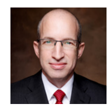
The Quest for Defense

How can you diversify against global equity risk?

October 2019



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KEY INSIGHTS

- Most multi-asset portfolios include a material exposure to global equities. Assets that diversify equity risk and perform well when equity markets perform poorly play a defensive role.
- We propose a new metric—"protective score"—that quantifies and ranks the protective quality of assets with respect to global equities (or any other selected asset), considering the protection's cost and effectiveness.
- According to our metric, U.S. Treasuries would seem to offer the most effective diversification against equity risk.

Multi-asset portfolios are usually heavily exposed to global equities. Even the performance of so-called "balanced" portfolios—typically 60% equities and 40% fixed income and cash—is mostly determined by how well equities perform. To balance this, multi-asset investors need assets that diversify equity risk and mitigate drawdowns. This presents two important questions: Which assets have been able to do this in the past? And which are likely to do so in the future?

To answer, we looked at the monthly returns of the MSCI All Country World Index (ACWI) over the last two decades, focusing on the months in which its return was negative. We then calculated the returns of various other asset classes during the months of the ACWI's negative performance.

U.S. Dollar-Based Portfolios

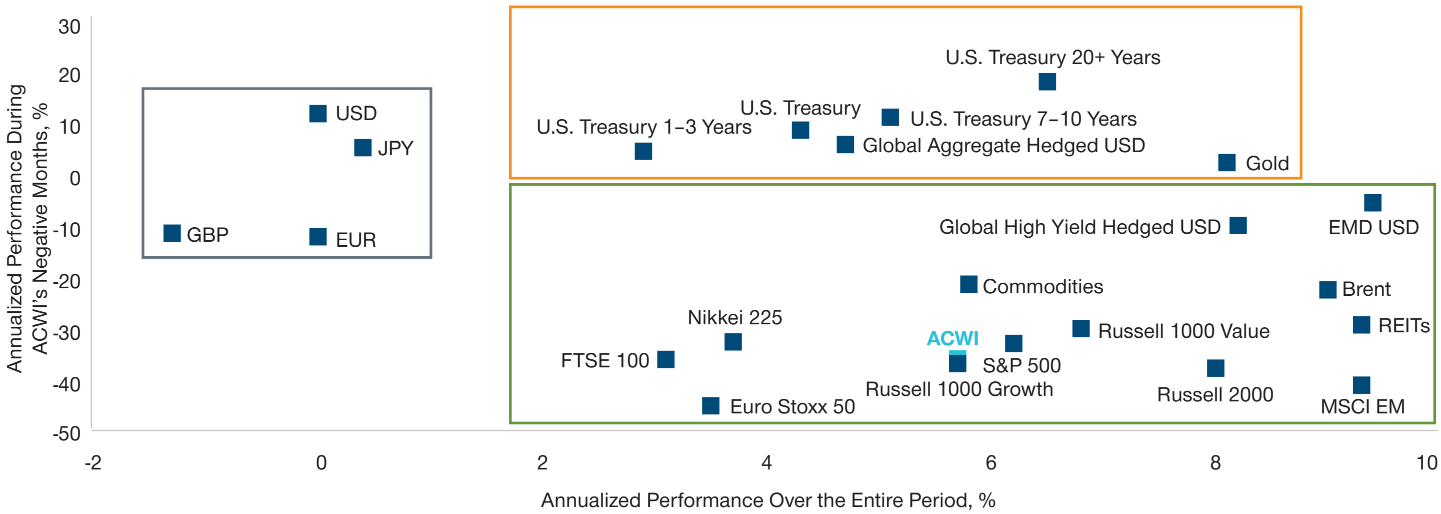
Fig. 1 plots the performance of the ACWI (measured in U.S. dollars) and selected asset classes from February 1999 through June 2019. The x-axis highlights performance over the whole period; the y-axis illustrates performance during the 97 months in which the ACWI was in negative territory. While the annualized return of the ACWI during the entire period was 5.7%, the annualized return over the negative months was -36.0%.

The asset classes in Fig. 1 appear in three clusters. At the bottom right, risk assets are in the green rectangle. These include equities, real estate investment trusts (REITs), commodities, high yield bonds, and emerging markets debt. Over the past two decades, most of these assets have offered relatively strong returns overall. However, during months when the ACWI fell, these assets tended to fall as well.

> "Even the performance of so-called "balanced" portfolios... is mostly determined by how well equities perform.

