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2025 Diversification Landscape

A look at how key asset classes performed in 2024, how correlations have changed, and the implications for portfolio building.

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Key Takeaways

► The plain-vanilla version of a 60/40 portfolio (made up of US stocks and US investment-grade bonds) gained about 15% in 2024. Diversifying into other asset classes generally led to lower returns.

► Although broader portfolio diversification was a net positive during the 2022 bear market, the basic 60/40 portfolio, composed of US stocks and high-quality bonds, has been tough to beat over longer periods. A 60/40 portfolio improved risk-adjusted returns versus an all-stock benchmark in more than 83% of the rolling 10-year periods dating back to 1976.

► Correlations between the United States and other developed markets around the world have remained high while non-US stocks lagged by a wide margin through 2024, raising questions about the long-term value of international diversification.

► Over the past 20 years several asset classes—including corporate bonds, global bonds, high-yield bonds, municipal bonds, REITs, and Treasury Inflation-Protected Securities—have become more closely correlated with stocks. Many of these categories have also posted losses in periods of equity market stress. In such periods, Treasury bonds, gold, commodities, and some alternative investment strategies have been more compelling portfolio diversifiers.

► Diversification strategies that have worked in the past may not work in the future. In a period of rising interest rates and/or above-average inflation, Treasuries and other high-quality bonds would likely be less reliable diversifiers, although they still have merit as core portfolio holdings. The major shifts in US tariff policy announced in April 2025 have also added massive levels of uncertainty to the investment landscape, potentially upending many previously established performance patterns.

Introduction

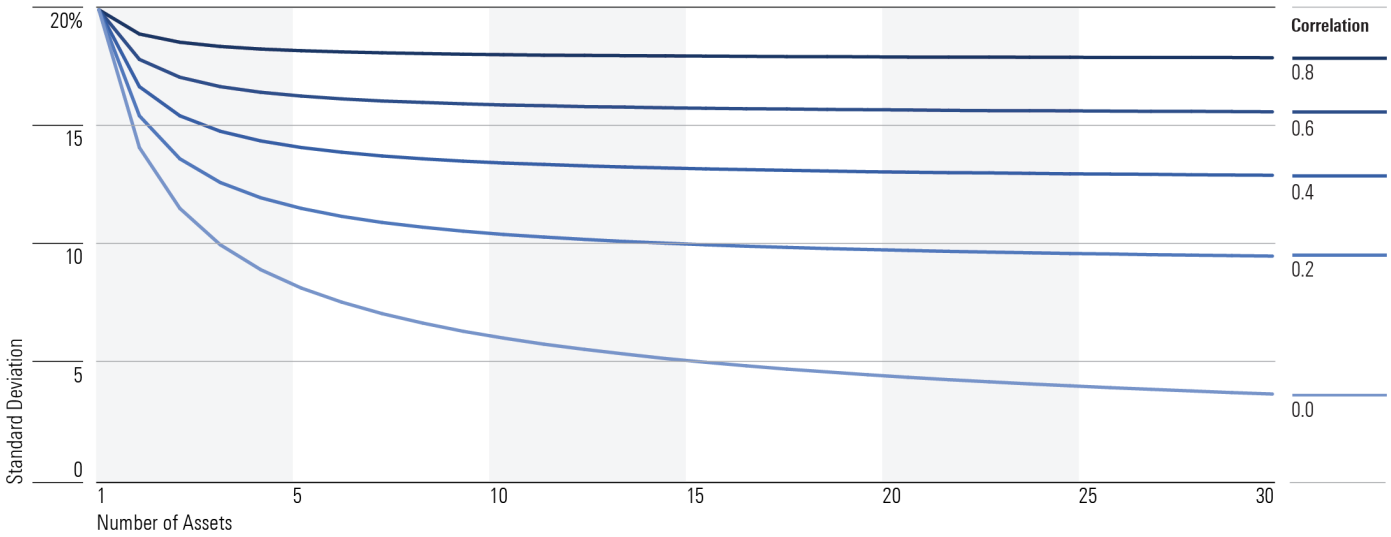
Diversification has often been called the only free lunch in investing. As Harry Markowitz first established in his landmark research[1] in 1952, a portfolio's risk level isn't just the sum of its individual components, but it also depends on how the holdings interact with each other. This interaction is referred to as *correlation*, which is a statistical measure that captures how two securities move in relation to each other (although it captures only the direction, not the magnitude, of returns). A correlation coefficient of 1 means the two securities have historically moved in lockstep in the same direction, while a coefficient of negative 1 means they move in lockstep but in opposite directions. A correlation coefficient of 0 means the two securities have historically had no relationship.

