

FEBRUARY 2023

Capital market assumptions

Raising our long-term capital market assumptions (CMAs)

- After a tumultuous year that saw double-digit declines in most equity and fixed income asset classes, our 20-year return assumptions are higher across the board. This is largely attributable to a positive impact from valuations, given that some of our growth expectations have actually declined from last year due to structural forces.
- We have raised our long-run expectations for U.S. equities to a 7.2% annualized return, relative to 5.8% at the end of 2021.
- We are building in slightly higher inflation expectations in the U.S., but there is greater uncertainty in our baseline forecasts. Our assumption for U.S. inflation (CPI) has increased to 2.25%, though we still expect the US Federal Reserve to be successful in the long run, maintaining its target of 2%.
- Non-U.S. developed markets equity return expectations have also risen to 7.1%. Higher-dividend yield, greater multiple expansion and assumptions of a tailwind from USD depreciation offset expectations of lower GDP growth. Meanwhile, emerging markets have the highest expected return at 9%.
- Fixed income saw sharp losses across nearly all sectors in 2022 amid rapidly rising rates, significantly higher inflation and a stronger dollar. We are likely to see some retracement of the rise in yields and a steeper yield curve.
- Yields at the end of the third quarter of 2022 in some areas, including emerging markets debt and high-yield bonds, reflected a high risk of recession and are above levels that should be extrapolated over our 20-year horizon, so we could see some mean reversion.
- In terms of currencies, we expect the U.S. dollar to depreciate over a long-term horizon.

Table of contents

Economic commentary	2
Capital market assumptions	7
Methodology	8
Valuation-independent CMAs	11
Teams	12
Glossary	13
Index definitions	14
Additional information	16

Raising expectations for long-term capital market assumptions, supported by valuations and high starting yields in fixed income

Our long-term return assumptions (20 years) at the start of 2023 are higher across the board after a tumultuous year that saw most equity and fixed income asset classes experience double-digit declines. Last year, broad stock and bond markets declined concurrently and by a similar amount. The Federal Reserve hiked rates the fastest since 1994, leaving bond investors reeling and increasing both the cost of capital and the discount rate for corporations, which helped to drive down stock prices, some quite meaningfully. Outside the U.S., continued COVID-related disruptions were accompanied by high inflation and rising rates.

The increase in expected returns relative to 2021 is largely attributable to the positive impact from valuations, given that some of our expectations for economic growth have actually declined from last year. Outside the U.S., we see a substantial tailwind from what we expect to be a prolonged period of U.S. dollar weakness. It's possible that, despite the recent decline, the dollar could resume its bull run for next year or so, but the long-term outlook undoubtedly calls for it to weaken.

In fixed income, our assumptions for a steeper yield curve and somewhat lower credit spreads are more than offset by a higher starting point in yields across all fixed income asset classes.

Economic backdrop

Underpinning our asset class expectations are lower economic growth assumptions for many regions around the world due to the more pessimistic assessment of labor supply growth in the U.S., U.K. and Europe; continued COVID impacts; and secular shifts in China's economy. We have increased our assumption for **U.S. inflation** to 2.25% for the Consumer Price Index (CPI), even though we still expect the Federal Reserve to successfully maintain its long-run target of 2% for the Personal Consumption Expenditures Price Index (PCE).

Overall, we assume inflation will rise, given secular changes to supply chain patterns, climate transition and rising geopolitical risk. We have lowered our U.S. GDP (gross domestic product) growth estimates to 2.3% (annualized) from 2.6% last year, driven largely by demographic forces. Our economists' view is that lower labor force growth and participation won't be fully offset by immigration. We maintain our productivity assumption of 2% largely because we expect society to be rewarded by today's technology advances over the next 10 to 20 years.

Non-U.S. markets: Inflation and labor shortages

Similarly, both the European Union and the U.K. have struggled with labor shortages in the post-COVID era, reflecting a significant loss of older workers and an immigration slowdown. Combined with an assumption that the energy price shock will persist and the impact of Brexit in the U.K., we've lowered our growth outlook for the region.

