



Capital Market Assumptions

# FIVE-YEAR PERSPECTIVE 2020



## TABLE OF CONTENTS

1	United States.....	7
2	United Kingdom.....	11
3	Eurozone .....	15
4	Japan .....	19
5	Australia.....	23
6	Methodology .....	27
7	Appendix.....	35

**The T. Rowe Price Capital Market Assumptions  
leverage the expertise of our global investment platform.**

## Capital Market Assumptions Five Year Perspective | 2020

In-depth analysis and insights to inform your decision-making.

We are pleased to present the second annual publication of T. Rowe Price's Capital Market Assumptions. In this edition, we have incorporated feedback from our investment partners across the globe and are excited to present distinct forecasts for five regions:

- 1) United States
- 2) United Kingdom
- 3) Eurozone
- 4) Japan
- 5) Australia

We believe that offering a range of economic scenarios provides investors with flexibility to analyze asset allocations under multiple regimes to better inform their return expectations. Based on feedback we received, we have changed the scenario titles to make them more intuitive to investors:

- 1) Strong bull market
- 2) Moderate bull market
- 3) Moderate bear market
- 4) Strong bear market

Our capital market assumptions are best understood as forecasts for the central tendency of forward returns. We do not seek to predict actual or realized returns, as there is bound to be material variation around this central tendency for any given historical or future period. For this reason, T. Rowe Price's approach to portfolio construction relies on the use of multiple optimization methods and robustness checks.

Our baseline forecasts incorporate the insights of senior portfolio managers and analysts across our equity, fixed income, and multi-asset divisions. We believe this interdisciplinary approach to developing capital market assumptions, which seeks to capture both fundamental and quantitative insights, delivers the best thinking of T. Rowe Price.

We encourage questions, comments, and feedback. Please feel free to contact your T. Rowe Price relationship manager and/or any of the investment professionals who contributed to this effort.



## UNITED STATES

**5.3%**

U.S. LARGE-CAP EQUITY  
EXPECTED RETURN (in USD)

**1.7%**

U.S. TREASURY  
EXPECTED RETURN (in USD)

CURRENCY



*Consumers continue to drive growth supported by negative real rates. However, overall economic growth remains modest, given the aging workforce and headwinds from a corporate debt overhang. This dynamic keeps earnings momentum modest and capital spending muted.*

## UNITED KINGDOM

**7.7%**

UK EQUITY  
EXPECTED RETURN (in GBP)

**0.0%**

UK GILTS  
EXPECTED RETURN (in GBP)

CURRENCY



*Completing Brexit would impair growth, as domestic firms face costs of doing business with their largest trading partners in Europe, pushing up wages and inflation. In this environment the pound strengthens marginally, but remains relatively weak. Because the UK equity market is so internationally-focused, the weak currency helps lift earnings and boosts the dividend yield.*



## EUROZONE

6.2%

EUROPE EQUITY  
EXPECTED RETURN (in EURO)

CURRENCY



0.2%

EUROPE GOVERNMENTS  
EXPECTED RETURN (in EURO)

*Longer-term growth prospects remain weak in Europe. Rising costs of an aging society, muted economic dynamism, the prospects of negative yields for a decade could all hurt the financial sector. Against this backdrop, the equity market would see gains mostly from the high dividend yield.*

## JAPAN

6.7%

JAPAN EQUITY  
EXPECTED RETURN (in JPY)

CURRENCY



0.0%

JAPAN TREASURY  
EXPECTED RETURN (in JPY)

*The domestic economy still faces headwinds, as benefits from expanding female labor force participation fade. Maintaining similar growth would require unconventional monetary policy and exceptionally low rates. However, the corporate transformation could continue, unlocking shareholder value through higher dividend payouts and better earnings.*

## AUSTRALIA

7.2%

AUSTRALIA EQUITY  
EXPECTED RETURN (in AUD)

CURRENCY



1.1%

AUSTRALIA BONDS  
EXPECTED RETURN (in AUD)

*Unlike other markets, Australia still has a growing workforce. This could permit domestic rebalancing to continue, even if painful for sectors such as housing. Equity valuations could deteriorate, but that may be only a minor headwind to returns, given strong international earnings and high dividends.*

The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Please refer to the respective regional pages for data sources and important additional information.

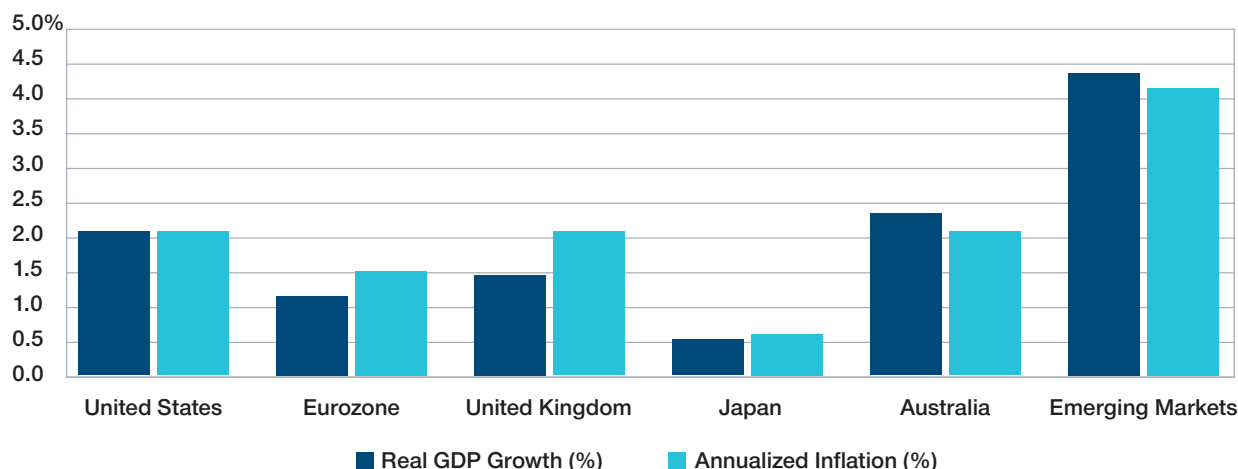


## COMMENTARY ON BASELINE FORECASTS

Following 2019, a year in which almost every major asset class experienced positive, and in many cases atypically positive returns, our baseline 2020 scenario reflects the expectation that markets are increasingly less likely to deliver the same level of returns as

recent history. Inflation and Gross Domestic Product (GDP) growth expectations remain positive across the globe, but are slightly lower than last year's forecasts with the notable exception of the United Kingdom, which has most of its Brexit uncertainty in the rear-view mirror.

## MACROECONOMIC FORECASTS FOR BASELINE RESULTS



### Equity

Our five-year expectation for the equity risk premia has compressed slightly compared to last year. Globally, we perceive equity valuations as slightly stretched with a small negative total-return contribution attributable to declining P/E ratios forthcoming. We expect real earnings to grow 2%-4.5% over the next five years, with Japan leading the way due to improved corporate governance. Indeed, a common theme across all markets that outperform is a heavy reliance on dividend payouts to boost returns. After a decade of outperformance, our investment professionals see U.S. returns finally falling below those elsewhere, thanks to a moderation of earnings growth after an exceptional run since 2009.

### Fixed Income

The backdrop of slow but positive economic growth and low yields globally have been accompanied by particularly tight spreads, leaving many drivers of fixed income returns particularly stretched. Our forward-looking baseline forecasts for developed-market bond returns are lower than historical experience, acknowledging that yield curves would need to move (or continue deeper) into negative territory to produce similar return experiences. Most developed-market yield curves started 2020 slightly inverted in the 0-2 year maturity space, implying central bank rate cuts in the near term.

Our investors expect the shape of the yield curve to normalize over the next five years, with higher yields overall, particularly at the long end of the curve. This bear steepener would cause short term negative returns for longer-duration instruments but higher reinvestment yields over longer time horizons.

Consistent with the experience in equities, we see a search for yield in fixed income markets continuing, because aging populations expect steady payouts in retirement. This constant hunt for yield, along with five more years of unconventional monetary policy, would help

keep a lid on spreads, with only modest long-term widening of credit premia with the notable exception of emerging market (EM) corporate bonds. Our U.S. inflation forecast is about 30 basis points higher than consensus, offering a slight return tailwind to Treasury Inflation-Protected Securities (TIPS).

### Alternatives

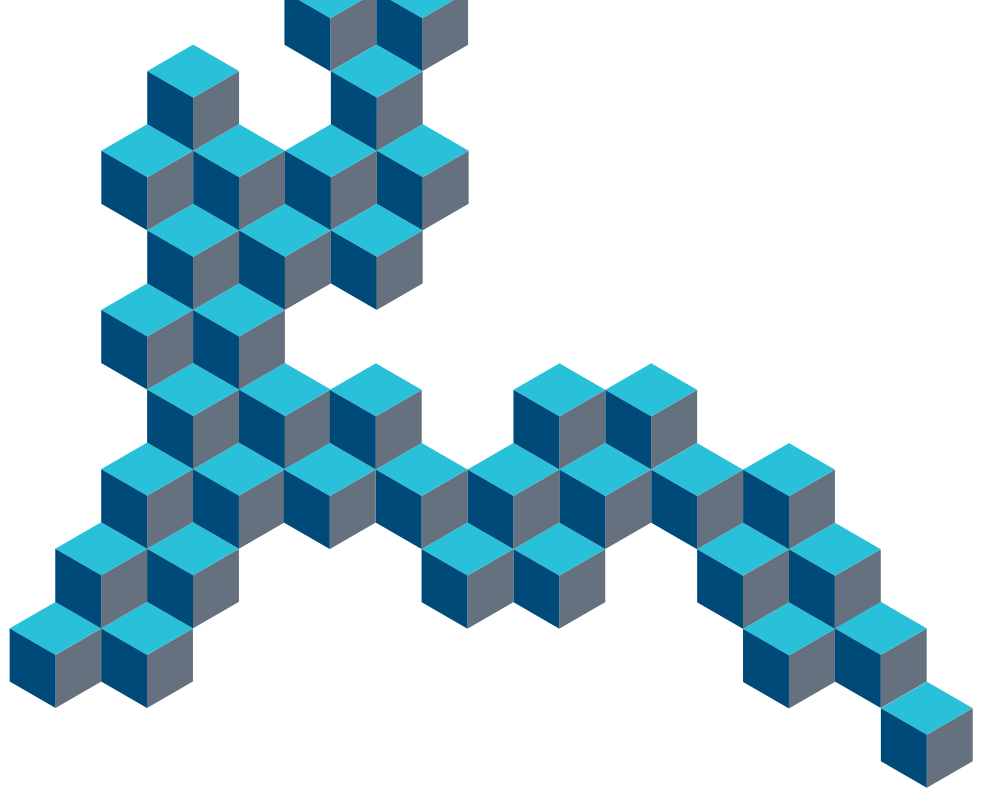
In 2019, oil prices rebounded 20%, with gold generating similar returns. As a real asset capable of generating real income, real estate also did well in the United States. Signs of a market bottom in residential real estate were visible by year end, particularly in Australia and Canada.

Despite this near-term rebound in commodity prices, we continue to be concerned, particularly within energy-related areas, as structural oversupply and strong productivity growth within the sector could hinder future returns for investors. Hedge fund performance, while widely varied based on strategy and investment approach, generally lagged public markets in 2019.

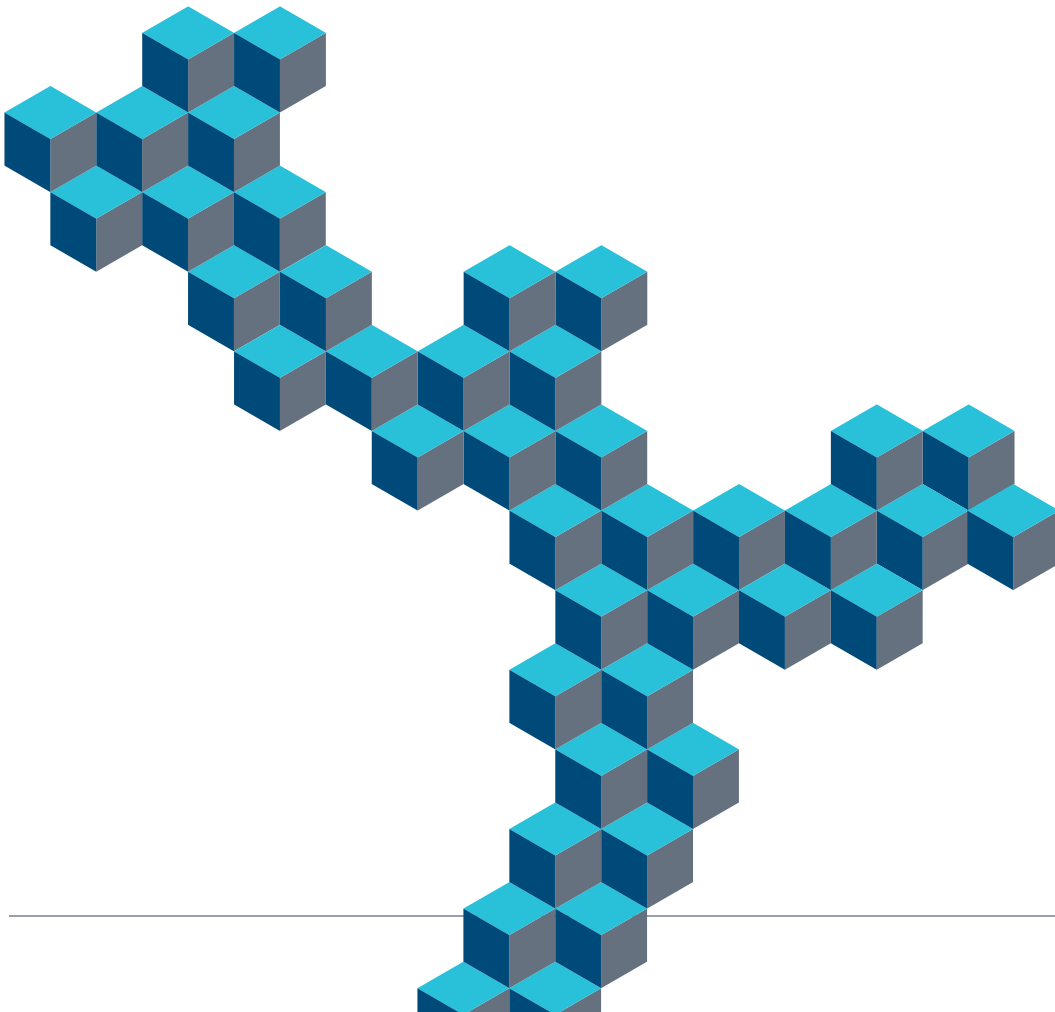
Our expectations for private assets include a slight liquidity premium but do not offer dramatically higher expectations than for public equity markets.

### Currency

While five-year currency trends are notoriously hard to forecast, our short-term interest rate views and global growth outlooks, where they differ from consensus, offer a lens into possible currency fluctuations. Our baseline forecasts incorporate a slight strengthening of the Australian dollar, euro, and pound sterling, with a weakening of the U.S. dollar and the Japanese yen. We also do not expect EM currencies to depreciate significantly relative to developed market currencies, although on a real basis, EM market exchange rates could appreciate on the backs of an economic rebound and stronger inflation differentials versus the developed markets.



## **REGION | UNITED STATES**



# REGION | UNITED STATES (\$ USD)

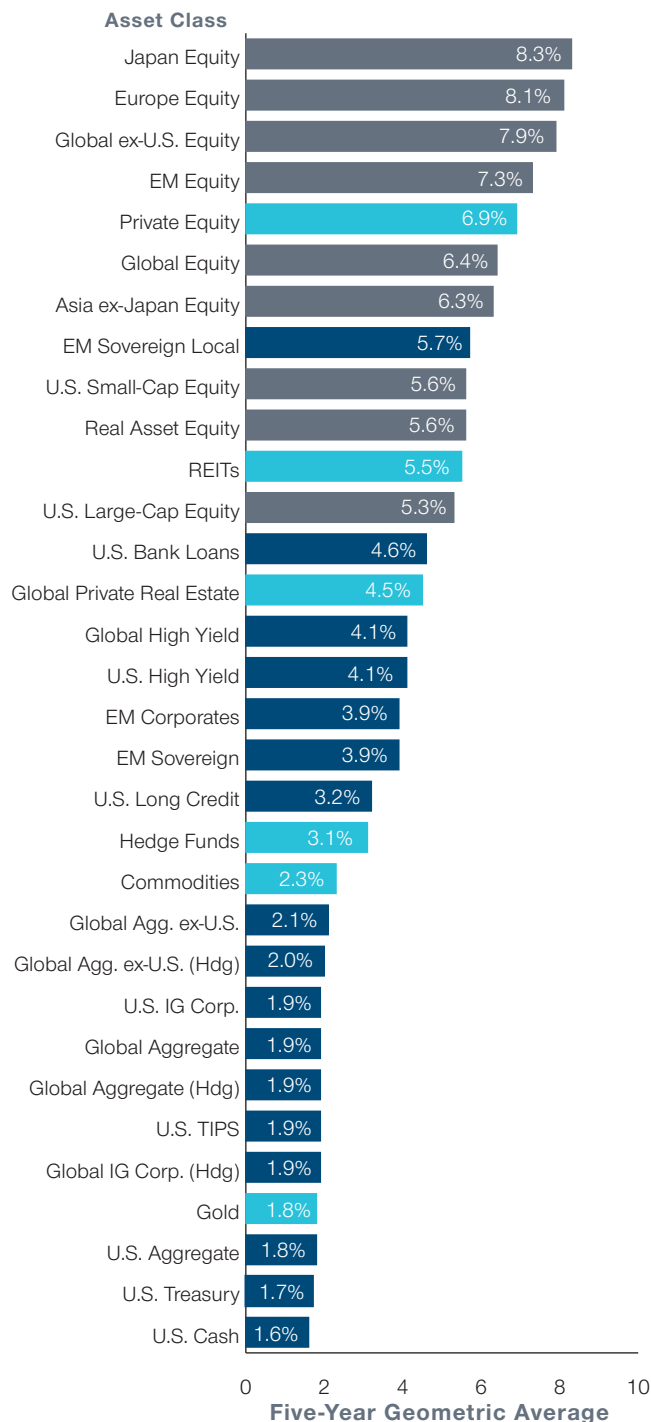


(Figures in U.S. Dollars)

## ANNUALIZED FORECAST AND HISTORICAL NOMINAL RETURNS

ASSET CLASS		2020 5-YEAR RETURN FORECAST	HISTORICAL 5-YEAR RETURNS, ENDED 31 DECEMBER		
			2019	2014	2009
EQUITY	Global Equity	6.4%	9.0%	9.7%	3.6%
	Global ex-U.S. Equity	7.9	5.9	4.8	6.3
	U.S. Large-Cap Equity	5.3	11.5	15.6	0.8
	U.S. Small-Cap Equity	5.6	8.2	15.5	0.5
	Europe Equity	8.1	5.6	5.8	4.5
	Asia ex-Japan Equity	6.3	6.8	5.7	13.7
	Japan Equity	8.3	8.4	5.9	-1.0
	EM Equity	7.3	5.9	2.0	15.7
	Real Asset Equity	5.6	4.1	8.1	7.1
	REITs	5.5%			
FIXED INCOME	Global Aggregate	1.9	2.3	2.6	4.6
	Global Aggregate (Hdg)	1.9	3.6	4.6	4.8
	Global Agg. ex-U.S. (Hdg)	2.0	3.9	4.7	4.6
	Global Agg. ex-U.S.	2.1	1.6	1.4	4.3
	Global IG Corp. (Hdg)	1.9	4.5	6.1	4.1
	Global High Yield	4.1	5.5	8.6	7.0
	U.S. Cash	1.6	1.0	0.1	2.9
	U.S. Treasury	1.7	2.4	3.9	4.8
	U.S. TIPS	1.9	2.6	4.1	4.6
	U.S. IG Corp.	1.9	4.6	6.5	4.6
	U.S. Long Credit	3.2	6.3	9.7	4.5
	U.S. Aggregate	1.8	3.0	4.4	5.0
	U.S. High Yield	4.1	6.1	9.0	6.5
	U.S. Bank Loans	4.6	4.7	5.7	4.4
	EM Sovereign Local	5.7	2.8	2.6	10.8
	EM Sovereign	3.9	6.2	7.6	8.0
	EM Corporates	3.9	6.3	6.8	7.0
	Commodities	2.3	-3.9	-5.5	2.0
	Gold	1.8	19.8	-15.1	2.2
	REITs	5.5	8.4	16.9	0.4
ALTERNATIVES	Hedge Funds	3.1	1.2	1.0	0.4
	Global Private Real Estate	4.5	8.2	12.1	4.7
	Private Equity	6.9	13.7	14.4	12.7

