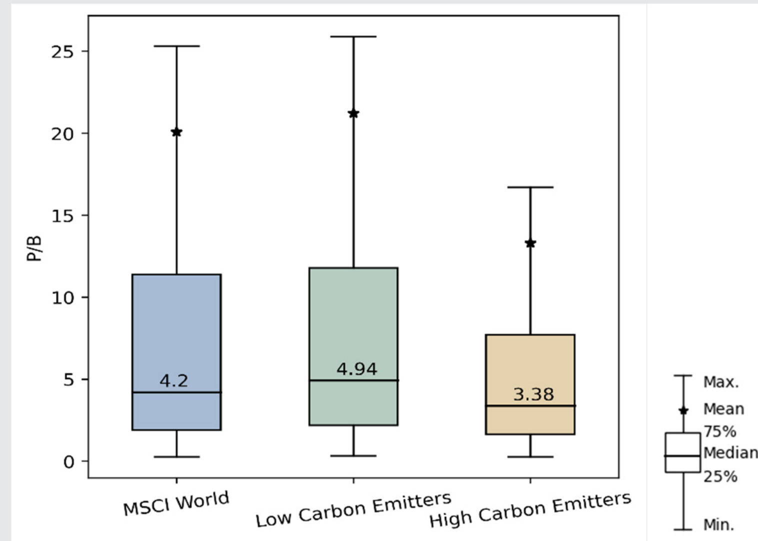
Source: Bloomberg, MSCI, Credit Suisse calculation

Exhibit 2 shows that low carbon emitters tend to have a higher valuation than both the benchmark constituents and the high carbon emitters, on average. This result suggests that financial markets may actually be pricing the environmental performance of firms insofar as carbon-inefficient assets seem to be trading at a discount[4]. This result is also in line with the finding of Mulder et al. (2020) that low carbon emitters tend to be less vulnerable to systematic risk. Lower risks translate into higher valuations[5].

[4] See Matsumura et al. (2014) and Noh & Park (2017)

[5] In a CAPM framework where systematic risk is measured through a firm's beta, a lower value for beta implies a lower cost of capital since the cost of equity is reduced. This, in turn, leads directly to higher valuation in the context of a DCF model framework.

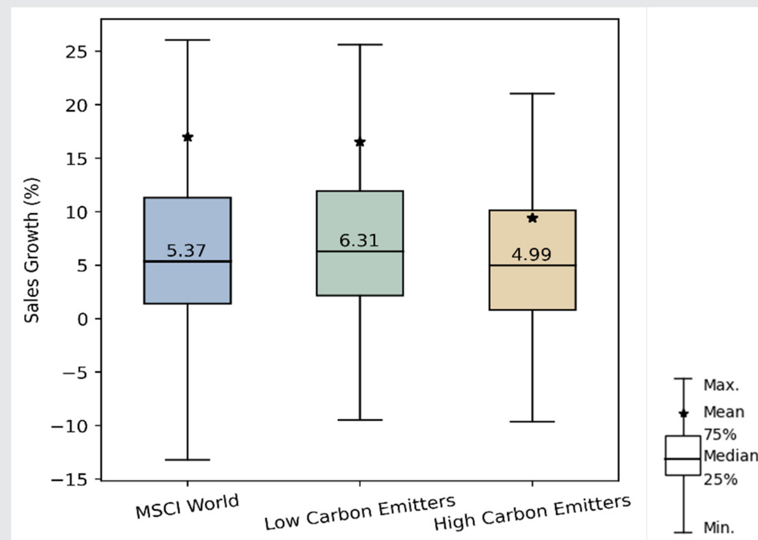
Exhibit 2: Price-to-book distribution for MSCI World, low and high carbon emitters in 2021.



Source: Bloomberg, MSCI, Credit Suisse calculation

In terms of growth, Exhibit 3 shows that low carbon emitters seem to be leading the way with higher median sales growth while high carbon emitters underperform. This could in part be due to the carbon-transition risk that high carbon emitters bear in the medium to long term. In an effort to transition toward a greener economy, consumers and investors have started to adapt their consumption and investment behaviors. Furthermore, companies that are at risk of stranded assets face unknown capital expenditures and carbon taxes going forward. As a result, more capital is flowing toward carbon-transition leaders to the detriment of the laggards, which could partly explain why they are trailing behind in terms of growth.

