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QUARTERLY INSIGHTS

WHEN BONDS FALL SHORT

The Shifting Roles of Bonds and Trend-Following in Portfolio Protection Before and After 2020

#28 | NOVEMBER 2026

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Executive summary

Government bonds have traditionally played a defensive role in institutional portfolios, providing a valuable offset during equity losses in both the 2000s and the 2010s.
More recently, this protection has weakened, with Treasury returns turning negative during equity stress, while trend-following has provided a stronger diversification contribution. Against this backdrop, our analysis from 2000 to Q3 2026 examines the changing diversification roles of Treasuries and trend-following, with particular emphasis on periods of simultaneous equity and Treasury losses and the contrast before and after 2020.
We define equity stress as a monthly decline of more than 2% in the equity index and assess the performance of unscaled, fully funded U.S. Treasury futures relative to a representative trend-following benchmark during these periods. Both exposures delivered positive average monthly returns during equity stress in 2000 – 2009 (Treasuries: +1.4%; trend-following: +2.4%) but subsequently diverged. Treasuries outperformed in 2010 – 2019 (+1.7% vs. -0.6%), while trend-following led in 2020 – Q3 2026 (+1.7% vs. -1.2%). Trend-following also generated positive average returns when equities and bonds fell together – an environment that became substantially more frequent in the latest period. These differences translated into different portfolio outcomes.

With equity exposure held constant at 60%, the portfolio allocating 40% to trend-following delivered higher average returns than its Treasury counterpart during joint equity–Treasury loss months in 2020 – Q3 2026. It also outperformed a 60% equity / 40% cash benchmark, indicating a contribution beyond simply reducing equity exposure. Full-period risk-adjusted performance showed a similar reversal: the Treasury portfolio led on Sharpe ratio in 2010 – 2019 (1.31 versus 0.90), while the trend-following portfolio led in 2020 – Q3 2026 (0.95 versus 0.59). Both diversified portfolios exceeded the equity-only Sharpe ratio in 2000 – 2009. European and Japanese comparisons revealed similar shifts between the two later periods in equity-stress contributions and portfolio Sharpe rankings.

These findings describe a historical change in relative diversification effectiveness, not a structural advantage for either exposure. Both bonds and trend-following provided benefits, but their effectiveness varied across periods and market conditions. For institutional allocators, the evidence supports considering trend-following alongside fixed income to broaden the sources of portfolio protection and reduce reliance on government bonds alone.

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When Bond Diversification Weakens

Can investors still rely on government bonds to diversify equity risk when bond excess returns are negative? The contrast between the preceding decade and the current one brings this question into focus. Figure 1 compares annualized compounded local-currency government bond excess returns across a sample of 15 developed and emerging markets. Excess returns were positive in every market during the available observations within 2010 – 2019 and negative from January 2020 through September 2026, revealing a broad international reversal in the realized return premium over cash.

Weaker returns alone, however, do not establish a loss of diversification benefits. Bonds may still provide a valuable offset if they perform well when equities decline. Figure 2 adds a second dimension to this international comparison: monthly equity-bond correlations increased across all 15 markets between 2010 – 2019 and January 2020 – September 2026. Most moved from negative to positive, while markets with positive correlations in the earlier period saw those relationships strengthen. The deterioration in bond excess returns thus coincided with a broader shift towards positive equity-bond correlations.

The U.S. experience illustrates this wider shift and provides the focus for the remainder of our main analysis. Using 10-year U.S. Treasury futures as a proxy for government bond exposure, annualized compounded excess returns fell from +3.1% in

Figure 1: International government bond return premium over cash, pre- and post-2020

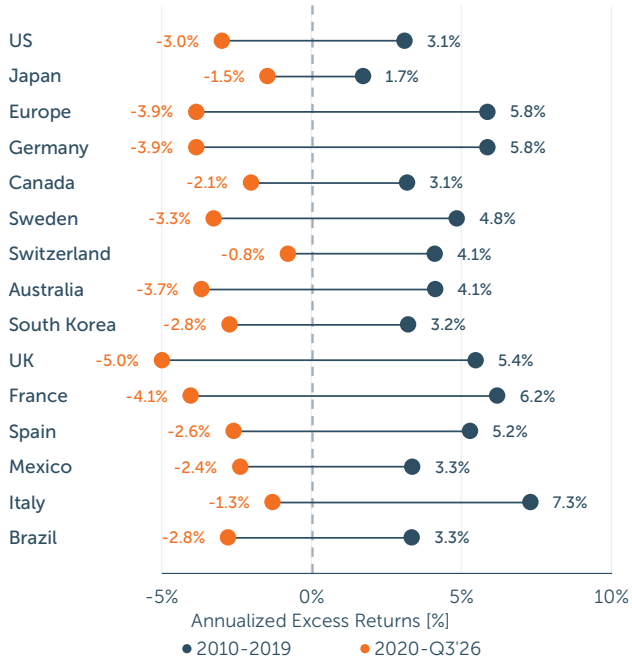


Figure 1: Annualized compounded local-currency excess returns of government-bond futures or interest-rate swaps across 15 markets, comparing 2010 – 2019 with 2020 – Q3 2026. Bond exposures generally represent the 10-year segment, not a fixed remaining maturity, with German Bund futures used for the European aggregate. Returns exclude cash income and are annualized over the covered calendar period: 120 earlier and 81 later months, except South Korea (110 earlier months, beginning Nov. 2010) and France (92 earlier months, beginning May 2012). For illustrative purposes only. Source: Quantica Capital.

Figure 2: International monthly equity-bond correlations, pre- and post-2020

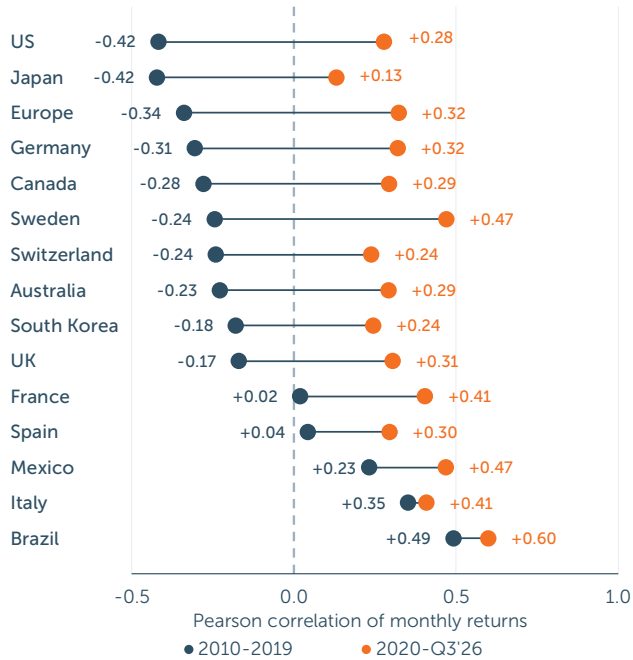


Figure 2: Pearson correlations between monthly local-currency equity returns and government-bond futures or interest-rate swap returns across 15 markets, comparing 2010 – 2019 with 2020 – Q3 2026. Bond exposures generally represent the 10-year segment, not a fixed remaining maturity, with German Bund futures used for the European aggregate. Correlations are calculated using all available paired monthly observations in each period (120 and 81 months, respectively), except for South Korea (110 months from November 2010) and France (92 months from May 2012) in the earlier period. For illustrative purposes only. Source: Quantica Capital.