## FIVE-YEAR ANNUALIZED EXPECTED RETURNS



### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE/Russell. January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



# REGION | UNITED STATES (\$ USD)



(Figures in U.S. Dollars)

## EXPECTED VOLATILITIES AND CORRELATIONS

Volatility and Correlation Matrix		EQUITY								FIXED INCOME																ALTERNATIVES					VOLATILITY (%)			
		Global Equity	Global ex-U.S. Equity	U.S. Large-Cap Equity	U.S. Small-Cap Equity	Europe Equity	Asia ex-Japan Equity	Japan Equity	EM Equity	Real Asset Equity	Global Aggregate	Global Aggregate (Hdg)	Global Agg. ex-U.S. (Hdg)	Global Agg. ex-U.S.	Global IG Corporate (Hdg)	Global High Yield	U.S. Cash	U.S. Treasury	U.S. TIPS	U.S. IG Corporate	U.S. Long Credit	U.S. Aggregate	U.S. High Yield	U.S. Bank Loans	EM Sovereign Local	EM Sovereign	EM Corporate	Commodities	Gold	REITs		Hedge Funds	Global Private Real Estate	Private Equity
EQUITY	Global Equity	1.0																																16.1
	Global ex-U.S. Equity	1.0	1.0																															18.0
	U.S. Large-Cap Equity	1.0	0.9	1.0																														15.0
	U.S. Small-Cap Equity	0.9	0.8	0.9	1.0																													18.7
	Europe Equity	1.0	1.0	0.9	0.8	1.0																												18.9
	Asia ex-Japan Equity	0.9	0.9	0.8	0.7	0.9	1.0																											20.4
	Japan Equity	0.8	0.8	0.7	0.7	0.7	0.7	1.0																										15.6
	EM Equity	0.9	0.9	0.8	0.7	0.9	1.0	0.7	1.0																									21.8
	Real Asset Equity	0.9	0.9	0.8	0.8	0.9	0.8	0.6	0.9	1.0																								20.7
FIXED INCOME	Global Aggregate	0.2	0.3	0.1	0.0	0.3	0.3	0.0	0.3	0.4	1.0																							5.6
	Global Aggregate (Hdg)	-0.2	-0.1	-0.2	-0.3	-0.1	0.0	-0.2	-0.1	0.0	0.7	1.0																						2.9
	Global Agg. ex-U.S. (Hdg)	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	-0.2	-0.1	0.0	0.6	1.0	1.0																					2.9
	Global Agg. ex-U.S.	0.3	0.3	0.1	0.0	0.4	0.3	0.1	0.3	0.4	1.0	0.5	0.5	1.0																				8.0
	Global IG Corporate (Hdg)	0.5	0.5	0.4	0.3	0.5	0.6	0.4	0.5	0.6	0.6	0.7	0.6	0.6	1.0																			4.5
	Global High Yield	0.8	0.8	0.8	0.7	0.8	0.8	0.5	0.8	0.9	0.3	-0.1	-0.1	0.3	0.6	1.0																		11.4
	U.S. Cash	0.0	0.1	-0.1	-0.1	0.1	0.1	-0.1	0.2	0.1	0.1	0.0	0.0	0.1	-0.1	-0.1	1.0																	0.8
	U.S. Treasury	-0.5	-0.5	-0.6	-0.6	-0.5	-0.4	-0.5	-0.4	-0.3	0.5	0.8	0.8	0.4	0.2	-0.5	0.1	1.0																4.6
	U.S. TIPS	0.0	0.1	0.0	-0.1	0.0	0.2	-0.2	0.2	0.3	0.5	0.5	0.4	0.4	0.4	0.3	0.1	0.4	1.0															4.8
	U.S. IG Corporate	0.4	0.4	0.3	0.2	0.4	0.5	0.3	0.4	0.5	0.7	0.7	0.6	0.6	1.0	0.5	-0.1	0.4	0.5	1.0														5.5
	U.S. Long Credit	0.2	0.3	0.2	0.1	0.3	0.3	0.2	0.3	0.4	0.7	0.8	0.7	0.5	0.9	0.3	-0.1	0.5	0.5	0.9	1.0													9.1
	U.S. Aggregate	-0.1	-0.1	-0.2	-0.3	-0.1	0.0	-0.2	0.0	0.1	0.7	0.9	0.8	0.6	0.7	0.0	0.1	0.9	0.6	0.8	0.8	1.0												3.3
	U.S. High Yield	0.8	0.8	0.8	0.7	0.8	0.8	0.5	0.8	0.9	0.2	-0.1	-0.1	0.2	0.6	1.0	-0.1	-0.5	0.3	0.5	0.3	0.0	1.0											10.3
	U.S. Bank Loans	0.7	0.7	0.7	0.6	0.6	0.7	0.4	0.7	0.7	0.0	-0.2	-0.3	0.0	0.4	0.9	-0.1	-0.6	0.2	0.3	0.1	-0.2	0.9	1.0										9.9
	EM Sovereign Local	0.6	0.7	0.5	0.4	0.7	0.7	0.4	0.8	0.7	0.6	0.2	0.2	0.6	0.6	0.7	0.2	0.0	0.3	0.5	0.4	0.3	0.6	0.4	1.0									10.6
	EM Sovereign	0.6	0.7	0.6	0.5	0.6	0.7	0.4	0.7	0.8	0.5	0.4	0.3	0.5	0.8	0.8	0.0	0.0	0.6	0.7	0.6	0.4	0.8	0.7	0.7	1.0							7.2	
	EM Corporate	0.7	0.7	0.6	0.5	0.7	0.8	0.4	0.8	0.8	0.4	0.2	0.2	0.4	0.8	0.9	-0.1	-0.2	0.5	0.7	0.5	0.3	0.9	0.8	0.7	0.9	1.0							8.1
ALTERNATIVES	Commodities	0.6	0.6	0.5	0.5	0.6	0.5	0.4	0.7	0.8	0.2	-0.2	-0.3	0.3	0.3	0.6	0.1	-0.4	0.3	0.2	0.1	-0.1	0.6	0.6	0.5	0.5	0.5	1.0						18.3
	Gold	-0.1	0.0	-0.1	-0.2	-0.1	0.1	0.0	0.2	0.1	0.3	0.3	0.3	0.3	0.2	0.0	0.0	0.3	0.4	0.3	0.3	0.3	0.1	0.0	0.3	0.3	0.2	0.3	1.0					14.1
	REITs	0.7	0.7	0.8	0.8	0.7	0.5	0.5	0.5	0.8	0.2	0.1	0.1	0.2	0.5	0.7	0.0	-0.3	0.1	0.4	0.3	0.1	0.7	0.6	0.5	0.6	0.5	0.4	-0.1	1.0				22.2
	Hedge Funds	0.8	0.8	0.8	0.7	0.8	0.8	0.6	0.8	0.8	0.0	-0.3	-0.3	0.0	0.4	0.8	0.0	-0.6	0.1	0.3	0.1	-0.2	0.8	0.7	0.4	0.6	0.7	0.7	0.1	0.4	1.0			9.0
	Global Private Real Estate	0.4	0.4	0.5	0.4	0.4	0.4	0.3	0.4	0.5	-0.2	-0.2	-0.3	-0.2	0.1	0.4	0.0	-0.4	0.2	0.0	0.0	-0.2	0.5	0.6	0.2	0.3	0.3	0.4	0.0	0.5	0.4	1.0		12.2
	Private Equity	0.8	0.8	0.8	0.7	0.8	0.8	0.5	0.8	0.8	0.1	-0.3	-0.3	0.1	0.3	0.7	0.1	-0.6	0.1	0.2	0.0	-0.3	0.7	0.7	0.5	0.5	0.6	0.6	0.0	0.5	0.8	0.6	1.0	21.4

### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE/Russell. January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.

# REGION | UNITED STATES (\$ USD)



(Figures in U.S. Dollars)

## FIVE-YEAR SCENARIO ANNUALIZED RETURNS

	ASSET CLASS	BASELINE	STRONG BEAR MARKET	MODERATE BEAR MARKET	MODERATE BULL MARKET	STRONG BULL MARKET
EQUITY	Global Equity	6.4%	-2.1%	3.0%	7.8%	12.3%
	Global ex-U.S. Equity	7.9	2.0	7.8	9.0	12.5
	U.S. Large-Cap Equity	5.3	-2.6	3.4	6.2	12.3
	U.S. Small-Cap Equity	5.6	-0.8	4.7	6.2	11.3
	Europe Equity	8.1	1.7	8.0	9.2	13.9
	Asia ex-Japan Equity	6.3	2.4	6.2	6.6	9.5
	Japan Equity	8.3	-2.0	7.8	10.5	14.2
	EM Equity	7.3	3.2	7.7	8.0	10.7
	Real Asset Equity	5.6	2.3	5.1	5.8	8.2
FIXED INCOME	Global Aggregate	1.9	1.0	1.8	2.1	2.8
	Global Aggregate (Hdg)	1.9	1.2	1.4	1.4	1.8
	Global Agg. ex-U.S. (Hdg)	2.0	2.0	2.0	2.1	2.4
	Global Agg. ex-U.S.	2.1	1.7	2.4	2.8	3.4
	Global IG Corporate (Hdg)	1.9	1.8	1.8	1.9	2.1
	Global High Yield	4.1	0.4	3.8	4.4	7.3
	U.S. Cash	1.6	1.6	1.7	1.8	2.2
	U.S. Treasury	1.7	1.8	1.6	1.4	1.2
	U.S. TIPS	1.9	0.4	1.8	2.0	2.0
	U.S. IG Corporate	1.9	0.7	1.8	2.0	2.9
	U.S. Long Credit	3.2	3.1	3.9	4.2	4.8
	U.S. Aggregate	1.8	1.2	1.7	1.7	2.0
	U.S. High Yield	4.1	1.1	3.7	4.3	7.4
	U.S. Bank Loans	4.6	3.0	4.6	4.8	6.4
	EM Sovereign Local	5.7	3.9	5.8	6.2	7.5
	EM Sovereign	3.9	-0.3	3.3	4.4	7.7
	EM Corporate	3.9	1.8	3.6	3.9	6.1
ALTERNATIVES	Commodities	2.3	0.1	2.1	2.4	5.7
	Gold	1.8	2.3	1.9	1.8	0.0
	REITs	5.5	-0.3	3.8	6.0	10.0
	Hedge Funds	3.1	0.2	2.4	3.4	6.3
	Global Private Real Estate	4.5	3.4	4.4	4.6	6.3
	Private Equity	6.9	1.2	5.4	7.6	12.3

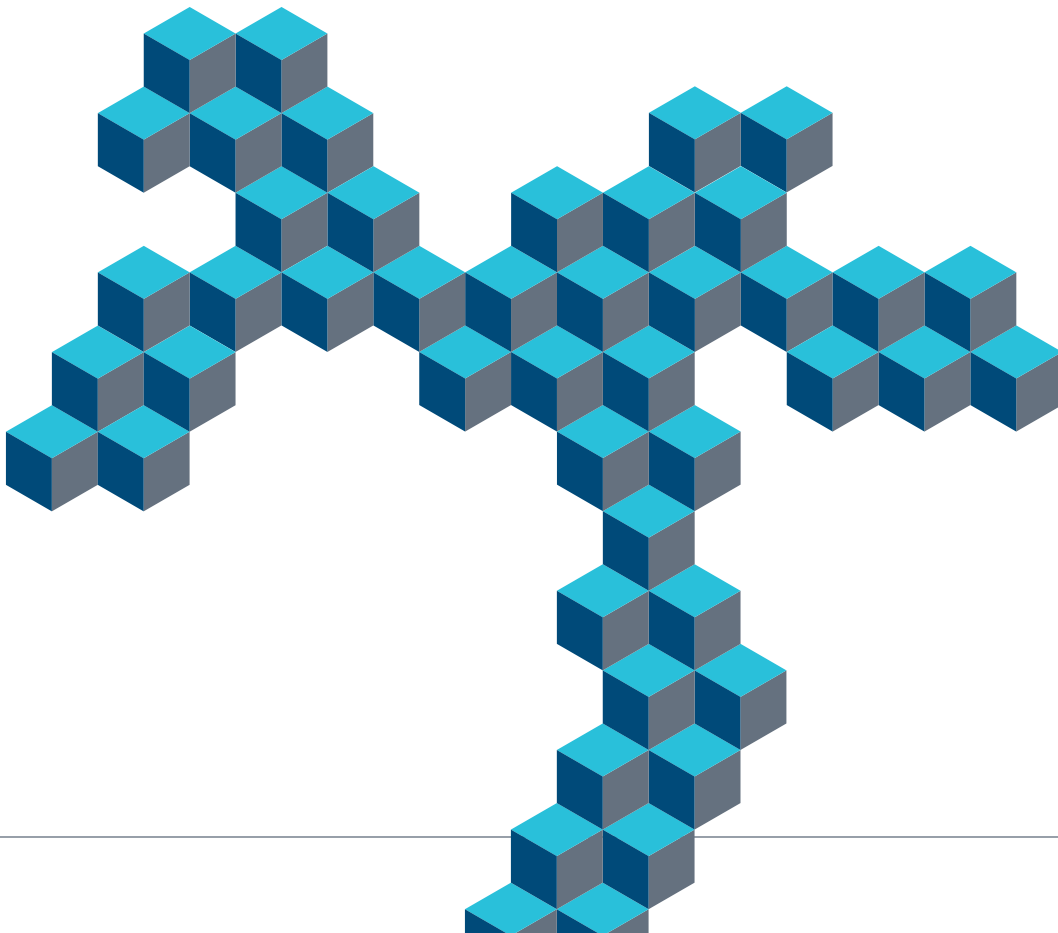
### Past performance is not a reliable indicator of future results.

Source: T. Rowe Price. January 2020. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



## REGION | UNITED KINGDOM

---



# REGION | UNITED KINGDOM (£ GBP)

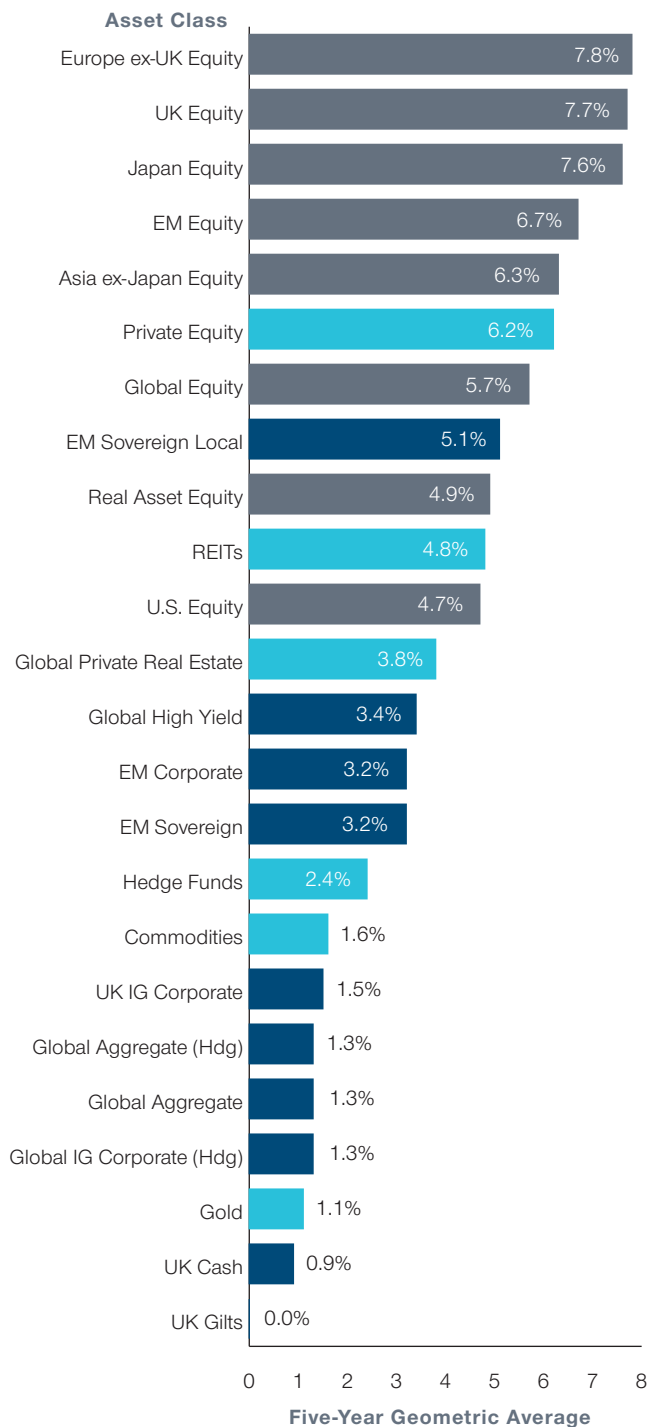


(Figures in Pounds Sterling)

## ANNUALIZED FORECAST AND HISTORICAL NOMINAL RETURNS

ASSET CLASS	2020 5-YEAR RETURN FORECAST	HISTORICAL 5-YEAR RETURNS, ENDED 31 DECEMBER		
		2019	2014	2009
EQUITY	Global Equity	5.7	12.5	7.2
	U.S. Equity	4.7	15.3	3.9
	Europe ex-UK Equity	7.8	10.1	6.0
	UK Equity	7.7	7.1	7.7
	Asia ex-Japan Equity	6.3	10.3	6.5
	Japan Equity	7.6	12.1	6.6
	EM Equity	6.7	9.4	2.7
	Real Asset Equity	4.9	7.5	8.9
	Global Aggregate	1.3	5.7	3.4
	Global Aggregate (Hdg)	1.3	2.7	4.9
FIXED INCOME	Global IG Corporate (Hdg)	1.3	3.6	6.2
	Global High Yield	3.4	9.0	9.3
	UK Cash	0.9	0.4	0.4
	UK Gilts	0.0	4.1	7.2
	UK IG Corporate	1.5	5.2	8.9
	EM Sovereign Local	5.1	6.2	3.4
	EM Sovereign	3.2	9.7	8.3
	EM Corporate	3.2	9.8	7.6
	Commodities	1.6	-0.8	-4.9
	Gold	1.1	23.8	-14.5
ALTERNATIVES	REITs	4.8	12.0	17.7
	Hedge Funds	2.4	4.5	1.8
	Global Private Real Estate	3.8	13.9	13.0
	Private Equity	6.2	19.0	15.3
				16.6

## FIVE-YEAR ANNUALIZED EXPECTED RETURNS



### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE/Russell. January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.