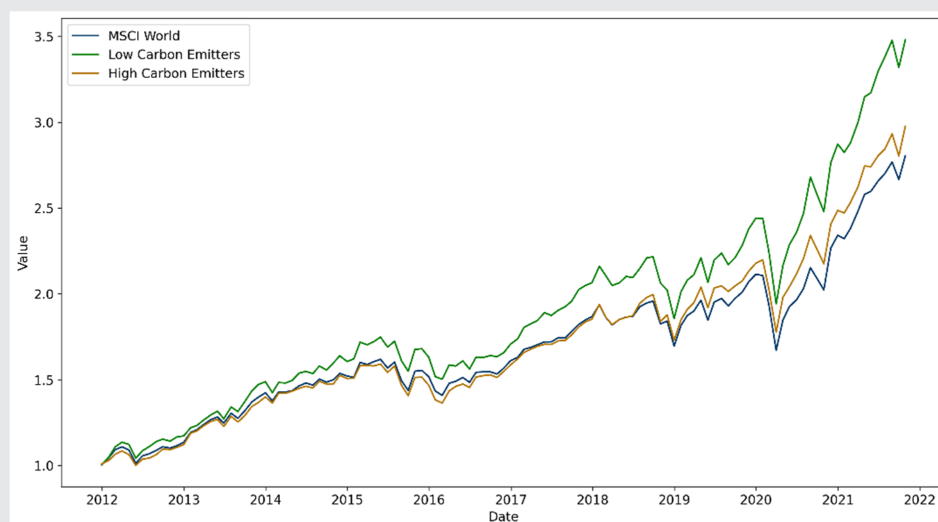
Exhibit 3: Sales growth distribution for MSCI World, low and high carbon emitters in 2021.



Source: Bloomberg, MSCI, Credit Suisse calculation

An important aspect for investors would be the relation between environmental concern and portfolio performance. To get a sense of this relation, we look at the change in value of the low and high carbon emitters in relation to the parent index during the last decade. Our analysis considers the changes in the MSCI World constituents over time. We form new quintiles every six months based on the composition of the MSCI World and carbon intensity figures prevailing at the time. In Exhibit 4, the total return lines show an outperformance of the low carbon emitters vis-à-vis both the benchmark (total market) and the high carbon emitters. Thus, over the past decade incorporating carbon intensity features in the stock selection process did actually improve performance. Past performance is no guarantee for future performance, but as the world still appears very much at the beginning of dealing with climate change, climate considerations should be taken into account when investing. Exhibit 5 summarizes the key aspects of historical performances: Annualized returns and volatilities are quite similar across all three portfolios, albeit a bit higher for low carbon emitters in both respects. Thus, the risk-adjusted return measured by the Sharpe ratio (SR) is somewhat higher for low carbon emitters. The Sortino ratio also provides valuable information in that it only considers a portfolio's downside risk; investors only truly care about the latter as upside volatility is usually appreciated. The low carbon emitters portfolio shows a higher ratio, suggesting a better trade-off between risk and return. Turning now to maximum drawdown, the differences are negligible. Low carbon emitters on average do not appear to be less resilient to market shocks. Overall, the results are quite promising, indicating that the degree of GHG intensity can be reduced with no degradation in portfolio fundamentals.

Exhibit 4: Total return lines normalized to 1 in 2021 for MSCI World, low and high carbon emitters for the period 2012-2021



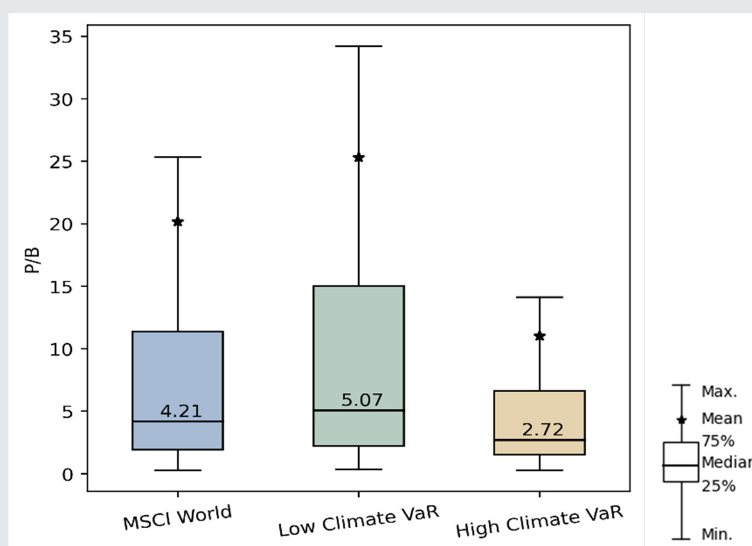
Source: Bloomberg, MSCI, Credit Suisse calculation. Past performance is no guarantee for future performance

Exhibit 5: Comparative data on quintile analysis

	MSCI World	Low carbon emitters	High carbon emitters
Number of constituents [min, max]	[1547, 1654]	[316, 351]	[271, 338]
Annualized return (%)	10.9	13.5	11.6
Annualized volatility (%)	10.9	12.6	10.8
Sharpe ratio	0.95	1.02	1.01
Sortino ratio	1.01	1.26	1.09
Maximum drawdown (%)	-20.9	-20.4	-19.2
Scope 1, 2 intensity in 2021 (tCO_2/million USD)	136.9	18.1	288.6

Source: Bloomberg, MSCI, Credit Suisse calculation
Sharpe ratio: The Sharpe ratio measures the expected return of an investment compared to a risk-free return and adjusted for its risk.
Sortino ratio: The Sortino ratio measures the expected return of an investment compared to a risk-free return and adjusted for its downside risk.