2010 – 2019 to -3.0% in 2020 – September 2026, a decline of 6.1%. Over the same periods, the monthly equity-bond correlation moved from -0.42 to +0.28. U.S. investors therefore faced both a negative realized return premium over cash and a reversal of the negative equity-bond relationship observed in the preceding decade.

These full-period measures document the shift, but not how reliably bonds provided protection during equity losses. A positive correlation does not preclude episodes of effective diversification, just as a negative correlation does not rule out simultaneous losses. For investors, the more consequential question is whether bonds actually provided positive returns when equities came under pressure – and what other sources of diversification were available when they did not.

This distinction builds on our earlier research, which found that equity-bond correlations were significantly higher in high cash-rate environments, strengthening the case for complementing fixed income with trend-following[1]. Here, we extend that analysis by examining how bonds and trend-following performed during equity stress and whether their contributions translated into better portfolio outcomes.

Trend-following offers a natural comparison. Unlike a conventional bond allocation, which maintains long exposure, a trend-following strategy can take both long and short positions across equities, fixed income, currencies and commodities as market trends evolve. Its potential diversification benefits therefore arise from a broader and changing set of market exposures, rather than depending primarily on the direction of bond prices.

Against this backdrop, we examine whether trend-following can complement government bonds in protecting portfolios during equity losses and improving full-period risk-adjusted performance. Our U.S. analysis uses the S&P 500 Total Return Index, 10-year U.S. Treasury futures and the SG Trend Index[2] over January 2000 through September 2026, focusing on the contrast between 2010 – 2019 and 2020 – 2026 Q3. We assess changes in bond excess returns and equity-bond correlations, compare diversification contributions during equity stress and simultaneous equity-Treasury losses, and evaluate the resulting portfolio outcomes. The Appendix examines whether these patterns extend to Europe and Japan.

Testing Bond Diversification During Equity Stress

We begin by exploring whether government bonds provided gains during periods of material equity losses. Using 10-year U.S. Treasury futures as the proxy, we compare funded bond returns[3] during equity-stress months in 2000 – 2009, 2010 – 2019 and 2020 – Q3 2026.

We define equity stress as a monthly S&P 500 TR Index return strictly below -2%, with all remaining months classified as "Other months". This judgmental cutoff captures meaningful equity losses while retaining a sufficient number of observations for comparison. The paper's main conclusions remain robust across the alternative equity-loss thresholds shown in Figure 7 of the Appendix, indicating that the findings do not depend on this particular definition of stress.

Figure 3 identifies when equity-stress months occurred and Table 1 reports the number of observations in each of the three periods.

[1] Quantica Capital, *The Additional Benefits of Trend-Following When Interest Rates Are High*, Quarterly Insights, Q3 2024, published October 2024.

[2] The SG Trend Index is designed to track the 10 largest trend following CTAs (by AUM) which meet a list of criteria (as defined by SG) and to be representative of the trend-followers in the managed futures space. The SG Trend Index is equally weighted, and rebalanced and reconstituted annually. The Index is not investable and does not reflect the actual performance of any specific investment product or managed account. Source: Société Générale.

[3] Treasury futures returns include daily cash accrual estimated using a three-month USD risk-free-rate proxy, based on the latest available observation preceding each accrual interval.

Figure 3: S&P 500 monthly returns and equity-stress periods (2000 – Q3 2026)

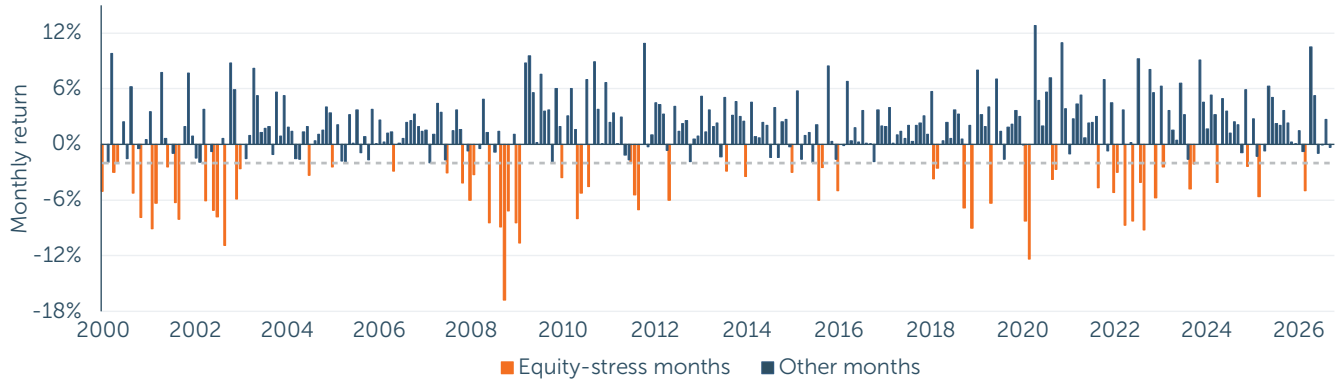


Figure 3: Monthly returns of the S&P 500 Total Return Index from January 2000 to September 2026. Equity-stress months, defined as months with index returns strictly below -2%, are highlighted. All remaining months are classified as "Other months". The S&P 500 Total Return Index is an unmanaged benchmark and is not directly investable. See the Appendix for the index definition and further information. For illustrative purposes only. Source: Quantica Capital.

Equity-stress months accounted for 29 of 120 observations (24%) in 2000 – 2009, compared with 19 of 120 (16%) in 2010 – 2019 and 19 of 81 (23%) in 2020 – 2026 Q3. Stress was therefore more frequent in the latest period than in the preceding decade – approximately one month in four rather than one in six – but broadly in line with the experience of the 2000s. Frequency alone, however, does not establish the severity of equity losses or how effectively bonds cushioned them.