# REGION | UNITED KINGDOM (£ GBP)



(Figures in Pounds Sterling)

## EXPECTED VOLATILITIES AND CORRELATIONS

Volatility and Correlation Matrix		EQUITY								FIXED INCOME										ALTERNATIVES						VOLATILITY (%)
		Global Equity	U.S. Equity	Europe ex-UK Equity	UK Equity	Asia ex-Japan Equity	Japan Equity	EM Equity	Real Asset Equity	Global Aggregate	Global Aggregate (Hdg)	Global IG Corporate (Hdg)	Global HY	UK Cash	UK Gilts	UK IG Corporate	EM Sovereign Local	EM Sovereign	EM Corporate	Commodities	Gold	REITs	Hedge Funds	Global Private Real Estate	Private Equity	
EQUITY	Global Equity	1.0																								13.0
	U.S. Equity	0.9	1.0																							13.4
	Europe ex-UK Equity	0.9	0.7	1.0																						15.8
	UK Equity	0.9	0.8	0.9	1.0																					13.2
	Asia ex-Japan Equity	0.8	0.6	0.8	0.8	1.0																				16.0
	Japan Equity	0.7	0.6	0.6	0.5	0.5	1.0																			15.2
	EM Equity	0.8	0.6	0.8	0.8	1.0	0.5	1.0																		17.3
	Real Asset Equity	0.8	0.8	0.7	0.8	0.6	0.5	0.6	1.0																	14.8
FIXED INCOME	Global Aggregate	0.0	0.1	-0.1	-0.2	-0.1	0.2	-0.2	0.3	1.0																10.9
	Global Aggregate (Hdg)	0.0	-0.1	0.0	-0.1	0.1	0.0	0.0	0.3	0.7	1.0															3.0
	Global IG Corporate (Hdg)	0.4	0.3	0.5	0.5	0.5	0.2	0.5	0.5	0.1	0.6	1.0														4.4
	Global HY	0.7	0.7	0.6	0.6	0.6	0.4	0.6	0.8	0.2	0.2	0.6	1.0													8.8
	UK Cash	-0.1	-0.2	0.0	-0.1	0.0	-0.1	0.1	0.0	0.0	0.0	-0.2	-0.3	1.0												1.0
	UK Gilts	-0.2	-0.1	-0.2	-0.2	-0.1	0.0	-0.2	0.2	0.7	0.8	0.3	0.1	-0.1	1.0											6.4
	UK IG Corporate	0.6	0.5	0.6	0.6	0.6	0.4	0.6	0.6	0.1	0.5	0.9	0.6	-0.3	0.3	1.0										6.7
	EM Sovereign Local	0.4	0.3	0.4	0.2	0.4	0.4	0.4	0.6	0.7	0.5	0.4	0.5	0.1	0.4	0.4	1.0									10.6
	EM Sovereign	0.3	0.4	0.2	0.2	0.3	0.3	0.2	0.6	0.7	0.6	0.4	0.7	-0.1	0.6	0.4	0.7	1.0								9.5
	EM Corporates	0.4	0.4	0.3	0.3	0.4	0.4	0.3	0.7	0.6	0.5	0.4	0.8	-0.2	0.5	0.4	0.7	0.9	1.0							9.3
ALTERNATIVES	Commodities	0.4	0.3	0.3	0.5	0.3	0.2	0.5	0.6	-0.1	-0.1	0.2	0.4	0.1	-0.2	0.2	0.1	0.1	0.2	1.0						15.8
	Gold	0.0	-0.1	-0.1	0.0	0.1	0.2	0.2	0.3	0.5	0.4	0.2	0.2	0.0	0.4	0.1	0.5	0.5	0.5	0.4	1.0					16.3
	REITs	0.7	0.7	0.6	0.6	0.4	0.4	0.4	0.7	0.1	0.2	0.4	0.6	-0.1	0.1	0.6	0.3	0.4	0.3	0.2	-0.1	1.0				22.0
	Hedge Funds	0.6	0.6	0.4	0.4	0.3	0.6	0.3	0.7	0.5	0.1	0.0	0.6	0.0	0.2	0.1	0.5	0.7	0.7	0.3	0.3	0.4	1.0			8.7
	Global Private Real Estate	0.1	0.3	-0.1	-0.1	-0.2	0.3	-0.2	0.3	0.6	0.2	-0.3	0.1	0.1	0.5	-0.1	0.4	0.6	0.4	0.0	0.3	0.3	0.7	1.0		12.0
	Private Equity	0.7	0.7	0.6	0.6	0.5	0.5	0.5	0.7	0.2	-0.1	0.0	0.5	0.0	0.0	0.2	0.3	0.4	0.4	0.4	0.2	0.5	0.8	0.6	1.0	17.3

### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE/Russell. January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.

# REGION | UNITED KINGDOM (£ GBP)



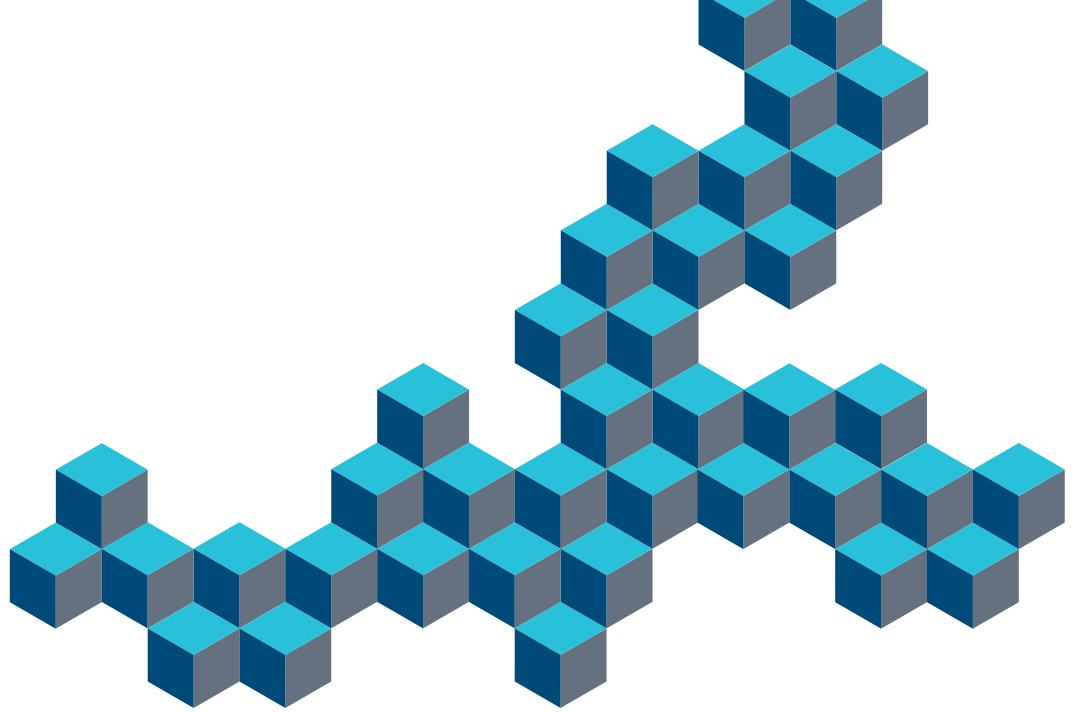
(Figures Are Pounds Sterling)

## FIVE-YEAR SCENARIO ANNUALIZED RETURNS

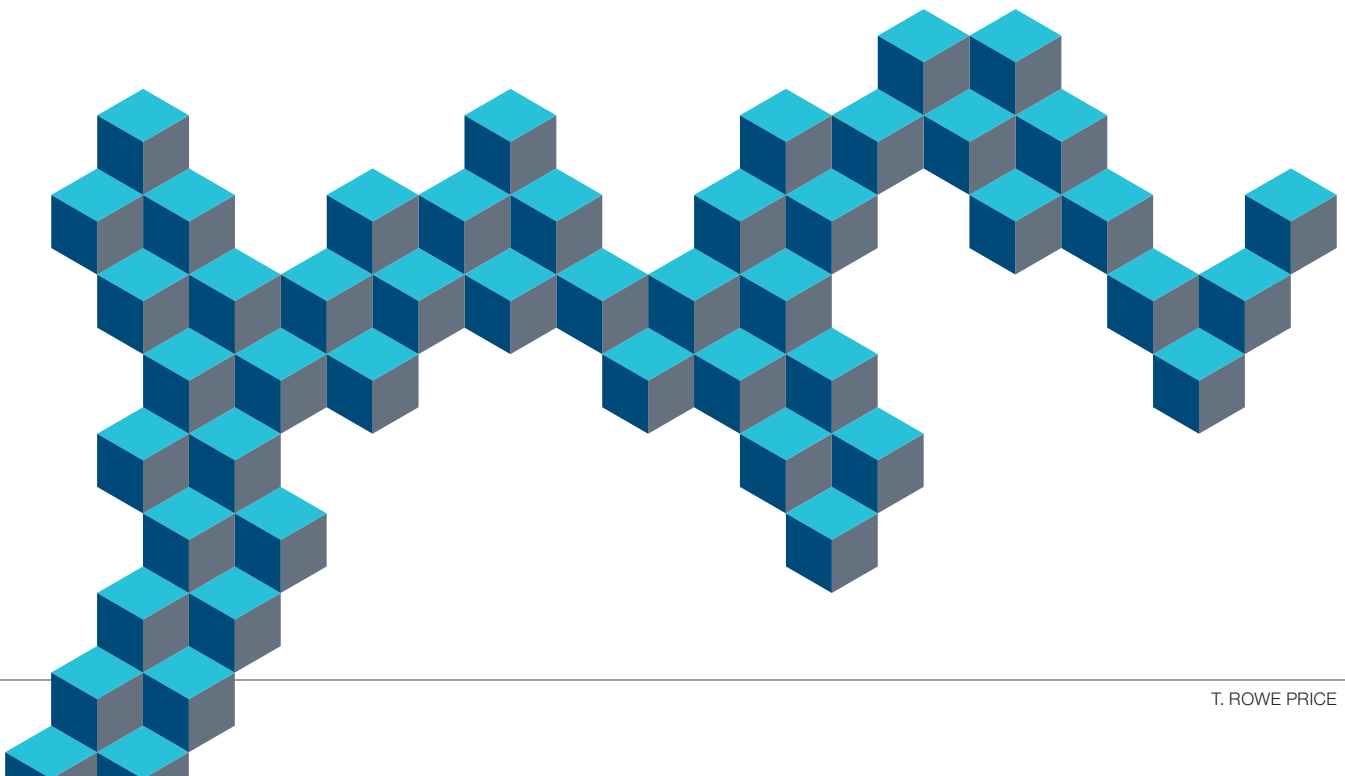
	ASSET CLASS	BASELINE	STRONG BEAR MARKET	MODERATE BEAR MARKET	MODERATE BULL MARKET	STRONG BULL MARKET
EQUITY	Global Equity	5.7%	-2.7%	2.2%	7.0%	11.1%
	U.S. Equity	4.7	-3.2	2.6	5.4	11.1
	Europe ex-UK Equity	7.8	0.0	6.9	8.2	13.0
	UK Equity	7.7	4.1	7.4	8.0	10.2
	Asia ex-Japan Equity	6.3	2.4	6.2	6.6	9.5
	Japan Equity	7.6	-2.6	7.1	9.6	12.9
	EM Equity	6.7	2.6	6.9	7.1	9.5
	Real Asset Equity	4.9	1.6	4.3	4.9	7.0
FIXED INCOME	Global Aggregate	1.3	1.0	1.8	2.1	2.8
	Global Aggregate (Hdg)	1.3	1.0	2.0	2.1	2.4
	Global IG Corporate (Hdg)	1.3	0.8	1.8	1.9	2.1
	Global High Yield	3.4	0.4	3.8	4.4	7.3
	UK Cash	0.9	0.9	0.9	0.9	1.0
	UK Gilts	0.0	0.1	-0.1	-0.1	-0.3
	UK IG Corporate	1.5	0.2	1.4	1.7	1.8
	EM Sovereign Local	5.1	3.3	5.0	5.4	6.3
	EM Sovereign	3.2	-0.9	2.5	3.5	6.4
	EM Corporate	3.2	1.2	2.9	3.1	4.9
ALTERNATIVES	Commodities	1.6	-0.5	1.3	1.6	4.4
	Gold	1.1	2.9	2.7	0.7	-1.2
	REITs	4.8	-0.9	3.0	5.1	8.8
	Hedge Funds	2.4	-0.4	1.6	2.5	5.1
	Global Private Real Estate	3.8	2.8	3.6	3.7	5.1
	Private Equity	6.2	0.5	4.6	6.7	11.1

### Past performance is not a reliable indicator of future results.

Source: T. Rowe Price. January 2020. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



## **REGION | EUROZONE**



# REGION | EUROZONE (€ EUR)

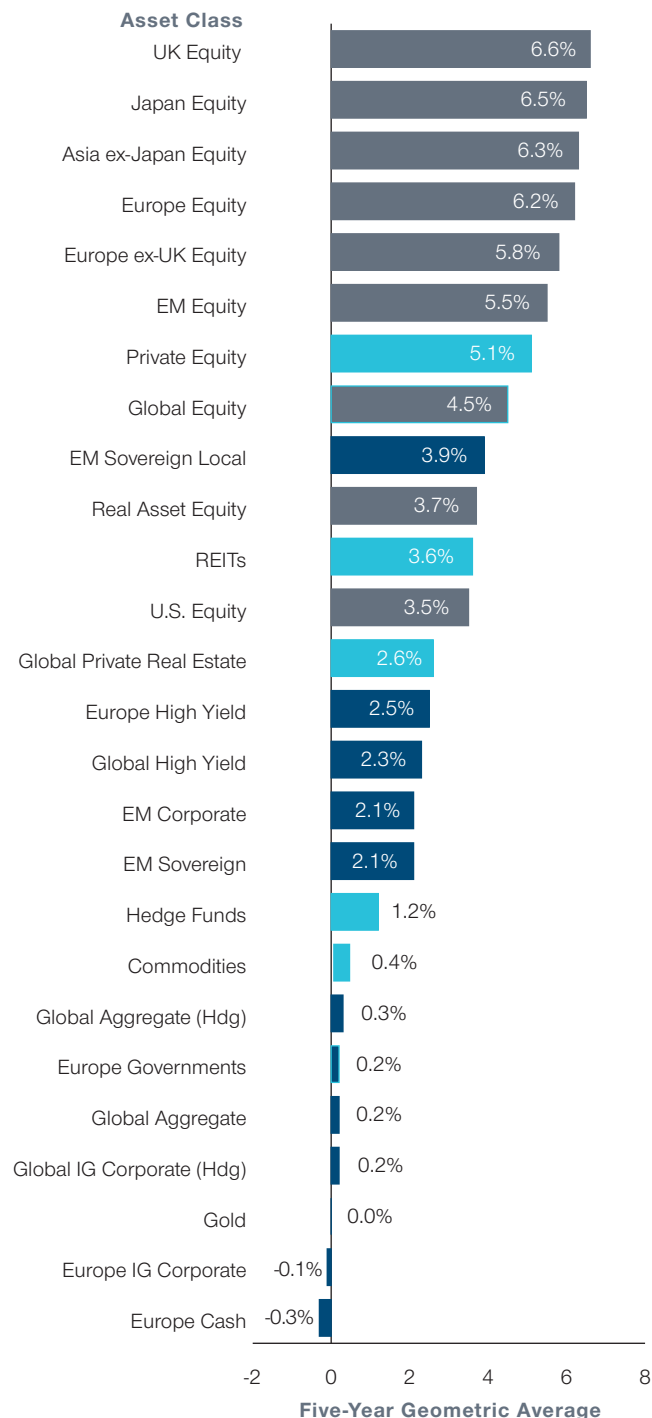
(Figures in Euros)



## ANNUALIZED FORECAST AND HISTORICAL NOMINAL RETURNS

ASSET CLASS		2020 5-YEAR RETURN FORECAST	HISTORICAL 5-YEAR RETURNS, ENDED 31 DECEMBER		
			2019	2014	2009
EQUITY	Global Equity	4.5%	10.6%	13.5%	2.5%
	U.S. Equity	3.5	13.4	19.4	-0.7
	Europe Equity	6.2	7.2	9.4	3.3
	Europe ex-UK Equity	5.8	8.2	8.9	4.4
	UK Equity	6.6	5.2	10.6	1.6
	Asia ex-Japan Equity	6.3	8.5	9.4	12.5
	Japan Equity	6.5	10.2	9.5	-2.0
	EM Equity	5.5	7.6	5.5	14.4
	Real Asset Equity	3.7	5.7	11.8	3.1
FIXED INCOME	Global Aggregate	0.2	3.9	6.2	3.4
	Global Aggregate (Hdg)	0.3	1.6	4.7	3.9
	Global IG Corporate (Hdg)	0.2	2.5	6.0	3.1
	Global High Yield	2.3	7.1	12.3	5.8
	Europe Cash	-0.3	-0.3	0.4	2.9
	Europe Governments	0.2	2.4	5.9	4.0
	Europe IG Corporate	-0.1	2.3	6.0	3.1
	Europe High Yield	2.5	4.7	11.4	7.0
	EM Sovereign Local	3.9	4.3	6.2	9.6
	EM Sovereign	2.1	7.8	11.3	6.8
	EM Corporate	2.1	7.9	10.5	5.8
ALTERNATIVES	Commodities	0.4	-2.5	-2.3	0.9
	Gold	0.0	21.6	-12.2	1.1
	REITs	3.6	10.1	20.9	-0.8
	Hedge Funds	1.2	2.7	4.5	-0.8
	Global Private Real Estate	2.6	10.8	16.0	3.6
	Private Equity	5.1	15.3	18.3	11.4

## FIVE-YEAR ANNUALIZED EXPECTED RETURNS



### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE/Russell. January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



# REGION | EUROZONE (€ EUR)



(Figures in Euros)

## EXPECTED VOLATILITIES AND CORRELATIONS

Volatility and Correlation Matrix		EQUITY								FIXED INCOME										ALTERNATIVES						VOLATILITY (%)	
		Global Equity	U.S. Equity	Europe Equity	Europe ex-UK Equity	UK Equity	Asia ex-Japan Equity	Japan Equity	EM Equity	Real Asset Equity	Global Aggregate	Global Aggregate (Hdg)	Global IG Corporate (Hdg)	Global High Yield	Europe Cash	Europe Governments	Europe IG Corporate	Europe High Yield	EM Sovereign Local	EM Sovereign	EM Corporate	Commodities	Gold	REITs	Hedge Funds		Global Private Real Estate
EQUITY	Global Equity	1.0																									14.6
	U.S. Equity	0.9	1.0																								14.9
	Europe Equity	0.9	0.8	1.0																							15.7
	Europe ex-UK Equity	0.9	0.8	1.0	1.0																						16.4
	UK Equity	0.9	0.8	1.0	0.9	1.0																					15.1
	Asia ex-Japan Equity	0.8	0.7	0.8	0.8	0.8	1.0																				18.1
	Japan Equity	0.7	0.7	0.6	0.6	0.6	0.6	1.0																			16.1
	EM Equity	0.8	0.7	0.8	0.8	0.8	1.0	0.6	1.0																		19.0
	Real Asset Equity	0.9	0.8	0.7	0.7	0.8	0.7	0.6	0.7	1.0																	17.5
FIXED INCOME	Global Aggregate	0.0	0.1	-0.2	-0.2	-0.1	0.0	0.2	-0.1	0.3	1.0																7.2
	Global Aggregate (Hdg)	-0.2	-0.2	-0.2	-0.1	-0.2	0.0	-0.2	-0.1	0.1	0.6	1.0															3.0
	Global IG Corporate (Hdg)	0.4	0.3	0.5	0.5	0.4	0.5	0.2	0.5	0.5	0.2	0.6	1.0														4.5
	Global High Yield	0.8	0.7	0.7	0.6	0.7	0.7	0.6	0.7	0.9	0.3	0.0	0.4	1.0													11.4
	Europe Cash	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.3	-0.1	-0.2	-0.1	0.1	-0.3	-0.3	1.0												0.8
	Europe Governments	-0.2	-0.2	-0.2	-0.2	-0.3	-0.1	-0.1	-0.2	-0.1	0.5	0.9	0.4	-0.1	0.0	1.0											4.3
	Europe IG Corporate	0.5	0.4	0.6	0.6	0.5	0.5	0.3	0.5	0.5	0.1	0.5	0.9	0.5	-0.3	0.5	1.0										3.9
	Europe High Yield	0.7	0.5	0.8	0.7	0.7	0.7	0.4	0.8	0.6	-0.2	-0.1	0.6	0.8	-0.3	-0.1	0.7	1.0									14.0
	EM Sovereign Local	0.5	0.4	0.4	0.4	0.4	0.6	0.4	0.6	0.6	0.5	0.3	0.4	0.6	0.0	0.2	0.4	0.4	1.0								9.2
	EM Sovereign	0.5	0.5	0.3	0.3	0.4	0.5	0.4	0.4	0.7	0.8	0.3	0.4	0.8	-0.2	0.3	0.3	0.3	0.7	1.0							10.2
	EM Corporate	0.6	0.6	0.4	0.3	0.5	0.5	0.5	0.5	0.8	0.6	0.2	0.4	0.9	-0.3	0.1	0.4	0.5	0.7	0.9	1.0						10.5
ALTERNATIVES	Commodities	0.5	0.4	0.5	0.4	0.6	0.4	0.4	0.6	0.7	-0.1	-0.3	0.2	0.5	0.0	-0.4	0.1	0.4	0.3	0.3	0.4	1.0					17.0
	Gold	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.2	0.3	0.5	0.3	0.1	0.2	-0.1	0.1	0.0	-0.1	0.4	0.4	0.4	0.4	1.0				15.0
	REITs	0.7	0.8	0.6	0.6	0.7	0.5	0.5	0.5	0.8	0.3	0.1	0.4	0.7	-0.2	0.0	0.4	0.5	0.5	0.5	0.5	0.3	0.0	1.0			23.1
	Hedge Funds	0.7	0.7	0.5	0.4	0.6	0.5	0.7	0.5	0.8	0.5	-0.2	0.0	0.8	-0.2	-0.1	0.1	0.3	0.5	0.8	0.8	0.5	0.3	0.5	1.0		9.3
	Global Private Real Estate	0.2	0.4	0.0	0.0	0.1	0.0	0.4	0.0	0.4	0.7	-0.1	-0.3	0.4	-0.1	0.0	-0.3	-0.2	0.3	0.6	0.5	0.2	0.3	0.4	0.8	1.0	13.5
	Private Equity	0.7	0.8	0.6	0.5	0.7	0.6	0.6	0.6	0.8	0.2	-0.3	0.0	0.7	-0.2	-0.3	0.0	0.3	0.4	0.6	0.6	0.5	0.2	0.6	0.9	0.7	1.0

### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE/Russell. January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.

