

# 2022 Investment Outlook



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# Executive summary

## Introduction

Following dramatic fiscal and monetary policy moves in 2020 and 2021, the stage is set for 2022 to be a year of transition as policies and economies move toward a more normal state. However, issues remain that will likely define the economic and market environment, including continued supply-chain disruptions and an upsurge in demand that threaten to keep inflation high across many economies. For 2022, our outlook is centered on the question of inflation and how markets and policymakers may react to it.

## Our Base Case

We expect global growth to normalize, remaining above its long-term trend but decelerating to a more sustainable rate as fiscal stimulus is gradually removed. We anticipate that inflation will peak in mid-2022 and then start to slowly moderate, backing down toward target rates by the end of 2023 as supply chain issues resolve, vaccination levels increase, and more employees return to the workforce. We look for the Federal Reserve (Fed) to remain patiently accommodative, with a rate lift-off in the back half of 2022, although other developed countries' central banks might act more quickly. Finally, we expect volatility will increase as markets digest the transition to slower growth and a gradual tightening in monetary policy.

## Transitory Inflation Risk

In our transitory inflation risk scenario, current inflation fears prove to be overblown, with inflation gradually coming off its current highs towards something close to or below 2%. We see growth higher than normal in this environment, ultimately pointing to economies being earlier in the cycle than we currently judge them.

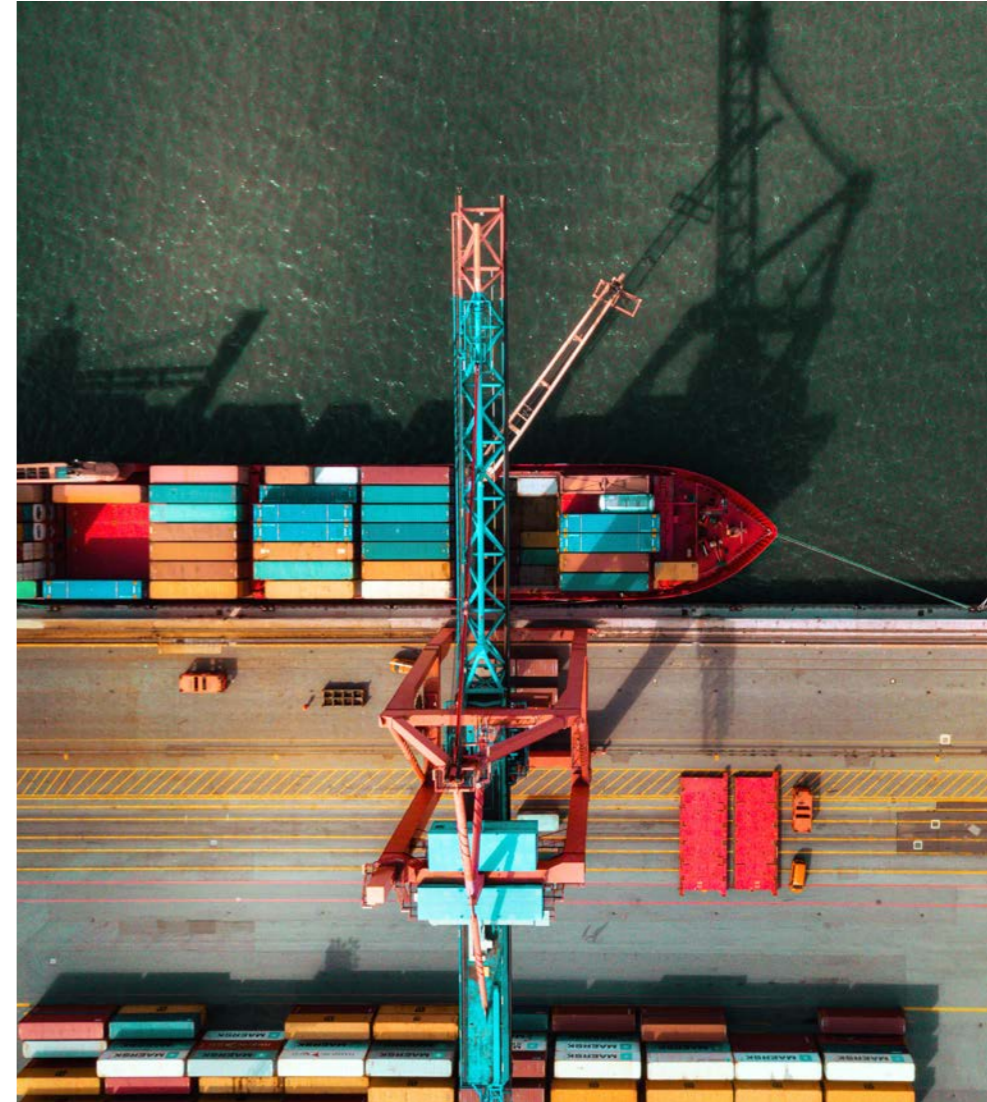
## Persistent Inflationary Risk

In our persistent inflationary risk scenario, developed central banks' messaging fails to convince markets that inflation is transitory, with further elevated prints throughout 2022. We see the problem as stemming from a combination of elevated demand driven by past monetary expansion and supply-side disruptions. This causes inflation expectations to become unanchored, with medium-term expectations rising above the 4% mark persistently. This would signal a loss of credibility for those central banks, requiring action that prompts a significant risk of ending the current economic cycle.

Our base case anticipates a transition to more normal growth and a peaking of inflation in 2022.

Our transitory inflation scenario anticipates growth to be higher and inflation lower sooner.

Our persistent inflation scenario anticipates inflation to remain elevated and the Fed to become more hawkish.



# Where are we in the cycle?

Returning to normal: We see the cycle resuming more normal growth patterns

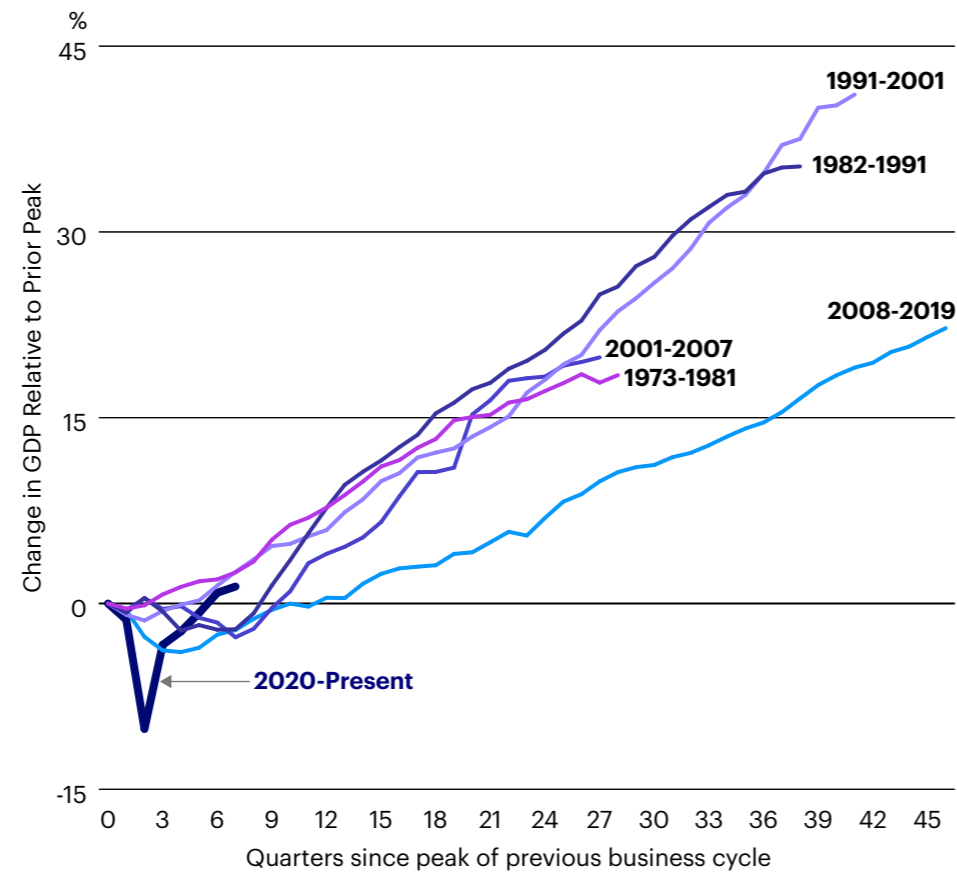
## Normalization Under Way

While our base case for the global economy may resemble a mid-cycle slowdown, we believe that pandemic-driven disruptions have significantly altered traditional business cycle analysis.

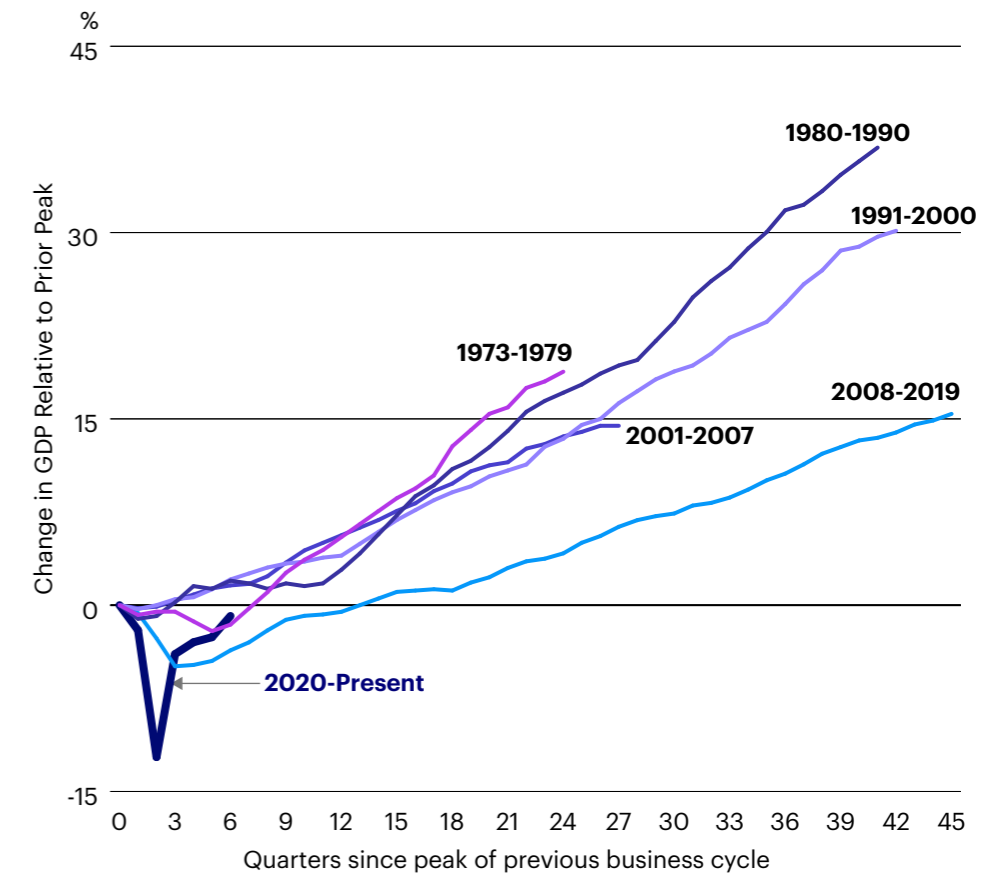
Instead, we view the path ahead as one of transition, marked by a period of continued growth but with a falling rate of change as economies digest the pandemic's extraordinary policy actions.

2022 looks set to be a year of transition as economies return to structural growth rates.

## US GDP growth during business cycles

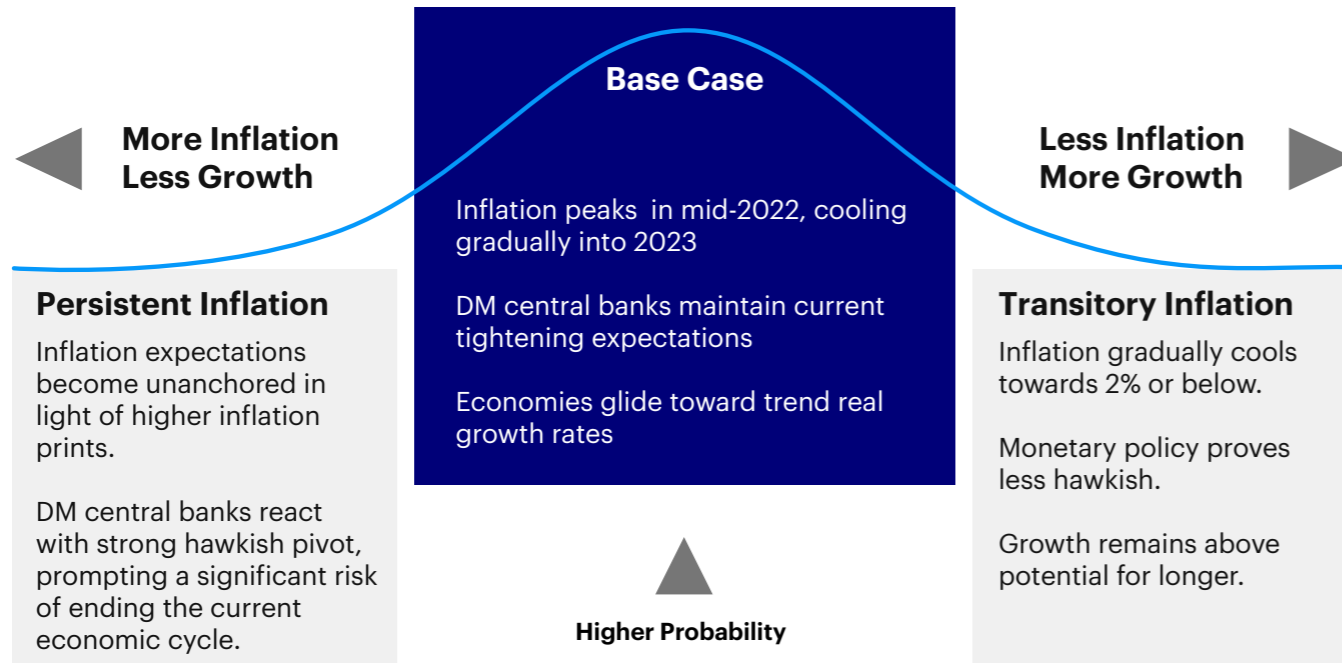


## G7 GDP growth during business cycles



# We see inflation peaking in mid-2022 and a return towards trend growth

With inflation effectively baked in, we turn our attention to policymakers' response



- Following a period of enormous policy actions to address the coronavirus pandemic, we find economies in a period of transition.
- While there are a variety of upside and downside risks, we view inflation as the distinguishing characteristic among our scenarios.