Table 1 compares funded Treasury returns with equity losses during these same stress months. The S&P 500 TR Index declined by an average of 6.3% per month in 2000 – 2009, 4.9% in 2010 – 2019, and 5.4% in 2020 – 2026 Q3. Equity losses in the latest period were on average slightly more severe than in the preceding decade, but less pronounced than in the 2000s.

Against this backdrop, Treasury futures provided gains that partially offset equity losses in both earlier decades, returning an average of +1.4% during stress months in 2000 – 2009 and +1.7% in 2010 – 2019. In 2020 – 2026 Q3, their average return fell to -1.2%, adding to equity losses rather than cushioning them. This represents a deterioration of 2.9% relative to the preceding decade, and a reversal of the positive contribution observed across both earlier periods.

The deterioration was not limited to average returns. Treasuries gained in 21 of 29 stress months (72%) in 2000 – 2009 and 16 of 19 stress

Table 1: U.S. Treasury futures and trend-following returns during equity-stress months (2000 – 2026)

Measure	2000 – 2009	2010 – 2019	2020 – Q3 2026
Number of equity-stress months	29 / 120	19 / 120	19 / 81
S&P 500 Total Return Index: mean monthly return	-6.3%	-4.9%	-5.4%
U.S. Treasury futures: mean / median monthly return	+1.4% / +1.4%	+1.7% / +2.2%	-1.2% / -1.4%
Number (Share) of positive U.S. Treasury months	21 (72%)	16 (84%)	4 (21%)
Trend-following: mean / median monthly return	+2.4% / +2.0%	-0.6% / -1.1%	+1.7% / +1.8%
Number (Share) of positive Trend-following months	18 (62%)	7 (37%)	14 (74%)

Table 1: Monthly returns of the S&P 500 TR Index, funded 10-year U.S. Treasury futures with cash income, and the SG Trend Index during equity-stress months, defined as months when the equity index returned strictly below -2%. Columns cover 2000–2009, 2010–2019 and 2020 – September 2026. Mean and median returns are not annualized. Cash income is estimated from a three-month USD interest-rate proxy. Treasury returns include cash income. Positive Treasury and trend-following months are reported as counts and percentages of equity-stress observations. The S&P 500 Total Return Index is an unmanaged benchmark and is not directly investable. See the Appendix for the index definition and further information. For illustrative purposes only. Source: Quantica Capital.

months (84%) during 2010 – 2019, but in only four of the 19 months (21%) thereafter. Median Treasury returns also shifted from +1.4% and +2.2% in the earlier decades to -1.4% in the latest period. The weakening of bond protection was therefore evident in the average contribution, the typical outcome and the frequency with which Treasuries provided positive returns during equity stress.

These findings indicate a marked deterioration in Treasury protection during equity stress, raising the question of whether trend-following can provide an alternative source of diversification.

The Diversification Shift During Equity Stress

To assess whether trend-following can help address the diversification gap, we compare SG Trend Index returns with those of funded U.S. Treasury futures during the equity-stress months identified above. We use unscaled returns to compare diversification contributions at equal capital allocations[4]. We then extend the analysis to months in which both equities and Treasury futures declined.

Table 1 illustrates the changing relative contributions of Treasuries and trend-following across the three periods. During the 29 equity-stress months in 2000 – 2009, both exposures generated positive average monthly returns (+1.4% and +2.4%, respectively). In 2010 – 2019, Treasuries outperformed during the 19 equity-stress months (+1.7% versus -0.6%). The ranking reversed during the 19 stress months in 2020–Q3 2026, with trend-following returning +1.7% versus -1.2% for Treasuries. This reversal extended to the frequency of positive returns: the share of stress months with Treasury gains fell from 84% to 21% between the two periods, while the corresponding share for trend-following rose from 37% to 74%. Thus, while both exposures provided positive average returns during equity stress in the 2000s, the stronger diversification contribution shifted from Treasuries in the 2010s to trend-following in the latest period[5].

The reversal was not limited to the -2% equity-stress threshold. Across the alternative monthly equity-loss thresholds examined in the U.S. panels of Figure 7 in the Appendix, Treasuries consistently delivered higher average returns during equity stress in 2010 – 2019, while trend-following outperformed in 2020 – Q3 2026[6].

When Equities and Bonds Fall Together

The preceding analysis considered months of material equity losses, regardless of bond performance. A more challenging diversification environment arises when equities and bonds decline simultaneously. We therefore explore whether trend-following provided an alternative source of gains during these joint-loss months.

We define joint-loss months as those in which both the S&P 500 TR Index and unfunded U.S. Treasury futures recorded negative returns.[7]

As Figure 4 shows, these episodes occurred in 12 months in each of the two earlier decades, representing 10% of observations, compared with 20 months, or 25%, in 2020 – 2026 Q3. Their frequency therefore more than doubled in the current decade.

Trend-following's contribution varied across the three periods. Its average monthly return during

[4] Treasury futures exhibit lower full-sample volatility than the SG Trend Index. Volatility-matching the exposures would allow a comparison at similar risk levels but would require leveraging Treasury futures, reducing the simplicity and intuition of an equal-capital allocation framework. We therefore retain unscaled returns, recognizing that performance differences reflect both diversification characteristics and differences in underlying risk exposure.

[5] Trend-following did not generate positive returns in every equity-stress month. Its historical diversification benefits should therefore not be interpreted as consistent or guaranteed downside protection.

[6] The threshold samples are nested and overlapping, rather than independent tests. More restrictive cutoffs also leave fewer observations, so estimates of average returns at these thresholds should be interpreted cautiously.

[7] This selection differs from the equity-stress definition used above. It includes months with modest equity losses when Treasury futures also declined, but excludes more severe equity losses when Treasuries gained.