(Fig. 1) U.S. Treasuries Proved Worth Over the Long Term

The performance of the ACWI and selected asset classes in U.S. dollar terms
February 1999 through June 2019



Past performance is not a reliable indicator of future performance.
Sources: T. Rowe Price and selected indices. Returns are measured in U.S. dollars. Please see Tab. 2 Appendix for names of indices used.

The second cluster includes conservative assets—government and investment-grade bonds and gold—positioned at the middle top of the chart in the orange rectangle. Some of the assets in this cluster have delivered attractive returns during both the entire period and, importantly, during months the ACWI has fallen. However, some of these assets have benefited from a secular drop in interest rates—something that should not be extrapolated into the future.

The third cluster (grey) shows currencies. They have typically delivered returns close to zero over the whole period. Some currencies are defensive, such as the U.S. dollar and Japanese yen; others, such as the euro and the British pound, are not. Emerging markets currencies, which do not appear on the chart, would not be defensive.

Assessing Protective Asset Classes

When considering how well an asset can "protect" another asset, two factors should be considered. The first is the excess performance of the "protective" asset when the "protected" asset falls. The objective is for the protective asset to generate the highest positive return when this occurs, or at least to outperform the protected asset during bad times. This factor indicates how well the protective asset performs when it is most needed.

The second factor is the opportunity cost of holding the protective asset. Assuming that the purpose of allocating away from the protected asset to the protective asset is to mitigate risk, the relative performance between the two matters. This factor indicates either the cost of protection (if relative return is negative) or the benefit of protection (if relative return is positive).

The first factor less the second one gives a single number—the protective score—that captures the benefit of holding the protective asset less the cost of holding it. This single number allows for quick ranking of protective assets with respect to a chosen protected asset. While the factors are typically backward-looking

(Tab. 1) Determining an Asset's "Protective Score"

Long-dated Treasuries offer better insurance against downturns

February 1999 through June 2019

Asset Class	Performance Overall	Performance in Negative ACWI Months	Protective Score
Global equity (ACWI)	**5.7%**	**-36.0%**	**0.0%**
U.S. Treasury 20+ years	6.5	17.8	54.7
U.S. Treasury 7–10 years	5.1	10.9	46.4
U.S. Treasury	4.3	8.4	43.1
USD	0.0	11.6	42.0
Global bonds hedged USD (Bloomberg Barclays Global Aggregate)	4.7	5.6	40.6
Gold	8.1	2.1	40.6
U.S. Treasury 1–3 years	2.9	4.3	37.5
JPY	0.4	5.0	35.8
Emerging markets debt (EMD) USD	9.4	-5.7	34.1
Global high yield hedged USD	8.2	-10.1	28.4
EUR	0.0	-12.3	18.1
GBP	-1.3	-11.6	17.5
Brent (oil)	9.0	-22.6	16.8
Commodities	5.8	-21.5	14.7
REITs	9.3	-29.4	10.3
U.S. large-cap value equity (Russell 1000 Value)	6.8	-30.1	7.0
U.S. large-cap equity (S&P 500)	6.2	-33.0	3.5
Japan equity (Nikkei 225)	3.7	-32.7	1.4
U.S. small-cap equity (Russell 2000)	8.0	-37.8	0.5
U.S. large-cap growth equity (Russell 1000 Growth)	5.7	-36.9	-0.9
Emerging markets equity (MSCI EM)	9.3	-41.1	-1.4
UK equity (FTSE 100)	3.1	-36.1	-2.6
Europe equity (Euro Stoxx 50)	3.5	-45.1	-11.2

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Souces: T. Rowe Price and selected indices. Returns are measured in U.S. dollars. Please see Tab. 2 Appendix for names of indices used.

(ex-post), they can be replaced with forward-looking estimates (ex-ante).

Tab. 1 includes the performance of assets over the entire time, their performance during months the ACWI had a negative return, and their protective scores. By definition, the ACWI—the protected asset—has a score of zero. U.S. Treasuries with a maturity of over 20 years have the highest score (54.7%), while European equity has the lowest score (-11.2%).

The Top Diversifiers of Equity Risk

1. **U.S. Treasuries.** The classic diversifier of global equity risk is U.S. Treasuries. When equities are under stress, this can result in a

The U.S. dollar and Japanese yen have been the most effective currency diversifiers of equity risk.

flight-to-quality as investors rush to the safety of government bonds, causing yields to fall. As Treasuries are long-duration assets (i.e., highly sensitive to interest rate changes), they deliver stronger performance when yields rally. Cash—with a duration close to zero—may not lose value when equities fall, but it also will not deliver a higher-than-average return over the short term.