In **Europe**, we assume that the European Central Bank (ECB) will hit its inflation target of 2% in the medium term, but the risks are now skewed to the upside given the energy shock, fiscal expansion and mounting political pressure on the ECB to temper rate hikes. Similarly, in the **U.K.**, we assume the Bank of England (BoE) will hit inflation targets but tolerate moderately higher inflation.

The outlook for **Japan** is unchanged, although the composition of real growth is different. We're assuming that higher productivity from digital transformation will be offset by even lower labor force growth. While sector-specific immigration in areas such as nursing, construction and agriculture is moving the needle, it has slowed post-COVID and is likely to grow at a slower pace. We expect the GDP growth rate for the non-U.S. developed world to be 1.1%.

For **China**, we have lowered our estimates for potential real growth for the next 20 years from 4% to 3%. Factors influencing the forecast are a maturing economy, a lack of market-oriented policy reforms from Beijing (including limited services-sector liberalization), the absence of additional funding for a social safety net, concerns about the stability of policies affecting private-sector investment, and a slow property market. Other secular forces having a dampening effect are the sharper-than-expected slowdown in the birthrate and a shift to "China+1" strategies at foreign companies invested in China, who are looking at ways to diversify their supply chain risk.

U.S. population and productivity estimates



As of 30 September 2022. This data has been generated with the help of NiGEM. The NiGEM economic model is the property of the National Institute of Economic and Social Research and NiGEM is a trade mark of the Institute. Population age is defined as the ages between 16 to 64. The estimated NiGEM annual productivity is defined as output per hour for all employed persons. There are a number of ways to define productivity, and this is one measure.

Economic commentary (continued)

Equities

All expected equity returns are meaningfully higher than one year ago. With the shift in markets, the impact from valuations is the largest driver of the increase. Outside the U.S., the impact from currency exchange rates has had a substantial impact, as the U.S. dollar has been expensive against both developed and emerging market currencies.

In the **U.S.**, higher assumptions for inflation offset expectations for lower real GDP growth, leaving valuations as the biggest driver of the change in equity returns. We expect U.S. equities to return 7.2% annualized over the 20-year horizon, more than 1% higher than what we predicted at year-end 2021.

We also assume a slightly higher net accretion in the U.S., as lower valuations may offset some of the accounting considerations as companies can retire more shares. That said, given higher debt costs, it could be more difficult to finance buybacks with debt. Low interest rates in the period after the Global Financial Crisis (GFC) have enabled many companies to distribute dividends and buybacks at levels that are higher than their free cash flow. This overdistribution has led companies to increase their leverage over time. With the ultra-low interest-rate environment behind us, some companies may need to deleverage their balance sheets, and overdistributions of dividends will be more difficult to justify.

Non-U.S. developed markets equity return expectations have also increased and are slightly below expectations for the U.S. Higher-dividend yield, greater multiple expansion and assumptions of a tailwind from U.S.-dollar depreciation offset expectations of lower GDP growth. Without the FX (foreign exchange) tailwind, expected returns would be significantly lower. The aggregate number does mask substantial differences between countries – expected returns are higher for the U.K. and Japan and lower for Europe and Canada.

Emerging markets (EMs) have the highest expected return on a 20-year view, with greater multiple expansion, a weaker U.S. dollar and a higher dividend yield, outpacing assumptions for lower expected growth in China. Finally, we assume a 2.5% net dilution factor, assuming net new issuance has a dilutive effect on the existing shareholders' ownership of stocks.

20-year expected returns (%)	Year-end 2022	Year-end 2021
U.S. equity	7.2	5.8
Non-U.S. developed markets equity	7.1	6.3
Emerging markets equity	9.0	6.0

Source: Capital Group. Year-end expected returns 2022 are as of 31 December 2022, with valuations as of September 2022. Year-end expected returns 2021 are as of 30 November 2021. Returns in USD terms.

Economic commentary (continued)

Fixed income

Fixed income returns have seen the largest net increase in expected returns from the 2021 year-end update across the board. Higher starting yields are the largest driver of forward long-term returns.

Overall, we expect some retracement of the rise in yields and **a steeper yield curve**. We're assuming a slightly steeper terminal yield curve relative to last year to reflect a higher term premium due to the uncertainty around inflation. We also assume that assets will no longer have the support of an open-ended quantitative easing (QE) program.