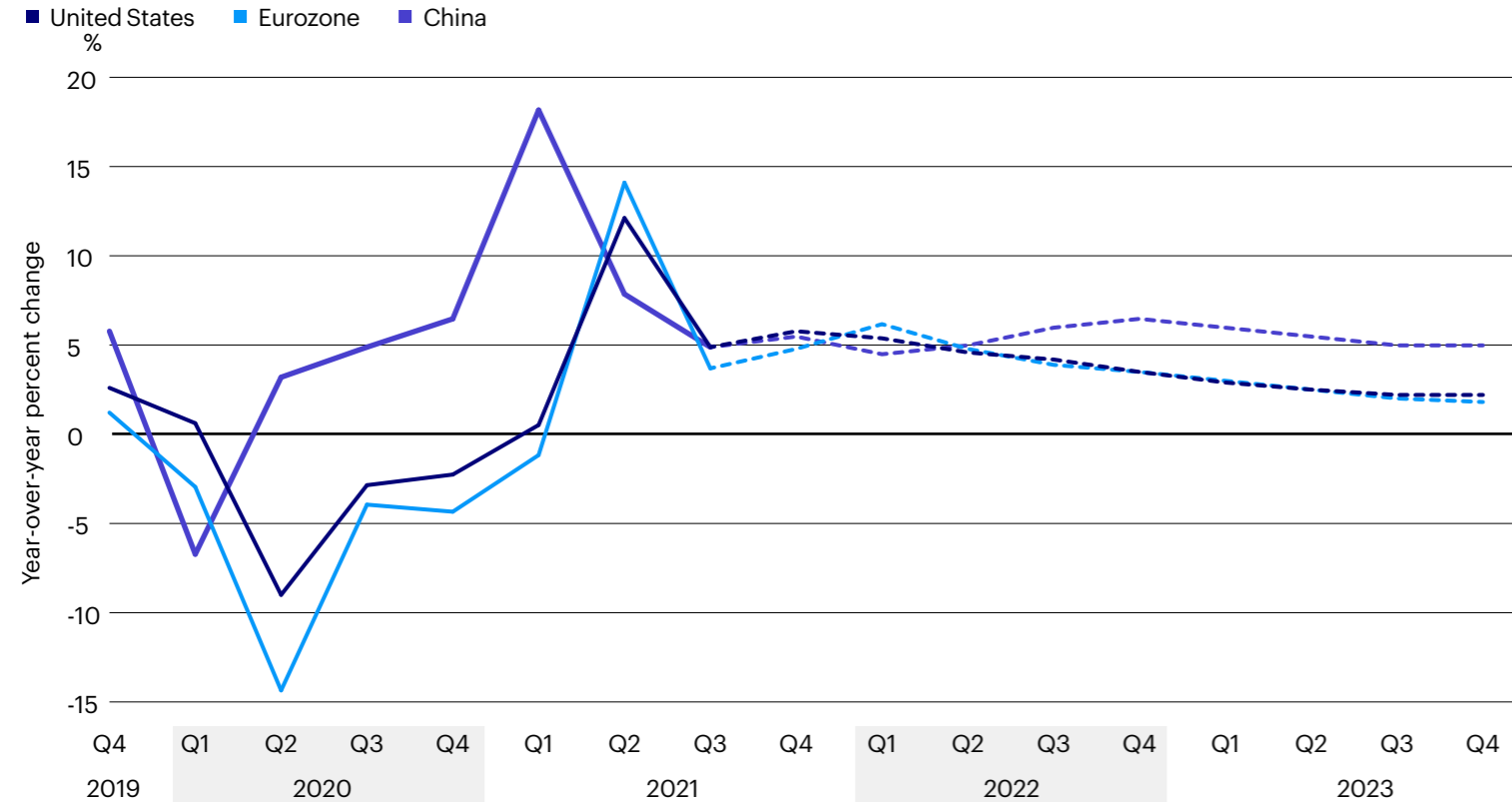


# What's the direction of economies?

US, eurozone gradually returning towards structural growth rates; China to slow temporarily

## GDP growth figures ahead

Invesco's assumptions for year-over-year GDP growth



- Following large fiscal programs and very accommodative monetary policy, we see economies slowing from their elevated post-pandemic growth rates into something more normal.
- We see the US and eurozone (EZ) approaching trend growth rates as we move through 2022.
- In China, we see growth moderating into the first half of 2022, followed by a pickup fueled partly by policy support.

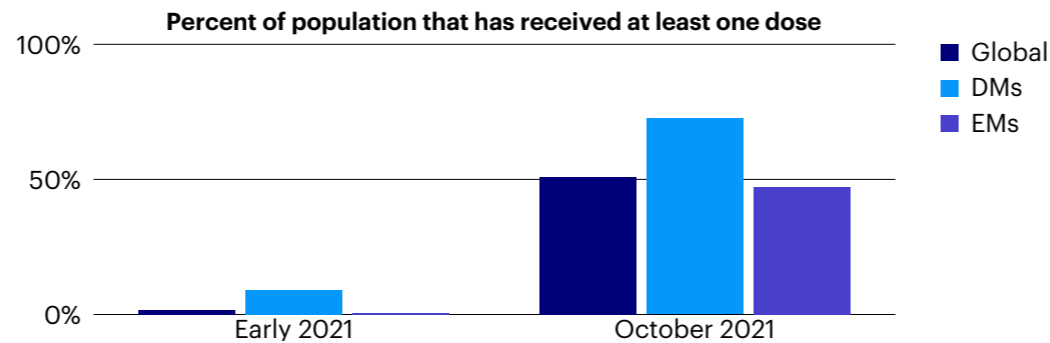
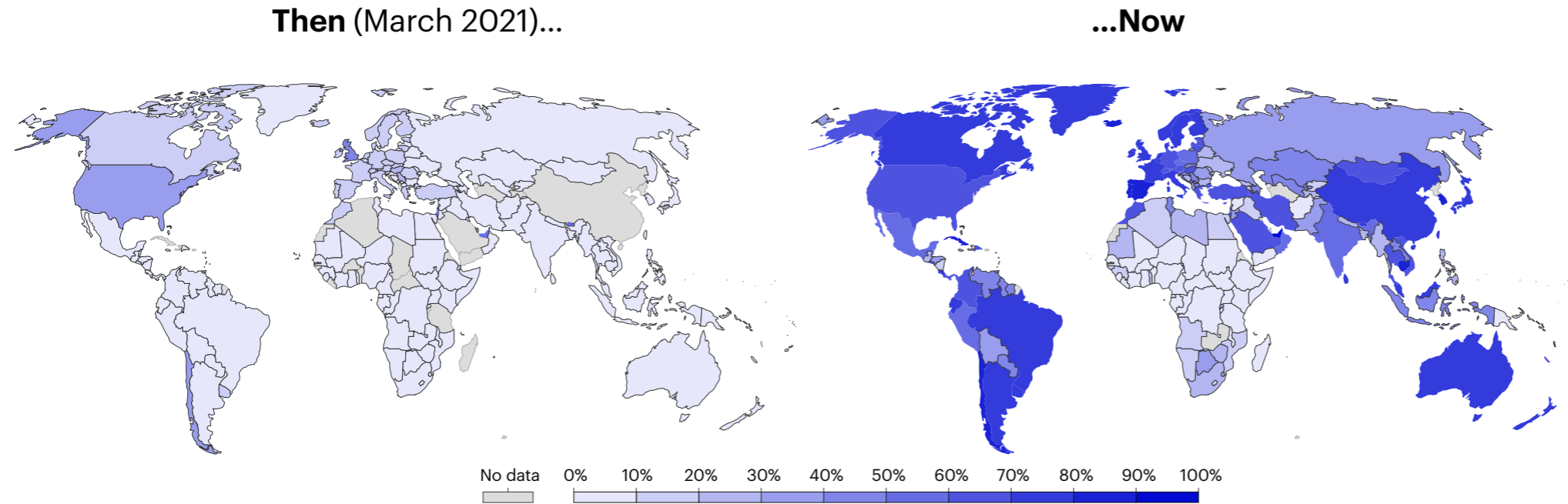


Sources: Bloomberg L.P., Invesco, as of October 31, 2021. Dashed lines indicate expected growth path.

# The world's increasing immunity to the coronavirus

As 2021 has progressed, COVID-19 has increasingly faded as a risk to economies

## Percentage of the world that has received at least one vaccine dose



- Whether through past infection or vaccination, people around the world are gaining immunity to the coronavirus, as confirmed in seroprevalence studies.
- While we remain wary of the potential of a new mutation of the virus, at present, COVID-19 is increasingly less of a concern in our outlook as the economic impacts of the virus continue to fade – though with fits and starts along the way.
- However, an uptick in cases in some countries remains a risk that could be accompanied by lockdowns and supply chain disruptions.

Sources: Our World in Data and Invesco, as of October 31, 2021. "Early 2021" is defined as March 1, 2021.

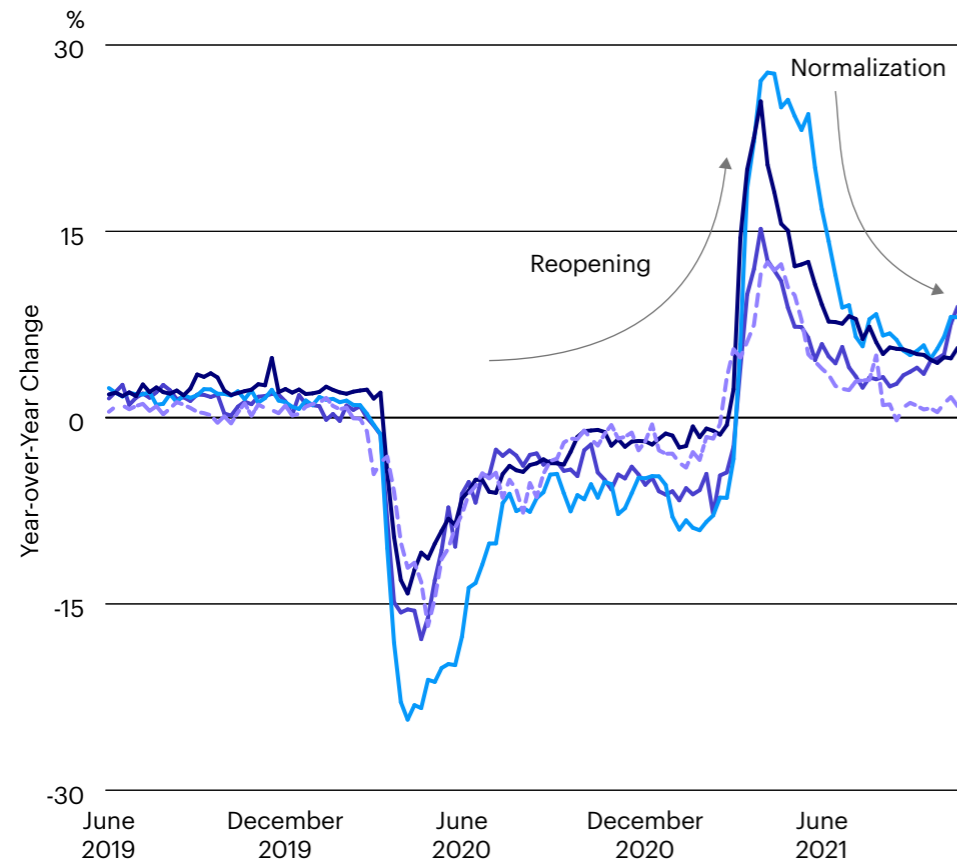
# Growth is likely to return to trend

Following recovery from the pandemic, we see economic growth normalizing

## Following reopening, growth is slowing but still fast

OECD weekly GDP tracker for selected economies

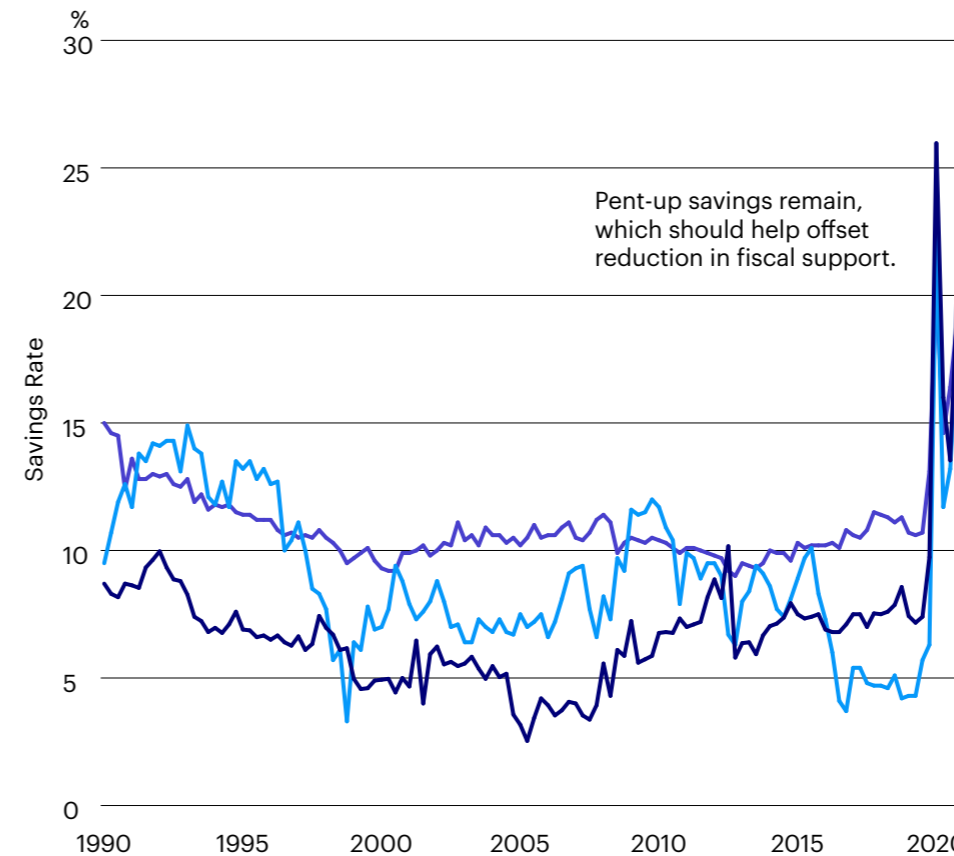
■ United States ■ United Kingdom ■ Germany ■ Japan