Figure 4: Diversifier returns during joint equity-Treasury losses

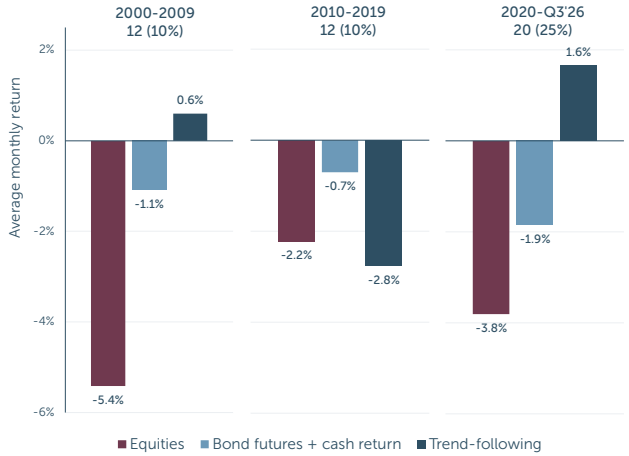


Figure 4: Average monthly returns of the S&P 500 TR Index, funded 10-year U.S. Treasury futures with cash income, and the SG Trend Index during joint equity-Treasury loss months, defined as months when both the equity index and unfunded Treasury futures recorded negative returns, for three distinct periods: 2000–2009, 2010–2019 and 2020–September 2026. Observation counts and frequencies are shown for each period. Treasury futures returns include cash income estimated using a three-month USD risk-free-rate proxy. Returns are not annualized. The S&P 500 TR Index and the SG Trend Index are unmanaged benchmarks and are not directly investable. See the Appendix for the index definition. For illustrative purposes only. Source: Quantica Capital.

joint losses was +0.6% in 2000 – 2009, -2.8% in 2010 – 2019 and +1.6% in 2020 – 2026 Q3. Trend-following therefore provided gains on average during simultaneous equity-bond losses in both the earliest and latest periods, but added to losses in the intervening decade. This variation highlights its potential to complement bonds without implying consistent protection across all market environments. The portfolio analysis that follows assesses how these joint-loss outcomes translated into portfolio returns.

From Diversification to Portfolio Outcomes

We next assess whether the differing contributions of bonds and trend-following during equity losses translated into better portfolio protection and stronger full-period risk-adjusted performance.

We compare two hypothetical monthly-rebalanced portfolios, each allocating 60% to the S&P 500 TR Index and 40% to either funded Treasury futures or the SG Trend Index[8].

We evaluate the portfolios against each other and the following two benchmarks:

- 100% equities
- 60% equities / 40% cash.

The equity-only benchmark provides a reference for the overall benefit of diversification, while the equity-cash portfolio helps distinguish each diversifier's contribution from the benefit of simply reducing equity exposure.

Portfolio Protection During Joint Equity-Treasury Losses

Figure 5 translates the joint-loss analysis into portfolio outcomes, comparing average returns across the two diversified portfolios and two benchmarks during identical joint equity-Treasury loss months.

During these months in 2020 – Q3 2026, the 60/40 trend-following portfolio declined by an average of 1.6% per month, compared with 3.0% for the Treasury portfolio – a 1.4% reduction in losses at the same equity weight. Equities alone lost 3.8%, while the 60% equity / 40% cash benchmark declined by 2.2%. By outperforming both the Treasury and cash allocations, trend-following demonstrated its ability to mitigate portfolio losses beyond the benefit of simply reducing equity exposure, even when traditional bond diversification failed to provide protection.

The earlier decades provide useful context. In 2000 – 2009, the trend-following portfolio also experienced smaller average joint-loss declines than the Treasury portfolio, at -3.0% versus -3.7%, and modestly outperformed the equity–cash

[8] Treasury futures returns include cash income estimated using a three-month USD risk-free-rate proxy, credited once to the 40% Treasury allocation. The S&P 500 Total Return Index and SG Trend Index retain their reported returns, without additional cash income. The 60% equity / 40% cash benchmark applies the same cash-rate proxy to its 40% cash allocation.

Figure 5: Portfolio performance during joint equity-Treasury losses

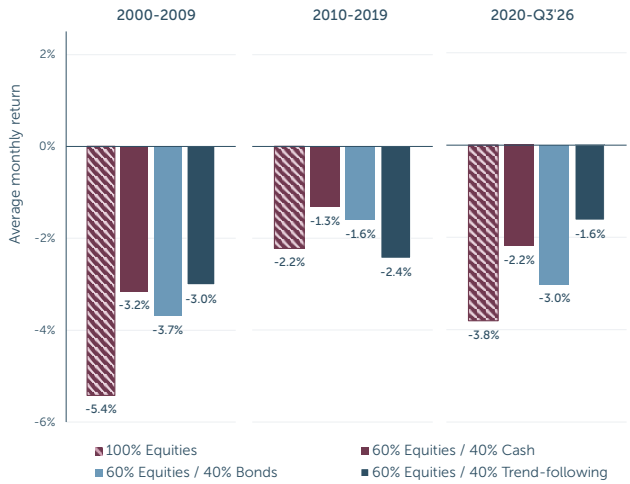


Figure 5: Hypothetical average monthly returns during joint equity-Treasury loss months in 2000–2009, 2010–2019 and January 2020–September 2026. Portfolios allocate 60% to the S&P 500 Total Return Index and 40% to either unscaled Treasury futures with cash income or the SG Trend Index, rebalanced monthly. Benchmarks are the equity-only index and 60% equities / 40% USD cash. Both cash components use the same three-month USD risk-free-rate proxy. Joint losses require both the equity index and unfunded Treasury futures to return strictly below zero. Values are arithmetic means, not annualized. Neither benchmark equalizes portfolio volatility. For illustrative purposes only. HYPOTHETICAL RESULTS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2. Source: Quantica Capital.

benchmark. In 2010 – 2019, however, the Treasury portfolio provided the stronger cushion, declining by 1.6% versus 2.4% for the trend-following portfolio. Neither diversified portfolio outperformed the equity-cash benchmark in that decade.

This historical variation underscores the importance of assessing diversification benefits across different market conditions. We next examine whether trend-following's stronger downside protection in the latest period was accompanied by higher risk-adjusted performance over the full investment horizon.

Diversification and Risk-Adjusted Performance

Figure 6 extends the analysis beyond periods of market stress, comparing portfolio Sharpe ratios across all months in each period using returns in excess of the USD cash benchmark.

In 2000 – 2009, both diversified portfolios outperformed equities alone on a risk-adjusted basis. The Treasury portfolio achieved a Sharpe ratio of 0.06 and the trend-following portfolio 0.11, compared with -0.15 for the equity-only benchmark. Both allocations therefore improved risk-adjusted performance, albeit from a low base.

The subsequent periods reveal a more pronounced divergence. In 2010 – 2019, the Treasury portfolio achieved the highest Sharpe ratio at 1.31, compared with 0.90 for trend-following and 1.04 for equities alone. The ranking reversed in 2020 – Q3 2026, when the trend-following portfolio led at 0.95, versus 0.59 for Treasuries and 0.76 for equities. Thus, trend-following's stronger downside protection in the latest period was accompanied by superior risk-adjusted performance over the full investment horizon.