Exhibit 6: Price-to-book distribution in 2021 for MSCI World compared to low and high CVaR companies



Source: Bloomberg, MSCI, Credit Suisse calculation

This conclusion is corroborated by another climate metric: The recently introduced Climate VaR (CVaR) by MSCI represents a forward-looking assessment that has the advantage of combining both environmental and financial data. The CVaR estimates the potential loss (or profit) over a 15-year horizon that might occur from climate-related factors. It consists of three pillars: physical risks such as adverse weather events (e.g., effects due to damage to infrastructure assets), transition risks such as new climate change policy requirements (e.g., carbon emission restrictions) and technology opportunities (that might arise due to transition changes required to achieve a low carbon economy, for instance). These pillars are considered in three different scenarios for future implied temperature increases of 1.5°C, 2°C and 3°C.

Following the quintile approach, we classify the MSCI constituents according to the best and worst CVaR quintiles, based on aggregate company numbers. Exhibit 6 shows the results for the 1.5°C

scenario[6] for the P/B valuation metric. As for carbon emissions, the companies with lower CVaR have a higher valuation.

The differences in P/B between the benchmark, low and high CVaR companies are greater than when looking at GHG emissions alone, suggesting that the market might be already more aware of climate risks than evidenced by carbon emissions alone. This might be due to the role of financial considerations in the CVaR calculations, making it a better metric to consider company valuation and environmental risks. Looking at the previously considered financial metrics, GPA and sales growth, we found qualitatively similar results.

To assess the relationship between emissions and CVaR, we can look at the GHG emissions for the best and worst quintile of CVaR exposure. We see that selecting a portfolio based on lower CVaR reduces GHG emissions. Similarly, the portfolio with lower GHG emissions also implies lower climate risk, as expressed by CVaR.

Exhibit 7: Mean and median values for GHG emissions (tCO2 e / USD million sales) for MSCI World compared to lowest and highest quintile of CVaR exposure for the 1.5°C scenario

	MSCI World	Low CVaR exposure quintile	High CVaR exposure quintile
Mean GHG emissions	206.21	107.7	330.28
Median GHG emissions	22.8	20.05	26.85

Source: Bloomberg, MSCI, Credit Suisse calculation

Exhibit 8: Mean and median 1.5°C scenario CVaR (%) values for MSCI World compared to lowest and highest quintile of GHG emissions

	MSCI World	Low carbon emitters	High carbon emitters
Mean CVaR	-14.07	-11.04	-20.4
Median CVaR	-6.73	-6.34	-9.28

Source: Bloomberg, MSCI, Credit Suisse calculation

Our results suggest that climate policy risks affect high carbon emitters more when the need to reduce emissions affects financial outcomes. Additionally, low carbon emitting companies might be more prepared to apply technological opportunities.

[6] The conclusions of the results shown for the 1.5°C scenario are also qualitatively found for the other two scenarios.

Performance review

- The long-term return forecasts for the global equity index MSCI AC World, a key input to our strategic asset allocation, show no sign of systematic error.
- For 2017, the most recent year for which five-year realizations are available for comparison, we detect a smaller underestimation of the return potential of equities compared to a year ago. Most bond market returns were slightly overestimated.

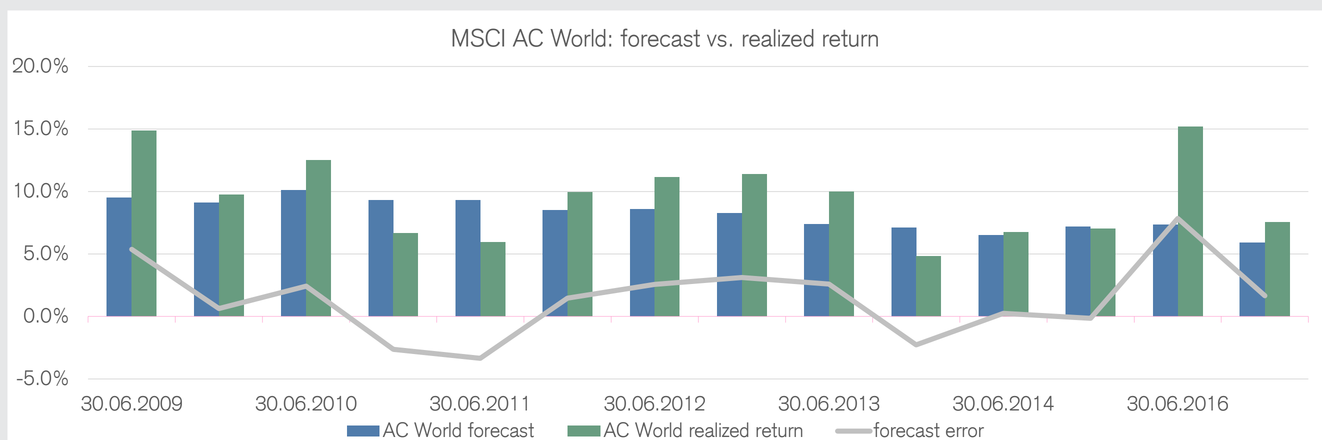
Evaluation of 2008 to 2017 CMA forecasting