## Household savings rates are coming off record highs, but remain elevated

% of disposable income, selected major developed economies

■ United States ■ United Kingdom ■ Germany

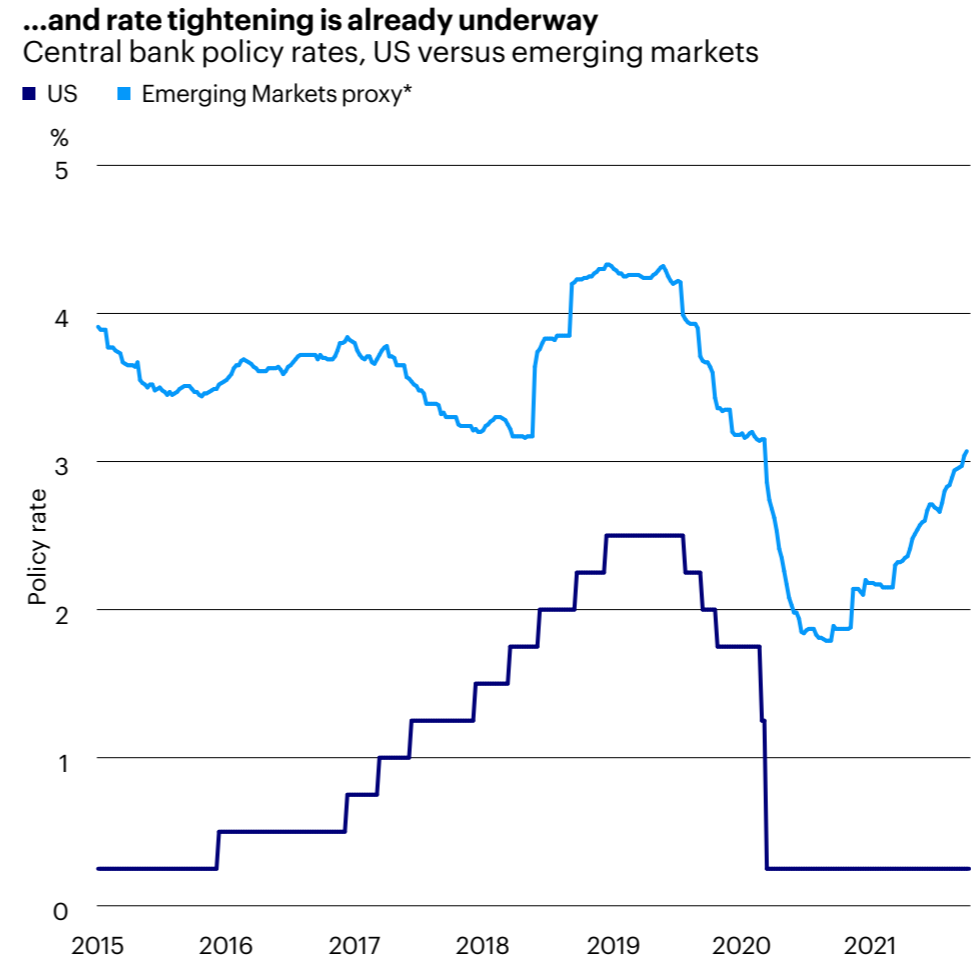
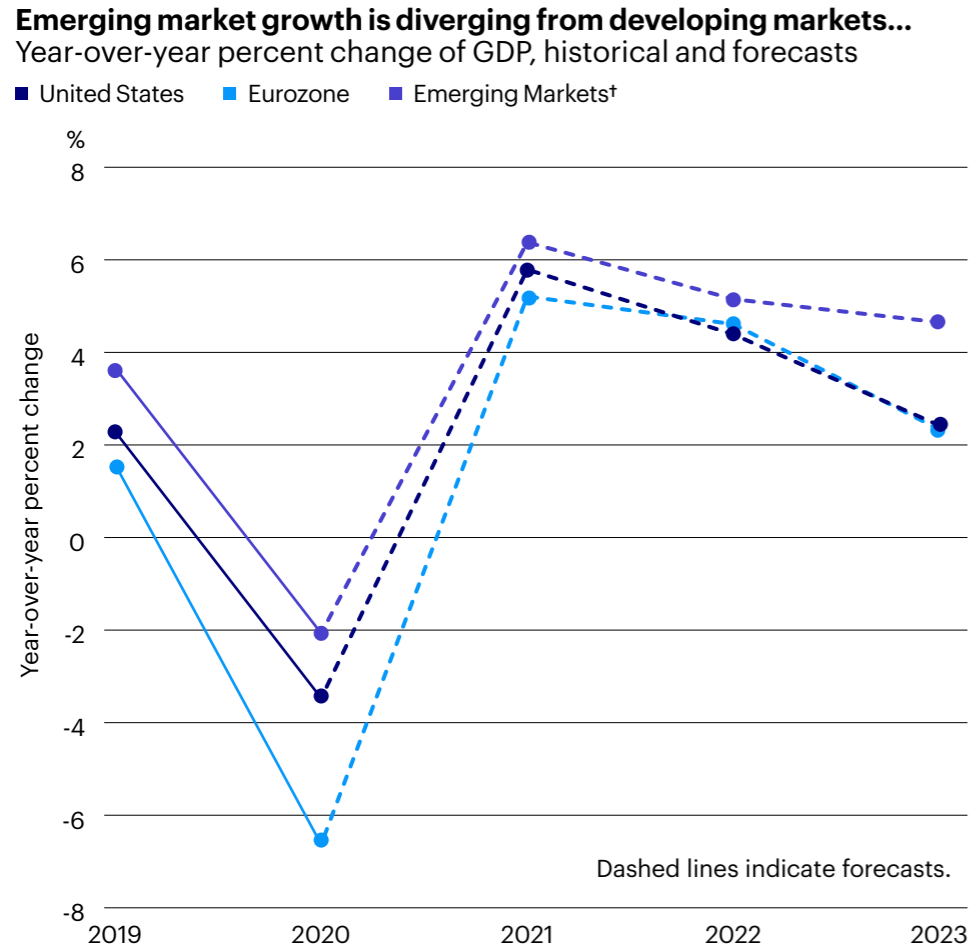


- In 2022, we expect a gradual transition away from policy-led changes in growth. Instead, we see a return to more normal growth rates as business and household spending patterns normalize.
- The continued drawdown of unusually high household savings is likely to offset fiscal tightening, allowing for a further release of pent-up demand.



# Emerging market growth is likely to diverge from developed markets

Recovery and reopening to proceed in emerging markets on the back of rising immunity



- In emerging markets, we see growth picking up relative to developed markets as immunity to the coronavirus is acquired, and the US dollar remains relatively neutral.
- Monetary policy tightening also appears relatively advanced in many emerging market economies. We expect further emerging market policy changes to reflect country-specific growth and inflation pressures as the US Federal Reserve normalizes in line with its guidance.

†Emerging Markets (EM) forecasts are sourced from the International Monetary Fund's October 2021 World Economic Outlook. Dashed lines indicate forecasts.  
 \*Emerging Markets Proxy = 25 emerging market economies.  
 Sources: US Federal Reserve, International Monetary Fund, various central banks, and Invesco. US and eurozone forecasts are based on Invesco assumptions. As of October 31, 2021.

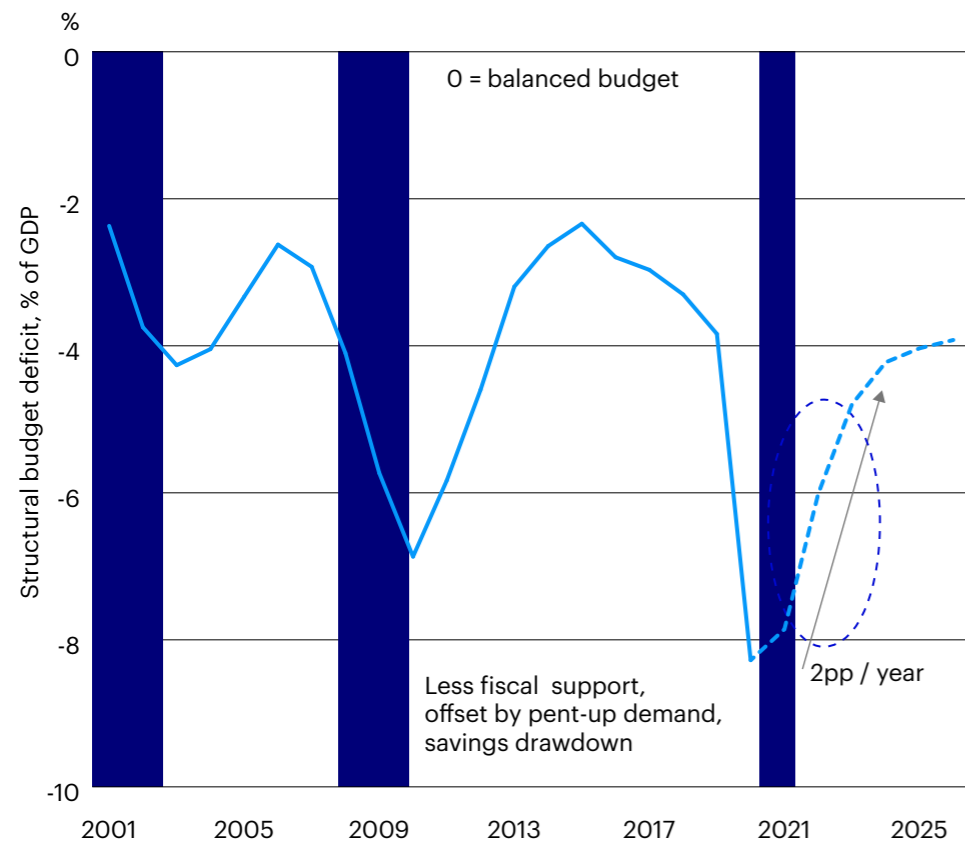
# Shrinking fiscal deficits and tightening monetary policy ahead

With tapering underway, we turn next to the timing and pace of rate hikes

## Less fiscal support expected in G7s in 2022

Cyclically adjusted budget balances for G7 economies

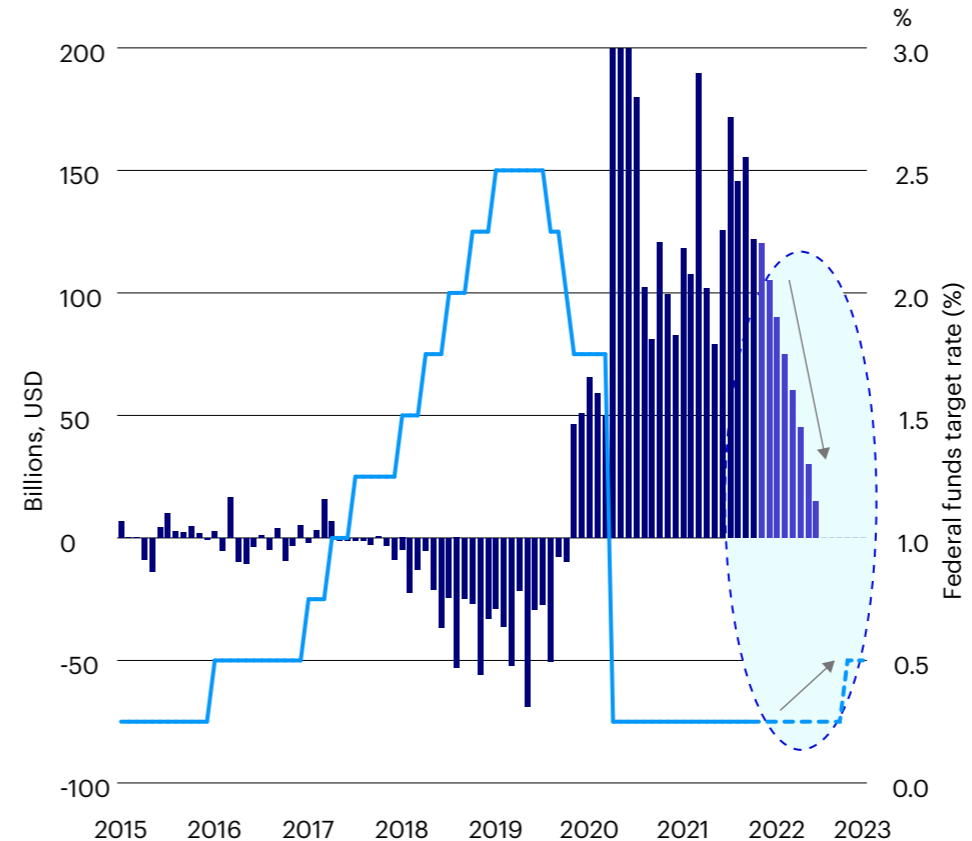
■ US Recessions    — G7 structural budget deficit  
 - - - G7 structural budget deficit (forecast)



## Monetary policy stance is tightening

Expected path of Fed monetary policy: balance sheet and rates

■ Net purchases of securities (\$ billion)    — Federal funds target rate (%)  
 ■ Net purchases of securities (forecast)    - - - Federal funds target rate (forecast)



- Policy stances are changing across economies. In G7 nations, we see a combination of less fiscal support and monetary policy tightening in 2022 and beyond.
- Fiscal tightening should be offset by drawdowns of built-up private savings.
- We also expect a single rate hike from the Federal Reserve in the second half of 2022, in line with current FOMC 'dot plot' forecasts.