The historical comparison underscores that neither diversifier consistently delivered superior portfolio outcomes. While both improved risk-adjusted performance relative to equities alone in the 2000s, only Treasuries did so in the 2010s and only trend-following in the latest period. These shifting rankings highlight the value of complementary sources of diversification, without implying a persistent advantage for either exposure across market environments.

Interpreting the Diversification Shift

The changing rankings suggest that the conditions supporting bond protection may differ from those favoring trend-following. While our analysis does not establish causality, the macroeconomic backdrop offers a plausible interpretation. During much of the 2010s, subdued inflation allowed central banks to respond to growth concerns with monetary easing, supporting bond returns during equity

Figure 6: Portfolio Sharpe ratios across three periods

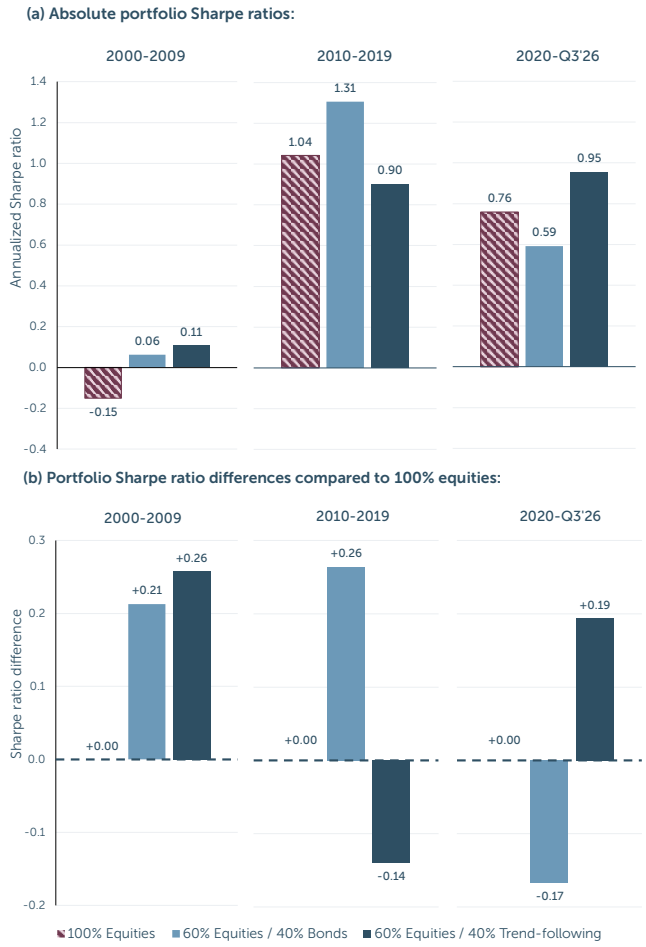


Figure 6: Hypothetical annualized Sharpe ratios of monthly-rebalanced portfolios allocating 60% to the S&P 500 TR Index and 40% to either funded 10-year U.S. Treasury futures with cash income or the SG Trend Index, in 2000–2009, 2010–2019 and 2020–September 2026, respectively. Panel (a) shows portfolio Sharpe ratios alongside the equity-only benchmark; panel (b) shows differences relative to that benchmark. Sharpe ratios use all monthly returns in excess of the cash return accrued from the same three-month USD risk-free-rate proxy. Treasury notional is 40% of portfolio capital. Cash is credited once to Treasury futures. The S&P 500 TR Index and the SG Trend Index are unmanaged benchmarks and are not directly investable. See the Appendix for the index definition. For illustrative purposes only. HYPOTHETICAL RESULTS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2. Source: Quantica Capital.

weakness. Positive Treasury returns and a negative equity-bond correlation together supported both loss mitigation and stronger portfolio risk-adjusted performance.

At the same time, relatively stable market conditions and policy responses that contained market stress may have limited opportunities for trend-following. Research similarly attributes the strategy's weaker performance during the decade to fewer large market moves rather than a diminished ability to capture trends[9].

The inflation shock following the pandemic altered this environment. Higher inflation constrained monetary easing, while monetary tightening put pressure on equities and bonds simultaneously. Sustained price adjustments across interest rates, commodities and currencies also created opportunities for trend-following to capture both rising and falling prices. The inflation and monetary-policy repricing of 2021 – 2022 illustrates how conditions that weaken conventional bond protection can create opportunities for trend-following[10].

The reversal in relative performance was also evident beyond the U.S. Comparisons using German Bund futures and the Euro Stoxx 50 Index, and Japanese Government Bond (JGB) futures and the Topix Index, showed similar shifts in portfolio Sharpe rankings between 2010 – 2019 and 2020 – 2026 Q3. The Appendix presents these results alongside the corresponding equity-stress outcomes. The U.S. and regional evidence thus points to a consistent reversal in relative diversification effectiveness between 2010 – 2019 and 2020 – Q3 2026, evident in both equity-stress returns and full-period portfolio Sharpe ratios.

[9] Babu, A., Hoffman, B., Levine, A., Ooi, Y. H., Schroeder, S. and Stamelos, E., "You Can't Always Trend When You Want," The Journal of Portfolio Management, 31 March 2020.

[10] These conditions provide a possible interpretation of the later period's results; the analysis does not formally attribute performance to specific macroeconomic drivers, markets or positions. The 2021 – 2022 episode should not be taken as representative of the entire post-2020 period. Trend-following benefits from persistent price moves and remains vulnerable to abrupt reversals.

Conclusion

The role of government bonds in equity diversification changed materially between 2010 – 2019 and 2020 – Q3 2026. In the U.S., weaker Treasury excess returns and a shift from negative to positive monthly equity-bond correlations coincided with a marked deterioration in Treasury performance during equity stress. Government bonds, which had generally provided gains when equities declined materially in the 2000s and 2010s, generated negative average returns during equity stress in the latest period. This deterioration was reflected not only in average returns but also in median outcomes and the frequency of positive months.

The relative diversification contributions of bonds and trend-following also varied across the three periods. Both provided positive average returns during equity stress in 2000 – 2009. Bonds delivered the stronger contribution in 2010 – 2019, while trend-following led in 2020 – Q3 2026, including during periods of simultaneous equity-Treasury losses. The reversal extended to portfolio outcomes: at a constant 60% equity allocation, trend-following portfolios experienced smaller average losses than their Treasury counterparts during joint-loss months in the latest period and also outperformed the equity-cash benchmark. This advantage was accompanied by higher full-period Sharpe ratios, reversing the relative ranking observed in the preceding decade. In the 2000s, both diversified portfolios improved risk-adjusted performance relative to equities alone.