In the performance review of our Capital Market Assumptions, we analyze the accuracy and potential biases of our five-year return forecasts, which we publish since 2008. We compare the five-year average forecasts we predicted between 2008 and 2017 with realized returns over the respective five-year periods. We thus want to provide transparency to regular users of these numbers. In our analysis of five-year forecasts covering 2008-2017, we look at the main asset classes as well as the different regions and sub-asset classes.

For example, for the period of 2008 to 2017, our forecasts for MSCI AC World equities showed a mean “absolute” forecast error of 2.7%. Although this asset class exhibits significant historical volatility (forecasted volatility of 17.7% in 2022), our analysts providing those forecasts were able to avoid a structural bias toward over- or underestimating returns over time. As can be seen in the first chart, the forecast errors show periods with over- and underestimations, which are fairly balanced over time.

MSCI AC World equities: Forecast vs. realized return

Annualized forecast returns vs. realized returns for 2008 – 2017



Source: Credit Suisse, Bloomberg Finance L.P.
Note: Up to 2014, the CMAs were updated twice a year. Since then, they are updated annually.

Capital Market Assumptions are no guarantee for future performance and there is no certainty that the expected returns/volatilities will be reached.

Revisiting our 2017 CMA forecasts

Our last full five-year period covers the period from September 2017 to September 2022. For this period, the 2017 forecasts show an under- and over-estimation of realized returns (see scatter chart below) depending on asset classes and regions. In general, bond markets were slightly overestimated, equity markets underestimated.

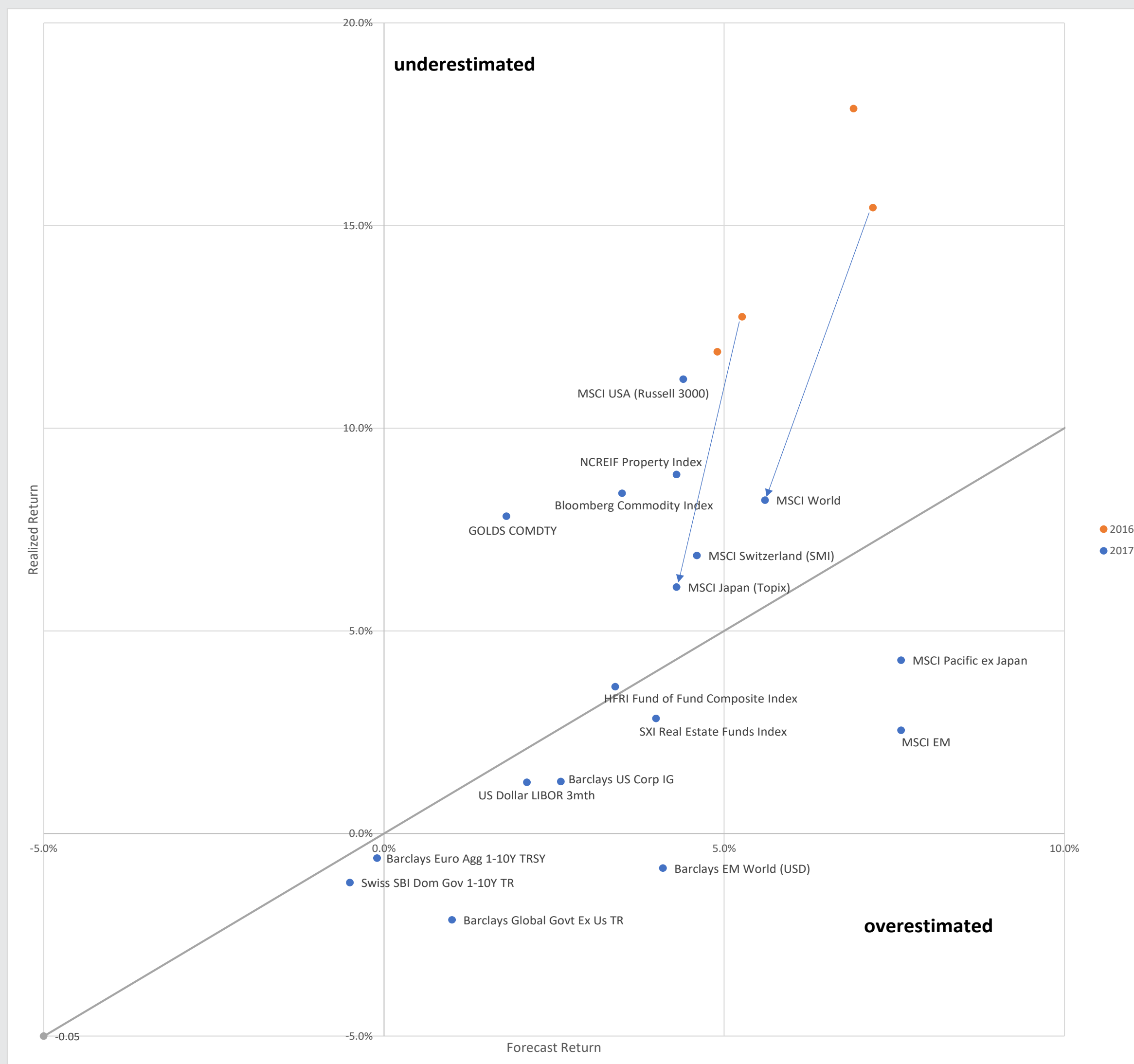
Two unexpected exogenous shocks had a significant effect on both bond and equity markets: the COVID-19 pandemic and then the war between Russia and Ukraine. Reopening after the pandemic and, even more so, the war drove global inflation to unexpectedly high levels, leading to increasing interest rates and, as a result, negative price returns in bond markets.