# REGION | EUROZONE (€ EUR)



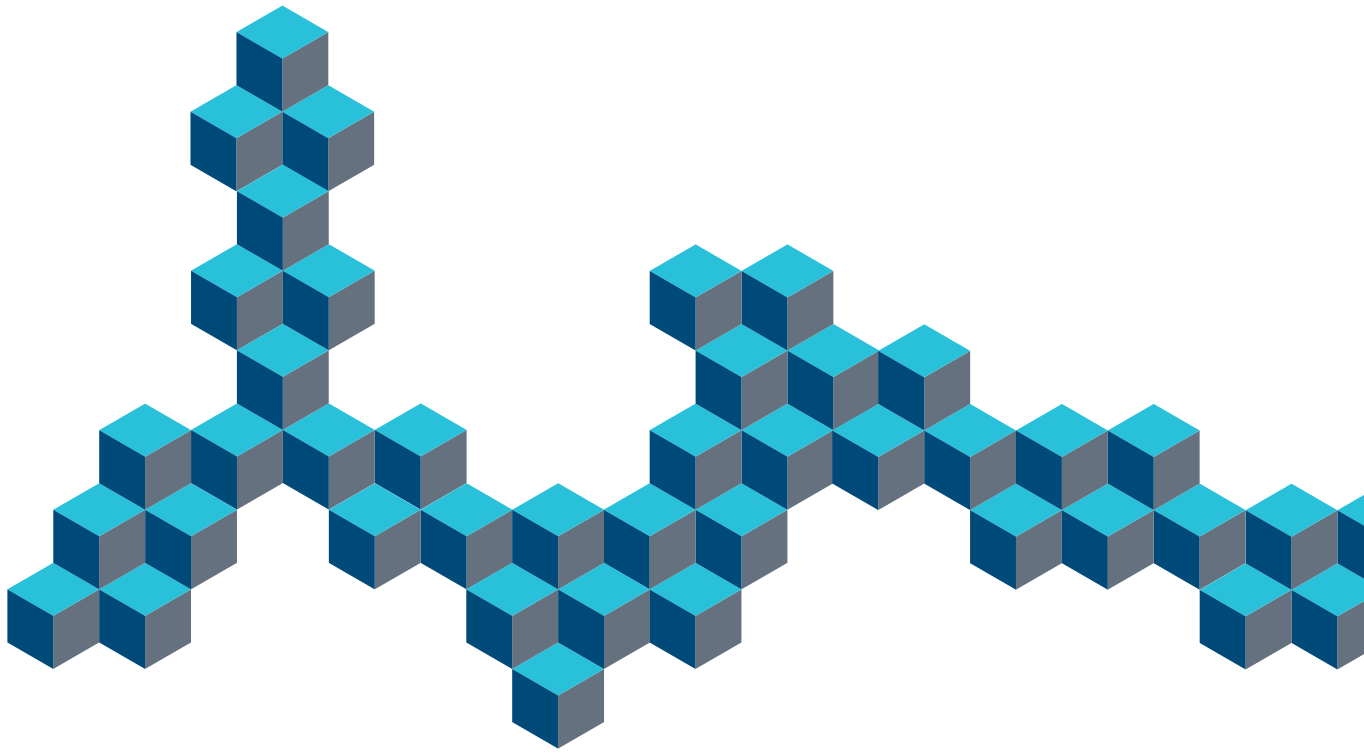
(Figures in Euros)

## FIVE-YEAR SCENARIO ANNUALIZED RETURNS

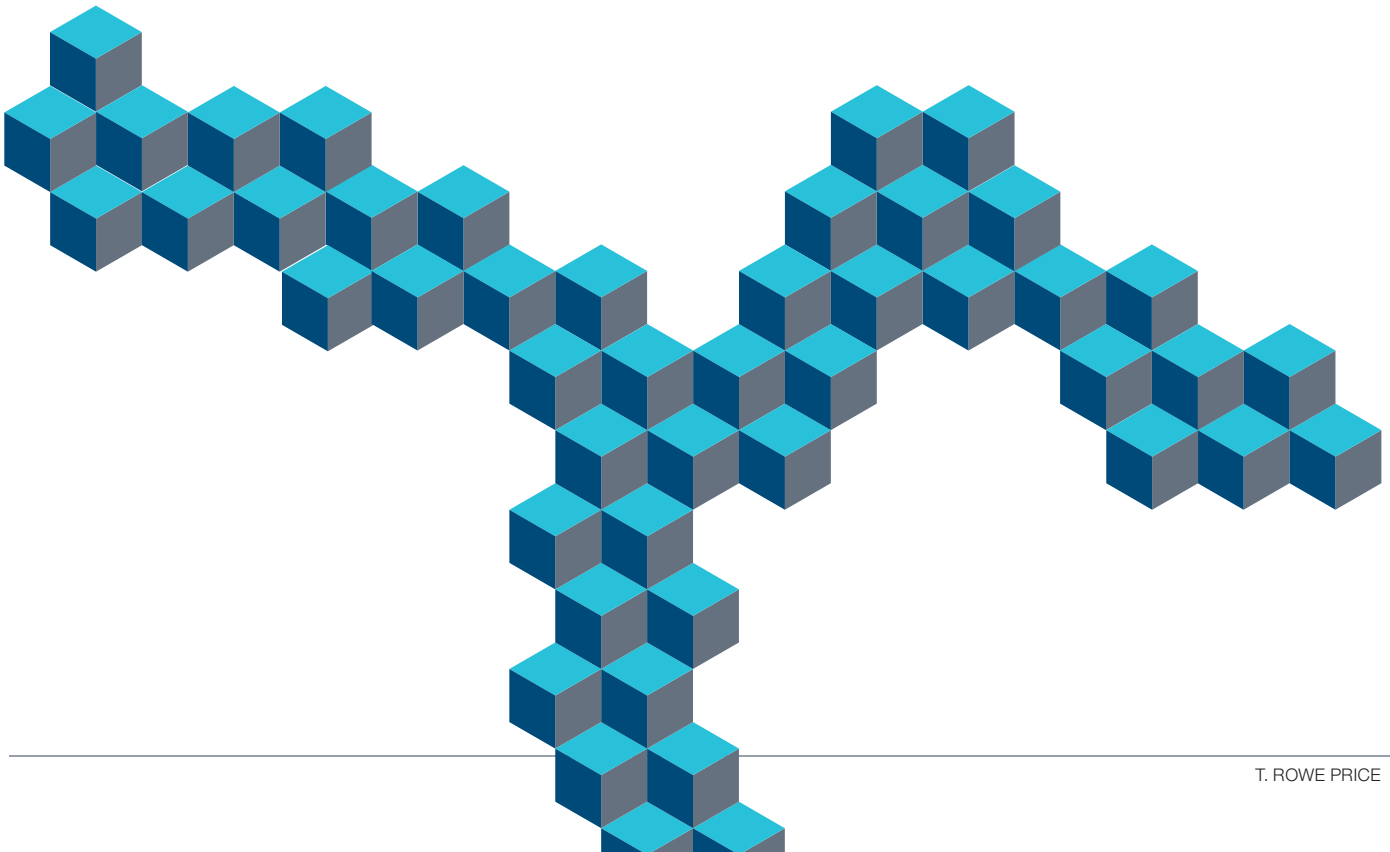
	ASSET CLASS	BASELINE	STRONG BEAR MARKET	MODERATE BEAR MARKET	MODERATE BULL MARKET	STRONG BULL MARKET
EQUITY	Global Equity	4.5%	-4.2%	1.0%	5.7%	9.9%
	U.S. Equity	3.5	-4.7	1.4	4.1	9.9
	Europe Equity	6.2	-0.3	6.0	7.1	11.5
	Europe ex-UK Equity	5.8	-1.4	5.6	6.9	11.8
	UK Equity	6.6	2.7	6.2	6.7	9.0
	Asia ex-Japan Equity	6.3	2.4	6.2	6.6	9.5
	Japan Equity	6.5	-4.1	5.8	8.3	11.7
	EM Equity	5.5	1.1	5.7	5.9	8.3
	Real Asset Equity	3.7	0.2	3.1	3.7	5.8
FIXED INCOME	Global Aggregate	0.2	-1.0	0.8	2.1	2.8
	Global Aggregate (Hdg)	0.3	-2.0	1.0	2.1	2.4
	Global IG Corporate (Hdg)	0.2	-1.8	0.8	1.9	2.1
	Global High Yield	2.3	0.4	3.8	4.4	7.3
	Europe Cash	-0.3	-0.5	-0.3	-0.3	-0.2
	Europe Governments	0.2	0.4	0.2	0.2	0.3
	Europe IG Corporate	-0.1	-0.8	-0.1	-0.1	0.8
	Europe High Yield	2.5	-4.5	2.3	2.4	4.6
	EM Sovereign Local	3.9	1.8	3.8	4.1	5.1
	EM Sovereign	2.1	-2.4	1.3	2.2	5.2
	EM Corporate	2.1	-0.3	1.6	1.8	3.7
	Commodities	0.4	-2.0	0.1	0.3	3.2
ALTERNATIVES	Gold	0.0	4.4	3.9	-1.0	-2.4
	REITs	3.6	-2.4	1.8	3.8	7.6
	Hedge Funds	1.2	-1.9	0.4	1.2	3.9
	Global Private Real Estate	2.6	1.4	2.4	2.5	3.9
	Private Equity	5.1	-0.9	3.4	5.5	9.9

### Past performance is not a reliable indicator of future results.

Source: T. Rowe Price. January 2020. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



## REGION | JAPAN



# REGION | JAPAN (¥ JPY)

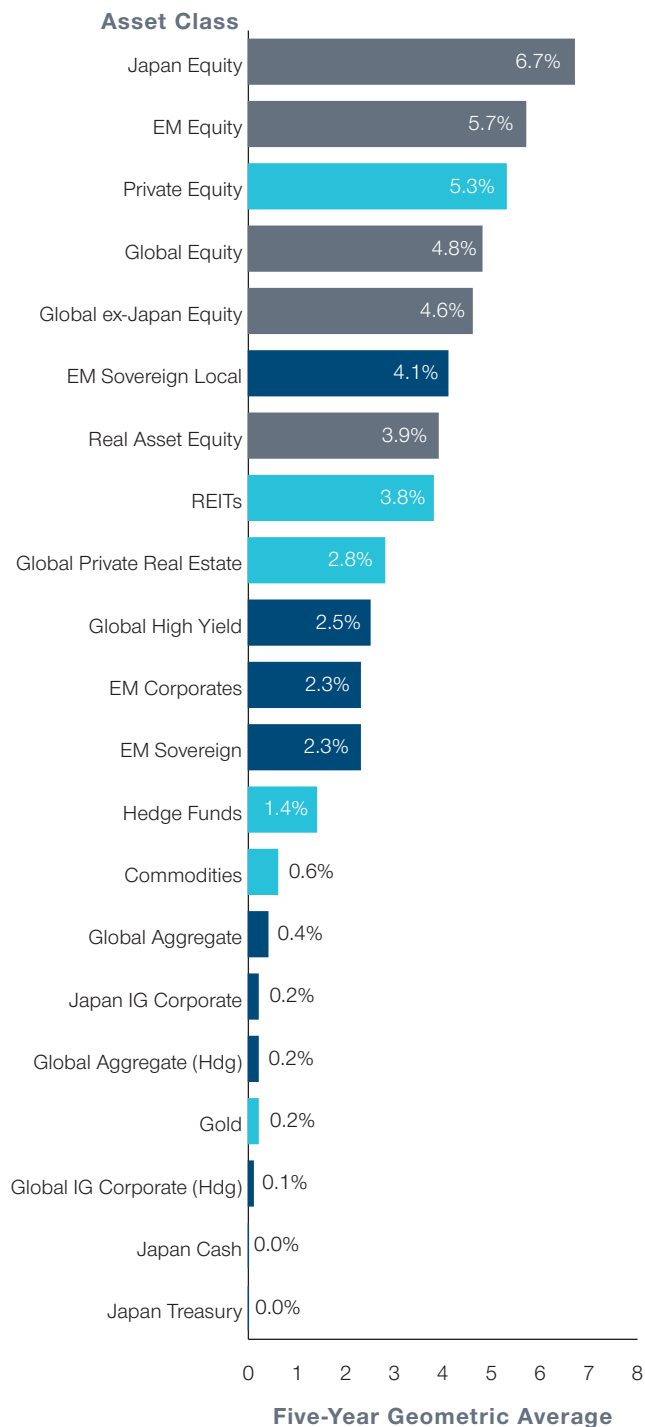
(Figures in Yen)



## ANNUALIZED FORECAST AND HISTORICAL NOMINAL RETURNS

ASSET CLASS		2020 5-YEAR RETURN FORECAST	HISTORICAL 5-YEAR RETURNS, ENDED 31 DECMEBER		
			2019	2014	2009
EQUITY	Global Equity	4.8%	6.8%	15.4%	1.7%
	Global ex-Japan Equity	4.6	7.3	17.0	1.0
	Japan Equity	6.7	6.4	11.5	-3.2
	EM Equity	5.7	3.9	7.3	13.5
	Real Asset Equity	3.9	2.1	13.7	3.0
	Global Aggregate	0.4	0.3	8.0	2.6
FIXED INCOME	Global Aggregate (Hdg)	0.2	1.6	4.2	1.4
	Global IG Corporate (Hdg)	0.1	2.6	5.7	0.8
	Global High Yield	2.5	3.5	14.2	5.0
	Japan Cash	0.0	0.0	0.1	0.4
	Japan Treasury	0.0	1.4	2.6	1.7
	Japan IG Corporate	0.2	0.5	0.5	1.3
	EM Sovereign Local	4.1	0.8	8.0	8.7
	EM Sovereign	2.3	4.2	13.1	5.9
	EM Corporate	2.3	4.2	12.3	4.9
	Commodities	0.6	-5.8	-0.6	-0.1
	Gold	0.2	17.5	-10.7	0.3
	REITs	3.8	6.3	23.0	-1.5
	Hedge Funds	1.4	-0.8	6.3	-1.5
	Global Private Real Estate	2.8	6.0	17.9	2.7
ALTERNATIVES	Private Equity	5.3	11.1	20.3	10.5

## FIVE-YEAR ANNUALIZED EXPECTED RETURNS



### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE./Russell January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.

# REGION | JAPAN (¥ JPY)

(Figures in Yen)



## EXPECTED VOLATILITIES AND CORRELATIONS

Volatility and Correlation Matrix		EQUITY					FIXED INCOME										ALTERNATIVES						VOLATILITY (%)
		Global Equity	Global ex-Japan Equity	Japan Equity	EM Equity	Real Asset Equity	Global Aggregate	Global Aggregate (Hdg)	Global IG Corporate (Hdg)	Global High Yield	Japan Cash	Japan Treasury	Japan IG Corporate	EM Sovereign Local	EM Sovereign	EM Corporate	Commodities	Gold	REITs	Hedge Funds	Global Private Real Estate	Private Equity	
EQUITY	Global Equity	1.0																					20.4
	Global ex-Japan Equity	1.0	1.0																				20.6
	Japan Equity	0.9	0.8	1.0																			20.1
	EM Equity	0.9	0.9	0.8	1.0																		24.4
	Real Asset Equity	1.0	1.0	0.8	0.9	1.0																	26.4
FIXED INCOME	Global Aggregate	0.8	0.8	0.7	0.7	0.8	1.0																7.5
	Global Aggregate (Hdg)	-0.4	-0.4	-0.4	-0.3	-0.3	-0.3	1.0															3.0
	Global IG Corporate (Hdg)	0.2	0.2	0.1	0.3	0.2	0.1	0.7	1.0														4.7
	Global High Yield	0.9	0.9	0.7	0.9	0.9	0.8	-0.3	0.2	1.0													16.3
	Japan Cash	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	0.0	-0.3	-0.3	1.0												0.1
	Japan Treasury	-0.4	-0.4	-0.5	-0.4	-0.3	-0.3	0.8	0.4	-0.4	0.1	1.0											2.4
	Japan IG Corporate	0.0	0.0	-0.1	0.0	0.0	-0.1	0.5	0.5	0.0	0.1	0.5	1.0										1.4
	EM Sovereign Local	0.8	0.8	0.7	0.9	0.8	0.8	-0.3	0.2	0.8	-0.1	-0.3	0.0	1.0									12.9
	EM Sovereign	0.8	0.8	0.7	0.8	0.9	0.9	-0.2	0.2	0.9	-0.2	-0.3	-0.1	0.8	1.0								11.8
	EM Corporate	0.8	0.8	0.7	0.8	0.9	0.9	-0.2	0.2	1.0	-0.3	-0.3	0.0	0.8	1.0	1.0							13.1
ALTERNATIVES	Commodities	0.7	0.7	0.6	0.7	0.8	0.6	-0.5	0.0	0.7	-0.2	-0.4	-0.1	0.6	0.6	0.7	1.0						20.6
	Gold	0.0	-0.1	0.0	0.2	0.0	-0.1	0.1	0.1	0.0	-0.2	0.2	0.0	0.1	0.1	0.1	0.3	1.0					12.4
	REITs	0.8	0.8	0.6	0.6	0.8	0.6	-0.1	0.3	0.7	-0.3	-0.1	0.1	0.6	0.6	0.6	0.5	-0.2	1.0				24.3
	Hedge Funds	0.9	0.9	0.8	0.8	0.9	0.9	-0.5	-0.1	0.9	-0.2	-0.5	-0.2	0.8	0.9	0.9	0.7	0.0	0.6	1.0			14.3
	Global Private Real Estate	0.7	0.7	0.6	0.5	0.7	0.8	-0.5	-0.3	0.7	-0.2	-0.4	-0.3	0.6	0.8	0.7	0.6	0.0	0.5	0.9	1.0		15.0
	Private Equity	0.9	0.9	0.8	0.8	0.9	0.9	-0.5	-0.1	0.9	-0.3	-0.5	-0.2	0.8	0.8	0.8	0.7	0.0	0.6	0.9	0.9	1.0	27.2

### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE./Russell January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.