Over the past 20 years, U.S. Treasuries with maturities of 20 years or more have delivered the best returns during the negative months of the ACWI. The cost of holding long-term bonds has been low as they performed well over the period, outperforming the ACWI.

As Fig. 2 shows, rates have markedly fallen over this time, boosting the performance of Treasuries. Given the current low levels of interest rates, the ability of Treasuries to diversify equity risk going forward is likely to be more modest compared with the past two decades. Inflation has also fallen during this time. Bonds are protective in times of disinflation or low inflation but would offer less protection if the environment were inflationary.

2. **Currencies.** The U.S. dollar and Japanese yen have been the most effective currency diversifiers of equity risk. Investors tend to rush to the safety of these two currencies when markets go through periods of stress. For U.S. dollar-based portfolios, which are already mostly exposed to the U.S. dollar, the decision whether to hedge or unhedge foreign currencies, such as the euro and British pound, should consider whether to add exposure (hedge) or give up exposure (unhedge) to the U.S. dollar.

3. **Investment-grade bonds.** The Bloomberg Barclays Global Aggregate Bond Index, which tracks global investment-grade bonds, has generally performed well when global equity performed negatively. The Bloomberg Barclays Global Aggregate Bond Index is an expansion of sovereign debt and may be a way to provide protection with a lower cost compared with that of government bonds, given their current low or negative yields.

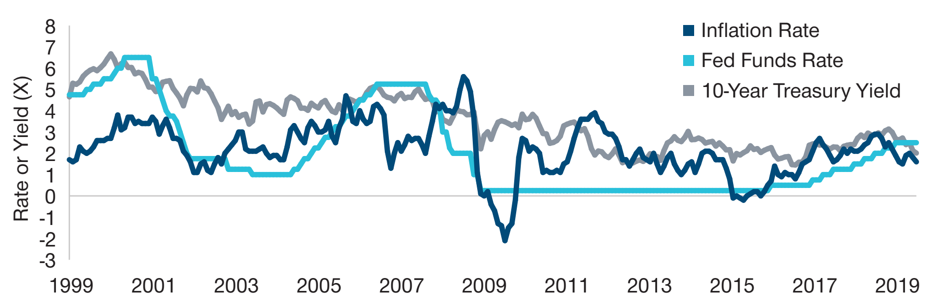
4. **Gold.** Gold has delivered positive returns when global equities have lost value. The performance of gold would be linked to inflation and real interest rates.

Within equity markets, the U.S. equity market—and in particular, U.S. large-cap value—has outperformed other regional markets when the ACWI suffered. The results suggest that U.S. equities are relatively defensive when

(Fig. 2) Falling Rates Have Boosted Treasuries

Yields from 1999 to 2019

As of June 30, 2019



Sources: T. Rowe Price and Bloomberg Index Services Limited (see Additional Disclosures).

compared with other equity markets, tending to outperform when global equities lose value.

Some fixed income asset classes, such as global high yield bonds and emerging markets debt, do not diversify equity risk. The role of these assets in multi-asset portfolios should be to deliver income and potential capital gains. Their role is not conservative, and they are not poised to significantly mitigate equity risk. They do, however, have lower downside risk than equities.

Fig. 3 shows the cumulative performance of each of the mentioned asset classes and the ACWI during the 97 months in which the ACWI experienced negative performance.

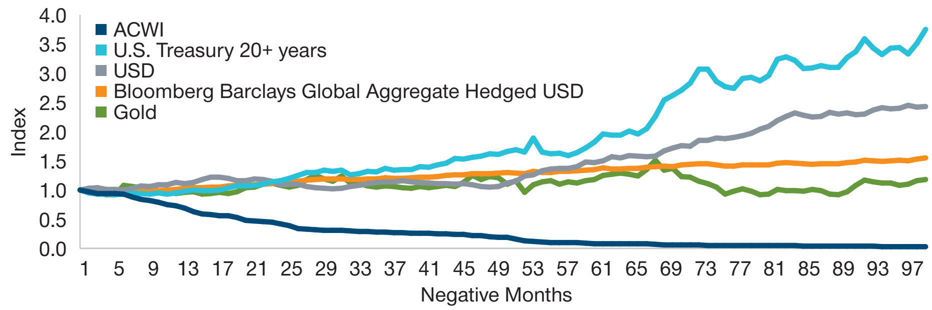
Euro-Based Portfolios

Fig. 4 repeats the exercise with returns measured in euros. The

(Fig.3) Long-Dated U.S. Sovereigns Deliver Stronger Performance for Dollar Investors