This year's correction in equity markets has moved the five-year realized returns since September 2017 to September 2022 down compared to realizations of the previous five-year period, closer to the returns we predicted in 2017. In the scatter plot, this is shown using four examples, where the orange dots, showing the combination of our 2016 forecasts with the respective five-year historical performance afterward, move down to the blue dots with the respective combination for 2017. Thus, the underestimation has been reduced versus one year ago.

Forecasts of developed bond markets were rather accurate. However, emerging market bonds and equities show a significantly larger forecast error, having been negatively impacted by the COVID-19 pandemic.

Five-year forecast returns 2017 versus realized returns p.a.

Main CMA categories



Source: Credit Suisse / Index in brackets shows prior benchmark

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Appendix

Summary tables

Equity

Asset class	Index proxy	Projected volatility (p.a.)	Expected return (total return, p.a.)	Cash flow return*
Developed market equities	MSCI World Gross Total Return USD Index	18.2	7.4	2.2
Developed market equities ESG	MSCI World ESG Leaders Gross Return Index	18.1	7.8	2.4
Developed and emerging markets equities	MSCI ACWI Gross Total Return USD Index	18.7	7.6	2.3
US core equities	MSCI USA Gross Total Return USD Index	17.2	6.9	1.9
Eurobloc core equities	MSCI EMU Gross Total Return EUR Index	20.4	7.4	3.5
UK equities	MSCI UK Gross Total Return Local Index	14.9	8.4	4.1
Swiss equities	MSCI Switzerland Gross Total Return Local Index	15.2	6.1	2.7
Japanese equities	MSCI Japan Gross Total Return Local Index	19.7	5.8	2.4
AC Asia ex Japan equities	MSCI AC Asia ex Japan Gross Total Return USD Index	22.2	8.1	3.0
Australian equities	MSCI Australia Gross Total Return Local Index	15.4	7.3	3.9
Singapore equities	MSCI Singapore Gross Total Return Local Index	21.0	6.1	2.5
Emerging market equities	MSCI Emerging Gross Total Return USD Index	24.4	8.0	2.9
Emerging market equities ESG	MSCI EM ESG Leaders Gross Total Return Index	23.3	9.0	2.4
China A series equities	MSCI China A Onshore Gross Total Return Local Index	30.9	7.7	2.0
China equities	MSCI China Gross Return HKD Index	29.9	8.0	2.7
Indian equities	MSCI India Gross Return INR Index	25.2	8.3	1.3

Source: Credit Suisse calculations

* Cash flow return represents our forecast annualized return from payouts by the investment over five years. For equity and real estate, it represents the return related to the forecast dividend payouts, while for fixed income, it is the forecast payout from fixed coupon payments for the respective bond index. For assets like hedge funds or private equity, payouts are expected to be reinvested and thus returns fully accrue via capital appreciation; cash flow returns are therefore assumed to be zero.