Our expectation for the **five- to 10-year U.S. Treasury** terminal yield is at 2.7%. At this level, given our assumptions for real yields, it still provides a 0.45% positive real yield with a terminal inflation breakeven of 2.4% against a backdrop of relatively high debt levels in developed economies, which is likely to keep monetary policy leaning to be more accommodative overall.

We also expect a slight increase in terminal credit spreads relative to last year. **Credit spreads** in the third quarter of 2022 in areas such as emerging markets and high yield reflected a high risk of recession and were above levels that should be extrapolated over a 20-year horizon. However, some mean reversion is likely.

Our **U.S. high-yield** expected returns have increased to 6.6% from 4% one year ago due to higher starting yields, even though we have increased our expectations for spreads and default losses considering a more volatile inflation and rate environment. We still believe that the higher quality composition of the index will persist, as CCC-rated credits have become a smaller portion of the index relative to BB-rated bonds. As such, we are not assuming mean reversion for spreads or defaults. Our expectation for high-yield spreads over intermediate Treasuries is at 425 basis points relative to a historical median spread of 475 basis points.

We expect the gap between U.S. and most non-U.S. rates to narrow, primarily because there is more room for the Fed to lower rates and be more active relative to the ECB and BoE. It is likely that the ECB's monetary policy will remain more accommodative than the Fed over the forecast horizon given structural shifts such as changing demographics and migration patterns, as well as the needs of weaker countries like Italy and Spain for monetary support.

On the other hand, **Japan** is already an outlier with yield curve control. While we maintain that Japanese government bond (JGB) spreads will stay wide, we have trimmed the range modestly given the very recent change to the yield curve range.

Economic commentary (continued)

From a total return perspective, **emerging markets debt** continues to look the most attractive. Starting yields are higher than other fixed income asset classes at 7.2%. Looking at the asset class in aggregate, the tailwind from currencies in emerging markets local debt has helped to offset potential defaults in USD-denominated emerging markets debt.

In **major markets**, we are assuming that **real yields** will increase from current levels, but on a nominal basis, they will stay below nominal GDP growth. We are already at record-high debt levels in almost every major economy and almost every sector. If yields go above nominal growth rates and stay there, it risks creating unstable debt dynamics. Therefore, it's unlikely that we will see a 20-year period of nominal yields that are higher than nominal growth rates.

20-year expected returns (%)	Year-end 2022	Year-end 2021
Cash (USD)	2.3	1.1
U.S. Treasury intermediate term	3.4	1.6
U.S. TIPS	3.6	0.9
U.S. aggregate	4.2	2.0
U.S. high yield	6.6	4.0
Emerging markets debt (USD)	7.6	4.7

Source: Capital Group. Year-end expected returns 2022 are as of 31 December 2022, with valuations as of September 2022. Year-end expected returns 2021 are as of 30 November 2021. Returns in USD terms.

Currencies

We expect major currencies to appreciate against the U.S. dollar on average over our 20-year horizon. Our return estimates start with the observation that the dollar is currently significantly overvalued against major currencies, an assessment supported by two different currency models that we use. We assume that the dollar will depreciate gradually, eventually converging with its fair value.

We see the largest FX returns in the Japanese yen, which, at current levels, is considerably undervalued by our estimates. Assuming it eventually converges back to its fair value implies a 3.8% annualized appreciation against the dollar. Conversely, we see negative FX returns in the Turkish lira and the Brazilian real. Both currencies are assumed to be overvalued and fair value convergence would require a respective 4% and 2% depreciation per annum against the dollar.

Non-USD-based equity and fixed income assets are poised to experience a tailwind from foreign currency exposure. We expect currencies to add 1.4% per annum to the returns of the MSCI World ex USA Index for equities and 1.6% annualized to the Bloomberg Global Aggregate ex USD Index for fixed income over the long term.