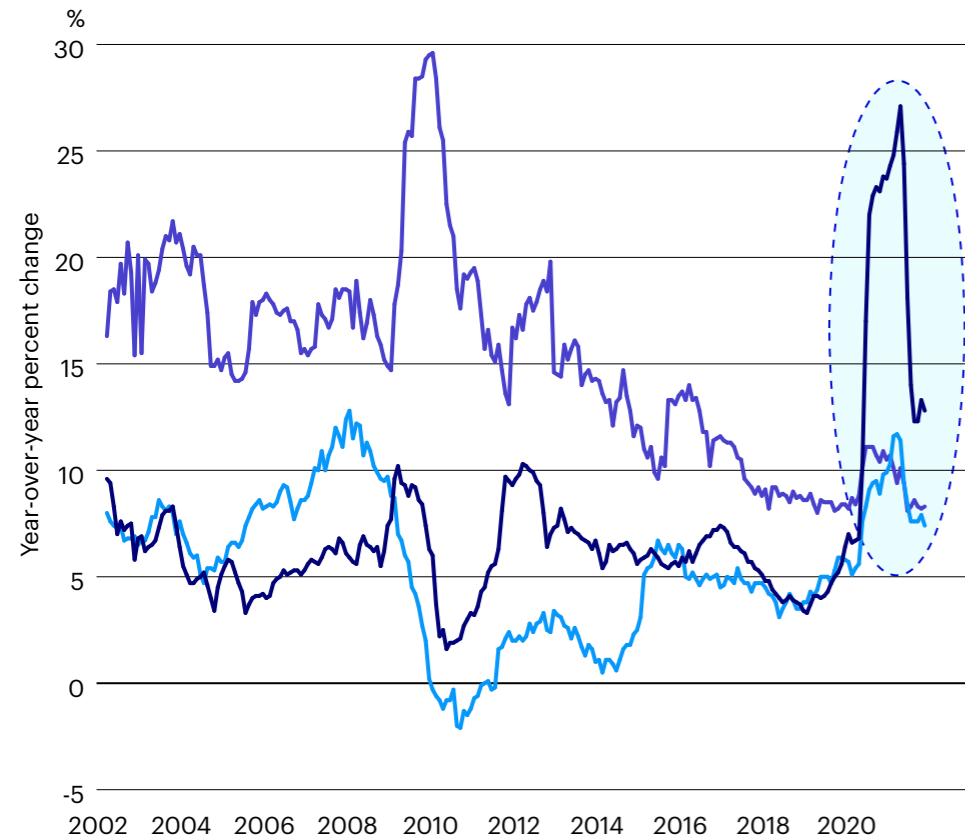
# Inflation is likely on track to peak in mid-2022

Economic data signals slowing inflation is likely

## Money supply growth has peaked...

Broad money supply growth for selected economies

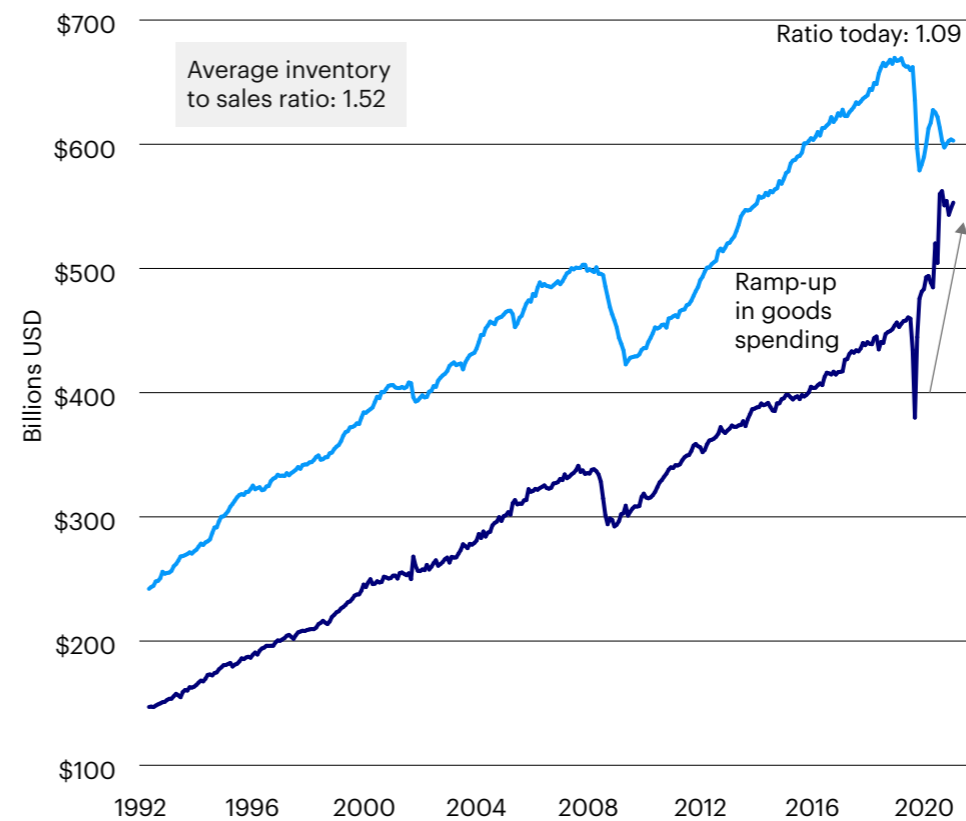
- US, broad money supply, M2
- Eurozone, broad money supply, M3
- China, broad money supply, M2



## ...and the inventory crunch should normalize

US retail sales versus inventories

- US retail sales
- US retailer inventories



- We see inflation continuing to rise until peaking in mid-2022, followed thereafter by high but falling readings.
- We are encouraged by falling money supply growth. When viewed as a precursor to inflation, this suggests fewer inflation pressures ahead.
- Moreover, COVID-19 resulted in a concentration of spending in durables while supply chains became strained, resulting in heightened price pressures that appear to be resolving slowly.

## Risk scenario: Inflation proves transitory in the short term

If inflation has already peaked, we figure more dovish policy and greater growth potential

### Factors that could cause inflation to moderate in 2022...

#### Temporary supply-side issues fading.

Commodity and freight prices are partly surging on temporary, pandemic-induced supply factors. We believe this to be transitory. Prices appear to have already peaked for used cars, many commodities, freight, and a number of other goods.

#### Slack remains.

Capacity utilization remains depressed, indicating supply-side slack. We also anticipate labor market normalization as more workers return to the workforce, alleviating some wage pressure.

#### Spending reorienting.

Spending had shifted into goods due to social distancing. As reopening continues, spending is likely to continue to rebalance more to services.

#### Pent-up demand is fading.

Pent-up demand has been elongated by supply chain issues. Its impact on inflation should be a one-off and relatively short-lived factor.

#### Fiscal stimulus is fading.

Fiscal stimulus is expected to drop in 2022, which is likely to reduce overheating risk.

- In this scenario, we hypothesize that current fears of inflation prove to be excessive, with inflation in major developed countries falling to 2% or below.
- We see growth higher than normal in this environment, ultimately pointing to economies being earlier in the cycle than we currently judge, which would cause us to favor cyclical assets.



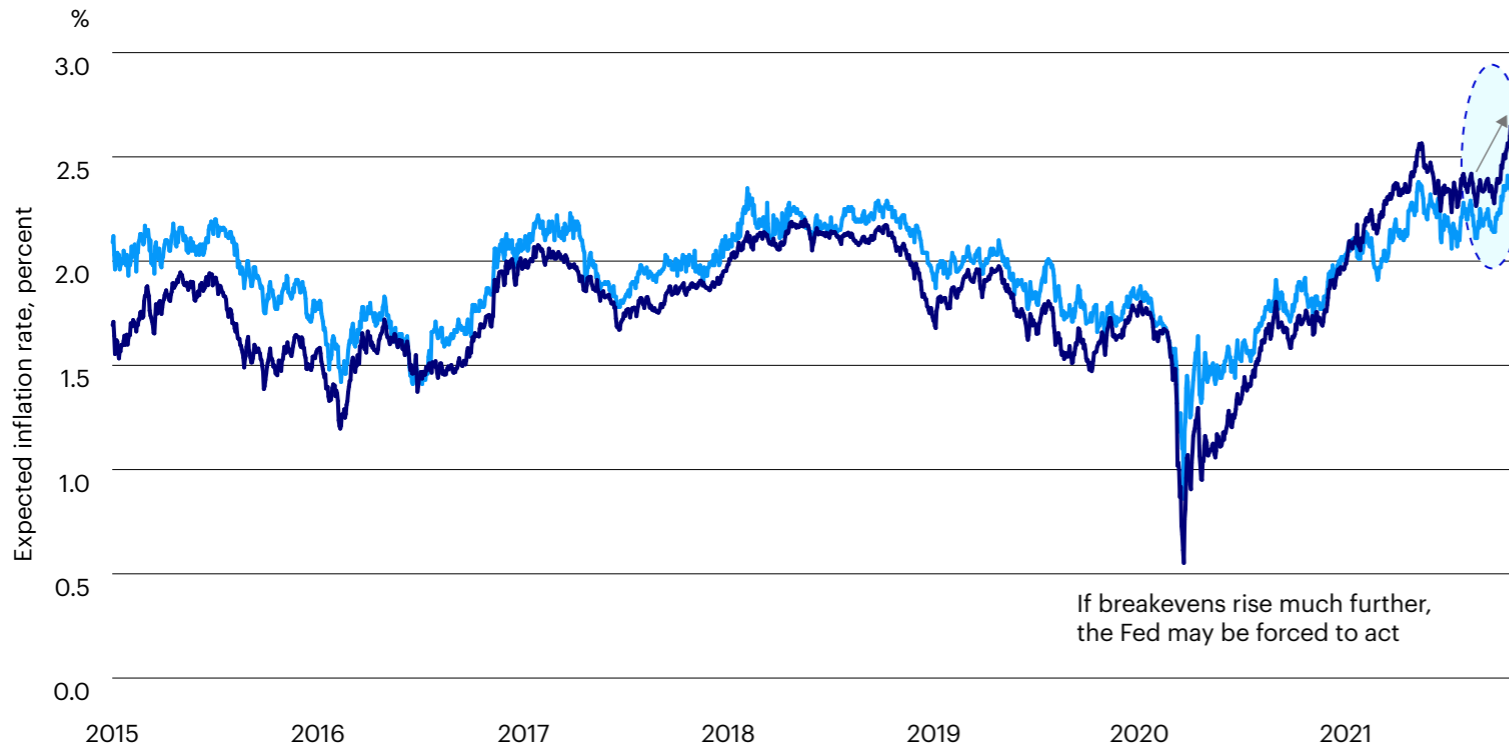
# Risk scenario: Inflation persists without cooling

If inflation prints continue at their high rate, we see Fed action in play

## If inflation expectations become unanchored, we see corrective actions from central banks

Market-based inflation expectations for the United States

■ US 10-year breakeven rate ■ US 5-year, 5-years-forward expected inflation rate



- In this scenario, we see persistently high inflation leading to an unanchoring of inflation expectations above the 4% mark. We expect this to force developed market central banks into a more hawkish policy pivot.
- In this environment, we would expect a curtailment of the economic cycle and would favor defensive assets.



# Returns among asset classes tend to converge during slowdown regimes

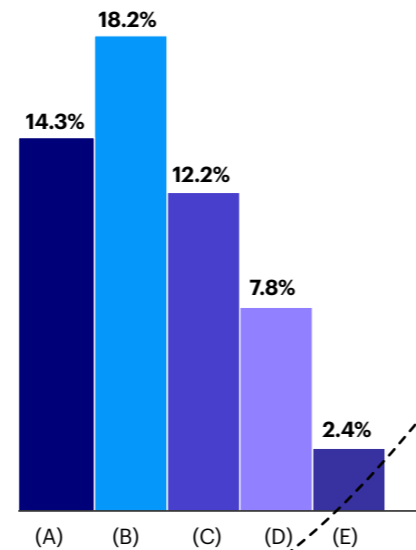
Declining compensation for growth risk, with gradual rotation towards defensives

- Risky credit tends to lead in **recoveries**, while equities lead in **expansions** as growth moves above trend and earnings improve.
- Returns across asset classes converge in **slowdown** regimes, when growth is above trend but decelerating.
- Government bonds and safe assets outperform in **contractions**.

Global cycle: Historical excess returns across asset classes

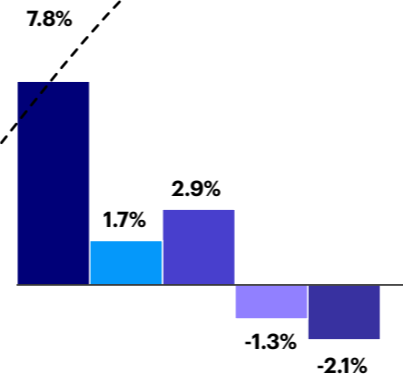
■ (A) Equities ■ (B) High yield ■ (C) Bank loans ■ (D) Investment grade ■ (E) Government bonds