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Fixed income

Asset class	Index proxy	Projected volatility (p.a.)	Expected return (total return, p.a.)	Cash flow return*
Global investment grade convertible bonds	Refinitiv Global Focus IG (USD)	9.9	5.7	0.7
US govt, medium-term bonds	Barclays US Intermediate Treasury TR Index Value Unhedged	3.7	4.2	4.0
US govt, long-term bonds	Barclays US Long Treasury Total Return Index Value Unhedged	12.3	4.1	4.0
US intermediate credit bonds	Barclays U.S. Intermediate Credit TR Index Value Unhedged	5.0	4.9	4.5
Senior loans	Credit Suisse Leveraged Loan (USD) TR Index	9.0	6.8	7.3
US high yield bonds	Barclays US Corporate High Yield Total Return Index Value Unhedged	11.5	6.9	7.6
US inflation-linked bonds	Barclays US Govt Inflation-Linked 1 to 10 Year TR Index	4.7	4.2	3.6
US securitized MBS/ABS/CMBS	Barclays US Securitized MBS/ABS/CMBS (USD) TR Index	3.4	3.6	4.2
US floating rate notes	Barclays US Floating Rate Notes <5Y (USD) TR Index	2.1	3.3	3.8
Green bonds	Bloomberg MSCI Global Green Bond 1-10 year (unhedged USD)	6.8	2.5	2.5
Euro govt medium-term bonds	Barclays EuroAgg Treasury 1-10 Years TR Index Value Unhedged EUR	3.9	1.8	2.0
Euro govt long-term bonds	Barclays Euro-Aggregate Government 10+ Year TR Index Value	9.2	0.6	3.3
Euro corporate bonds	Bloomberg Euro-Aggregate Corporate Total Return Index Value Unhedged	4.5	2.9	3.1
Euro high yield bonds	Barclays Pan-European High Yield (Euro) TR Index Value Unhedged	13.1	6.3	7.1
Euro inflation-linked bonds	Barclays Euro Govt Inflation Linked Bonds 1 to 10 Year TR Index	4.4	1.8	1.9
Sterling medium-term govt bonds	Bloomberg Sterling Aggregate Gilts 1-10Y Index	4.5	3.6	3.9
Sterling inflation-linked bonds	Barclays UK Inflation Linked Bonds 1 to 10 Year TR Index	5.7	3.6	3.8
Sterling corporate bonds	Barclays Sterling Corporate TR Value unhedged GBP	7.1	5.4	5.8

Source: Credit Suisse calculations

*Cash flow return represents our forecast annualized return from payouts by the investment over five years. For equity and real estate, it represents the return related to the forecast dividend payouts, while for fixed income, it is the forecast payout from fixed coupon payments for the respective bond index. For assets like hedge funds or private equity, payouts are expected to be reinvested and thus returns fully accrue via capital appreciation; cash flow returns are therefore assumed to be zero.

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Fixed income

Asset class	Index proxy	Projected volatility (p.a.)	Expected return (total return, p.a.)	Cash flow return*
Swiss govt bonds (only Eidgenossen)	Swiss Bond Index SBI Domestic Government 1-10 Total Return	2.4	0.9	1.8
Swiss liquid bonds (ex Eidgenossen)	Credit Suisse Liquid Swiss Ex-Swiss Government (CHF) TR Index	3.2	2.6	2.5
Japan all maturities govt bonds	Bloomberg Asian-Pacific Japan Treasury Index	2.2	0.2	0.8
Australia all maturities govt bonds	Bloomberg Global Tsy Australia Index	5.2	3.5	3.8
Singapore all maturities govt bonds	Singapore All Maturities Govt Bonds (SGD) TR Index	4.3	3.0	2.7
EM hard currency bonds	J.P. Morgan EMBI Emerging Markets Global Diversified HC Composite (USD) TR Index	11.3	8.3	8.2
EM corporate bonds	J.P. Morgan Corporate EMBI Broad Diversified Composite Index	9.6	7.7	7.1
EM local currency bonds	J.P. Morgan GBI-EM Global Diversified Composite Unhedged USD	13.1	6.6	6.8
EM Asia local currency bonds	J.P. Morgan GBI Emerging Markets Asia Diversified Local Currency Govt Bond TR Index	5.4	3.1	4.1
Asian investment grade bonds	Bloomberg EM Asia USD Credit High Grade TR Index Value Unhedged USD	5.0	5.5	5.2
Asian high yield bonds	Bloomberg EM Asia USD Credit High Yield TR Index Value Unhedged USD	11.2	7.5	12.0
China govt bonds	J.P. Morgan GBI Emerging Markets China Unhedged	3.6	1.7	2.7
India govt bonds	J.P. Morgan GBI Emerging Markets India Unhedged	6.4	6.8	7.3

Source: Credit Suisse calculations

*Cash flow return represents our forecast annualized return from payouts by the investment over five years. For equity and real estate, it represents the return related to the forecast dividend payouts, while for fixed income, it is the forecast payout from fixed coupon payments for the respective bond index. For assets like hedge funds or private equity, payouts are expected to be reinvested and thus returns fully accrue via capital appreciation; cash flow returns are therefore assumed to be zero.