The ACWI versus U.S. Treasuries, the U.S. dollar, the Global Agg., and gold

As of June 30, 2019



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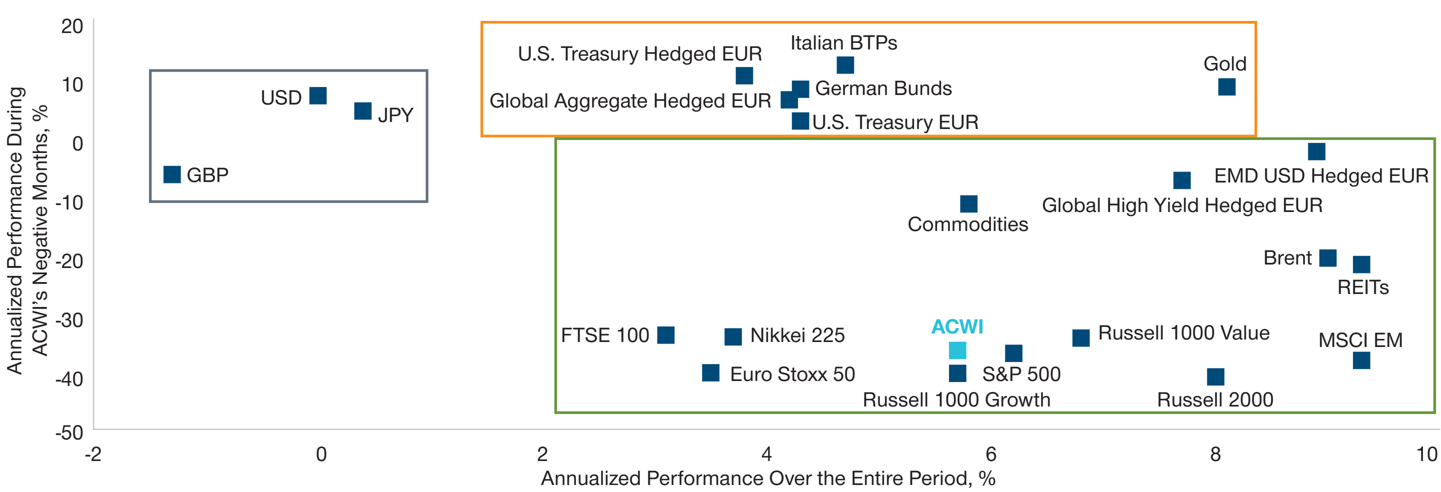
Sources: T. Rowe Price, MSCI (see Additional Disclosures), and Bloomberg Index Services Limited (see Additional Disclosures). Please see Tab. 2 Appendix for names of indices used.

(Fig. 4) Italian Government Bonds Appear to Deliver for Euro Investors

The performance of the ACWI and selected asset classes in euro terms

As of June 30, 2019



Past performance is not a reliable indicator of future performance.

Sources: T. Rowe Price and selected indices. Returns are in euros. Please see Tab. 2 Appendix for list of indices used.

ACWI measured in euro registered 91 negative months from February 1999 to June 2019. This chart is also clustered into risk assets, conservative assets, and currencies. Fig. 5 shows the cumulative performance of some assets during the negative months of the ACWI.

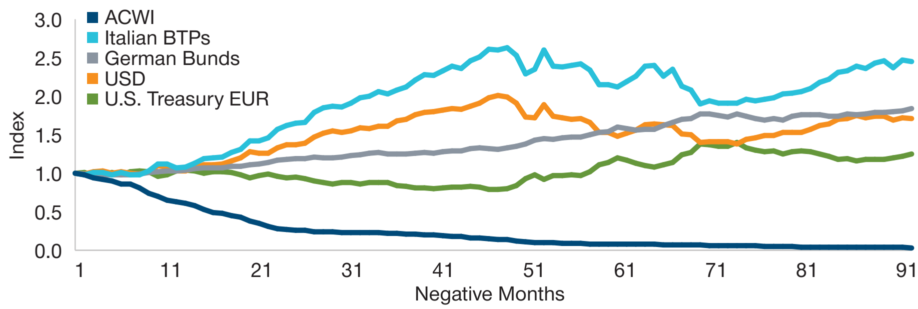
Government bonds denominated in euros—such as German bunds—are commonly used to diversify against equity risk. However, some assets that traditionally have been diversifiers of equity risk, such as Italian government bonds, have not recently offered such protection. They have been behaving more like a risk asset since the 2011 European sovereign debt crisis.