Capital market assumptions (CMAs)

Standard deviation (%)		Correlation matrix																					
Long-term expected returns (20 yrs) (%)																							
Asset class		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	
1 Cash(USD)	2.3	0.4	1.00																				
2 U.S.Treasury short term	3.1	2.1	0.24	1.00																			
3 U.S.Treasury intermediate term	3.4	5.6	0.11	0.87	1.00																		
4 U.S.Treasury long term	4.1	11.0	0.07	0.71	0.89	1.00																	
5 U.S. TIPS	3.6	6.0	0.04	0.57	0.68	0.61	1.00																
6 U.S. aggregate	4.2	3.8	0.09	0.76	0.85	0.82	0.77	1.00															
7 U.S. corporate	5.1	6.2	0.00	0.44	0.56	0.57	0.71	0.82	1.00														
8 U.S. corporate long duration	5.5	10.6	-0.01	0.46	0.64	0.72	0.67	0.85	0.91	1.00													
9 U.S. high yield	6.6	7.0	-0.05	-0.09	-0.04	-0.05	0.42	0.33	0.63	0.47	1.00												
10 Non-U.S. global aggregate	4.0	8.0	0.08	0.48	0.49	0.41	0.62	0.62	0.62	0.58	0.42	1.00											
11 Global aggregate	4.1	5.8	0.09	0.59	0.62	0.55	0.70	0.75	0.72	0.69	0.43	0.94	1.00										
12 Emerging markets debt USD	7.6	8.9	0.02	0.22	0.32	0.30	0.62	0.60	0.78	0.67	0.76	0.60	0.65	1.00									
13 Emerging markets debt local	7.8	11.7	0.10	0.15	0.18	0.12	0.45	0.40	0.56	0.47	0.63	0.68	0.66	0.77	1.00								
14 Municipal bonds	3.6	4.4	0.01	0.44	0.54	0.51	0.58	0.70	0.68	0.64	0.42	0.44	0.53	0.58	0.34	1.00							
15 U.S. equity	7.2	14.7	-0.04	-0.15	-0.11	-0.11	0.27	0.17	0.42	0.31	0.71	0.38	0.35	0.58	0.58	0.20							
16 U.S. small-cap equity	8.7	19.2	-0.05	-0.20	-0.17	-0.17	0.22	0.11	0.38	0.26	0.71	0.31	0.28	0.55	0.55	0.17	0.89	1.00					
17 Developed markets equity	7.2	15.3	0.00	-0.13	-0.11	-0.12	0.29	0.19	0.46	0.34	0.74	0.45	0.42	0.63	0.66	0.21	0.93	0.87	1.00				
18 All country world equity	7.4	15.5	0.01	-0.13	-0.11	-0.12	0.30	0.19	0.46	0.34	0.75	0.47	0.43	0.65	0.69	0.22	0.92	0.86	0.96	1.00			
19 All country world small-cap equity	7.5	18.0	-0.02	-0.17	-0.14	-0.15	0.29	0.17	0.46	0.33	0.77	0.43	0.39	0.64	0.66	0.22	0.89	0.92	0.92	0.92	1.00		
20 Non-U.S. developed markets equity	7.1	16.6	0.03	-0.11	-0.10	-0.12	0.30	0.19	0.46	0.34	0.73	0.51	0.46	0.65	0.71	0.22	0.85	0.81	0.93	0.93	0.90	1.00	
21 Emerging markets equity	9.0	20.7	0.08	-0.09	-0.08	-0.10	0.32	0.20	0.45	0.33	0.69	0.49	0.45	0.65	0.77	0.20	0.73	0.71	0.80	0.84	0.82	0.84	1.00
22 Inflation	2.3	1.8																					

As of 31 December 2022, with valuations as of 30 September 2022. Returns in USD terms. All assumptions are for market asset classes only and are reviewed at least annually. These figures represent the views of a small group of investment professionals based on their individual research and are approved by the Capital Market Assumptions Oversight Committee. They should not be interpreted as the view of Capital Group as a whole. As Capital Group employs The Capital System™, the views of other individual analysts and portfolio managers may differ from those presented here. They are provided for informational purposes only and are not intended to provide any assurance or promise of actual returns. They reflect long-term projections of asset class returns and are based on the respective indexes or other proxies and therefore do not include any outperformance gain or loss that may result from active portfolio management. Note that the actual results will be affected by any adjustments to the mix of asset classes. All market forecasts are subject to a wide margin of error.