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Alternative investments

Asset class	Index proxy	Projected volatility (p.a.)	Expected return (total return, p.a.)	Cash flow return*
Commodities	Bloomberg Commodity (USD) TR Index	18.9	5.0	
Gold	Gold Spot	15.1	4.9	
Hedge funds	HFRI 500 Fund Weighted Composite Index	7.5	5.5	
Hedge funds (passive approach)	Hedge Fund Research HFRX Global Hedge Fund Index†	7.9	3.5	
Private equity (TR)	Credit Suisse Private Equity Composite (80% Buyout, 20% Venture Capital) (USD) TR Index	16.7	10.3	
Private equity (IRR)	Credit Suisse Private Equity Composite (80% Buyout, 20% Venture Capital) (USD) TR Index	22.2	12.0	
Private debt (IRR)	Preqin Capital Quarterly Index Private Debt	17.3	9.4	
Private debt (TR)	Private Debt Manually Generated TR Series	11.2	7.6	
US real estate equities	MSCI Real Estate US	22.6	4.9	3.0‡
US direct properties	NCREIF Property (USD) TR Index	12.5	3.8	3.6
Developed markets real estate equities	MSCI Real Estate World	21.4	4.9	3.2
Eurozone real estate equities	MSCI Real Estate EMU	25.4	4.8	5.4
UK real estate equities	MSCI Real Estate UK	23.3	5.1	3.4
Swiss real estate, funds	SXI Real Estate Funds (CHF) TR Index	7.1	4.1	2.7
Australia real estate equities	MSCI Real Estate Australia	19.7	6.2	3.8
Singapore real estate equities	MSCI Real Estate Singapore	29.5	6.4	3.9
Asia Pacific real estate equities	MSCI AC Asia Pacific Real Estate	22.4	4.2	3.9

Source: Credit Suisse calculations

* Cash flow return represents our forecast annualized return from payouts by the investment over five years. For equity and real estate, it represents the return related to the forecast dividend payouts, while for fixed income, it is the forecast payout from fixed coupon payments for the respective bond index. For assets like hedge funds or private equity, payouts are expected to be reinvested and thus returns fully accrue via capital appreciation; cash flow returns are therefore assumed to be zero.

† Fully investable benchmark for first-time hedge fund investors who access the broad hedge fund space without specialized due diligence.

‡ MSCI US All Property Net Operating Income Yield

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Currencies

Asset class	Index proxy	Projected volatility (p.a.)	Expected return (total return, p.a.)
EURUSD	EUR/USD Spot	9.7	1.0
GBPUSD	GBP/USD Spot	8.9	0.7
AUDUSD	AUD/USD Spot	12.6	0.2
USDJPY	USD/JPY Spot	9.2	-3.5
USDCHF	USD/CHF Spot	9.0	-0.2
EURCHF	EUR/CHF Spot	5.4	0.8
USDSGD	USD/SGD Spot	5.1	-0.4
USDCNY	USD/CNY Spot	4.1	0.3
USDINR	USD/INR Spot	7.6	0.9

Source: Credit Suisse calculations

Cash

Asset class	Index proxy	Projected volatility (p.a.)	Expected return (total return, p.a.)
Taxable cash USD	J.P. Morgan Cash Index USD 1 month	0.6	3.3
EUR cash	J.P. Morgan Cash Index Euro Currency 1 month	0.5	1.7
GBP cash	J.P. Morgan Cash Index GBP 1 month	0.7	3.0
CHF cash	J.P. Morgan Cash Index CHF 1 month	0.4	0.8
JPY cash	J.P. Morgan Cash Index JPY 1 month	0.1	0.0
AUD cash	J.P. Morgan AUD Cash Index 1 Month	0.6	3.0
SGD cash	J.P. Morgan SGD Cash Index 1 month	0.4	3.4
INR cash	Financial Benchmarks India Interbank 3 Month Rate	0.6	6.5
CNY cash	CFETS China Fixing Repo Rates 7 Day	0.3	2.5

Source: Credit Suisse calculations

Capital Market Assumptions are no guarantee for future performance and there is no certainty that the expected returns/volatilities will be reached.