The regional comparisons reinforce these findings. Across the U.S., Europe and Japan, the relative advantage shifted from government bonds to trend-following in both equity-stress contributions and portfolio Sharpe ratios between 2010 – 2019 and 2020 – 2026 Q3. Although the magnitude of the benefits and certain joint-loss outcomes differed across markets, the broadly consistent reversal indicates that the shift in diversification effectiveness extended beyond the U.S.

These findings describe a historical shift rather than a permanent advantage for either exposure. The effectiveness of both bonds and trend-following depends on prevailing market conditions. For institutional allocators, the evidence highlights the importance of diversifying not only across asset classes but also across sources of portfolio protection. Trend-following can complement fixed income by broadening those sources and reducing reliance on government bonds as the primary offset to equity risk.

Appendix: Does the Diversification Shift Extend Beyond the U.S.?

Regional Methodology and Instruments

To assess whether the U.S. findings extend to other markets, we apply the same analytical framework to Europe and Japan across three periods: 2000 – 2009, 2010 – 2019 and 2020 – Q3 2026. Table 2 summarizes the equity total-return indices, government-bond futures and cash benchmarks used in each market.

Consistent with the U.S. analysis, bond returns include estimated cash income, while trend-following returns are expressed in the respective local currencies[11]. Equity stress is defined as a monthly equity-index decline exceeding 2%, with alternative thresholds examined to assess robustness. Joint-loss months are identified when both the local equity index and unfunded bond futures record negative returns.

Portfolio comparisons maintain a constant 60% equity allocation, with the remaining 40% invested in either funded government-bond futures or trend-following. Portfolios are rebalanced monthly, and Sharpe ratios are calculated relative to the corresponding local cash benchmark.

The framework is applied independently to each market, so equity-stress and joint-loss months may differ in timing and severity.

Table 2: Regional instruments and cash benchmarks

Region	Equity TR Index	Bond Futures	Cash / Ccy
U.S.	S&P 500	10-year Treasury	3-month USD
Europe	Euro Stoxx 50	German Bund	3-month EUR
Japan	Topix	10-year JGB	3-month JPY

Table 2: Equity total-return indices, government-bond futures and three-month local-currency cash-rate benchmarks used in the regional analysis. The S&P 500, Euro Stoxx 50, and Topix Total Return Indexes are unmanaged benchmarks and are not directly investable. See the Appendix for index definitions.
Source: Quantica Capital.

Robustness of the Diversification Shift Across Markets and Stress Thresholds

Figure 7 explores whether the reversal observed in the U.S. extends to Europe and Japan and remains robust to alternative definitions of equity stress. Across all six monthly equity-loss thresholds and all three markets, government bonds delivered higher average returns than trend-following during 2010 – 2019, while trend-following outperformed in 2020 – Q3 2026. The reversal was thus consistent across markets and did not depend on the -2% equity-stress threshold used in the main analysis[12].

The 2000 – 2009 results provide a broader historical perspective. Both exposures generated positive average returns across all thresholds and markets. Trend-following outperformed bonds at every threshold in Europe and Japan, while the relative ranking in the U.S. depended on the threshold applied.

[11] Cash returns are estimated using three-month USD, EUR and JPY risk-free-rate proxies for the U.S., Europe and Japan, respectively. The SG Trend Index retains its reported USD returns for the U.S. analysis. European and Japanese trend-following returns incorporate illustrative synthetic hedge-carry adjustments based on local-minus-USD short-term interest-rate differentials. These adjustments are approximations and do not represent official currency-hedged index returns. Joint-loss months are identified using unfunded bond futures returns, while reported bond returns include estimated cash income.

[12] Because the threshold samples are nested and overlapping, they do not constitute independent tests. Moreover, stricter thresholds reduce the number of observations. The results should therefore be interpreted as supporting evidence of robustness rather than independent statistical confirmation.

Figure 7: Bond and trend-following returns across markets and equity-stress thresholds