Credit leads (meaningful spread compression) followed by equities



Recovery

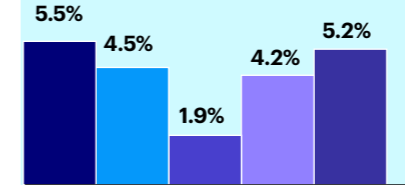
Expansion



**Equities:** Top performer through earnings growth

**Credit:** Harvesting income over government bonds, limited spread compression

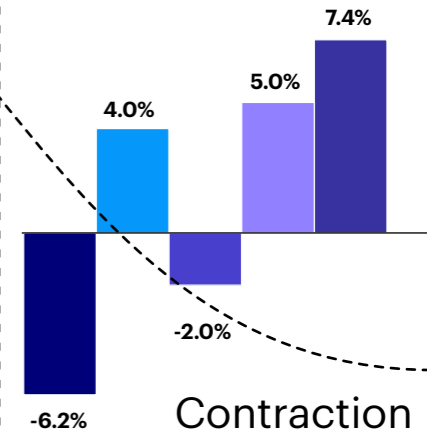
Slowdown



**Convergence of returns amongst asset classes**

**Government bonds lead in risk-adjusted terms**

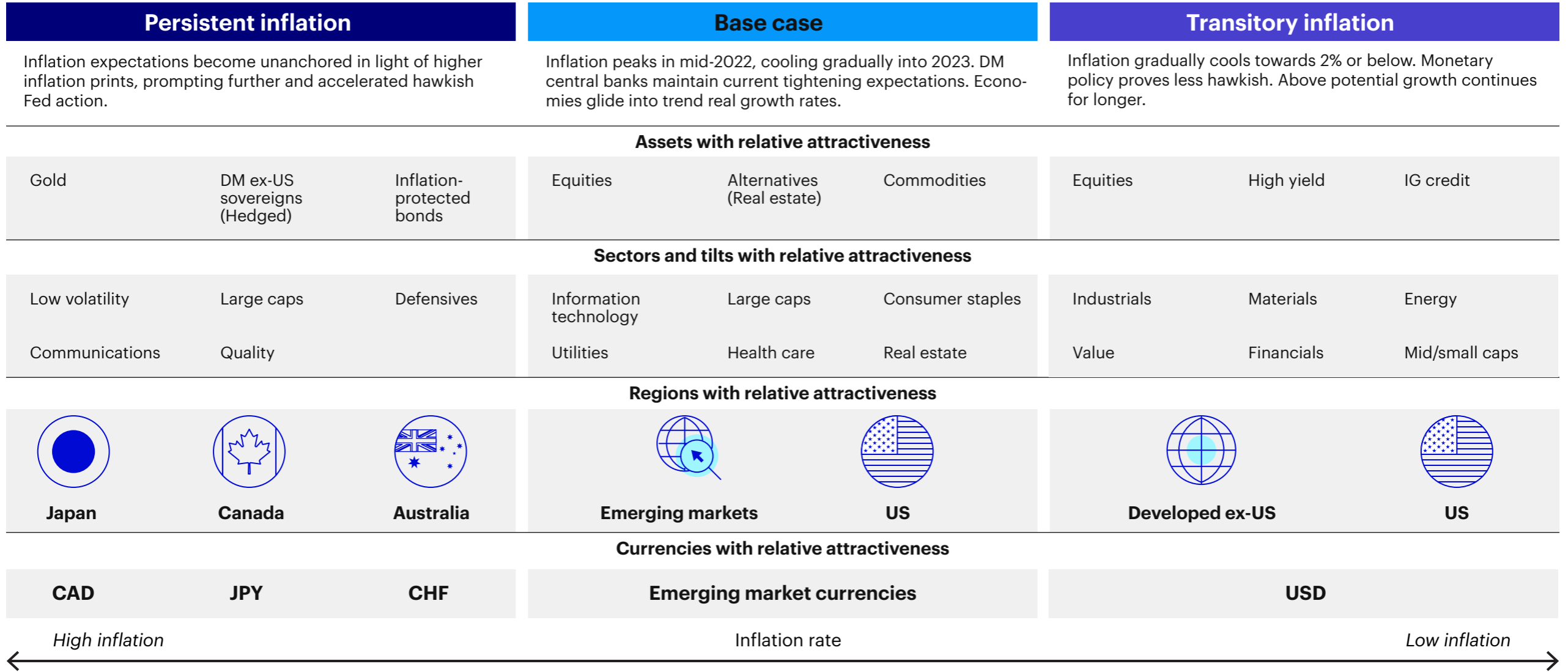
Gov't bonds are top performer



Contraction

Sources: Invesco Investment Solutions' proprietary global business cycle framework and Bloomberg L.P. Notes: Index return information includes back-tested data. Returns, whether actual or back-tested, are no guarantee of future performance. Annualized monthly returns of the defined risk premia from January 1973 – December 2020, or since asset class inception if at later date. Includes latest available data as of most recent analysis. Asset classes excess returns defined as follows: Equities = MSCI ACWI - US T-bills 3-Month, High Yield = Bloomberg Barclays HY - US T-bills 3-Month, Bank loans = Credit Suisse Leveraged Loan Index - US T-bills 3-Month, Investment Grade = Bloomberg Barclays US Corporate - US T-bills 3-Month, Government bonds = US Treasuries 7-10y - US T-bills 3-Month. For illustrative purposes only.

# Summary of our Scenarios



Source: Invesco. The asset choices are designed to show our favored assets within a diversified selection of asset categories.

# Relative tactical asset allocation positioning

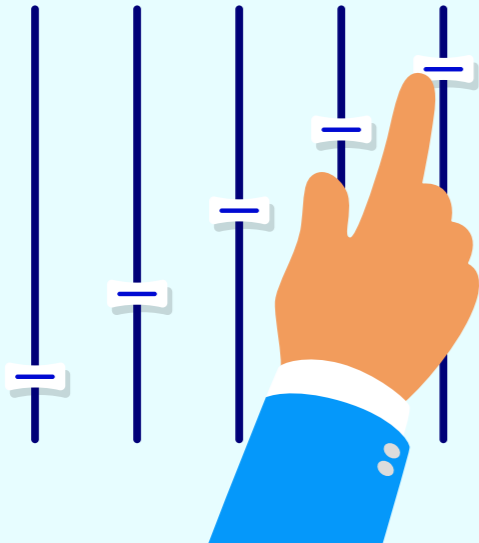
Declining compensation for growth risk, with rotation towards defensive sectors

**Reduce risk posture**, with slight overweighting of equities, but tilted towards defensive sectors. Expect higher volatility and greater convergence in returns across asset classes.

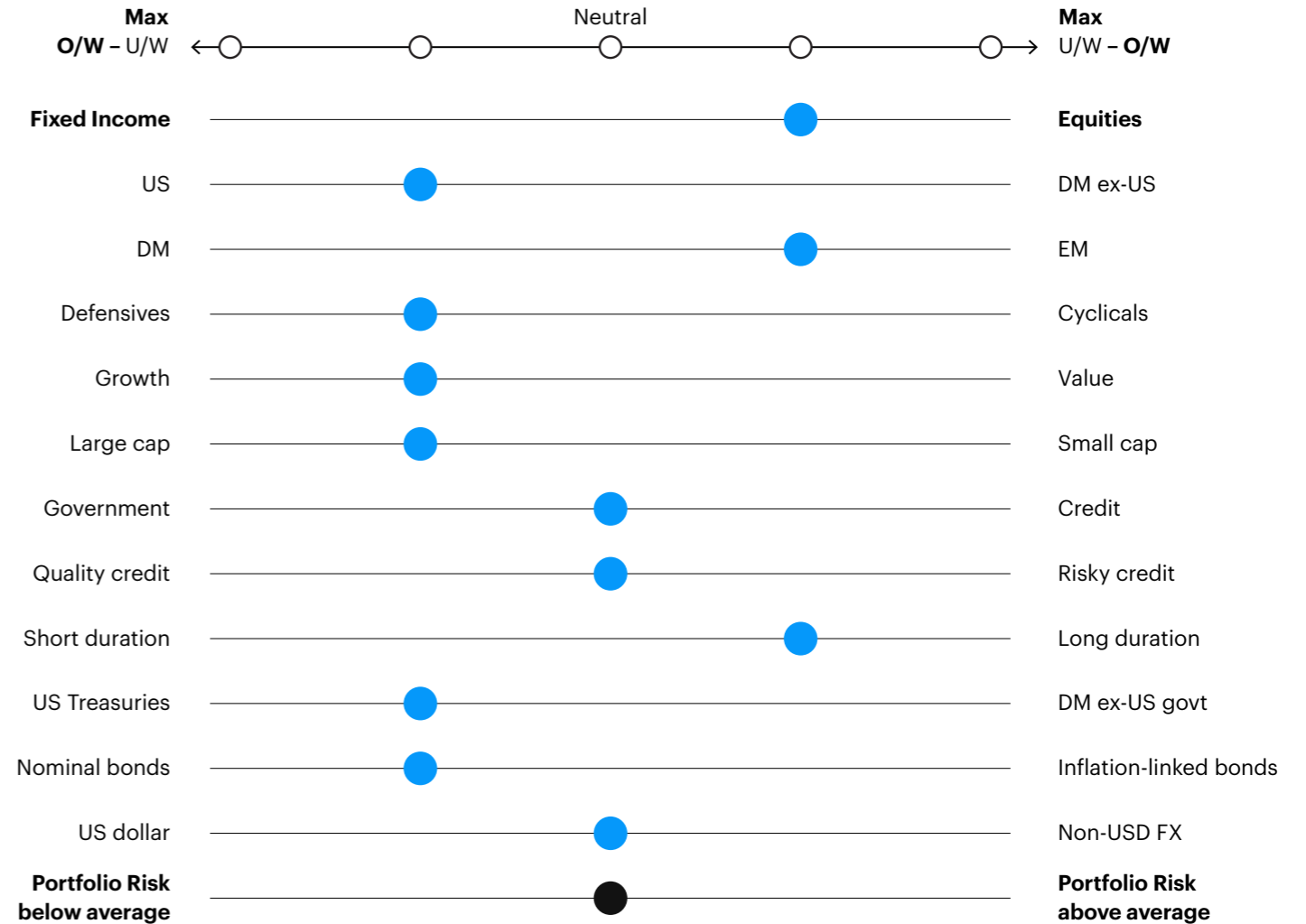
**Equities:** Favor emerging markets on cyclical divergence. Favor US, quality, and large caps on slowing growth expectations and stable to lower long-term bond yields.

**Fixed Income:** Moderate overweight to duration, expecting higher rates up to intermediate maturities, but stable to lower yields in the long-end. Overweight US Treasuries.

**FX:** Overweight emerging market currencies.



Relative Tactical Asset Allocation Positioning: Base Case



Source: Invesco Investment Solutions, October 2021. Note: For illustrative purposes only.



# Relative tactical asset allocation positioning

## Investing in Fixed Income\*

- Solid economic growth is supportive of credit fundamentals, and low interest rates globally continue to be supportive of technical for credit markets.
- Valuations are very tight in a historical context, limiting the potential upside from spread tightening and increasing the potential downside in a widening scenario. Low overall yield levels increase the risks when overall yield levels rise.
- Bank loans are supported by strong credit fundamentals and may benefit from rising rates as bank loans have floating interest rates.

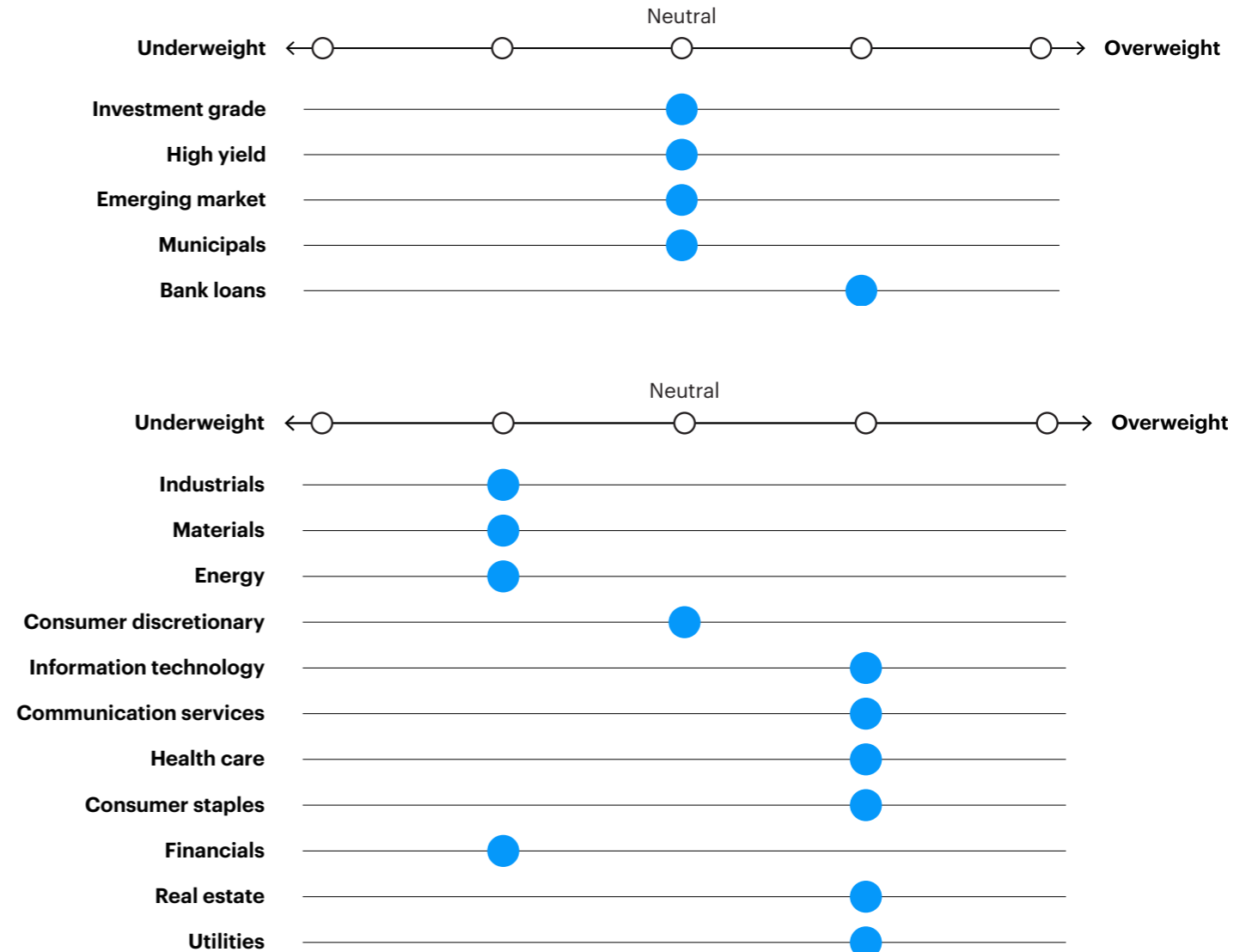
## Investing in Equities\*\*

- Across scenarios, our sector allocations are a byproduct of our factor/style allocations.
- In our base case scenario, we expect slowing growth and peaking inflation to support moderate outperformance of defensive sectors with quality characteristics and higher duration (IT, communication services, health care, real estate, and consumer staples).
- Favor quality and large caps, given slowing growth expectations and stable (or lower) long-term bond yields.
- Favor US equities over developed markets ex-US, as the global slowdown favors regions with lower cyclical exposure and lower operating leverage.

\* Source: Invesco Fixed Income.

\*\* Source: Invesco Investment Solutions, October 2021. Note: For illustrative purposes only.

## Absolute Tactical Asset Allocation Positioning: Base Case



# 2022 Investment outlook: Tactical asset allocation

## Investing in Commodities\*

- Agriculture provides the least economically sensitive exposure with outcomes dependent upon weather, crop yields, and inventory levels, as well as the rate of change in the US dollar for exported commodities.
- With more developed and emerging economies reopening, energy demand will increase while producers maintain a disciplined approach to raising production.
- Given their high economic sensitivity, we are neutral on industrial materials due to anticipated slowing growth. The ongoing slowdown in China limits upside potential.
- Gold responds favorably to rising inflation and the decrease in real rates as growth decelerates. Exposure to silver and its crossover use as an industrial metal is a potential limiting factor.