We would normally advise to always hedge the currency exposure of foreign investment-grade bonds denominated in developed currencies to the

(Fig. 5) BTPs Deliver Stronger Performance Overall—But With Volatility

ACWI versus Italian BTPs, German bunds, the U.S. dollar, and U.S. Treasuries

As of June 30, 2019



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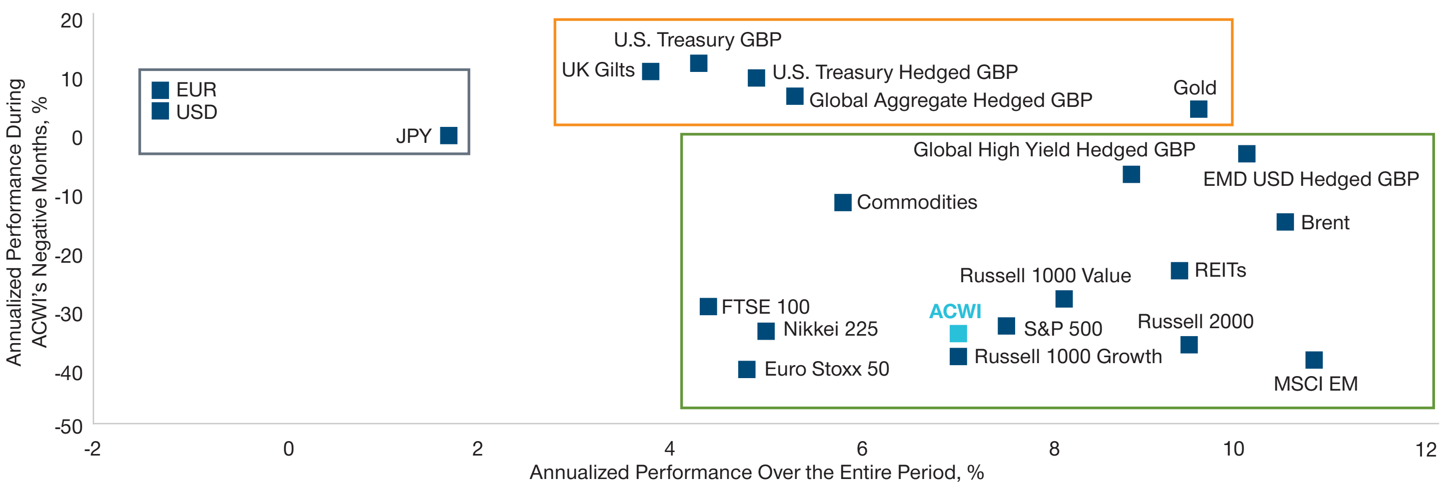
Sources: T. Rowe Price, MSCI (see Additional Disclosures), and Bloomberg Index Services Limited (see Additional Disclosures). Please see Tab. 2 Appendix for names of indices used.

(Fig. 6) U.S. and UK Sovereigns Provide Protection for Sterling-Based Investors

The performance of the ACWI and selected assets in UK sterling terms

As of June 30, 2019



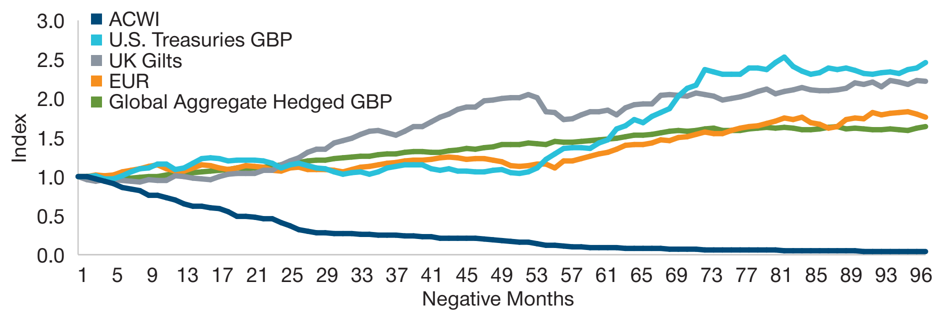
Past performance is not a reliable indicator of future performance.