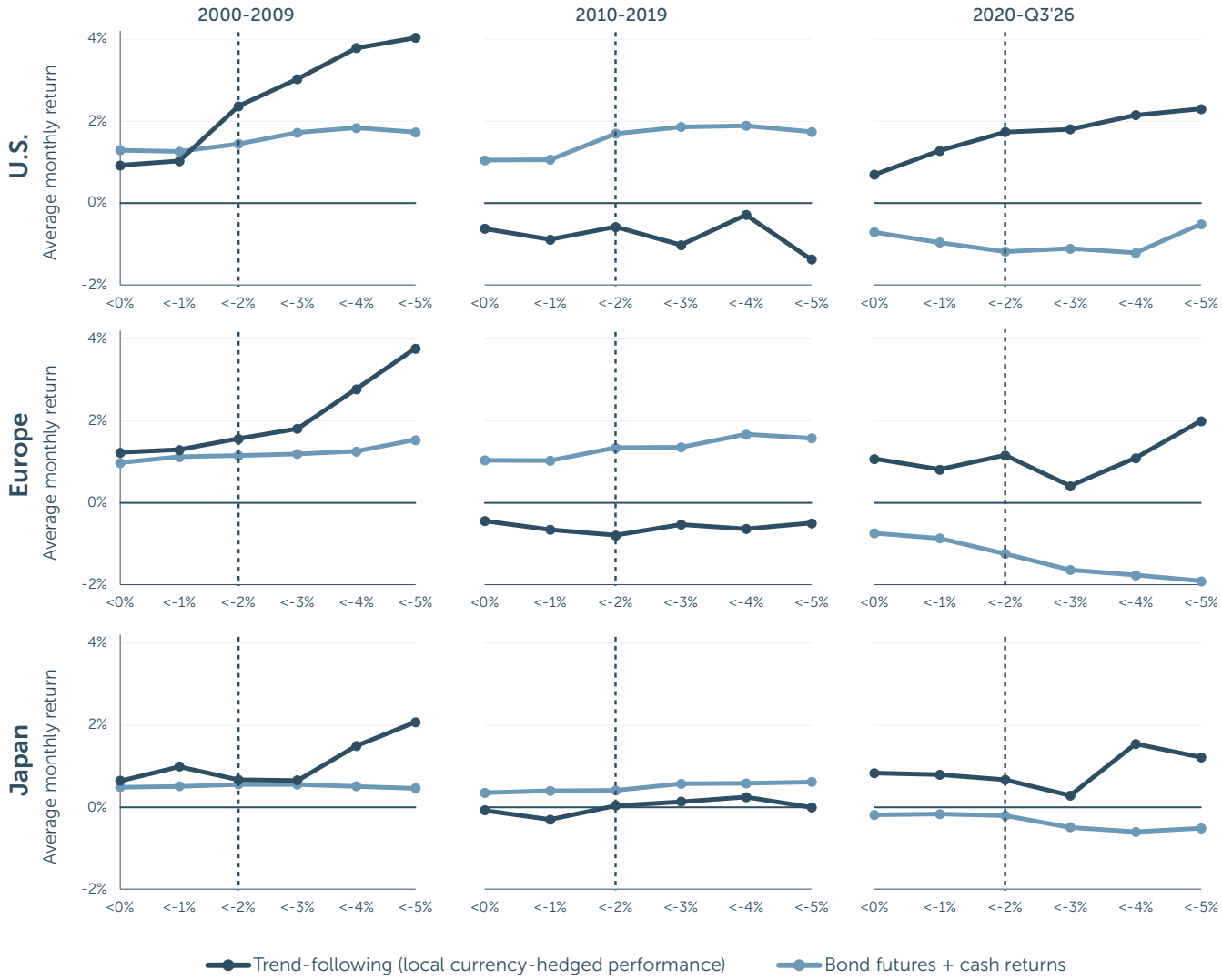


Figure 7: Average monthly local-currency returns of funded government-bond futures and trend-following during months when local equity-index returns fell strictly below the indicated thresholds. Rows show the U.S., Europe and Japan; columns cover 2000 – 2009, 2010 – 2019 and 2020 – Q3 2026. The vertical dotted line marks the -2% equity-stress cutoff used in the main analysis. All panels share the same return scale. Instruments and currency conventions follow Table 2 and the regional methodology. Bond futures returns include cash income estimated using the corresponding three-month local-currency risk-free-rate proxy. Returns are not annualized. For illustrative purposes only. HYPOTHETICAL RESULTS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2. Source: Quantica Capital.

Portfolio Protection When Equities and Bonds Fall Together

The threshold analysis considers equity losses irrespective of bond performance. Figure 8 focuses on periods when equities and bonds declined simultaneously, comparing their implications for portfolio protection across the three markets. In 2020 – Q3 2026, portfolios combining equities with trend-following incurred smaller average monthly losses than their bond counterparts in all three markets, by approximately 1.4% in the U.S., 1.9% in Europe and 0.8% in Japan. All three trend-following portfolios also outperformed their respective 60% equity / 40% cash benchmarks, demonstrating incremental downside protection beyond the benefit of reducing equity exposure alone.

The earlier periods provide an important contrast. In 2010 – 2019, bond portfolios experienced smaller average losses across all three markets, although neither allocation outperformed its

Figure 8: Diversifier and portfolio returns during joint equity-bond losses across markets

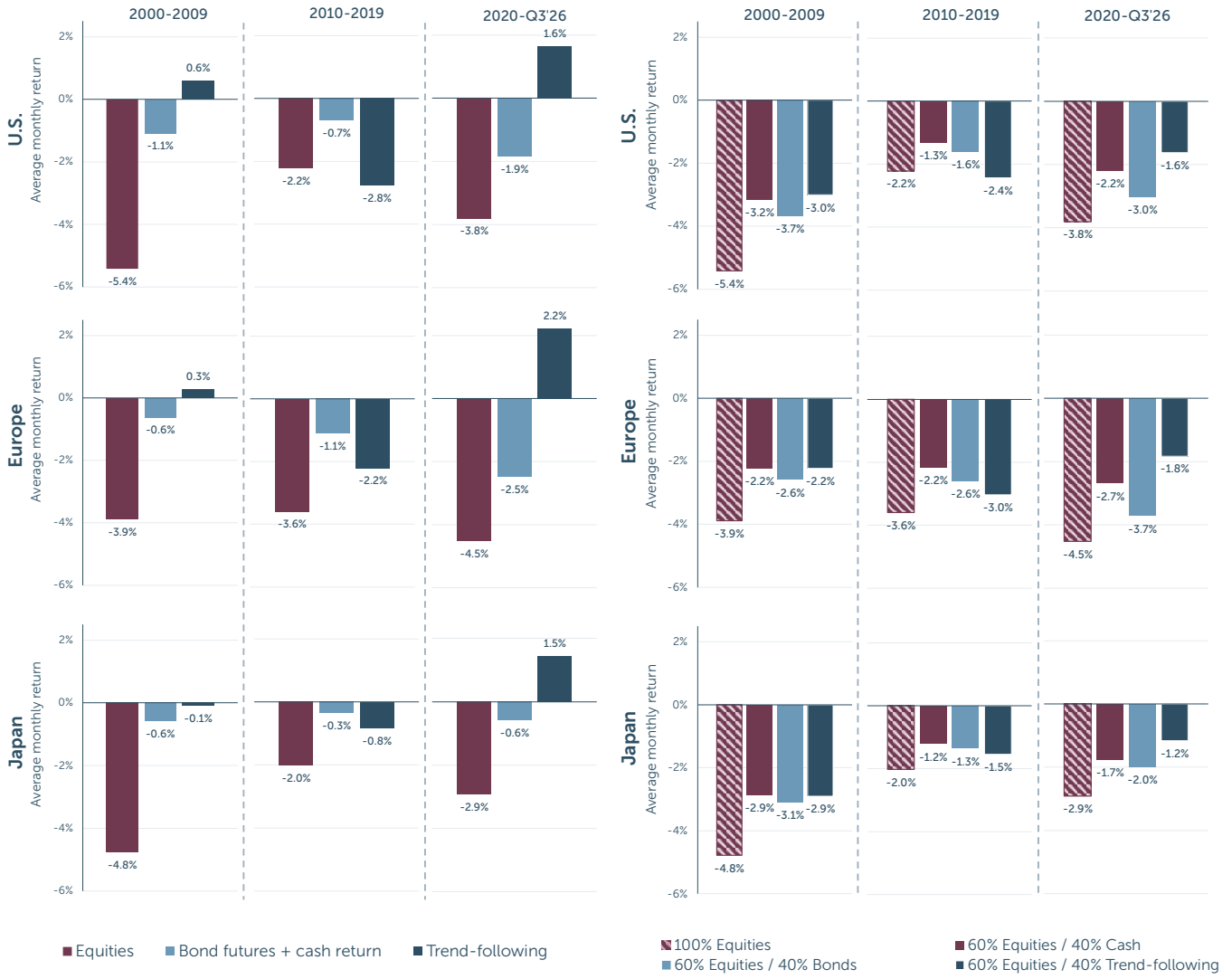


Figure 8: Average monthly local-currency returns during joint equity-bond loss months, defined as months when both the equity index and unfunded government-bond futures returned strictly below zero. The left panels show returns of the equity index, funded bond futures with cash income, and trend-following; the right panels show the equity-only benchmark and portfolios allocating 60% to equities and 40% to cash, bonds or trend-following. Bond cash income and the cash allocation use the same three-month local-currency risk-free-rate proxy. Rows represent the U.S., Europe and Japan, while columns cover 2000–2009, 2010–2019 and January 2020–September 2026. Returns are not annualized. Instruments and portfolio conventions follow the regional methodology. The S&P 500 TR, Euro Stoxx 50, and Topix Total Return Indexes are unmanaged benchmarks and are not directly investable. See the Appendix for the index definition. For illustrative purposes only. HYPOTHETICAL RESULTS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2. Source: Quantica Capital.