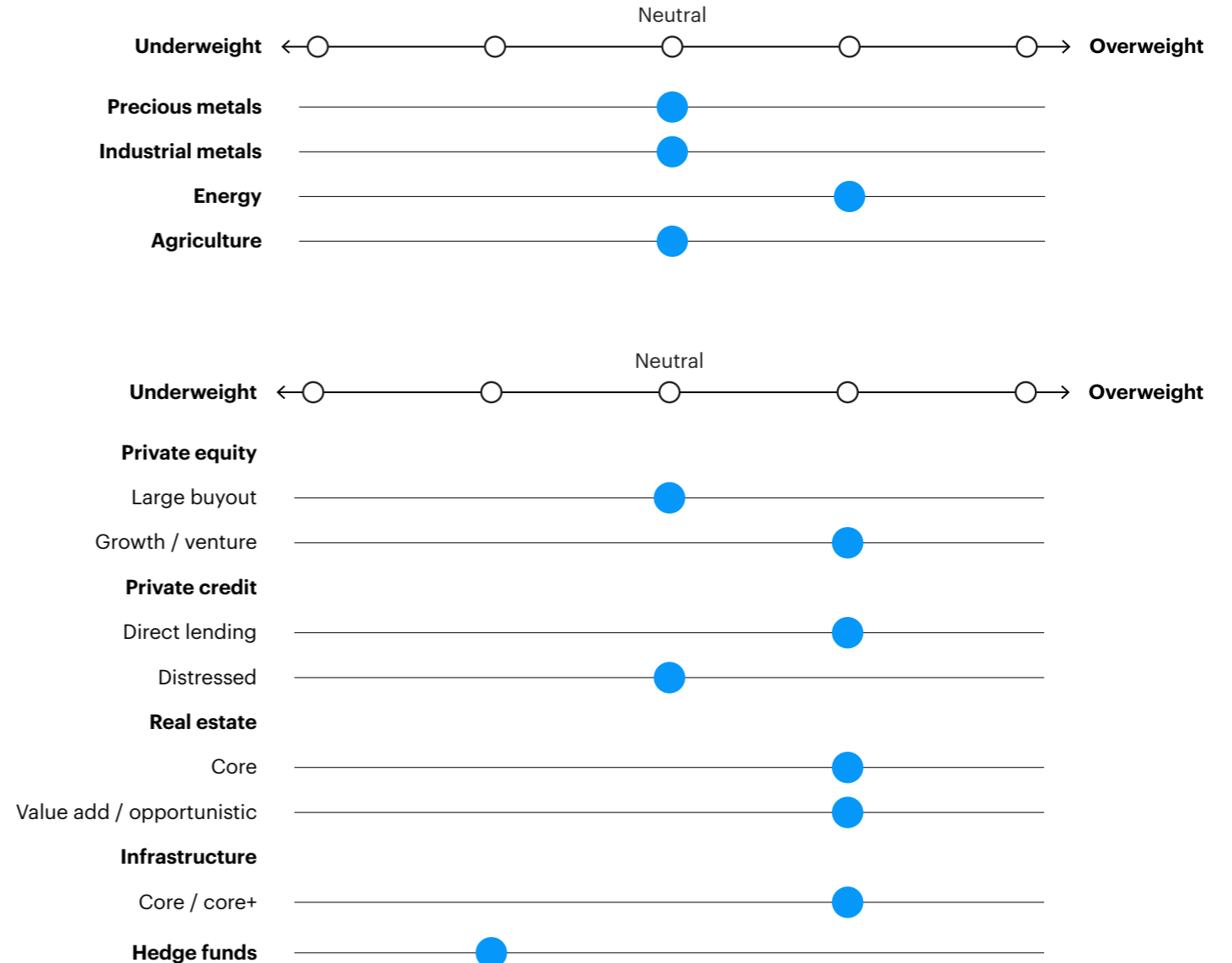
## Investing in Alternatives\*\*

- Within the private equity space, we favor growth and venture categories which are expected to continue to outperform across a range of macroeconomic scenarios, while buyout strategies may face headwinds driven by relatively high valuations and an increasing supply of dry powder competing for deals.
- Direct lending strategies should continue to benefit from strong credit fundamentals and have the potential to benefit from increasing interest rates given their floating rate structure.
- Real assets respond favorably to inflation, both as a result of increasing revenue as well as physical asset appreciation. The potential for a continued rebound in global trade, passenger travel, and office occupancy, coupled with relatively attractive valuations and inflation protection, results in a favorable outlook.

\* Source: Invesco Systemic & Factor Investing, ETF and Indexing teams.

\*\* Source: Invesco Investment Solutions. Alternatives tactical asset valuations represent our view of which asset classes are likely poised to outperform over an approximate 3- to 5-year timeframe, October 2021. Note: For illustrative purposes only.

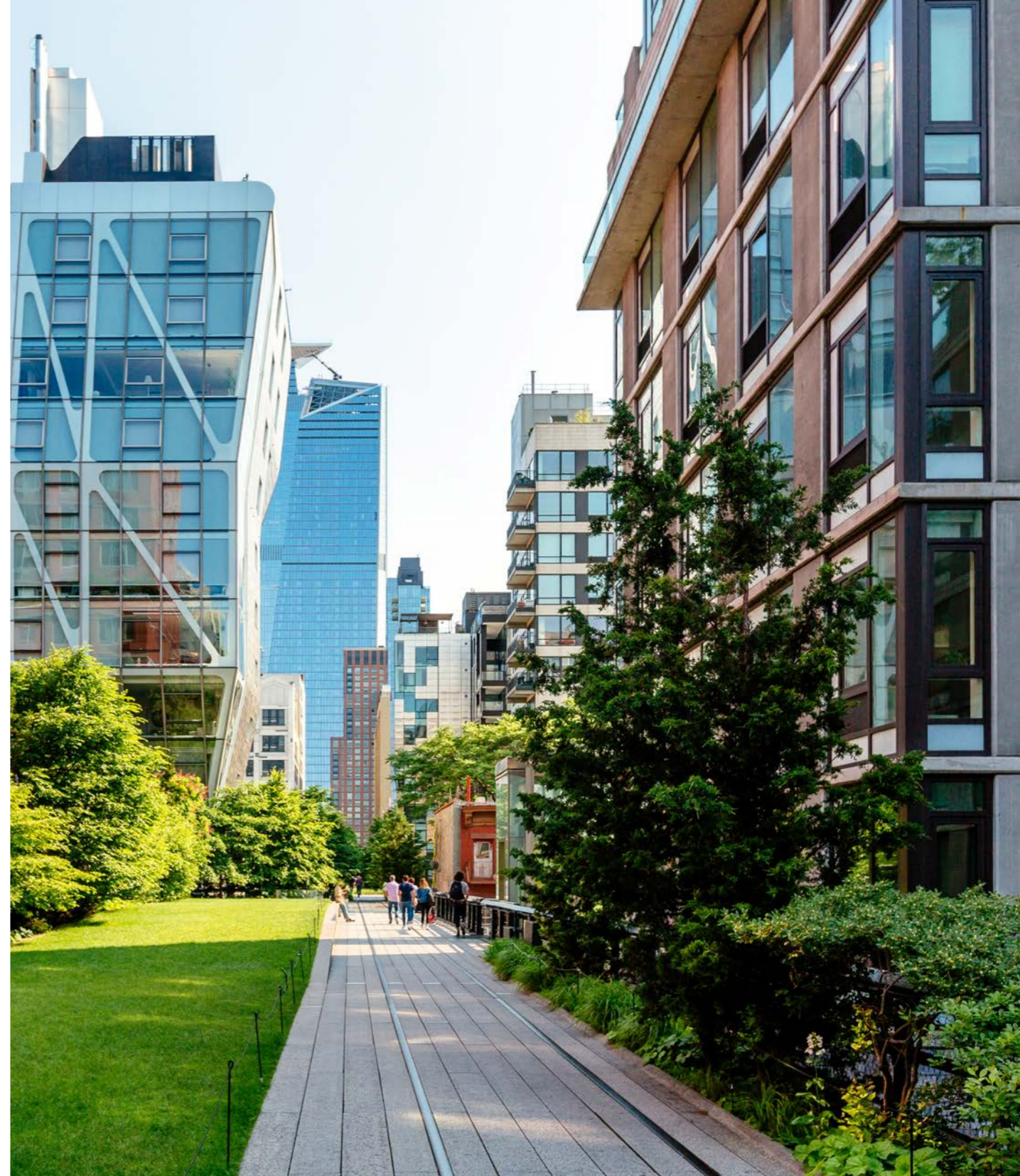
## Absolute Tactical Asset Allocation Positioning: Base Case



## Introducing the Economic Transition Monitor

- Our Economic Transition Monitor (ETM) is intended to help identify alpha-generating opportunities arising from the journey to net-zero:
  - Bloomberg recently estimated that up to \$173 trillion of infrastructure investment will be needed to enable a net-zero global economy by 2050.
  - Just over \$500 billion was invested in the emerging energy-tech arena last year – we are barely scratching the surface.
- The ETM is an innovative approach that will:
  - Monitor the progress of individual countries toward net-zero (versus their targets and our forecasts).
  - Identify new technologies and their potential to reduce carbon intensity (thereby spotting investment opportunities).
  - Adjust economic data to allow for contributions to climate change (internalizing an externality).
  - Allow us to integrate the economic transition into our regular economic and market commentaries.

*The Economic Transition Monitor will be included in the 2022 Midyear Outlook.*

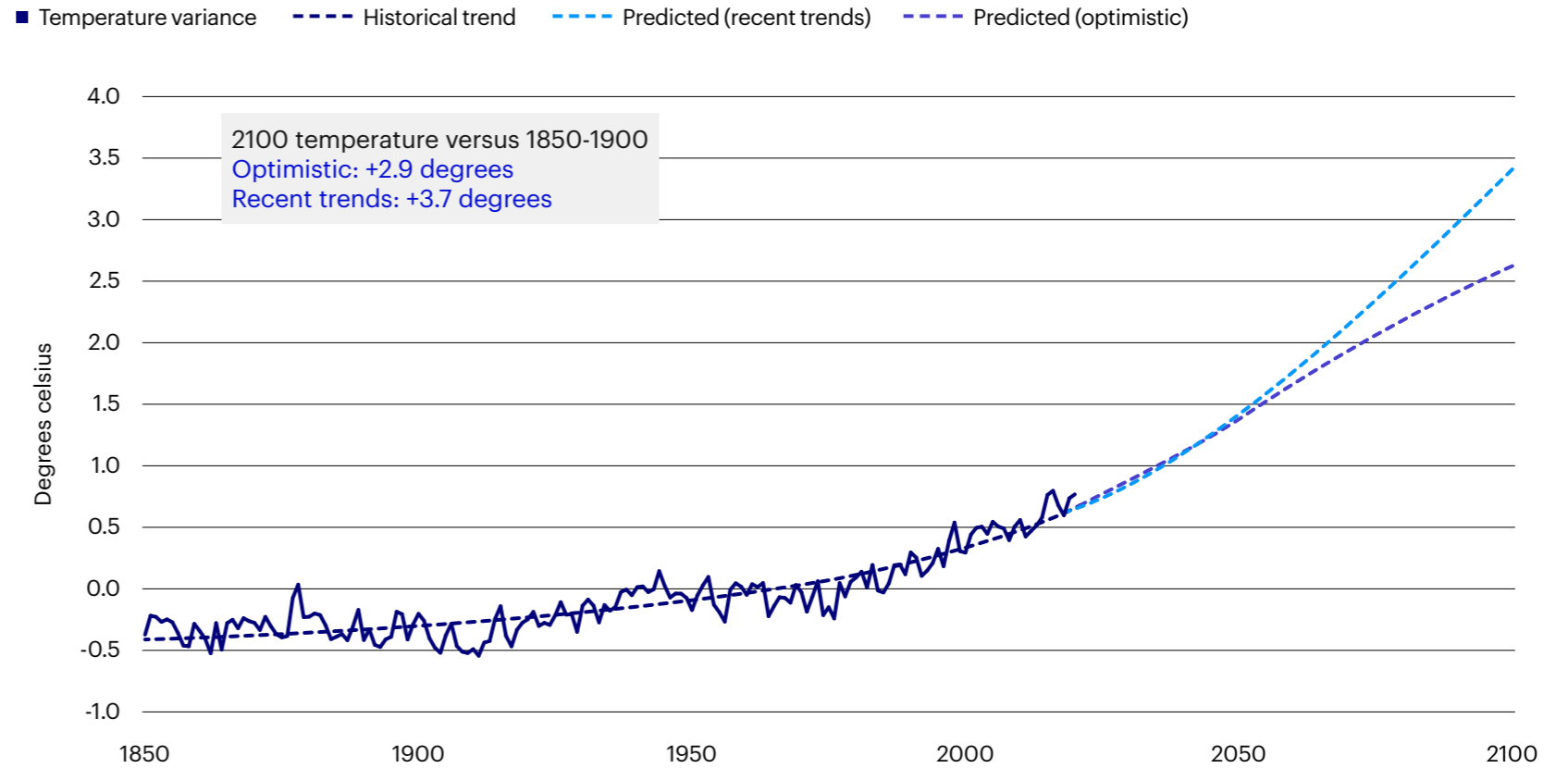


# We need to double (at least) the rate of technological innovation and adapt...

...creating investment opportunities

- The current rate of innovation (reduction in CO<sub>2</sub> intensity) is not enough (we predict a ceteris paribus global temperature gain from 1850-1900 to 2100 of 3.7 degrees Celsius).
- We think a doubling of the rate of innovation would limit temperature change to 2.9 degrees by 2100.
- We need more carbon-reducing technologies such as wind/solar/wave power, heat pumps/geothermal systems, electric cars/planes, CRYObatteries, long-distance electricity transmission systems, alternative air conditioning, etc.
- Carbon capture is also important via new technology or reforestation (we estimate that planting 900bn trees in the coming decade would offset the climate change effect of 0.7 percentage points of annual global GDP growth to 2100).
- Adaptation spending (infrastructure, engineering, agri-sciences, etc.) will also be critical.