How we build our CMAs

Long-term capital market assumptions – 2023

These assumptions are intended to reflect our forward-looking views over a long-term (20-year) horizon spanning multiple market cycles. We believe these are reasonable expectations to use as a starting point for strategic asset allocation recommendations. They are meant to capture the relative return/volatility of asset classes within a total portfolio context. Central to the design of our approach is that the starting point of the analysis matters and that a number of key asset class variables demonstrate some level of mean reversion over the long term.

Equities

We use a building blocks approach for our equity return assumptions, as defined by this formula.

Equity return	Earnings growth
	-/+ Dilution/accretion
	+ Dividend yield
	+ Valuation impact
	+ Currency impact

Earnings growth: We use expected real GDP growth plus inflation as the proxy for earnings growth, in line with standard practices. For inflation and real earnings growth assumptions, we seek the input of economists on our Capital Strategy Research (CSR) team and reference a global macro model.

Dividend yield: For the dividend yield component, we take an average of the prevailing dividend yield and the median historical yield for the corresponding MSCI regional or country index.

Net dilution/accretion: We account for net dilution/accretion to capture the expected gap between GDP growth and earnings-per-share growth, and the impact of earnings-per-share dilution or accretion. Net dilution is estimated as in Bernstein and Arnott (2003),* which suggests using the ratio of an index's market cap to its price level as a simple measure of the net impact of share issuance and buybacks. As markets grow through new issuance, the number of listed shares increases, diluting the ownership of existing shareholders. Hence, high economic growth doesn't necessarily translate to higher earnings-per-share growth, as we have seen in several emerging markets over the last decade.

We combine two approaches in determining our estimate: regression using various productivity measures (the theory being that productivity growth coincides with economic growth and has also empirically been shown to be meaningful to net dilution), and regression to estimate net buyback yield using cash, debt and tax-rate estimates as the variables and supplement that with views from our economist team.

Valuation: The impact of valuations is computed as the multiple expansion or contraction from current valuation levels to a target valuation. The valuation measures we consider are cyclically adjusted price-to-earnings ratios (CAPEs) of the corresponding MSCI regional or country indexes. This measures the real price as the numerator and the average of real earnings from the last 10 years as the denominator. The target valuations are mostly a 40/60 blend of mean reversion and change to reach a "fair value" CAPE calculated using a multivariate regression of CAPE to real GDP growth and the 10-year yield. The current CAPE ratio is measured against the target CAPE ratio to determine if a market is over or undervalued.

* Bernstein, W.J. and R.D. Arnott (2003), "Earnings Growth: The Two Percent Dilution," *Financial Analysts Journal*, 59:5, 47-55.

How we build our CMAs (continued)

Additionally, for mean reversion, the impact of valuation for each country or region is not based on that country or region in isolation; rather, we assume that the broader regional and global context is important. Here, the target CAPEs are calculated as composites of country, regional and global CAPEs. For example, for the U.S. market, we compute the target CAPE as two-thirds of the U.S. CAPE and one-third of the global (MSCI World) CAPE. These ratios allow us to acknowledge the importance of global linkages and concurrently mitigate the impact of outliers on the impact of valuation figures.

Fixed income

To arrive at our expected returns for each fixed income asset class, we compute its projected annual return for each year over the investment horizon, which we then geometrically compound before calculating the annualized return for the full period.

Bond return building blocks:

Bond return	Yield to worst
	+ Valuation impact
	+ Default impact
	+ Currencies

Yield to worst: We start with the prevailing yield to worst for the corresponding proxy index (principally Bloomberg and J.P. Morgan indexes) and projected ending yields in 10 years' time.

The projected ending yields are based on historical spreads over U.S. intermediate-duration Treasuries (five- to 10-year maturities), with a view as to whether spreads will be tighter or wider in the future relative to where they are today. For years 11 through 20, we assume yields remain flat. The return for each year is calculated based on the prevailing duration of the index and assumes a linear change in yields, plus any impact from default losses and currencies.

Default impact: The assumptions we use for default losses are based on historical averages and the view from our fixed income analysts/portfolio managers on how the future may diverge from the past.