# REGION | JAPAN (¥ JPY)

(Figures in Yen)

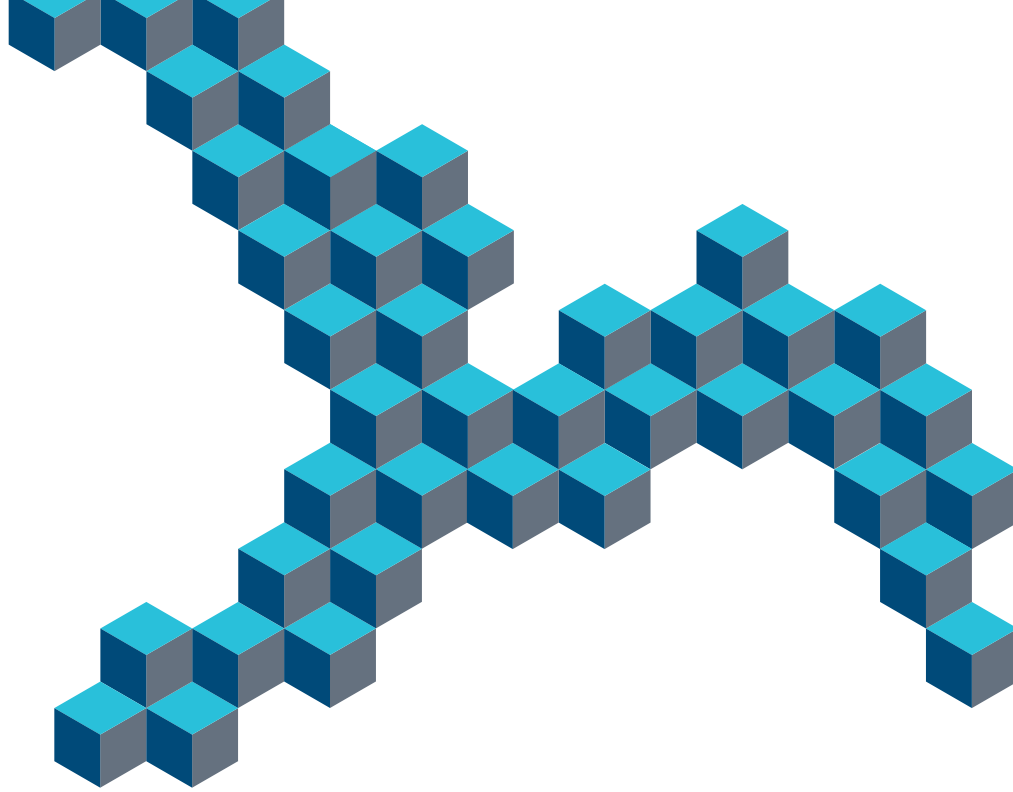


## FIVE-YEAR SCENARIO ANNUALIZED RETURNS

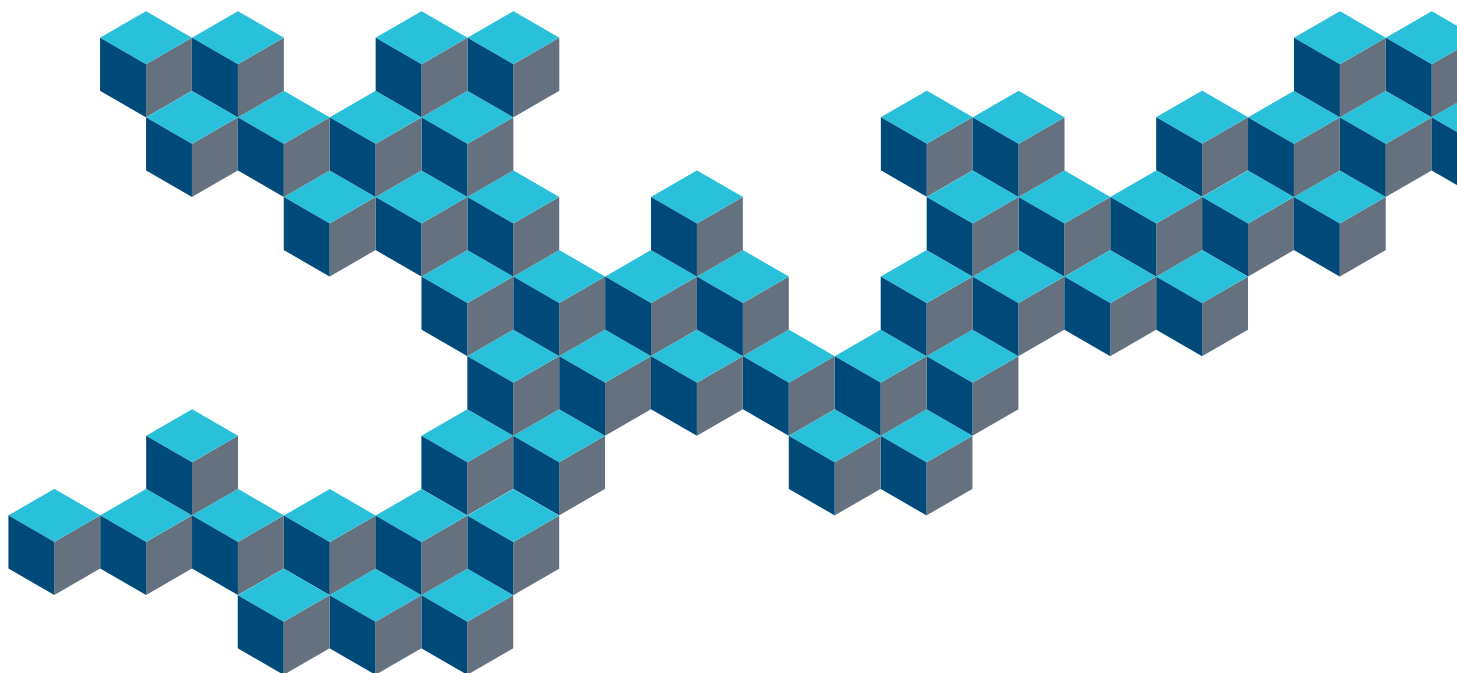
	ASSET CLASS	BASELINE	STRONG BEAR MARKET	MODERATE BEAR MARKET	MODERATE BULL MARKET	STRONG BULL MARKET
EQUITY	Global Equity	4.8%	-3.8%	1.2%	6.0%	10.1%
	Global ex-Japan Equity	4.6	-2.0	3.4	5.3	9.9
	Japan Equity	6.7	-3.7	6.1	8.6	11.9
	EM Equity	5.7	1.6	5.9	6.2	8.4
	Real Asset Equity	3.9	0.6	3.3	4.0	5.9
FIXED INCOME	Global Aggregate	0.4	-1.0	1.8	2.1	2.8
	Global Aggregate (Hdg)	0.2	-1.0	1.0	2.1	2.4
	Global IG Corporate (Hdg)	0.1	-1.8	1.8	1.9	2.1
	Global High Yield	2.5	0.4	3.8	4.4	7.3
	Japan Cash	0.0	-0.1	-0.1	0.0	0.0
	Japan Treasury	0.0	0.1	-0.1	-0.1	-0.1
	Japan IG Corporate	0.2	0.2	0.2	0.2	0.2
	EM Sovereign Local	4.1	2.2	4.0	4.4	5.3
	EM Sovereign	2.3	-1.9	1.5	2.5	5.4
	EM Corporate	2.3	0.2	1.9	2.1	3.9
ALTERNATIVES	Commodities	0.6	-1.5	0.3	0.6	3.4
	Gold	0.2	3.9	1.7	-1.7	-2.2
	REITs	3.8	-1.9	2.0	4.1	7.8
	Hedge Funds	1.4	-1.4	0.7	1.5	4.1
	Global Private Real Estate	2.8	1.8	2.7	2.8	4.1
	Private Equity	5.3	-0.5	3.6	5.8	10.1

### Past performance is not a reliable indicator of future results.

Source: T. Rowe Price. January 2020. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



## REGION | AUSTRALIA



# REGION | AUSTRALIA (\$ AUD)

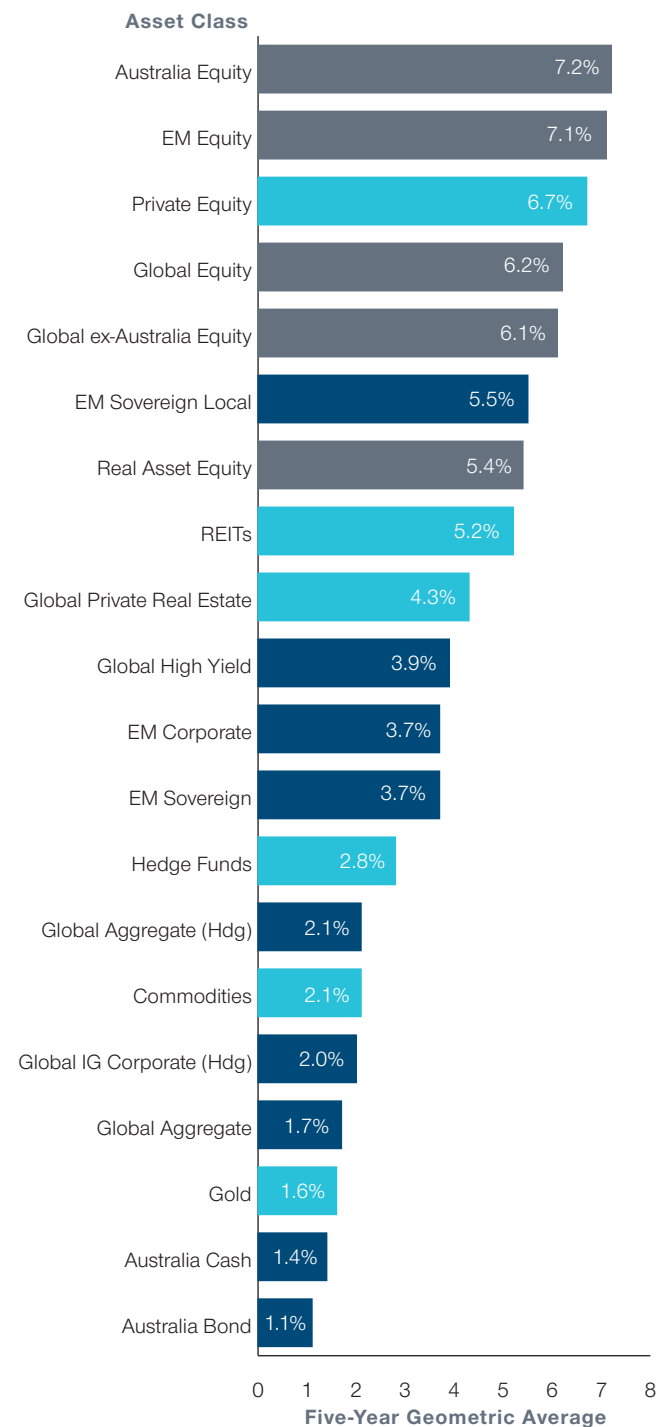


(Figures in Australian Dollars)

## ANNUALIZED FORECAST AND HISTORICAL NOMINAL RETURNS

ASSET CLASS	2020 5-YEAR RETURN FORECAST	HISTORICAL 5-YEAR RETURNS, ENDED DECEMBER 31		
		2019	2014	2009
EQUITY	Global Equity	6.2%	12.3%	11.8%
	Global ex-Australia Equity	6.1	12.4	11.9
	Australia Equity	7.2	9.0	6.8
	EM Equity	7.1	9.2	3.9
	Real Asset Equity	5.4	7.3	10.2
FIXED INCOME	Global Aggregate	1.7	5.5	4.6
	Global Aggregate (Hdg)	2.1	4.2	8.4
	Global IG Corporate (Hdg)	2.0	5.1	9.7
	Global High Yield	3.9	9.1	10.8
	Australia Cash	1.4	1.9	3.8
	Australia Bonds	1.1	4.2	7.3
	EM Sovereign Local	5.5	6.0	4.6
	EM Sovereign	3.7	9.5	9.6
	EM Corporate	3.7	9.6	8.8
	Commodities	2.1	-1.0	-3.7
ALTERNATIVES	Gold	1.6	23.5	-13.5
	REITs	5.2	11.7	19.1
	Hedge Funds	2.8	4.3	3.0
	Global Private Real Estate	4.3	12.8	14.3
	Private Equity	6.7	17.6	16.6

## FIVE-YEAR ANNUALIZED EXPECTED RETURNS



### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE./Russell January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



# REGION | AUSTRALIA (\$ AUD)



(Figures in Australian Dollars)

## EXPECTED VOLATILITIES AND CORRELATIONS

Volatility and Correlation Matrix		EQUITY					FIXED INCOME									ALTERNATIVES						VOLATILITY (%)
		Global Equity	Global ex-Australia Equity	Australia Equity	EM Equity	Real Asset Equity	Global Aggregate	Global Aggregate (Hdg)	Global IG Corporate (Hdg)	Global High Yield	Australia Cash	Australia Bonds	EM Sovereign Local	EM Sovereign	EM Corporate	Commodities	Gold	REITs	Hedge Funds	Global Private Real Estate	Private Equity	
EQUITY	Global Equity	1.0																				11.6
	Global ex-Australia Equity	1.0	1.0																			11.6
	Australia Equity	0.7	0.7	1.0																		14.2
	EM Equity	0.7	0.7	0.7	1.0																	14.8
	Real Asset Equity	0.8	0.8	0.4	0.4	1.0																13.3
FIXED INCOME	Global Aggregate	-0.1	-0.1	-0.6	-0.4	0.3	1.0															10.7
	Global Aggregate (Hdg)	-0.3	-0.3	-0.1	-0.2	0.0	0.3	1.0														3.0
	Global IG Corporate (Hdg)	0.1	0.1	0.4	0.3	0.1	-0.3	0.6	1.0													4.5
	Global High Yield	0.6	0.6	0.2	0.4	0.8	0.3	-0.1	0.1	1.0												8.2
	Australia Cash	-0.3	-0.3	-0.2	-0.2	-0.2	0.1	0.2	-0.2	-0.3	1.0											0.9
	Australia Bonds	-0.3	-0.3	-0.4	-0.4	0.1	0.7	0.7	0.1	0.0	0.2	1.0										3.3
	EM Sovereign Local	0.2	0.2	-0.2	0.1	0.4	0.6	0.3	-0.1	0.4	0.1	0.4	1.0									8.5
	EM Sovereign	0.2	0.2	-0.2	-0.1	0.6	0.8	0.3	-0.1	0.7	-0.1	0.5	0.6	1.0								9.0
	EM Corporate	0.3	0.3	-0.2	0.0	0.6	0.7	0.2	0.0	0.8	-0.2	0.4	0.5	0.9	1.0							8.0
ALTERNATIVES	Commodities	0.3	0.3	0.3	0.3	0.4	-0.2	-0.3	-0.1	0.2	0.0	-0.3	-0.2	-0.1	-0.1	1.0						13.8
	Gold	-0.3	-0.3	-0.2	0.0	0.0	0.2	0.3	0.0	-0.1	0.0	0.3	0.2	0.2	0.2	0.2	1.0					15.5
	REITs	0.6	0.6	0.4	0.3	0.7	0.1	0.1	0.2	0.6	-0.2	0.1	0.3	0.3	0.3	0.1	-0.2	1.0				20.7
	Hedge Funds	0.5	0.5	0.0	0.1	0.7	0.6	-0.3	-0.4	0.7	-0.2	0.1	0.4	0.7	0.8	0.2	0.0	0.3	1.0			9.6
	Global Private Real Estate	0.2	0.2	-0.4	-0.2	0.5	0.8	-0.1	-0.5	0.5	0.0	0.3	0.5	0.7	0.6	0.1	0.1	0.3	0.8	1.0		14.6
	Private Equity	0.6	0.6	0.1	0.3	0.7	0.4	-0.3	-0.4	0.7	-0.2	-0.1	0.3	0.5	0.5	0.3	0.0	0.4	0.9	0.8	1.0	15.4

### Past performance is not a reliable indicator of future results.

Sources: T. Rowe Price, MSCI, Bloomberg Barclays, S&P, J.P. Morgan Chase & Co., HFR, Cambridge Associates, NCREIF, and FTSE./Russell January 2020. See Appendix for a representative list of indexes. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.

# REGION | AUSTRALIA (\$ AUD)



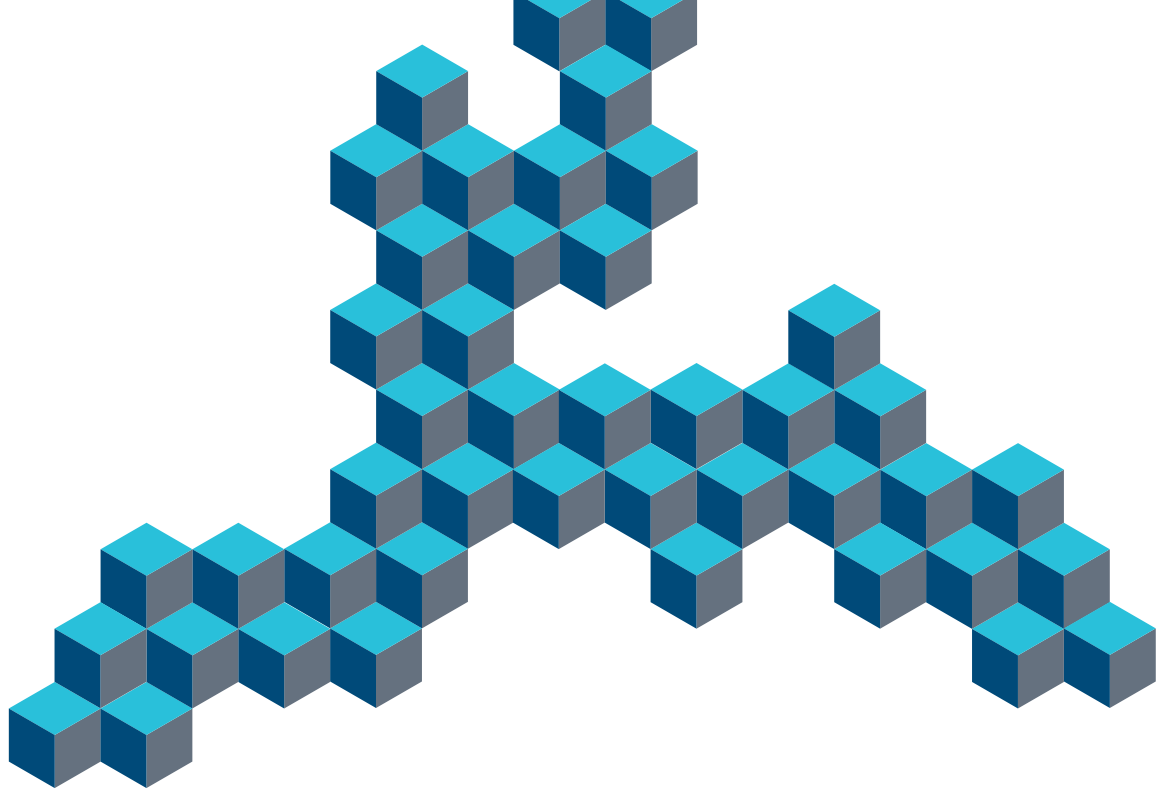
(Figures in Australian Dollars)