Projected temperature variance to 2100



The chart shows annual data from 1850 to 2100. It shows the historical global temperature variance ("Temp variance"), which is the global average land-sea temperature anomaly relative to the 1961-1990 average temperature in degrees Celsius, median estimate, as provided by UK Met Office Hadley Centre. "Fitted temp variance" is the result of a regression analysis that fits historical temperature variance to atmospheric CO<sub>2</sub> concentration (using the natural logarithm of the 100-year moving average of concentration, on the assumption that temperature at any moment is determined by CO<sub>2</sub> concentration during the previous 100 years). "Predicted (recent trends)" applies that fitted relationship to our forecast of CO<sub>2</sub> concentrations, assuming that recent trends in CO<sub>2</sub> intensity and GDP per capita continue, though with some convergence between World Bank income groups after 2050 (see Climate change scenario information). "Predicted (optimistic)" assumes a doubling of the rate of decline in CO<sub>2</sub> intensity (with the added assumption that high-income CO<sub>2</sub> emissions trend to zero in 2060). Source: NOAA, Our World in Data, UK Meteorological Office, United Nations, World Bank, Refinitiv, Datastream, and Invesco.

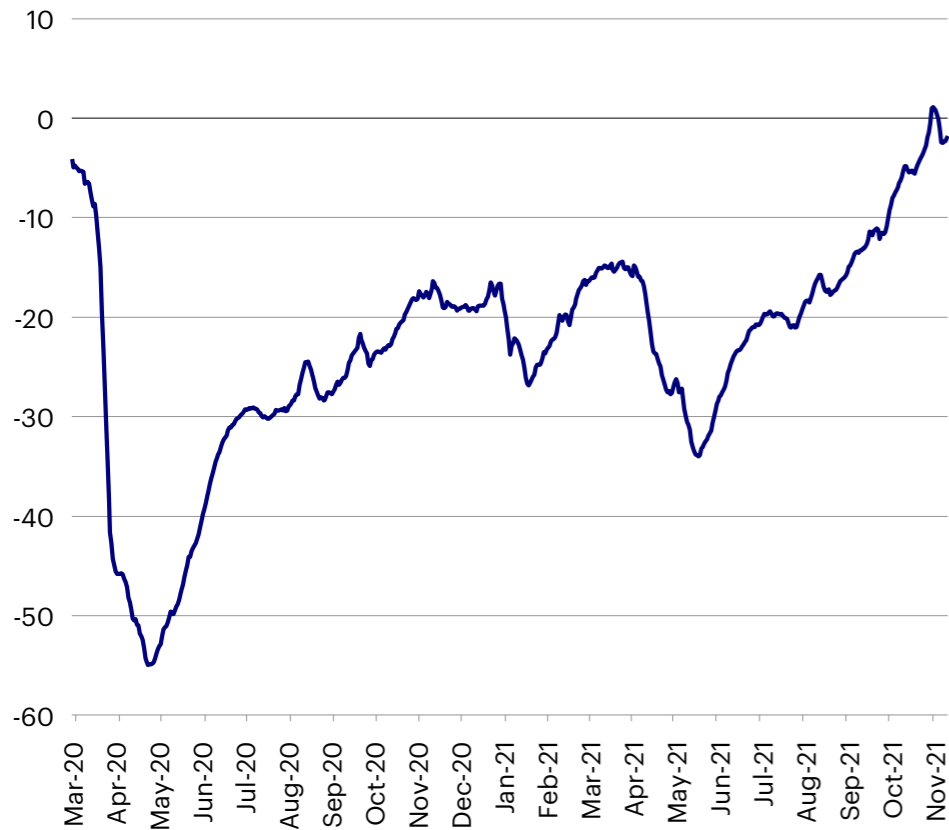
# Asia equities: Recovery in domestic and external demand bodes well for Asia in 2022

Policy actions to be closely monitored on the growth, supply chain and ESG fronts

## Mobility is improving in Asia

Asia ex-China google community mobility reports, 7-day avg (% change from baseline\*)

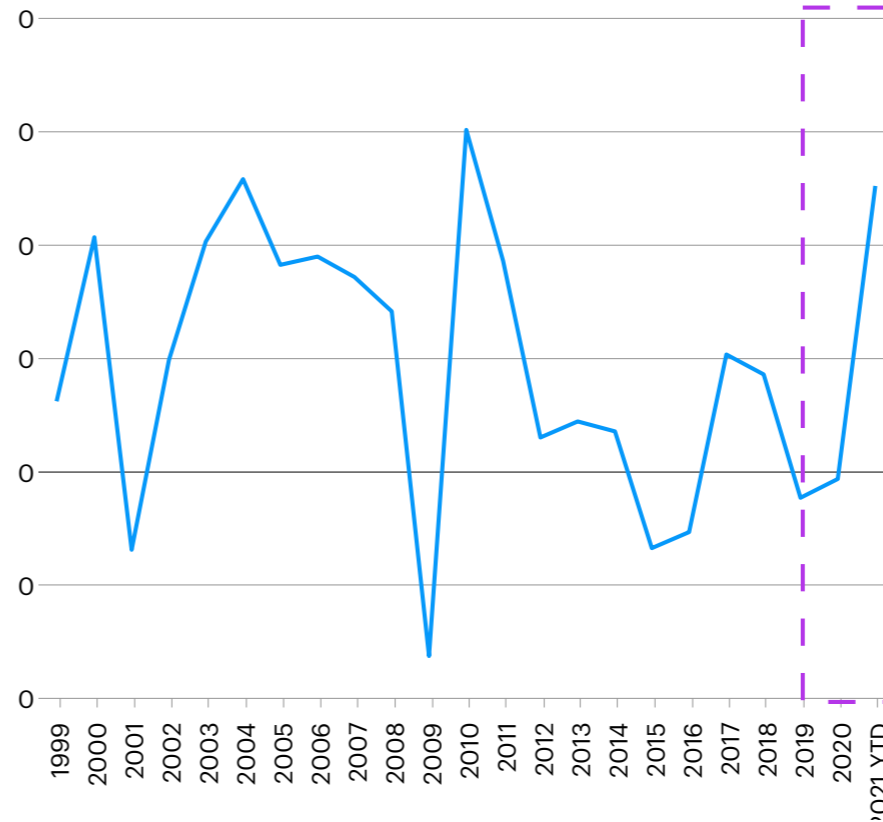
■ Retail & Recreation



## External demand is driving up export growth

Asia ex-Japan export value, %YoY

■ AXJ Export Value, %Y



**Mike Shiao**  
Chief Investment Officer  
Asia ex Japan

- In most of Asia, mobility has been improving as vaccination progresses. External demand is firm as well, supporting strong recovery in export growth.
- Policymakers are closely watched as their actions on growth, supply chain and ESG will affect long-term growth trajectory.
- China has gained relative attractiveness given valuation discount; while ASEAN can gain more traction as borders reopen.

Source (LHS): Google, CEIC, Morgan Stanley Research. \*The baseline is the median value, for the corresponding day of the week, during the 5-week period Jan 3-Feb 6, 2020.  
Source (RHS): CEIC, Haver Analytics, IMF, Morgan Stanley Research. Export data as of Sep-21.

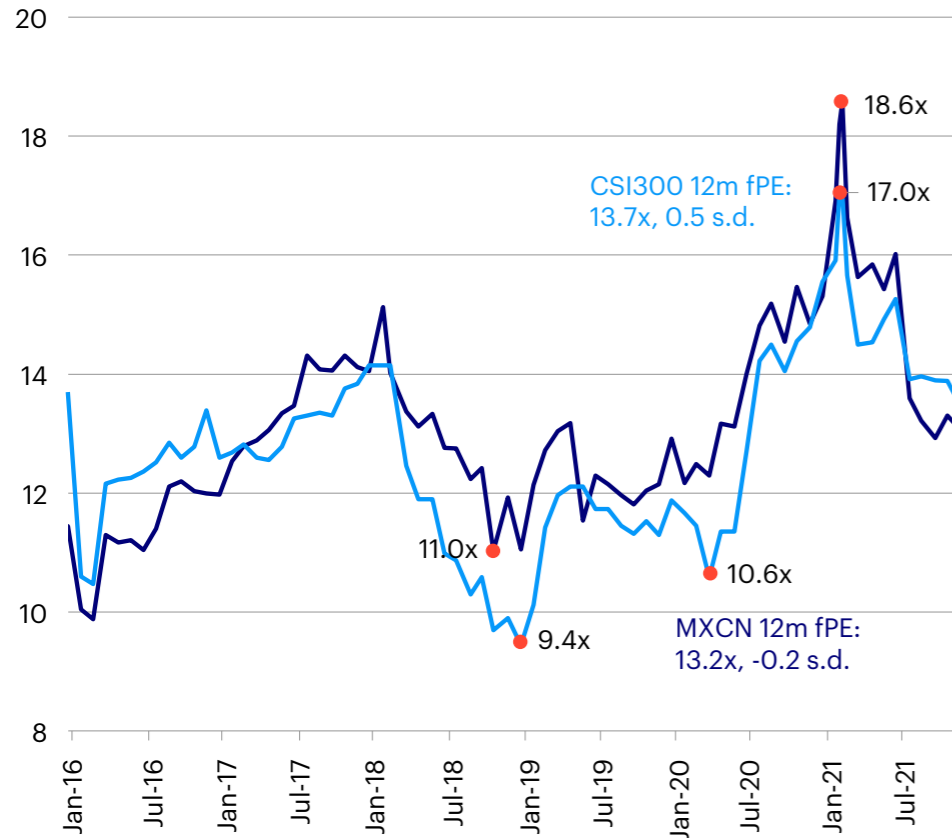
# China equities: Structural growth remains intact under the common prosperity framework

Valuations have discounted for headwinds facing the market

## Valuation is back to attractive levels

12m forward P/E (X)

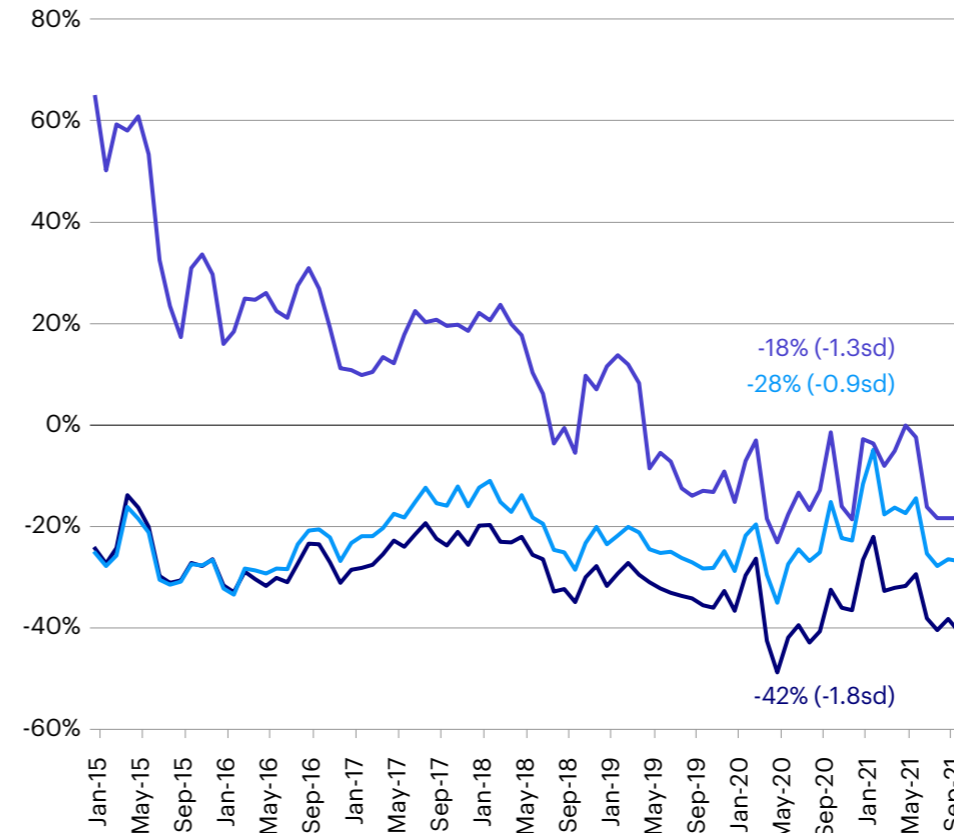
■ MXCN (aggregate) ■ CSI300



## Valuation is at discount compared with global equities

Premium/discount of 12m forward P/E

■ MXCN vs S&P500 (sector neutral) ■ MXCN vs MSCI ACWI  
■ China Internet vs US Internet



**Mike Shiao**  
Chief Investment Officer  
Asia ex Japan

- Common prosperity is raised to promote quality growth, social wellbeing, and environmental sustainability.
- Policies towards areas ranging from technology, property and decarbonization have become clearer and the focus will be on execution going forward.
- Risk-reward is attractive from a historical perspective and against global peers, indicating opportunities into select companies.

# Asia fixed income (IG): Challenging environment in 2022 given elevated inflation risks and a weakening macro backdrop

China is the most attractive from a valuation perspective

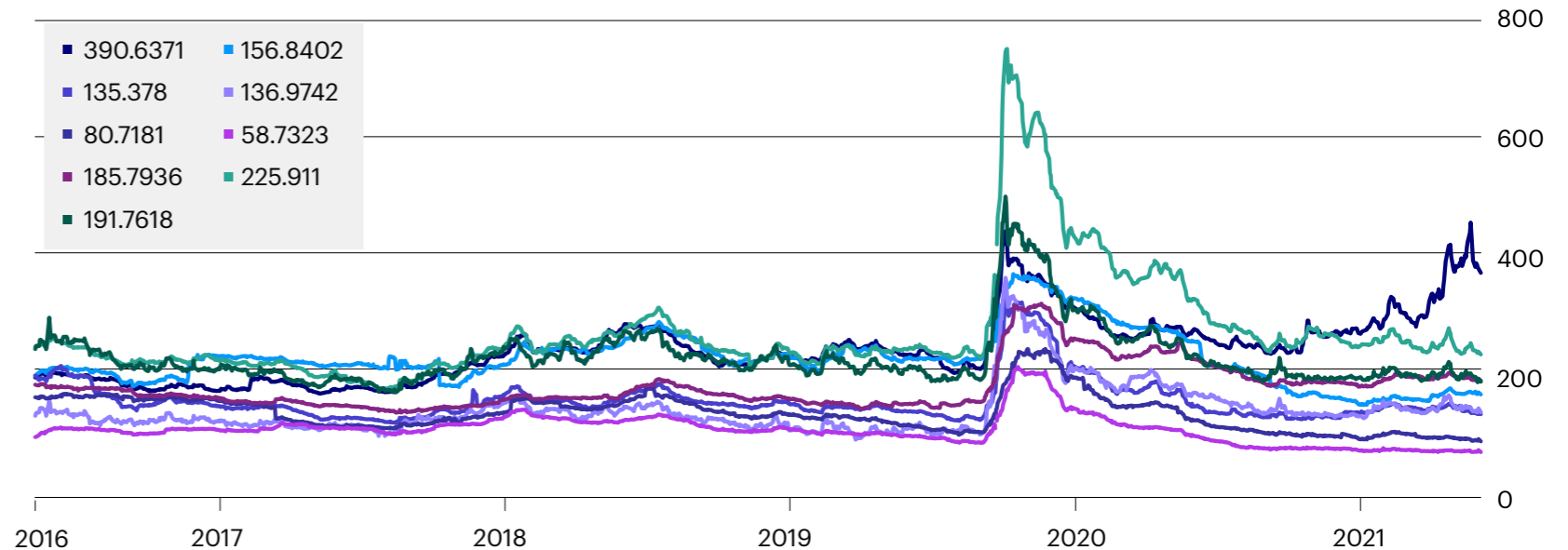


**Chris Lau**  
Senior Portfolio Manager  
Invesco Fixed Income

- Asia investment grade (IG) is likely to remain challenging in 2022, given elevated inflation/stagflation risks, a weakening macro backdrop and the brought forward US rate hike expectations.
- Fund flows to Asian investment grade should remain constructive given the attractive valuation versus global investment grade.
- China stands out from a valuation perspective, followed by India IG, whereas Korea, Singapore and the Philippines are the most expensive and provide little buffer against potential higher US rates.