Combining asset classes that have correlations below 1.0 can reduce the portfolio's overall risk profile. It is one of the few cases where the whole can be more than the sum of the parts: A well-constructed

1 Markowitz, H. 1952. "Portfolio Selection." *J. Finance,* Vol. 7, P. 77.

portfolio can have better risk-adjusted returns than its components. Exhibit 1 below shows the basic math of diversification. The lower the correlation, the greater the reduction in volatility from adding additional assets.

Exhibit 1 Risk Reduction From Additional Assets



Source: Morningstar analysts. Chart shows portfolio volatility by number of assets assuming a correlation coefficient of 0.0, 0.2, 0.4, 0.6, or 0.8.

The problem is that correlation coefficients shift over time, so what worked in the past won't necessarily work in the future. In addition, adding asset classes to reduce volatility can also drag down returns, sometimes over multiyear periods. Moreover, correlations between many assets spike during periods of market crisis—in other words, exactly when you need diversification the most. The catalysts for crisis periods that lead to equity market declines can also vary dramatically. Economic weakness and other unforeseen events can drive declines (as they did during 2008 and early 2020) but so can rising interest rates, higher inflation, uncertainty about the impact of tariff policy, and so on. Those underlying conditions can affect which diversifiers fare best.

In this paper, we dig into the diversification benefits of adding various asset classes and styles to a US equity portfolio, including taxable and municipal bonds in the US, international equity, commodities, alternatives, sector-specific indexes, investment styles, factor indexes, private investments, and cryptocurrencies.

Methodology

We used Morningstar's indexes to measure correlations whenever possible. The correlation metrics are based on monthly returns during each period in all sections except for the one dedicated to private investments, in which case only quarterly returns are available. In a few cases, we used third-party indexes or fund categories as proxies for different investment areas. Unless otherwise noted, all benchmark returns referenced in this report are total returns denominated in US dollars.

We approached diversification from the perspective of a US-based investor and measured correlations relative to the Morningstar US Market Index (all equities) as a primary benchmark. Investors often construct portfolios with a foundation of US equities, which currently make up about two thirds of the global stock market. As a result, it is likely that most investors could use other holdings that would help balance their US equity exposure.

To test the value of portfolio diversification, we created a portfolio made up of 11 different asset classes. We allocated 20% of the portfolio to larger-cap domestic stocks; 10% each to developed- and emerging-markets stocks, Treasuries, US core bonds, global bonds, and high-yield bonds; and 5% each to US small-cap stocks, commodities, gold, and REITs.[2]

2 Our test portfolio is just one of many potential portfolios that could be tested. We focused on the asset classes most commonly used for diversification purposes and assigned the allocations in simple proportions based on our best estimates of how investors typically use these assets in practice. We assumed annual rebalancing for the sake of simplicity and to align with how everyday investors generally manage their portfolios.

2024 Overview and Long-Term Trends

Portfolio diversification didn't boost returns in 2024's generally bullish market environment. As US stocks notched another year of 20%-plus returns, most other asset classes (except for bitcoin and gold) fell behind. Similar to the performance trends we saw in 2023, nearly every "diversified" asset class lagged the Morningstar US Market Index in 2024. As a result, the most basic version of a 60/40 portfolio (made up of US stocks and US investment-grade bonds) gained about 15% for the year, but a more diversified version fell nearly 5 percentage points behind.

Thanks to slightly lower correlations for many of the "diversified" asset classes, the diversified portfolio would have done a better job reducing risk, but not enough to result in higher risk-adjusted returns.

Exhibit 2 Effect of Diversification in 2024

	Total Return %	Standard Deviation	Sharpe Ratio
Morningstar US Market	24.09	11.16	1.54
Morningstar US Core Bond	1.36	5.82	–0.63
60/40 Portfolio	15.00	8.50	1.09
Diversified Portfolio	10.05	6.71	0.70

Source: Morningstar Direct. Data as of Dec. 31, 2024. The 60/40 portfolio consists of a 60% weighting in the Morningstar US Market Index and 40% in the Morningstar US Core Bond Index. The diversified portfolio includes a 20% weighting in larger-cap domestic stocks; 10% each in developed- and emerging-markets stocks, Treasuries, core bonds, global bonds, and high-yield bonds; and 5% each in small-cap stocks, commodities, gold, and REITs.