## FIVE-YEAR SCENARIO ANNUALIZED RETURNS

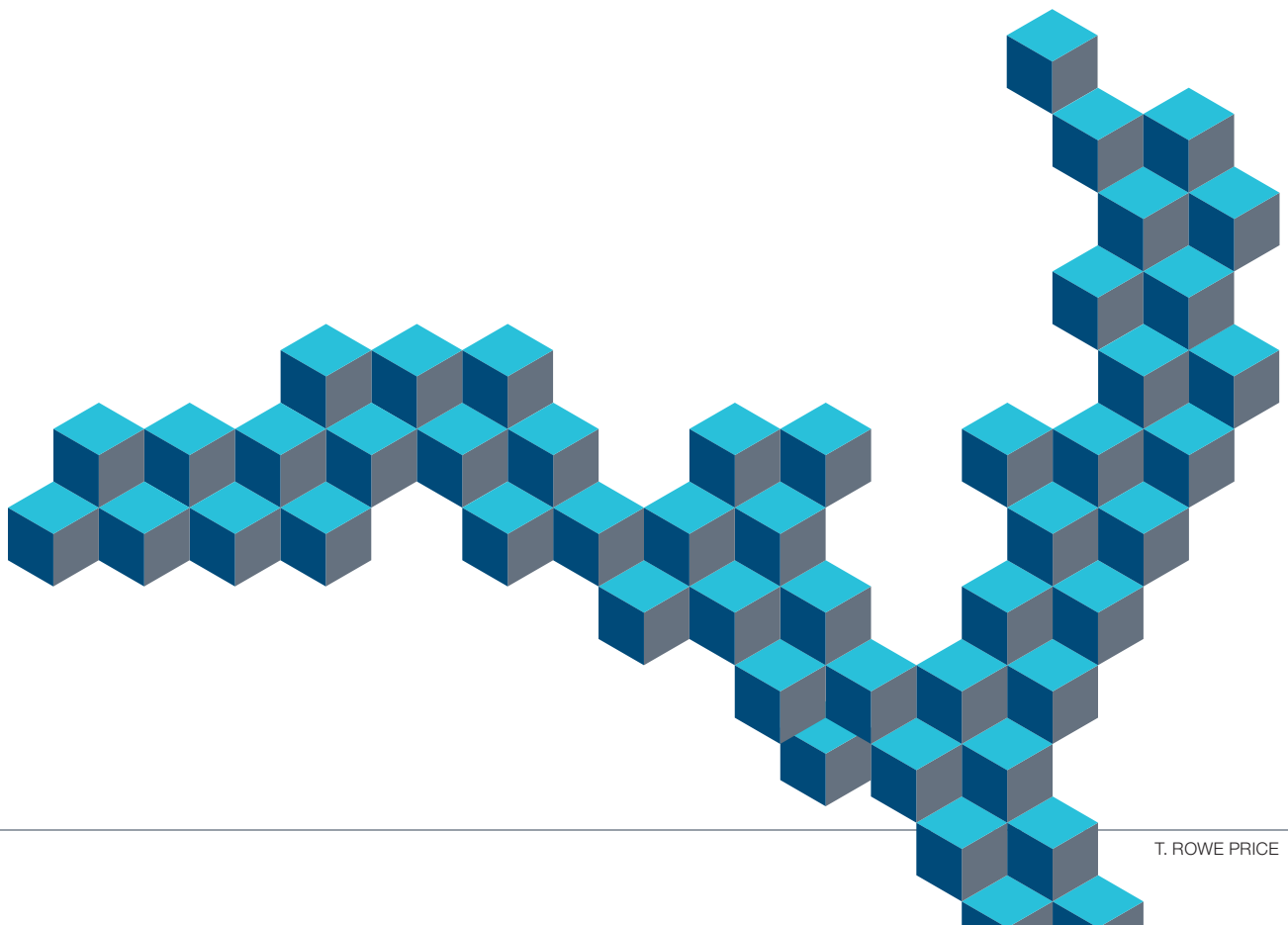
	ASSET CLASS	BASELINE	STRONG BEAR MARKET	MODERATE BEAR MARKET	MODERATE BULL MARKET	STRONG BULL MARKET
EQUITY	Global Equity	6.2%	-3.7%	1.9%	6.7%	11.4%
	Global ex-Australia Equity	6.1	-2.1	4.2	6.2	11.3
	Australia Equity	7.2	3.1	6.9	7.6	9.5
	EM Equity	7.1	1.6	6.6	6.9	9.8
	Real Asset Equity	5.4	0.7	4.0	4.7	7.3
FIXED INCOME	Global Aggregate	1.7	1.0	1.8	2.1	2.8
	Global Aggregate (Hdg)	2.1	2.0	2.0	2.1	2.4
	Global IG Corporate (Hdg)	2.0	1.8	1.8	1.9	2.1
	Global High Yield	3.9	0.4	3.8	4.4	7.3
	Australia Cash	1.4	0.0	0.6	0.7	2.3
	Australia Bonds	1.1	1.9	1.5	1.4	1.0
	EM Sovereign Local	5.5	2.3	4.7	5.1	6.6
	EM Sovereign	3.7	-1.9	2.2	3.2	6.8
	EM Corporate	3.7	0.2	2.5	2.8	5.3
ALTERNATIVES	Commodities	2.1	-1.5	1.0	1.3	4.8
	Gold	1.6	3.9	3.0	-3.0	-0.9
	REITs	5.2	-1.9	2.7	4.9	9.1
	Hedge Funds	2.8	-1.4	1.3	2.3	5.4
	Global Private Real Estate	4.3	1.8	3.3	3.5	5.4
	Private Equity	6.7	-0.4	4.3	6.5	11.4

### Past performance is not a reliable indicator of future results.

Source: T. Rowe Price. January 2020. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not indicative of future results. Forecasts are based on subjective estimates about market environments that may never occur. See the Methodology section for additional information. See Important Information in the Appendix.



## METHODOLOGY





## METHODOLOGY

# Fixed Income

### Basic Model

We decompose fixed income sector returns into three components: the average yield over the five-year period, the average roll-down yield over the five-year period, and the average annual return due to changes in valuation of the five-year period:

$$\text{Return} = \text{average yield} + \text{roll-down} + \text{valuation change}$$

These three components are calculated from the following inputs: current yield, forecast yield, and current duration for a given asset class.

### Current Yield

The current yield is calculated using linear interpolation—matching the yield on the appropriate sovereign yield curve for the maturity that matches the current duration of the sector. For spread sectors, the current option-adjusted spread is added to the yield of the sovereign maturity that matches the duration of the spread sector.

### Forecast Yield

The forecast yield is calculated similar to the current yield, with the inputs provided by the survey results. For a non-government index (e.g., credit), the five-year spread forecast from our survey is then added to the forecast sovereign yield.

### Current Duration

The current duration is used in two ways: first, to find current yield through duration-matching to the sovereign curve, as discussed above. Second, it is used to calculate the average annual roll-down yield and return due to valuation change. These calculations assume the sector will maintain a constant duration throughout the subsequent five-year period. Our research shows that this assumption, while not perfect, is reasonable since modified durations typically vary within +/- one year over rolling five-year windows.

### Average Yield

The average yield is the simple average of the current yield and the forecast yield five years forward, incorporating expectations for spread capture ratios in non-Treasury asset classes:

$$\text{Average yield} = (\text{current yield} + \text{forecast yield}) / 2$$

### Change in Yield

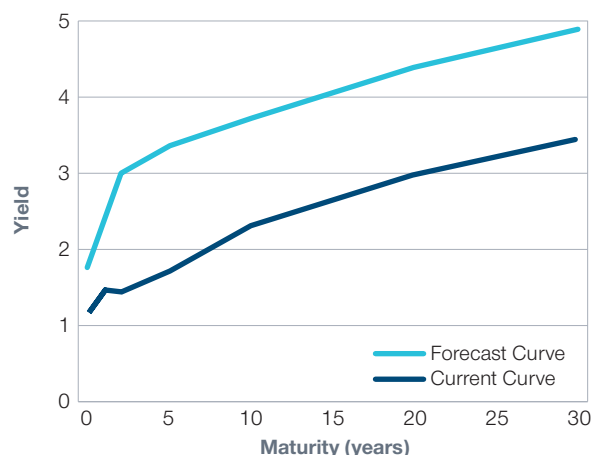
The change in yield is the annual average change from the current yield to the five-year forecast yield:

$$\text{Yield change} = (\text{forecast yield} - \text{current yield}) / 5$$

### Roll-Down Return

The roll-down return is earned through rebalancing each year to maintain a constant duration. The return is due to the convergence of a bond's end-of-period yield to the beginning-

## FORECAST U.S. TREASURY CURVE



of-period yield of an equivalent bond with a one-year shorter maturity. Thus, we estimate the roll-down return as follows:

1. First, we use the same estimation methods as for the current and forecast rolled-down yields, except that we interpolate to the maturity points on the current and future yield curves that are one year less than the current average maturity of the index.

2. Second, we estimate the average rolled-down yield over the five-year period as the simple average of the current and forecast rolled-down yields from step 1:

$$\text{Average rolled-down yield} = (\text{current rolled-down yield} + \text{forecast rolled-down yield}) / 2$$

3. Third, we calculate the average annual change in yield due to rolling down the curve (roll-down change):

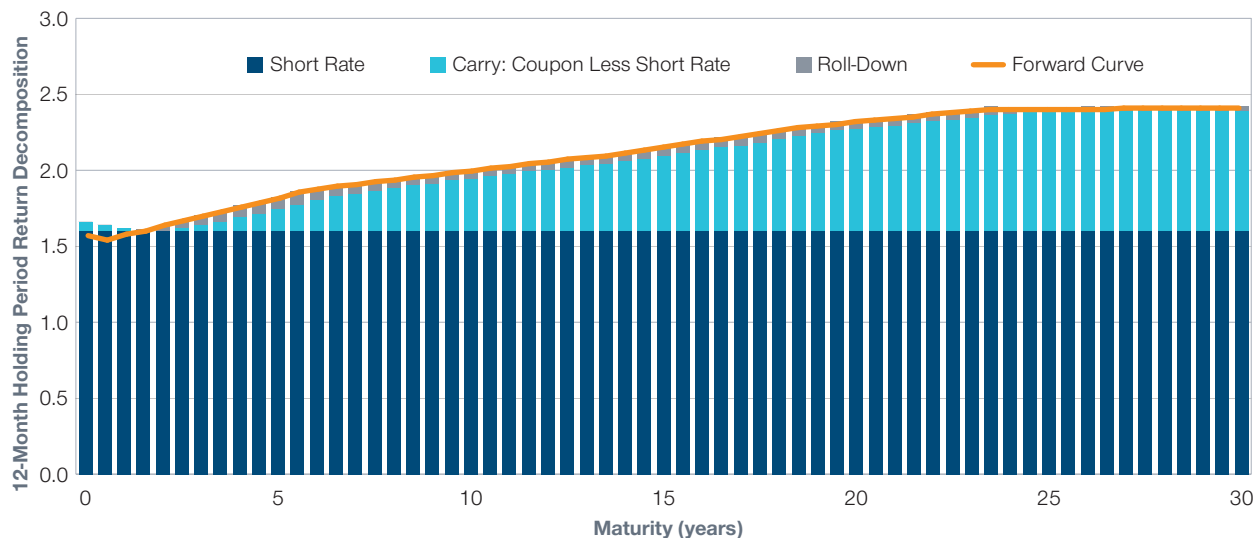
$$\text{Average roll-down change} = (\text{average rolled-down yield} - \text{average yield}) / 5$$

4. Last, we multiply the current duration by the roll-down change to get the average annual return to the index from rolling down the yield curve:

$$\text{Average roll-down return} = \text{current duration} \times \text{average roll-down change}$$



## CARRY AND ROLL-DOWN FOR GOVERNMENT BONDS



### Valuation Change

Valuation change has two components: the return due to changes in the level of the underlying sovereign curve and the return due to changes in the spread over the sovereign curve:

*Average level change return = current duration x yield change*

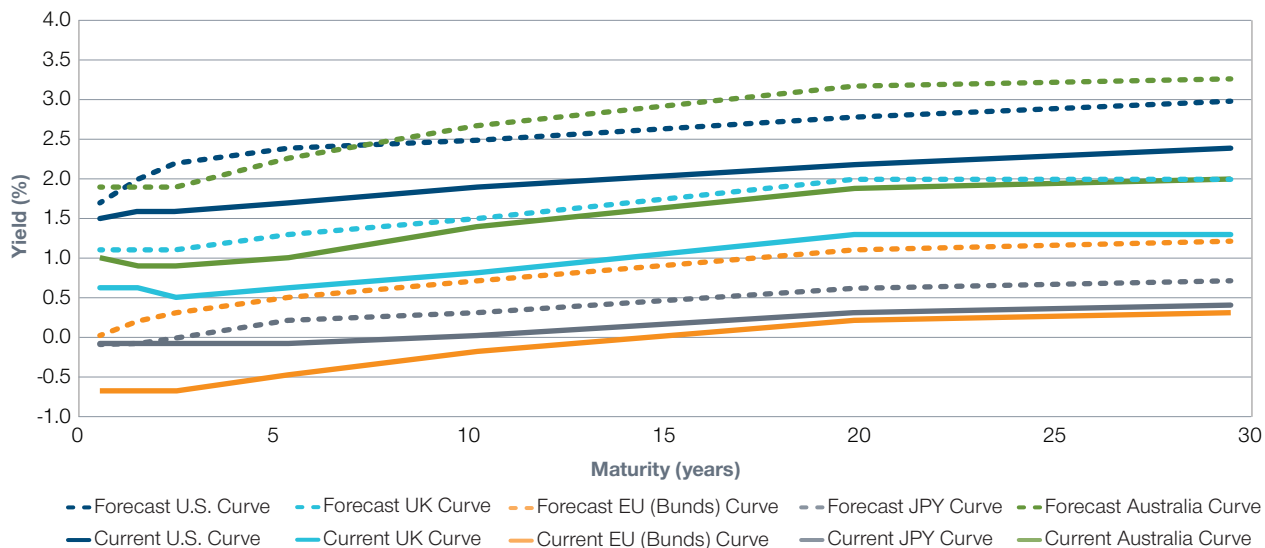
### Comment on Durations

We use analytical modified adjusted durations to ascertain the correct point on the yield curve for interpolation. However, we use empirical durations for estimating the returns from valuation changes so that we can ensure that we can cleanly separate the duration due purely to level changes in the underlying sovereign curve and changes in spread levels for a sector.

### TIPS

We decompose TIPS returns into two components: the portion of return due to underlying changes in the nominal U.S. sovereign curve and the portion attributable to unexpected changes in inflation. The nominal Treasury return is developed using the same process as described previously. The unexpected inflation return is computed by subtracting the current five-year consensus inflation estimate from our inflation forecast and then multiplying by the current duration of the index.

## GLOBAL YIELD CURVES





## METHODOLOGY

### Equities

The capital market assumptions for equities provide return forecasts for the U.S., UK, Europe, Japan, Australia and emerging markets. U.S. returns are further broken out by large-cap and small-cap returns. Our survey process leverages the knowledge and expertise of our global equity portfolio manager and analyst teams via forecasts for each market and are combined to arrive at a global equity forecast. We blend the survey results with market data to develop our equity market assumptions.

#### Survey Data:

1. Expected Inflation—headline consumer price index annualized over next five years
2. Real earnings per share (EPS) growth—arithmetic average over the next five years
3. Future price/earnings ratio (P/E)—multiple in five years' time

#### Market Data:

1. Dividend yield—historical average percentage yield
2. Current P/E—Last 12-month P/E

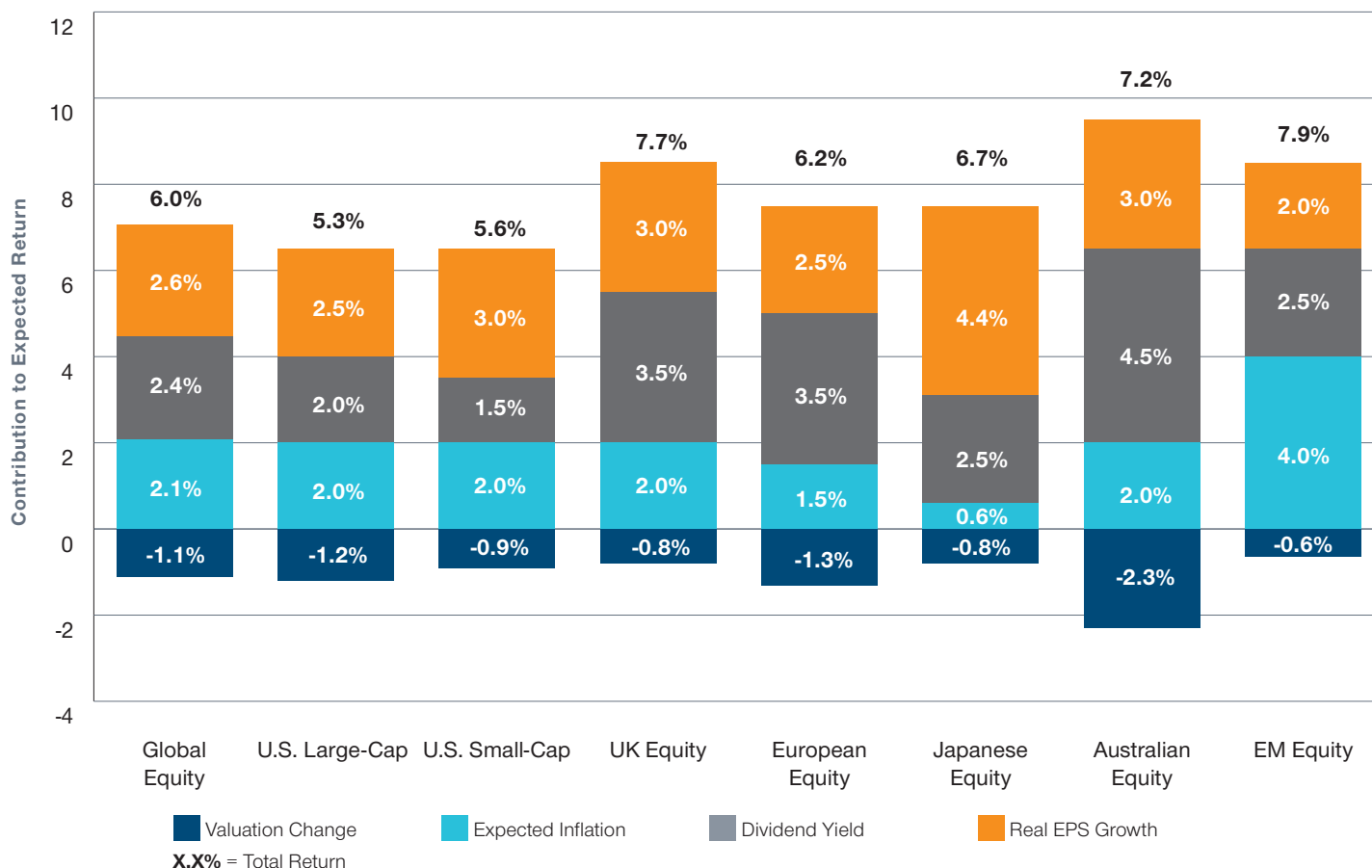
For each equity asset class, the above inputs are used to calculate expected average annual returns, according to the equation:

$$\text{Expected Inflation} + \text{Real EPS Growth} + \text{Dividend Yield} + \Delta\text{Valuation}$$

Where annual  $\Delta\text{Valuation}$  for each of the next five years is given by:

$$\left( \frac{\text{Future P/E}}{\text{Current P/E}} \right) \times \frac{1}{5}$$

### EQUITY MARKET EXPECTED RETURNS FROM 2020 TO 2025 (IN LOCAL CURRENCY)



Source: T. Rowe Price. January 2020. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not guarantees of future results. Forecasts are based on subjective estimates about market environments that may never occur. See Important Information in the Appendix.



### Real Asset Equity

The returns for real asset equities reflect the three components that make up of the underlying benchmark: inflation-sensitive equities, Real Estate Investment Trusts, and physical commodities. Returns for the asset class reflect a 50% MSCI ACWI ex-USA equity, 25% REITs, and 25% commodities weighting. MSCI ACWI ex-USA Index returns were selected to give higher notional weight to commodities producing countries at the expense of the U.S.

### Impact of Buybacks and New Issuance

Two components purposefully absent from our equity-return model are share buybacks and net issuance. When companies buy their own stock, the remaining outstanding shares each represent a larger ownership percentage and should, therefore, appreciate in price. However, the positive effects of share buybacks may be offset by initial and secondary stock offerings. Published academic literature has been inconclusive on the net effect at the market level.

In favor of a negative buyback effect, on the order of -2% per year, William Bernstein and Rob Arnott argue that share issuances and initial public offerings have consistently outpaced buybacks. Their observation that the market capitalizations of global stock markets consistently grow faster than the price level of indexes that follow the same markets supports this argument. On the other side of the debate, Philip Straehl and Roger Ibbotson have argued for a positive buyback effect on the order of +1.5%, based on aggregating net issuance at the individual company level divided by beginning market capitalization for all stocks in the S&P 500 from 1970–2014.

Rather than align directly with either side of the debate, we have chosen a middle ground by assuming no net change in return due to buybacks and new issuance.