How we build our CMAs (continued)

Currencies

Our currency projections are based around long-run currency fair values using our trade-weighted multilateral model. Fair values are determined by relative inflation and a proxy for productivity trends and assume that inflation/productivity trends will continue.

The expected nominal FX return calculations assume current spot rates revert to fair values in the medium term and track their respective currency fair value trends over the 10-year horizon. The annualized change (i.e., return) applied to various asset classes is calculated based on the underlying currency weights in the index proxies.

In addition to the trade-weighted multilateral model, this year we have incorporated a bilateral-USD model, which incorporates metrics and forecasts widely used across CMA equity and fixed income building blocks and integrates long-run inflation and productivity estimates. As a result, it more closely aligns our currency forecasts with the approach taken across other CMA asset classes.

Each model uses a standard framework to value in a way that it is globally consistent, coherent and easily interpretable. Both models assume that current FX spot rates will gradually converge to their implied fair values. We produce forecasts across a set of 25 currency pairs versus the U.S. dollar and 43 economies. Output from both models is averaged.

Volatility and correlation assumptions

Our assumptions about asset class volatilities and correlation figures are based largely on estimates from the historical return data series of the asset class proxies. The traditional approach in estimating the correlation matrix using asset class returns contains estimation error, magnified with the outliers in the sample data. As a result, we derive our estimates by transforming the sample matrix using a statistical method called shrinkage, which tends to pull the most extreme values toward the center, reducing estimation error.

Valuation-independent CMAs

We have created an alternative set of valuation-independent CMAs for long-horizon solutions. Our view is that for very long horizons of 40 to 50 years, it is also useful to look at a set of CMAs that strip out factors such as the impact of mean reverting valuations, the effect of market accretion or dilution and currency moves. These valuations are primarily used for the long-term strategic design of our solution offerings. We share here the valuation-independent CMAs for the major asset classes, assuming:

- Equity valuations do not revert
- There is no currency impact
- We do not account for net dilution or accretion
- We use only expected yields 10 years out to project bond returns and disregard starting yields

Asset Class	Long-horizon expected returns (%)	Volatility (%)	Historical proxy
Cash (USD)	1.9	0.4	FTSE 3-Month U.S. T-Bill Index Series
U.S. Treasury short term	2.4	2.1	Bloomberg 1-5 Year U.S. Treasury Index
U.S. Treasury intermediate term	2.7	5.6	Bloomberg 5-10 Year U.S. Treasury Index
U.S. TIPS	2.8	6.0	Bloomberg U.S. Treasury Inflation-Protected Securities (TIPS) Index
U.S. aggregate	3.4	3.8	Bloomberg U.S. Aggregate Bond Index
U.S. high yield	5.5	7.0	Bloomberg U.S. Corporate High Yield Index 2% Issuer Cap
Non-U.S. global aggregate	2.0	8.0	Bloomberg Global Aggregate ex-USD Index
Global aggregate	2.7	5.8	Bloomberg Global Aggregate Bond Index
U.S. equity	6.4	14.7	MSCI USA Index
U.S. small-cap equity	8.0	19.2	MSCI USA Small Cap Index
Developed markets equity	6.3	15.3	MSCI World Index
All country world equity	6.6	15.5	MSCI All Country World Index (ACWI)
All country world small-cap equity	7.5	18.0	MSCI All Country World Small Cap Index
Non-U.S. developed markets equity	6.3	16.6	MSCI World ex USA Index
Emerging markets equity	9.0	20.7	MSCI Emerging Markets Index

As of 31 December 2022, with valuations as of 30 September 2022. All assumptions are for market asset classes only and are reviewed at least annually. These figures represent the views of a small group of investment professionals based on their individual research and are approved by the Capital Market Assumptions Oversight Committee. They should not be interpreted as the view of Capital Group as a whole. As Capital Group employs The Capital System, the views of other individual analysts and portfolio managers may differ from those presented here. They are provided for informational purposes only and are not intended to provide any assurance or promise of actual returns. They reflect long-term projections of asset class returns and are based on the respective indexes or other proxies and therefore do not include any outperformance gain or loss that may result from active portfolio management. Note that the actual results will be affected by any adjustments to the mix of asset classes. All market forecasts are subject to a wide margin of error.