Sources: T. Rowe Price and selected indices. Returns are in sterling. Please see Tab. 2 Appendix for list of indices used.

Some fixed income asset classes, such as global high yield bonds and emerging markets debt, do not provide diversification against equity risk.

(Fig. 7) Sterling-Denominated Treasuries Outperform

ACWI versus U.S. Treasuries (GBP), UK gilts, euros, and the Global Agg. Hedged GBP
As of May 30, 2019



Sources: T. Rowe Price, MSCI (see Additional Disclosures), and Bloomberg Index Services Limited (see Additional Disclosures). Please see Tab. 2 Appendix for names of indices used.

portfolio's base currency. Otherwise, the volatility and drawdowns of the bonds imbed currency risk, often turning them from a conservative asset into a risky one. However, given current hedging costs of the U.S. dollar to euro, in the case of U.S. Treasuries, we would deviate from this golden rule. Holding Treasuries without hedging their currency in portfolios whose base currency is not the U.S. dollar provides exposure to two defensive assets: U.S. Treasuries and the U.S. dollar. While the volatility of unhedged Treasuries (10.2%) would be much higher than hedged ones (4.4%), holding unhedged Treasuries to diversify global equity risk could work well, as long as investors are comfortable with the volatility.

UK Sterling-Based Portfolios

Fig. 6 repeats the exercise, now with returns measured in UK sterling, and Fig. 7 shows the cumulative performance of selected assets during the negative months of the ACWI—96 such months when return is measured in British pounds. The results are similar to those of a euro-based portfolio. However, the two safe-haven currencies have been the U.S. dollar and euro, rather than the Japanese yen. The British pound has greatly been affected by Brexit over the last three years, and it has greatly impacted the experience of currencies. Unhedged U.S. Treasuries have been an attractive way to diversify equity risk.

Safe-Haven Currencies Appear to Offer Most Effective Diversification

Overall, it is clear from our analysis that given the current environment of low or negative interest rates of government bonds, investors might struggle to diversify the equity risk within their portfolios. Government bonds may still provide such diversification, but at higher costs than in the past because overall performance is unlikely to be as strong as it was when rates were falling. As such, safe-haven currencies seem to offer the best potential for diversification. For portfolios with base currencies other than the U.S. dollar, unhedged U.S. Treasuries may also offer diversification, albeit at the cost of volatility.

(Tab. 2) Appendix

Indices used

Asset class	Index
Global equity (ACWI)	MSCI All Country World
U.S. large cap equity	S&P 500
U.S. large-cap growth equity	Russell 1000 Growth
U.S. large-cap value equity	Russell 1000 Value
U.S. small-cap equity	Russell 2000
Europe equity	Euro Stoxx 50 Price
UK equity	FTSE 100
Japan equity	Nikkei 225
Emerging markets equity	MSCI Emerging Markets
U.S. Treasury	Bloomberg Barclays US Treasury TR Unhedged
U.S. Treasury 1–3 years	Bloomberg Barclays US 1–3 Year TR Value Unhedged
U.S. Treasury 7–10 years	Bloomberg Barclays US 7–10 Year TR Value Unhedged
U.S. Treasury 20+ years	Bloomberg Barclays US 20+ Year TR Value Unhedged
German bunds	Bloomberg Barclays Euro Aggregate Treasury Germany TR Value Unhedged EUR
UK gilts	FTSE Actuaries UK Conventional Gilts All Stocks TR
Italian BTPs	Bloomberg Barclays Italy Government All Bonds TR
Global aggregate	Bloomberg Barclays Global Aggregate TR Value
Global high yield	Bloomberg Barclays Global High Yield TR Value
EMD USD	Bloomberg Barclays EM USD Aggregate TR Value Unhedged
Commodities	S&P GSCI Index Spot CME
REITs	FTSE EPRA NAREIT Developed TR USD
USD	US Dollar Index Spot Rate (DXY); Euro US Dollar Spot; British Pound US Dollar Spot
JPY	Japanese Yen US Dollar Spot; Japanese Yen/Euro Cross; British Pound/Japanese Yen Cross
EUR	Euro US Dollar Spot; British Pound/Euro Cross
GBP	British Pound US Dollar Spot; British Pound/Euro Cross
Brent (oil)	Generic 1st CO Future (Brent future, USD/barrel)
Gold	Gold US Dollar Spot (USD/Troy ounce); Gold Euro Cross; Gold British Pound Cross

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