## METHODOLOGY

### Alternatives

To forecast the returns of the alternative asset classes, we use a factor regression model with the following premiums used as the predictive variables:

- Equity risk premium
- Small-cap premium
- EM premium
- Credit premium
- Duration premium

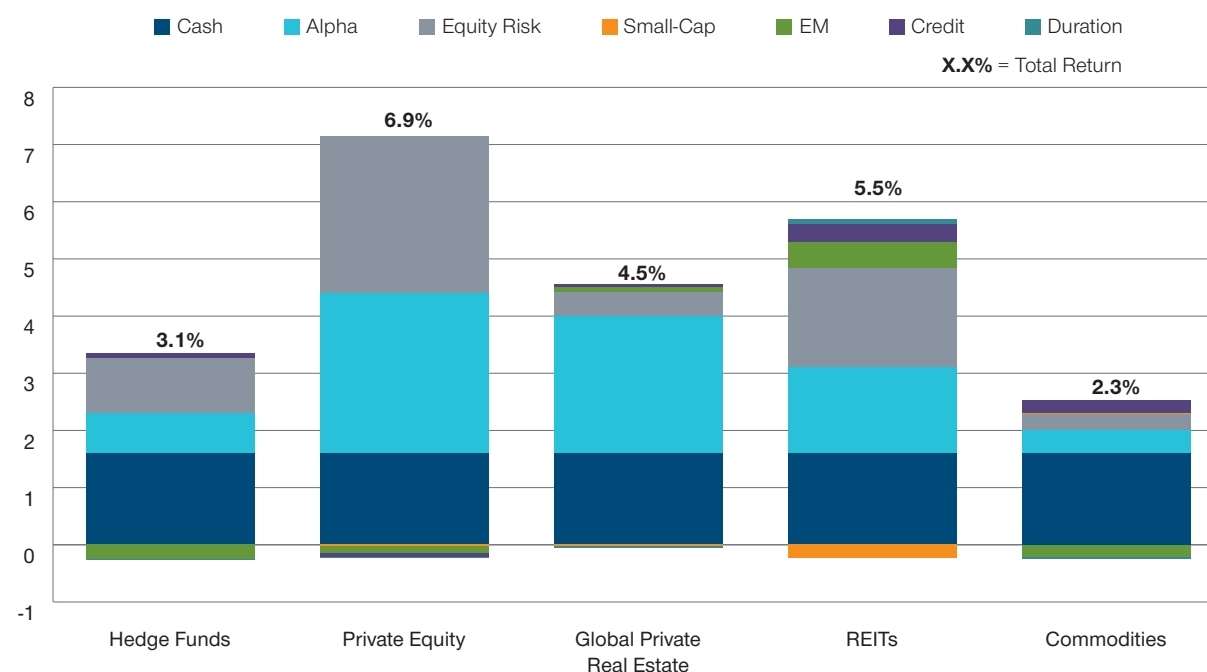
We use data starting in 2002 to help estimate the exposure of each asset class to the premia. Additionally, asset classes such as hedge funds and private equity/real estate have a

non-negligible active management component that is a foundational portion of the asset class's value proposition.

Based on our survey results, we quantify each premium as shown below and apply each asset class's historical beta to the premiums to calculate an expected return.

Premiums	Forecast Value Over Next 5 Years
Equity Risk	3.7%
Small-Cap	0.3%
EM	2.0%
Credit	0.2%
Duration	0.1%

### COMPONENT OF EXPECTED RETURN



Source: T. Rowe Price. January 2020. This information is not intended to be investment advice or a recommendation to take any particular investment action. The forecasts contained herein are for illustrative purposes only and are not guarantees of future results. Forecasts are based on subjective estimates about market environments that may never occur. See Important Information in the Appendix.

### Commodities

In addition to the factor model described above, for commodities we also use gold and oil forecasts from our sector specialists as inputs into our estimates. Generally, we are bearish on commodities, as supply/demand imbalances in oil have continued to place downward pressure on the asset class.

Our investors forecast the average spot price in five years for a barrel of Brent crude oil and an ounce of gold as \$60 and \$1,670, respectively.





### Survey

The foundation of our CMAs is a survey provided to a wide range of senior T. Rowe Price portfolio managers, economists, and analysts across our equity, fixed income, and multi-asset divisions. The survey requests forecasts for many inputs: GDP growth, inflation, commodity prices, equity valuations, earnings growth, fixed income yields, slopes of yield curves, and spread levels. Respondents are asked to offer insights for their respective areas of expertise and are invited to add thoughts for other categories. After all surveys are collected, baseline forecasts are developed for each asset class. The Capital Markets Assumptions Governance Committee then reviews the results for internal consistency and reasonableness.

### Correlations and Volatility

Empirical research has shown that over short time horizons (days and months), volatility regimes tend to cluster—i.e., today's volatility environment is highly correlated to that which investors are likely to experience in the near future. However, these results are less conclusive over longer time horizons. Similarly, certain asset classes, like EM debt, have experienced significant structural declines in volatility over the past decade, while others, like developed market investment-grade debt, recently have increased in volatility as the duration of the asset class has extended in a low interest rate environment.

The volatility and correlation matrix shown is based on 15 years of historical data, making adjustments as necessary to reflect recent developments within each asset class. We “unsmooth” return histories of alternative asset classes, which have significant auto-correlation, to better reflect the economic volatility of the underlying assets.

### Currency Treatment

One of the most significant changes to the T. Rowe Price CMAs in 2020 is the expansion of our forecasts to five geographies, rather than forecasting all asset classes in local terms like we did in 2019. While the previous approach offered several benefits, most notably simplicity, the resulting forecasts were not actually applicable for any investor without additional manipulation. Necessary adjustments would have included a return differential for currency expectations, a volatility component to reflect the contribution to risk attributable to currency fluctuations, and a correlation effect based on how spot exchange rates interact with market risk sentiment. We have attempted to unburden users of our 2020 CMAs by incorporating all of these adjustments into the publication.

Estimating returns for assets domiciled in a different currency than the base currency invites several questions:

- Should currency movements be hedged and does that view change by asset class?
- What is a reasonable approach for estimating currency return?

For the 2020 assumptions, we presume that uncovered interest rate parity holds – essentially the difference in nominal interest rates between two countries is equal to the expected depreciation of one currency relative to the other. Using our cash forecasts, therefore, we are able to estimate the currency return impact of translating returns of an asset valued in one currency to another.

Empirically we realize that uncovered interest-rate parity does not always hold but we believe it is a reasonable expectation over the next five-year horizon.

In terms of hedging considerations, historical data demonstrates that better risk-adjusted returns potentially can be earned by investors hedging high-quality fixed income versus leaving investment grade foreign bond exposures unhedged. This is generally true for investors domiciled across the globe. The data is less conclusive for equities and the results are more country specific. We have elected to forecast returns for global aggregate bonds and global investment grade corporates with hedging, while leaving all other foreign currency exposures unhedged. The difference between our hedged and unhedged return expectations are driven by differences between our interest-rate views and the five-year forward cash rate implied by the market as of December 31, 2019.



## METHODOLOGY

### Scenarios

Point estimates of future returns are implicitly accompanied by some level of uncertainty. For that reason, we have constructed four additional sets of capital market assumptions that represent bearish, moderately bearish, moderately bullish, and bullish outlooks. These scenarios are intended to bookend our baseline scenarios, allowing for consideration of a range of economic and return scenarios.

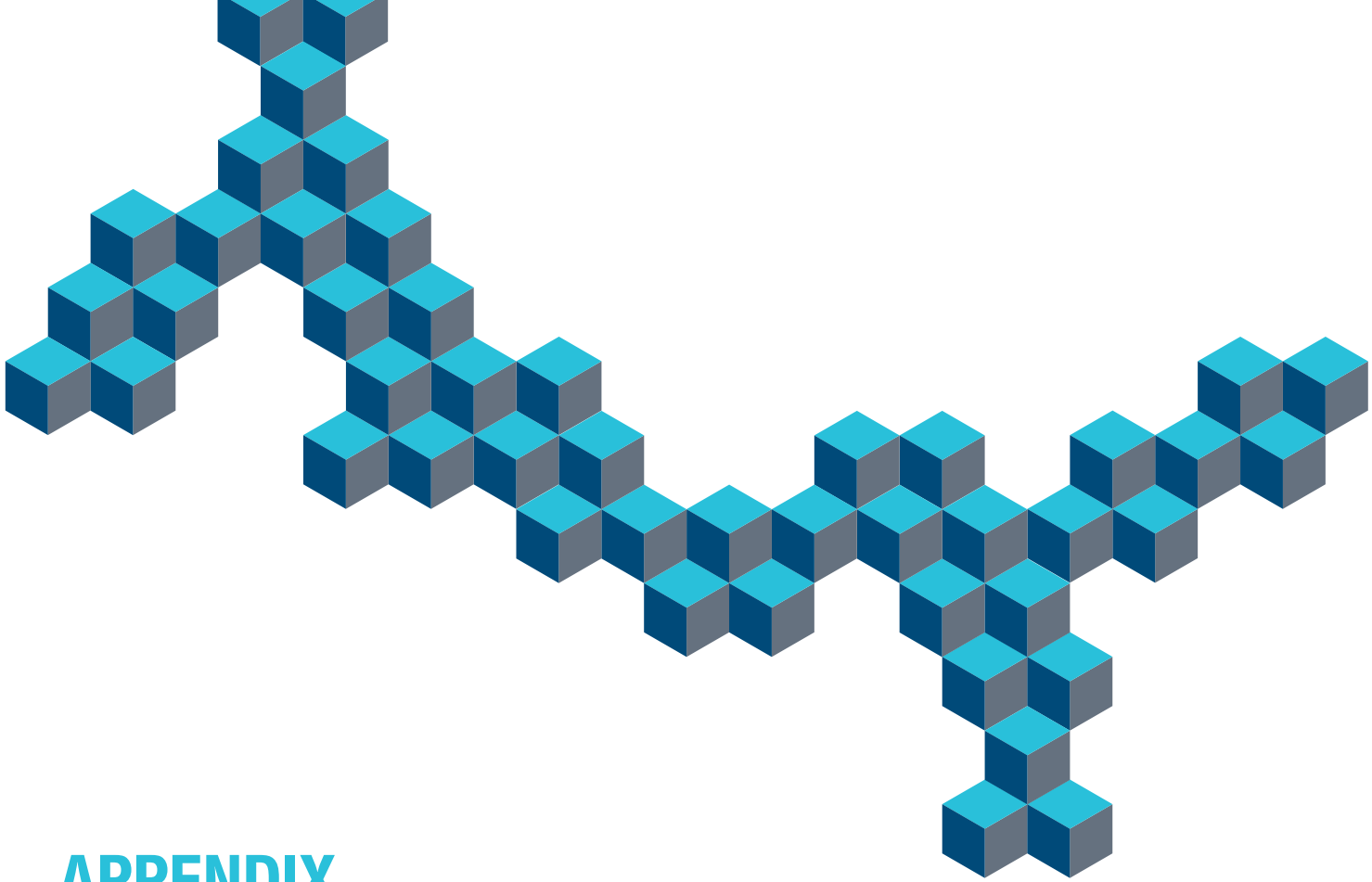
The scenarios are underpinned by the belief that the level of aggregate investor risk appetite is the primary driver of investment returns over short- to medium-term horizons. With this in mind, our scenario generation process begins by analyzing historical periods of differing investor sentiment towards risk. Using global equity returns as a proxy for risk, we divide the past 15 years of common asset class performance into quartiles and estimate the volatility of each asset class and its correlation to global equities during those periods. We then divide the past 30 years of rolling 5-year periods into

quartiles and reconstruct the broader set of asset class returns using their previously estimated volatilities and correlations.

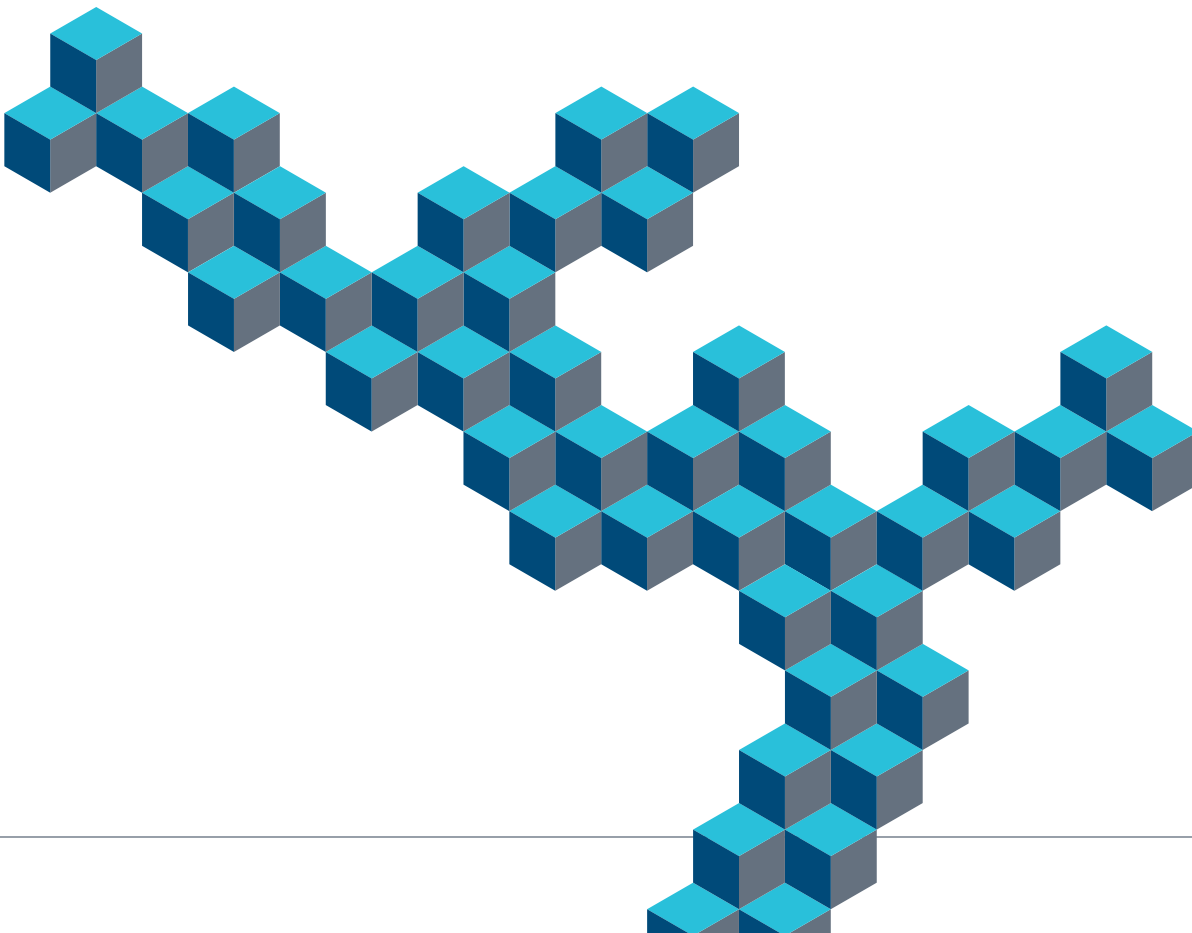
The resulting asset class returns from this quantitative process form the starting point for the Capital Markets Assumptions Governance Committee's oversight. The Governance Committee make adjustments to returns, often due to structural changes of an asset class that are not reflected through a solely backwards-looking quantitative lens. These qualitative insights are important in assessing the forward-looking potential behavior of investments.

---

We believe that considering portfolio designs across multiple regimes is necessary for aligning investor objectives and asset allocation.



## APPENDIX





## APPENDIX

### Acknowledgments

The following investment professionals make up the T. Rowe Price Capital Markets Assumptions Governance Committee:

**Peter Austin**

Head of Global Multi-Asset Solutions

**Megumi Chen**

Multi-Asset Quantitative Analyst

**David Clewell, CFA**

Multi-Asset Quantitative Analyst

**Jason DaCruz**

Multi-Asset Solutions Analyst

**Charles Shriver**

Multi-Asset Portfolio Manager

**Chris Faulkner-MacDonagh, Ph.D.**

Global Portfolio Strategist, Portfolio Manager

**Justin Harvey, ASA, CFA**

Head of Analysis, Multi-Asset Solutions

**Stefan Hubrich, CFA, Ph.D.**

Director of Research, Portfolio Manager

**Andrew Jacobs van Merlen, CFA**

Associate Portfolio Manager—Multi-Asset

**Sean McWilliams**

Multi-Asset Quantitative Analyst, Portfolio Manager

**Robert Panariello, CFA, CAIA, FRM**

Associate Director of Research, Multi-Asset

**Sébastien Page, CFA**

Head of Global Multi-Asset

The Capital Markets Assumptions Governance Committee would like to thank the following T. Rowe Price investors for their contribution to the Capital Market Assumptions:

Aadish Kumar, Alan Levenson, Andrew Armstrong, Andrew Keirle, Archibald Ciganer, Arif Husain, Christopher Brown, Colin McQueen, David Stanley, Ernest Yeung, Gonzalo Pangaro, Hajime Takigawa, Heather McPherson, Hiroshi Watanabe, Howard Woodward, Ivan Morozov, Jeff Rottinghaus, Ju Yen Tan, Ken Orchard, Kevin Loomer, Lauren Wagandt, Lowell Yura, Matt Lawton, Michael Connelly, Michael Conelius, Michael Delle Vedova, Michael Sewell, Nikolaj Schmidt, Paul Massaro, Peter Botoucharov, Quentin Fitzsimmons, Randal Jenneke, Ray Mills, Richard Coghlan, Rick de los Reyes, Rodney Rayburn, Roy Adkins, Samy Muaddi, Saurabh Sud, Scott Berg, Sebastien Mallet, Steve Bartolini, Tetsuji Inoue, Thomas Poullaoec, Wyatt Lee, Yoram Lustig



**Yoram Lustig, Head of Multi-Asset Solutions, EMEA and LATAM**  
44.20.7002.4381 | yoram.lustig@troweprice.com

**Thomas Poullaoec, Head of Multi-Asset Solutions, Asia Pacific**  
852.2536.7354 | thomas.poullaoec@troweprice.com

**Lowell Yura, Head of Multi-Asset Solutions, North America**  
410.345.4644 | lowell.yura@troweprice.com

**Peter Austin, Head of Global Multi-Asset Solutions**  
410.345.6540 | peter.austin@troweprice.com

## APPENDIX



### REFERENCE INDEXES

	ASSET CLASS	REPRESENTATIVE INDEX
EQUITY	Global Equity	MSCI ACWI
	Global ex-U.S. Equity	MSCI ACWI ex-USA
	Global ex-Japan Equity	MSCI Kokusai
	Global ex-Australia Equity	MSCI ACWI ex-Australia
	U.S. Equity	Russell 3000
	Europe ex-UK Equity	MSCI Europe ex-UK
	UK Equity	FTSE 100
	U.S. Large-Cap Equity	Russell 1000
	U.S. Small-Cap Equity	Russell 2000
	Europe Equity	MSCI Europe
	Asia ex-Japan Equity	MSCI Asia ex-Japan
	Japan Equity	MSCI Japan
	Australia Equity	S&P/ASX 200
	EM Equity	MSCI Emerging Markets
	Real Asset Equity	S&P Real Assets Index
FIXED INCOME	Global Aggregate	Bloomberg Barclays Global Aggregate
	Global Aggregate (Hdg)	Bloomberg Barclays Global Aggregate (Hdg)
	Global Agg ex-U.S. (Hdg)	Bloomberg Barclays Global Aggregate ex-U.S. (Hdg)
	Global Agg ex-U.S.	Bloomberg Barclays Global Aggregate ex-U.S.
	Global IG Corporate (Hdg)	Bloomberg Barclays Global-Aggregate Corporate (Hdg)
	Global High Yield	Bloomberg Barclays Corporate High Yield
	U.S. Cash	Bloomberg Barclays 1–3M Treasury Bills
	U.S. TIPS	Bloomberg Barclays Global Inflation-Linked U.S. TIPS
	U.S. Treasury	Bloomberg Barclays U.S. Treasury
	U.S. IG Corporate	Bloomberg Barclays U.S. Aggregate Corporate
	U.S. Long Credit	Bloomberg Barclays U.S. Long Credit
	U.S. Aggregate	Bloomberg Barclays U.S. Aggregate Bond
	U.S. High Yield	Bloomberg Barclays U.S. Corporate High Yield
	U.S. Bank Loans	S&P/LSTA Leveraged Performing Loan
	UK Cash	Bloomberg Barclays Sterling Treasury Bills 0-3 Month
	UK Gilts	Bloomberg Barclays UK Gilts
	UK IG Corporate	Bloomberg Barclays UK Aggregate Corporate
	Europe Cash	Bloomberg Barclays EUR Treasury Bills 0-3 Month
	Europe Treasury	Bloomberg Barclays EUR Treasury
	Europe IG Corporate	Bloomberg Barclays EUR Aggregate Corporate
	Europe High Yield	Bloomberg Barclays EUR High Yield
	Japan Cash	Bloomberg Barclays Japan Treasury Bills 1-3 Months
	Japan Treasury	Bloomberg Barclays Japan Treasury
	Japan IG Corporate	Bloomberg Barclays Japan Aggregate Corporate
	Australia Cash	Bloomberg Ausbond Bank Bill
	Australia Bonds	Bloomberg Ausbond 0+ Composite
ALTERNATIVES	EM Sovereign Local	JP Morgan GBI – EM Global Diversified
	EM Sovereign	JP Morgan EMBI Global Diversified
	EM Corporate	JP Morgan CEMBI
	Hedge Funds	HRFX Global Hedge Fund
	Private Equity	Cambridge Associates LLC Global Private Equity
	Commodities	Bloomberg Commodity
	Gold	S&P GSCI Gold Total Return
	Global Private Real Estate	NCREIF Property
	REITs	FTSE EPRA/NAREIT Developed

### References

- Bernstein, William J., and Arnott, Robert D., "Earnings Growth: The Two Percent Dilution." *Financial Analyst Journal*. September/October 2003. 47–55.
- Black, F., and Litterman, R. (1991), "Global Asset Allocation with Equities, Bonds, and Currencies." Fixed Income Research, Goldman, Sachs & Company, October.
- Diebold, F.X., and Li, C. (2006), "Forecasting the Term Structure of Government Bond Yields," *Journal of Econometrics*, 130, 337–364.
- Diebold, F.X., Rudebusch, G.D., and Aruoba, B. (2006), "The Macroeconomy and the Yield Curve: A Dynamic Latent Factor Approach." *Journal of Econometrics*, 131, 309–338.
- Desclee, Albert, Maitra, Anando, and Polbennikov, Simon (2013), "Managing Conflicting Views in Asset Allocation Decisions." Barclays Bank PLC.
- Ibbotson, Roger G., and Chen, Peng, "Long-Run Stock Returns: Participating in the Real Economy." *Financial Analysts Journal*, Vol. 59, No. 1, February 2003.
- Mahalanobis, Prasanta Chandra (1936), "On the generalised distance in statistics" (PDF). Proceedings of the National Institute of Sciences of India.
- Pedersen, Niels, Page, Sébastien, and He, Fei (2014), "Asset Allocation: Risk Models for Alternative Investments." *Financial Analysts Journal*, Vol. 70, No. 3: 34–45.
- Straehl, Philip U., and Ibbotson, Roger G. (2017), "The Long-Run Drivers of Stock Returns: Total Payouts and the Real Economy." *Financial Analysts Journal*, Vol. 73, No. 3: 32–52.