Capital Market Assumptions Oversight Committee



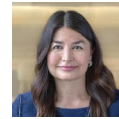
Brad Vogt
Equity Portfolio
Manager



John Queen
Fixed Income
Portfolio Manager



Philip Chitty
Fixed Income
Portfolio Manager



Michelle Black*
Portfolio Manager



Raj Paramaguru*
Research Director

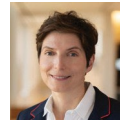
Economist team



Darrell Spence
Economist



Jared Franz
Economist



Anne Vandenebee
Economist



Robert Lind
Economist



Jens Søndergaard
Currency Analyst



Stephen Green
Economist



Dane Mott
Accounting Analyst



Elizabeth Mooney
Accounting Analyst

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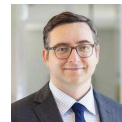
Grace Chen
Analyst



Chima Nwadike
Business Operations
Manager



Eswarie Balan
Analyst



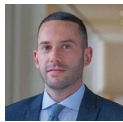
Eugene Han
Analyst



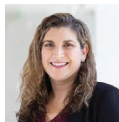
Samir Mathur
Portfolio Manager



Andrew Shannon
Business Operations
Manager



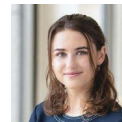
Glenn Cagan
Analyst



Katie Kilday
Analyst



Wesley Phoa, Ph.D.
Portfolio Manager



Ella Sinfield
Analyst



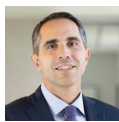
Swati Chandra
Analyst



Ilia Lanski, Ph.D.
Analyst



Jeanell Novak
Senior Business
Manager



Denis Chaves, Ph.D.
Analyst



Boqiu Lu
Analyst

*Also a member of the Capital Solutions Group

Glossary

Capital market assumptions: Long-term projections of the future performance of asset class returns based on their respective indexes or other proxies that incorporate analysis and observations.

Yield to worst: The lowest yield that can be realized by either calling or putting on one of the available call/put dates or holding a bond to maturity.

Correlation: A statistical measure of how a security and an index move in relation to each other. A correlation ranges from -1 to 1. A positive correlation close to 1 implies that as one moved, either up or down, the other moved in lockstep, in the same direction. A negative correlation close to -1 indicates the two have moved in the opposite direction.

Standard deviation: A statistical measure of dispersion of the observed return that depicts how widely a stock or portfolio's returns varied over a certain period of time. When a stock or portfolio has a high standard deviation, the predicted range of performance is wide, implying greater volatility.

Currency impact: An increase or decrease in the value of a foreign investment or of something bought or sold in a foreign country caused by a change in the exchange rate.

Dividend yield: The dividends a company pays out to investors as a percentage of the share price.

Net dilution: The reduction of a shareholder's ownership percentage caused by the issuance of additional shares.

Net buyback yield: The amount of a company's net repurchase of outstanding shares, or buybacks, divided by its market capitalization. Please note that net buyback yield does not represent a dividend paid by the company.

Retracement: A technical term used to identify a minor pullback or change in the direction of a financial instrument, such as a stock or index.

Mean reversion: The assumption that an asset's price will tend to converge with its average price over time, despite long-term variations.

Index definitions

All indexes are unmanaged, and their results include reinvested distributions but do not reflect the effect of sales charges, commissions, account fees, expenses or U.S. federal income taxes.

Cash (USD): The **FTSE 3-Month U.S. T-Bill Index Series** is intended to track the daily performance of three-month U.S. Treasury bills. The indexes are designed to operate as a reference rate for a series of funds.

U.S. Treasury short term: The **Bloomberg 1-5 Year U.S. Treasury Index** measures USD-denominated, fixed-rate, nominal debt issued by the U.S. Treasury with maturities of one to five years.

U.S. Treasury intermediate term: The **Bloomberg 5-10 Year U.S. Treasury Index** measures USD-denominated, fixed-rate, nominal debt issued by the U.S. Treasury with maturities of five to 10 years.