**Asia Investment Grade Credit spread changes - JP Morgan JACI**

- J.P. Morgan JACI China Strip Spread to Worst (%)
- J.P. Morgan JACI Malaysia Strip Spread to Worst (%)
- J.P. Morgan JACI Singapore Strip Spread to Worst (%)
- J.P. Morgan JACI Thailand Strip Spread to Worst (%)
- J.P. Morgan JACI Indonesia Strip Spread to Worst (%)
- J.P. Morgan JACI Hong Kong Strip Spread to Worst (%)
- J.P. Morgan JACI Philippines Strip Spread to Worst (%)
- J.P. Morgan JACI Korea Strip Spread to Worst (%)
- J.P. Morgan JACI India Strip Spread to Worst (%)



# Asia fixed income (HY): Expectations of gradual valuation recovery suggest Asia HY will stabilize in 2022

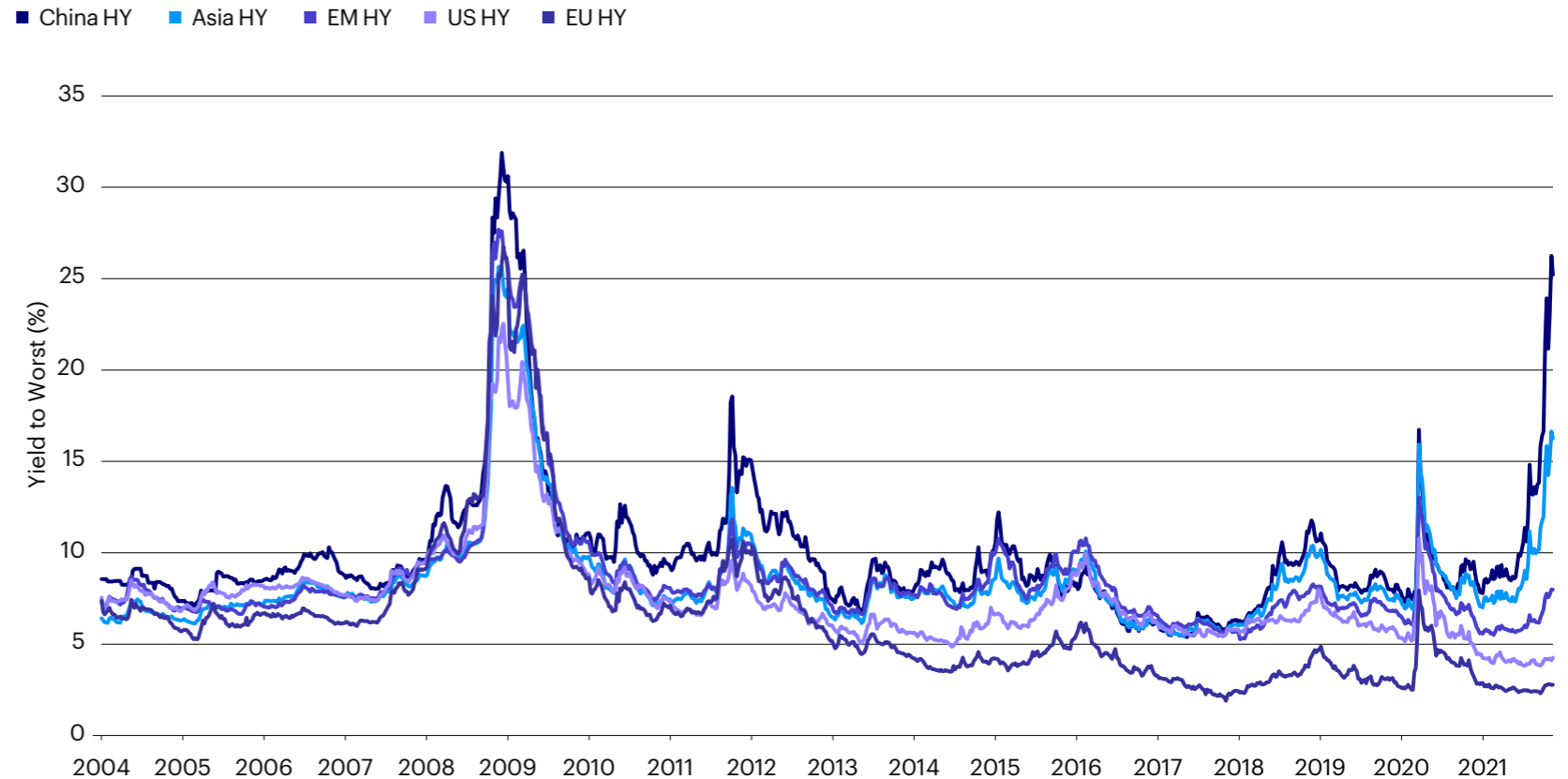
While Asia ex China HY corporate fundamentals are expected to stay largely stable, stretched valuations mean limited performance potential



**Gigi Guo**  
Credit Portfolio Manager  
Invesco Fixed Income

- Asia high yield (HY) has delivered the worst performance YTD among all global fixed income sub asset classes on the back of strict regulations for corporates to deleverage and tighter credit conditions.
- Coming into 2022, we expect Asia HY to stabilize with gradual valuation recovery.
- We expect fundamentals of Asia ex China HY corporates to stay largely stable, however the space shows limited performance potential given the stretched valuation in many names.

**Asia HY, especially China HY, has reached historically most attractive level vs. other major markets**



Note: China HY: ICE BofA Asian Dollar High Yield Corporate China Issuer Index; Asia HY: ICE BofA Asian Dollar High Yield Corporate Index; EM HY: ICE BofA High Yield Emerging Markets Corporate Plus Index; US HY: ICE BofA US High Yield Index; EU HY: ICE BofA Euro High Yield Index. Data frequency: weekly.

Sources: Invesco, BAML, Bloomberg, as of 16 November 2021.



# Asia fixed income (EM): Most Asian sovereigns are expected to suffer from high commodity prices and may see domestic inflation picking up in 2022

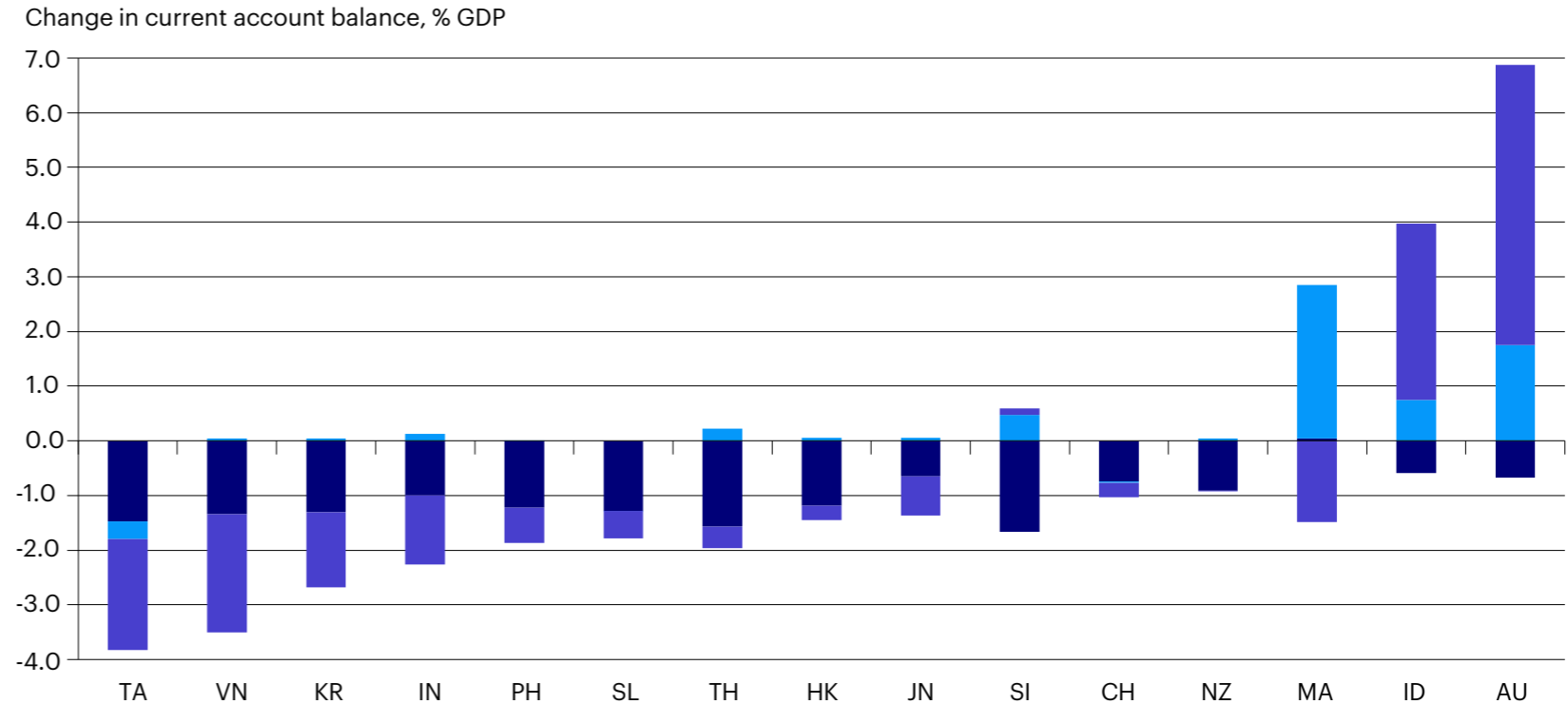


**Yifei Ding**  
Senior Portfolio Manager,  
Invesco Fixed Income

- High commodity prices and disruption in supply chains are expected to dampen the macro growth outlook in Asia.
- We favor Indonesia sovereign and quasi sovereign issuer USD bonds over Indian counterparts due to the different trade profile.
- Frontier Asian countries' hard currency sovereign bonds are either too expensive or idiosyncratic risks are too high.

Change in current account balances if energy prices stay at current level

■ Oil ■ Gas ■ Coal



Sources: BP, Bloomberg, HSBC (NB: CH refers to mainland China). Data as at October 8, 2021.

## Investment risks

The value of investments and any income will fluctuate (this may partly be the result of exchange rate fluctuations) and investors may not get back the full amount invested. Past performance is not a guide to future returns.

## Climate change scenario information

In all cases, global CO2 emission projections are calculated as the sum of emissions from low-, middle- and high-income countries (as currently defined by the World Bank). Emissions for each group are calculated as the product of population, GDP per capita and the CO2 intensity of GDP (kg of CO2 per 2011 PPP US dollar of GDP). Population estimates are provided by the UN's World Population Prospects 2019. World Bank data is used for emissions in the 1960 to 1989 period. Estimates for the period 1990 to 2020 are calculated using actual data for population, GDP per capita and CO2 intensity (though because CO2 intensity is only available to 2018 for middle- and high-income countries and to 2016 for low-income countries, recent trends are used to estimate more recent years)..

### Two scenarios are imagined for future emissions (starting in 2021):

- "Recent trends" assumes that for high-income countries, CO2 intensity continues to decline at the same annual rate as in the last 10 years (to 2018) and that GDP per capita continues to grow at the same rate as in the 10 years to 2019 (and not 2020, as that was an exceptional year due to Covid-19). For middle-income countries, it is assumed that CO2 intensity declines at the same rate as in the last 10 years (to 2018) until 2050, after which time it is assumed that the decline accelerates such that CO2 intensity matches that of high-income countries by 2100. Middle-income GDP per capita is assumed to grow at the same rate as in the last 10 years (to 2019) until 2050 and thereafter to grow more rapidly such that convergence with high-income GDP per capita occurs in 2100. Low-income countries are assumed to start industrialising, so it is assumed that CO2 intensity increases until it matches that of middle-income countries in 2050 and that it thereafter declines at the rate seen in middle-income countries in the last 10 years (to 2018). Low-income GDP per capita is assumed to grow at the same rate as in the last 10 years (to 2019) until 2050 and thereafter to grow at the rate seen in middle-income countries in the last 10 years (to 2019).
- "Optimistic" assumes for high-income countries that CO2 intensity reaches zero in 2060 (at which point gross emissions will be zero) and that in the meantime there is a linear convergence to zero. High-income GDP per capita is assumed to grow at the same rate as in the last 10 years (to 2019), as with the "recent trends" scenario. Middle-income CO2 intensity is assumed to decline at twice the rate seen in the last 10 years (to 2018) and GDP per capita is assumed to grow at the same rate as in the last 10 years (to 2019), until 2060 after which point it is assumed to accelerate, allowing linear convergence on high-income GDP by 2100 (the "recent trends" scenario assumed that convergence started in 2050). Low-income CO2 intensity is assumed to increase (due to industrialisation), converging on (the now more rapidly declining) middle-income CO2 intensity by 2050 and falling in line with it thereafter. Low-income GDP per capita is assumed to increase at the same rate as in the last 10 years (to 2019) until 2050 and to then grow at the same rate as in middle-income countries in the last 10 years (to 2019).

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All data as of October 31, 2021, unless otherwise stated. All data is USD, unless otherwise stated.

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