# Key Risks and Important Information

## Key Risks

Forecasts are based on subjective estimates about market environments that may never occur. Some of the factors that could impact these forecasts include, but are not limited to:

- Political and economic conditions
- Performance of financial markets
- Interest rate levels
- Changes to laws or regulations

Investments in equities are subject to the volatility inherent in equity investing, and their value may fluctuate more than investing in income-oriented securities. Certain asset classes are subject to sector concentration risk and are more susceptible to developments affecting those sectors than broader classes. Investment in small companies involves greater risk than is customarily associated with larger companies, since small companies often have limited product lines, markets, or financial resources. Transactions in securities denominated in foreign currencies are subject to fluctuations in exchange rates, which may affect the value of an investment. Debt securities could suffer an adverse change in financial condition due to a ratings downgrade or default, which may affect the value of an investment. Investments in high yield involve a higher element of risk. Investments in less developed regions can be more volatile than other, more developed markets due to changes in market, political, and economic conditions. Investments are less liquid than those that trade on more established markets.

## Additional Disclosures

Bloomberg Index Services Limited. BLOOMBERG® is a trademark and service mark of Bloomberg Finance L.P. and its affiliates (collectively "Bloomberg"). BARCLAYS® is a trademark and service mark of Barclays Bank Plc (collectively with its affiliates, "Barclays"), used under license. Bloomberg or Bloomberg's licensors, including Barclays, own all proprietary rights in the Bloomberg Barclays Indices. Neither Bloomberg nor Barclays approves or endorses this material, or guarantees the accuracy or completeness of any information herein, or makes any warranty, express or implied, as to the results to be obtained therefrom and, to the maximum extent allowed by law, neither shall have any liability or responsibility for injury or damages arising in connection therewith.

MSCI and its affiliates and third party sources and providers (collectively, "MSCI") makes no express or implied warranties or representations and shall have no liability whatsoever with respect to any MSCI data contained herein. The MSCI data may not be further redistributed or used as a basis for other indices or any securities or financial products. This report is not approved, reviewed, or produced by MSCI. Historical MSCI data and analysis should not be taken as an indication or guarantee of any future performance analysis, forecast or prediction. None of the MSCI data is intended to constitute investment advice or a recommendation to make (or refrain from making) any kind of investment decision and may not be relied on as such.

Information has been obtained from sources believed to be reliable, but J.P. Morgan does not warrant its completeness or accuracy. The index is used with permission. The index may not be copied, used, or distributed without J.P. Morgan's prior written approval. Copyright © 2020, J.P. Morgan Chase & Co. All rights reserved.

S&P Copyright © 2020, S&P Global Market Intelligence (and its affiliates, as applicable). Reproduction of S&P ASX, GSCI, Real Assets and S&P/LSTA Leveraged Performing Loan Indexes in any form is prohibited except with the prior written permission of S&P Global Market Intelligence (S&P). None of S&P, its affiliates, or their suppliers guarantee the accuracy, adequacy, completeness, or availability of any information and is not responsible for any errors or omissions, regardless of the cause or for the results obtained from the use of such information. In no event shall S&P, its affiliates, or any of their suppliers

be liable for any damages, costs, expenses, legal fees, or losses (including lost income or lost profit and opportunity costs) in connection with any use of S&P information.

London Stock Exchange Group plc and its group undertakings (collectively, the "LSE Group"). © LSE Group 2020. All rights in the FTSE Russell indexes or data vest in the relevant LSE Group company that owns the index or the data. Neither LSE Group nor its licensors accept any liability for any errors or omissions in the indexes or data, and no party may rely on any indexes or data contained in this communication. No further distribution of data from the LSE Group is permitted without the relevant LSE Group company's express written consent. The LSE Group does not promote, sponsor, or endorse the content of this communication.

## Important Information

**T. Rowe Price Capital Market Assumptions:** The information presented herein is shown for illustrative, informational purposes only. Forecasts are based on subjective estimates about market environments that may never occur. This material does not reflect the actual returns of any portfolio/strategy and is not indicative of future results. The historical returns used as a basis for this analysis are based on information gathered by T. Rowe Price and from third-party sources and have not been independently verified. The asset classes referenced in our capital market assumptions are represented by broad-based indices, which have been selected because they are well known and are easily recognizable by investors. Indices have limitations due to materially different characteristics from an actual investment portfolio in terms of security holdings, sector weightings, volatility, and asset allocation. Therefore, returns and volatility of a portfolio may differ from those of the index. Management fees, transaction costs, taxes, and potential expenses are not considered and would reduce returns. Expected returns for each asset class can be conditional on economic scenarios; in the event a particular scenario comes to pass, actual returns could be significantly higher or lower than forecast.

**This material is being furnished for general informational and/or marketing purposes only.** The material does not constitute or undertake to give advice of any nature, including fiduciary investment advice, nor is it intended to serve as the primary basis for an investment decision. Prospective investors are recommended to seek independent legal, financial and tax advice before making any investment decision. T. Rowe Price group of companies including T. Rowe Price Associates, Inc. and/or its affiliates receive revenue from T. Rowe Price investment products and services. **Past performance is not a reliable indicator of future performance.** The value of an investment and any income from it can go down as well as up. Investors may get back less than the amount invested.

The material does not constitute a distribution, an offer, an invitation, a personal or general recommendation, or a solicitation to sell or buy any securities in any jurisdiction or to conduct any particular investment activity. The material has not been reviewed by any regulatory authority in any jurisdiction.

Information and opinions presented have been obtained or derived from sources believed to be reliable and current; however, we cannot guarantee the sources' accuracy or completeness. There is no guarantee that any forecasts made will come to pass. The views contained herein are as of the date written and are subject to change without notice; these views may differ from those of other T. Rowe Price group companies and/or associates. Under no circumstances should the material, in whole or in part, be copied or redistributed without consent from T. Rowe Price.

The material is not intended for use by persons in jurisdictions that prohibit or restrict the distribution of the material, and in certain countries the material is provided upon specific request.

It is not intended for distribution to retail investors in any jurisdiction.





**Australia**—Issued in Australia by T. Rowe Price Australia Limited (ABN: 13 620 668 895 and AFSL: 503741), Level 50, Governor Phillip Tower, 1 Farrer Place, Suite 50B, Sydney, NSW 2000, Australia. For Wholesale Clients only.

**Brunei**—This material can only be delivered to certain specific institutional investors for informational purpose upon request only. The strategy and/or any products associated

with the strategy has not been authorised for distribution in Brunei. No distribution of this material to any member of the public in Brunei is permitted.

**Canada**—Issued in Canada by T. Rowe Price (Canada), Inc. T. Rowe Price (Canada), Inc.'s investment management services are only available to Accredited Investors as defined under National Instrument 45-106. T. Rowe Price (Canada), Inc. enters into written delegation agreements with affiliates to provide investment management services.

**China**—This material is provided to specific qualified domestic institutional investor or sovereign wealth fund on a one-on-one basis. No invitation to offer, or offer for, or sale of, the shares will be made in the People's Republic of China ("PRC") (which, for such purpose, does not include the Hong Kong or Macau Special Administrative Regions or Taiwan) or by any means that would be deemed public under the laws of the PRC. The information relating to the strategy contained in this material has not been submitted to or approved by the China Securities Regulatory Commission or any other relevant governmental authority in the PRC. The strategy and/or any product associated with the strategy may only be offered or sold to investors in the PRC that are expressly authorized under the laws and regulations of the PRC to buy and sell securities denominated in a currency other than the Renminbi (or RMB), which is the official currency of the PRC. Potential investors who are resident in the PRC are responsible for obtaining the required approvals from all relevant government authorities in the PRC, including, but not limited to, the State Administration of Foreign Exchange, before purchasing the shares. This document further does not constitute any securities or investment advice to citizens of the PRC, or nationals with permanent residence in the PRC, or to any corporation, partnership, or other entity incorporated or established in the PRC.

**DIFC**—Issued in the Dubai International Financial Centre by T. Rowe Price International Ltd. This material is communicated on behalf of T. Rowe Price International Ltd. by its representative office which is regulated by the Dubai Financial Services Authority. For Professional Clients only.

**EEA ex-UK**—Issued in the European Economic Area (ex-UK) by T. Rowe Price (Luxembourg) Management S.à r.l. 35 Boulevard du Prince Henri L-1724 Luxembourg which is authorised and regulated by the Luxembourg Commission de Surveillance du Secteur Financier. For Professional Clients only.

**Hong Kong**—Issued in Hong Kong by T. Rowe Price Hong Kong Limited, 6/F Chater House, 8 Connaught Road, Central, Hong Kong. T. Rowe Price Hong Kong Limited is licensed and regulated by the Securities & Futures Commission. For Professional Investors only.

**Japan** - Issued in Japan by T. Rowe Price Japan, Inc. (KLFB Registration No. 3043 (Financial Instruments Service Provider), Members of JIAA and JITA), located at GranTokyo South Tower 7F,9-2, Marunouchi 1-chome, Chiyoda-ku, Tokyo 100-6607. This material is intended for use by Professional Investors only and under no circumstances should the material, in whole or in part, be copied or redistributed without consent from T. Rowe Price Japan, Inc.

**Indonesia**—This material is intended to be used only by the designated recipient to whom T. Rowe Price delivered; it is for institutional use only. Under no circumstances should the material, in whole or in part, be copied, redistributed or shared, in any medium, without prior written consent from T. Rowe Price. No distribution of this material to members of the public in any jurisdiction is permitted.

**Korea**—This material is intended only to Qualified Professional Investors upon specific and unsolicited request and may not be reproduced in whole or in part nor can they be transmitted to any other person in the Republic of Korea.

**Malaysia**—This material can only be delivered to specific institutional investor upon specific and unsolicited request. The strategy and/or any products associated with the strategy has not been authorised for distribution in Malaysia. This material is solely for institutional use and for informational purposes only. This material does not provide investment advice or an offering to make, or an inducement or attempted inducement of any person to enter into or to offer to enter into, an agreement for or with a view to acquiring, disposing of, subscribing for or underwriting securities. Nothing in this material shall be considered a making available of, solicitation to buy, an offering for subscription or purchase or an invitation to subscribe for or purchase any securities, or any other product or service, to any person in any jurisdiction where such offer, solicitation, purchase or sale would be unlawful under the laws of Malaysia.

**New Zealand**—Issued in New Zealand by T. Rowe Price Australia Limited (ABN: 13 620 668 895 and AFSL: 503741), Level 50, Governor Phillip Tower, 1 Farrer Place, Suite 50B, Sydney, NSW 2000, Australia. No Interests are offered to the public. Accordingly, the Interests may not, directly or indirectly, be offered, sold or delivered in New Zealand, nor may any offering document or advertisement in relation to any offer of the Interests be distributed in New Zealand, other than in circumstances where there is no contravention of the Financial Markets Conduct Act 2013.

**Philippines**—THE STRATEGY AND/ OR ANY SECURITIES ASSOCIATED WITH THE STRATEGY BEING OFFERED OR SOLD HEREIN HAVE NOT BEEN REGISTERED WITH THE SECURITIES AND EXCHANGE COMMISSION UNDER THE SECURITIES REGULATION CODE. ANY FUTURE OFFER OR SALE OF THE STRATEGY AND/ OR ANY SECURITIES IS SUBJECT TO REGISTRATION REQUIREMENTS UNDER THE CODE, UNLESS SUCH OFFER OR SALE QUALIFIES AS AN EXEMPT TRANSACTION.

**Singapore**—Issued in Singapore by T. Rowe Price Singapore Private Ltd., No. 501 Orchard Rd, #10-02 Wheelock Place, Singapore 238880. T. Rowe Price Singapore Private Ltd. is licensed and regulated by the Monetary Authority of Singapore. For Institutional and Accredited Investors only.

**South Africa**—T. Rowe Price International Ltd ("TRPIL") is an authorised financial services provider under the Financial Advisory and Intermediary Services Act, 2002 (FSP Licence Number 31935), authorised to provide "intermediary services" to South African investors.

**Switzerland**—Issued in Switzerland by T. Rowe Price (Switzerland) GmbH, Talstrasse 65, 6th Floor, 8001 Zurich, Switzerland. For Qualified Investors only.

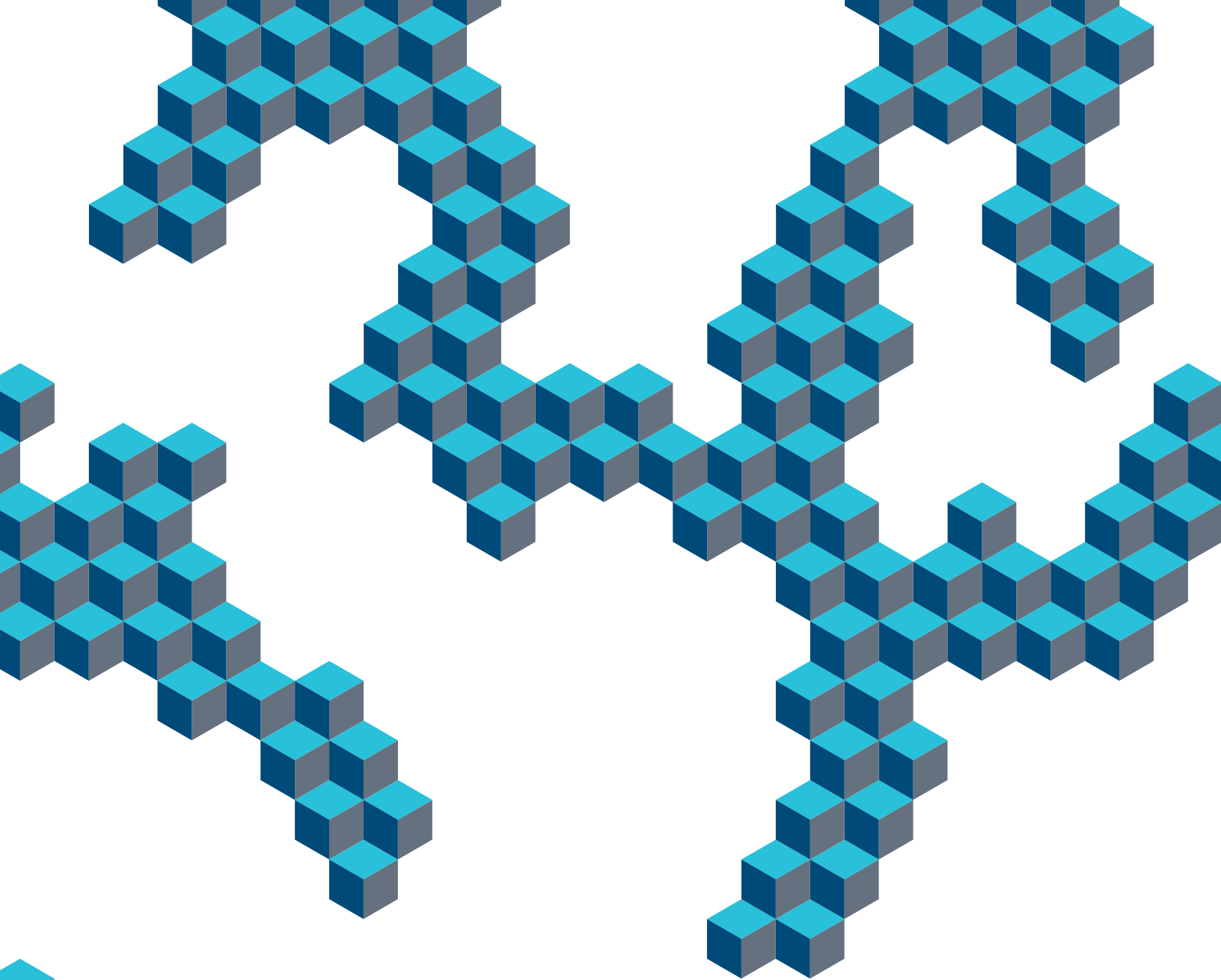
**Taiwan**—This does not provide investment advice or recommendations. Nothing in this material shall be considered a solicitation to buy, or an offer to sell, a security, or any other product or service, to any person in the Republic of China.

**Thailand**—This material has not been and will not be filed with or approved by the Securities Exchange Commission of Thailand or any other regulatory authority in Thailand. The material is provided solely to "institutional investors" as defined under relevant Thai laws and regulations. No distribution of this material to any member of the public in Thailand is permitted. Nothing in this material shall be considered a provision of service, or a solicitation to buy, or an offer to sell, a security, or any other product or service, to any person where such provision, offer, solicitation, purchase or sale would be unlawful under relevant Thai laws and regulations.

**USA**—Issued in the USA by T. Rowe Price Associates, Inc., 100 East Pratt Street, Baltimore, MD, 21202, which is regulated by the U.S. Securities and Exchange Commission. For Institutional Investors only.

**UK**—Issued in the UK by T. Rowe Price International Ltd, 60 Queen Victoria Street, London, EC4N 4TZ which is authorised and regulated by the UK Financial Conduct Authority. For Professional Clients only.

© 2020 T. Rowe Price. All rights reserved. T. ROWE PRICE, INVEST WITH CONFIDENCE, and the bighorn sheep design are, collectively and/or apart, trademarks or registered trademarks of T. Rowe Price Group, Inc.



INVEST WITH CONFIDENCE®