U.S. Treasury long term: The **Bloomberg 10-20 Year U.S. Treasury Index** measures USD-denominated, fixed-rate, nominal debt issued by the U.S. Treasury with maturities of 10 to 20 years. The **Bloomberg 20+ Year U.S. Treasury Index** measures USD-denominated, fixed-rate, nominal debt issued by the U.S. Treasury with maturities of 20 years or more.

U.S. TIPS: The **Bloomberg U.S. Treasury Inflation-Protected Securities (TIPS) Index** consists of investment-grade, fixed-rate, publicly placed, USD-denominated and non-convertible inflation-protected securities issued by the U.S. Treasury that have at least one year remaining to maturity and US\$250 million par amount outstanding.

U.S. aggregate: The **Bloomberg U.S. Aggregate Bond Index** represents the U.S. investment-grade fixed-rate bond market.

U.S. corporate: The **Bloomberg U.S. Corporate Investment Grade Index** represents the universe of investment-grade, publicly issued U.S. corporate and specified foreign debentures and secured notes that meet the specified maturity, liquidity and quality requirements.

U.S. corporate long duration: The **Bloomberg U.S. 20+ Year AAA-A Corporate Bond Liquid Index** measures fixed-rate, taxable corporate bonds with at least 20 years remaining to maturity. It includes USD-denominated securities issued by U.S. and non-U.S. industrial, utility and financial issuers with an index rating of at least AAA and at least US\$750 million par amount outstanding and excludes subordinated debt.

U.S. high yield: The **Bloomberg U.S. Corporate High Yield Index 2% Issuer Cap** covers the universe of fixed-rate, non-investment-grade debt. The index limits the maximum exposure of any one issuer to 2%.

Non-U.S. global aggregate: The **Bloomberg Global Aggregate ex-USD Index** measures the performance of global investment-grade bonds, excluding the United States. This multicurrency index includes Treasury, government-related, corporate and securitized fixed-rate bonds from both developed and emerging market issuers.

Global aggregate: The **Bloomberg Global Aggregate Bond Index** measures the performance of global investment-grade bonds. This multicurrency index includes Treasury, government-related, corporate and securitized fixed-rate bonds from both developed and emerging market issuers.

Index definitions (continued)

Emerging markets debt USD: The **J.P. Morgan Emerging Market Bond Index (EMBI) Global Diversified** is a uniquely weighted emerging markets debt index that tracks total returns for USD-denominated bonds issued by emerging market sovereign and quasi-sovereign entities.

Emerging markets debt local: The **J.P. Morgan Government Bond Index – Emerging Markets (GBI-EM) Global Diversified** covers the universe of regularly traded, liquid fixed-rate, domestic-currency emerging markets government bonds to which international investors can gain exposure.

Municipal bonds: The **Bloomberg Municipal Bond Index** is a market-value-weighted index designed to represent the long-term investment-grade tax-exempt bond market.

U.S. equity: The **MSCI USA Index** is a free-float-adjusted, market-capitalization-weighted index that measures the U.S. portion of the world market. Results reflect dividends gross of withholding taxes.

U.S. small-cap equity: The **MSCI USA Small Cap Index** is a free-float-adjusted, market-capitalization-weighted index that measures the performance of the small-cap segment of U.S. markets.

Developed markets equity: The **MSCI World Index** is a free-float-adjusted, market-capitalization-weighted index that measures equity market results in global developed markets, consisting of 23 developed market country indexes.

All country world equity: The **MSCI All Country World Index (ACWI)** is a free-float-adjusted, market-capitalization-weighted index that measures equity market results in global developed and emerging markets, consisting of more than 40 developed and emerging market country indexes.

All country world small-cap equity: The **MSCI All Country World Small Cap Index** is a free-float-adjusted, market-capitalization-weighted index that measures equity market results of smaller capitalization companies in both developed and emerging markets. Results reflect dividends net of withholding taxes.

Non-U.S. developed markets equity: The **MSCI World ex USA Index** is a free-float-adjusted, market-capitalization-weighted index that measures equity market results in global developed markets, consisting of 22 of 23 developed market country indexes, excluding the United States.

Emerging markets equity: The **MSCI Emerging Markets Index** is a free-float-adjusted, market-capitalization index that measures equity market performance of emerging markets.

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