corresponding equity-cash benchmark. In 2000 – 2009, trend-following portfolios outperformed their bond counterparts in every market, but only the U.S. portfolio also outperformed cash at the same equity weight. These comparisons highlight that outperforming bonds does not necessarily imply incremental protection relative to cash during joint-loss months. However, this conditional comparison captures only one dimension of diversification effectiveness, which must also be assessed through risk-adjusted performance over the full investment horizon.

Risk-Adjusted Performance Across Markets

Downside protection during adverse market conditions does not necessarily translate into stronger risk-adjusted performance over the full investment horizon. Figure 9 compares portfolio Sharpe ratios across all months in each period. The relative ranking reversed across all three markets: bond portfolios achieved higher Sharpe ratios than trend-following portfolios in 2010 – 2019, while trend-following portfolios led in 2020 – Q3 2026 and also outperformed their respective equity-only benchmarks.

The 2000 – 2009 results provide additional historical context. Trend-following portfolios achieved higher Sharpe ratios than bond portfolios across all three markets, while both allocations improved risk-adjusted performance relative to equities alone. Nevertheless, Sharpe ratios remained modest or negative, underscoring that relative improvements do not necessarily imply strong absolute risk-adjusted performance.

Overall, the regional analysis confirms that the relative diversification effectiveness of bonds and trend-following has varied across market environments. The shift in favor of trend-following during 2020 – Q3 2026 was evident across all three markets, alternative equity-stress thresholds, joint-loss outcomes and full-period Sharpe ratios. This consistency supports the value of complementary sources of diversification, while cautioning against extrapolating the relative advantage of either exposure into the future.

Figure 9: Portfolio Sharpe ratios across markets and periods

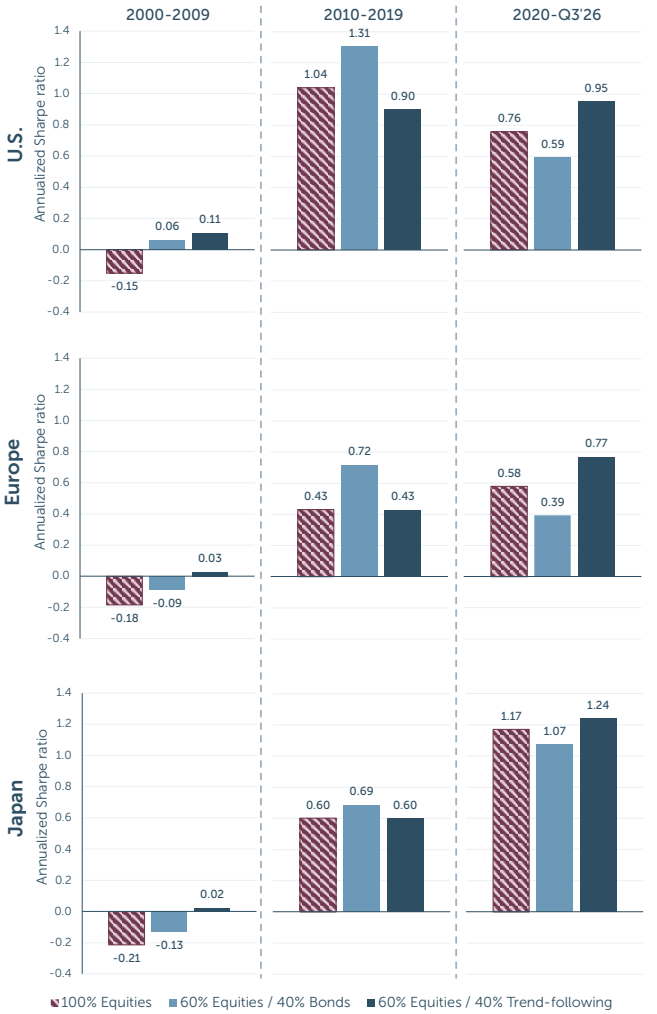


Figure 9: Hypothetical annualized Sharpe ratios of monthly-rebalanced portfolios allocating 60% to the local equity index and 40% to either funded government-bond futures or trend-following. Results are shown across three periods (2000 – 2009, 2010 – 2019 and 2020 – Q3 2026) and three regions (U.S., Europe and Japan), alongside the equity-only benchmark. Sharpe ratios are calculated using monthly excess returns over the corresponding three-month local-currency risk-free-rate proxy. Instruments, currency adjustments and portfolio conventions follow the regional methodology. For illustrative purposes only. HYPOTHETICAL RESULTS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2. Source: Quantica Capital.

Index Definitions

The **SG Trend Index** is designed to track the 10 largest trend-following CTAs (by AUM) that meet a list of criteria (as defined by SG) and be representative of the trend-followers in the managed futures space. The SG Trend Index is equally weighted, and rebalanced and reconstituted annually. The Index is not investable and does not reflect the actual performance of any specific investment product or managed account. Source: Société Générale.

The **S&P 500 Total Return Index** is a market-capitalization-weighted index comprising 500 leading U.S. companies and is widely regarded as a benchmark for U.S. large-cap equities. The Total Return version reflects the reinvestment of dividends. The index is unmanaged, is not directly investable and does not reflect investment management fees or other expenses associated with an investable portfolio. Index performance does not represent the actual performance of any investment product or managed account. Source: S&P Dow Jones Indices.

The **Euro Stoxx 50 Total Return Index** is a free-float market-capitalization-weighted benchmark of 50 leading euro-area companies, incorporating reinvested dividends. Source: Stoxx Ltd.

The **Topix Total Return Index** is a free-float-adjusted market-capitalization-weighted benchmark representing a broad segment of Japanese equities, incorporating reinvested dividends. Source: JPX Market Innovation & Research, Inc.

Unless otherwise specified, **cash income** is estimated from the corresponding three-month local-currency risk-free-rate proxy, with daily accrual calculated as the annualized rate divided by 252. Source: Quantica Capital.

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