Appendix

Climate Action Index

		Description	Calculation base	Data source	Year	Weight
Prepared-ness	**Fossil fuel indepen-dence**	Fossil fuel independence indicates how well an economy can manage the transition to a low-emissions economy. A high value is reflected in low cur-rent/future dependence on fossil fuels and CO2-intensive infrastructure.	Preparedness Index (Exposure) calculated us-ing four sub-indicators: Current fossil fuel ex-port revenues as a percentage of current GDP; expected fossil fuel rents as a percentage of current GNI; current CO2 intensity of manufac-turing exports; reliance on CO2-intensive goods and services as a function of age and emis-sions intensity of electricity generation.	IMF	2019	20%
	Resilience to LCT	Resilience indicates how well a country is able to manage the transition to a low-emissions economy. It reflects a country's ability to adapt to the im-pacts and challenges of structural change and to take advantage of some opportunities that such change would offer. A high value indicates a high resilience to LCT.	Preparedness Index (Resilience) calculated us-ing 11 sub-indicators: macroeconomic stability; adjusted savings rate of an economy; financial market development; GDP per capita; eco-nomic complexity; technology adoption; ease of doing business; infrastructure quality; human capital; institutional quality and governance; cost of oil production.	IMF	2019	20%
Physical risk	**Physical risk to climate change**	Physical risks measure the felt impacts of climate change (e.g., sea level rise, storms, temperature anomalies, drought, precipitation) of a country. A high value indicates a high vulnerability to the effects of climate change.	Physical Vulnerability to Climate Change Index (PVCCI) calculated at the subnational level to account for high geoclimatic diversity. The PVCCI includes the following components: Flood risks due to sea level rise or glacial lake outburst floods; risks due to increasing drought; risks due to precipitation; risks due to tempera-ture change; risks due to severe weather.	Goujon et al. (2022)	2022	10%
Political pressure	**Domestic pressure**	Domestic political pressure reflects do-mestic political pressure on the govern-ment to take action. Pressure is ex-erted due to homemade pollution, the costs of which are incurred domesti-cally (e.g., through air pollution). A high value indicates high domestic political pressure to take climate action.	Air pollution based on PM2.5 annual average concentration (µg/m³).	IQAir	2021	15%
	International pressure	International political pressure reflects international pressure on a country to take climate action. The pressure is exerted because of the high emissions that occur domestically but cause costs globally. A high value indicates high in-ternational political pressure to take cli-mate action.	Share of global CO2 emissions (%); CO2 emis-sions per capita (metric tons)	Our World in Data	2020	5%
Sustaina-bility ef-forts of govern-ment	**Ambitious-ness of NDCs**	Ambitiousness measures the level of ambition of nationally determined con-tributions (NDCs) – unconditional on the achievements of other countries. A high value indicates ambitious climate action goals.	Projected emissions savings for 2030 calcu-lated by emissions with NDCs compared to emissions with current policy (%)	Climate Action Tracker	2022	15%
	Future orien-tation of govern-ment	Future orientation measures the future orientation of government measures in terms of digitalization and sustainability.	Index score of future orientation of government actions is based on 7 sub-indicators: Government providing political stability; Govern-ment responsiveness to change; Adaptability of law to digital business models; Government long-term vision; Energy efficiency regulation; Renewable energy regulation; Environmental agreements in place.	Global Competi-tiveness Report (WEF)	2019	15%

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Historical returns and financial market scenarios are no reliable indicators of future performance. The price and value of investments mentioned and any income that might accrue could fall or rise or fluctuate. You should consult with such advisor(s) as you consider necessary to assist you in making these determinations.
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Where this document relates to emerging markets, you should be aware that there are uncertainties and risks associated with investments and transactions in various types of investments of, or related or linked to, issuers and obligors incorporated, based or principally engaged in business in emerging markets countries. Investments related to emerging markets countries may be considered speculative, and their prices will be much more volatile than those in the more developed countries of the world. Investments in emerging markets investments should be made only by sophisticated investors or experienced professionals who have independent knowledge of the relevant markets, are able to consider and weigh the various risks presented by such investments, and have the financial resources necessary to bear the substantial risk of loss of investment in such investments. It is your responsibility to manage the risks which arise as a result of investing in emerging markets investments and the allocation of assets in your portfolio. You should seek advice from your own advisers with regard to the various risks and factors to be considered when investing in an emerging markets investment.

Alternative investments

Hedge funds are not subject to the numerous investor protection regulations that apply to regulated authorized collective investments and hedge fund managers are largely unregulated. Hedge funds are not limited to any particular investment discipline or trading strategy, and seek to profit in all kinds of markets by using leverage, derivatives, and complex speculative investment strategies that may increase the risk of investment loss.
Commodity transactions carry a high degree of risk, including the loss of the entire investment, and may not be suitable for many private investors. The performance of such investments depends on unpredictable factors such as natural catastrophes, climate influences, hauling capacities, political unrest, seasonal fluctuations and strong influences of rolling-forward, particularly in futures and indices.
Investors in real estate are exposed to liquidity, foreign currency and other risks, including cyclical risk, rental and local market risk as well as environmental risk, and changes to the legal situation.

Private Equity

Private Equity (hereafter "PE") means private equity capital investment in companies that are not traded publicly (i.e. are not listed on a stock exchange), they are complex, usually illiquid and long-lasting. Investments in a PE fund generally involve a significant degree of financial and/or business risk. Investments in private equity funds are not principal-protected nor guaranteed. Investors will be required to meet capital calls of investments over an extended period of time. Failure to do so may traditionally result in the forfeiture of a portion or the entirety of the capital account, forego any future income or gains on investments made prior to such default and among other things, lose any rights to participate in future investments or forced to sell their investments at a very low price, much lower than secondary market valuations. Companies or funds may be highly leveraged and therefore may be more sensitive to adverse business and/or financial developments or economic factors. Such investments may face intense competition, changing business or economic conditions or other developments that may adversely affect their performance.

Interest rate and credit risks

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