More-diversified portfolio strategies have also struggled over longer periods, at least over the past two decades. The diversified portfolio reduced risk compared with a plain-vanilla mix of domestic stocks and bonds over most trailing periods but not enough to result in better risk-adjusted returns, as measured by the Sharpe ratio.

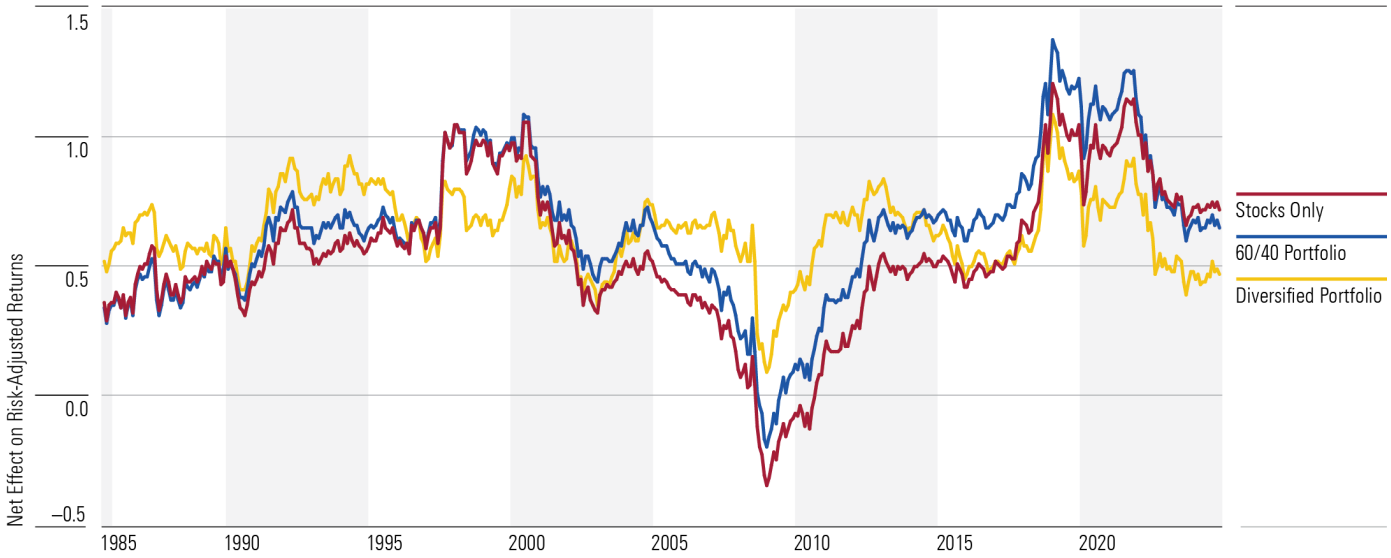
Exhibit 3 Effect of Diversification Over Trailing Periods

	3 Years			5 Years			10 Years			15 Years			20 Years		
	Total Return (%)	Std Dev	Sharpe Ratio	Total Return (%)	Std Dev	Sharpe Ratio	Total Return (%)	Std Dev	Sharpe Ratio	Total Return (%)	Std Dev	Sharpe Ratio	Total Return (%)	Std Dev	Sharpe Ratio
Morningstar US Market	8.13	17.80	0.30	13.96	18.76	0.66	12.66	15.75	0.72	13.66	14.98	0.85	10.38	15.41	0.61
Morningstar US Core Bond	–2.43	7.70	–0.85	–0.36	6.31	–0.44	1.32	4.93	–0.08	2.32	4.31	0.26	3.01	4.15	0.33
60/40 Portfolio	4.10	13.09	0.05	8.40	12.70	0.50	8.27	10.31	0.65	9.28	9.53	0.85	7.81	9.63	0.66
Diversified Portfolio	2.44	11.48	–0.10	5.83	11.44	0.33	5.98	9.33	0.47	6.59	9.07	0.61	6.69	9.78	0.54

Source: Morningstar Direct. Data as of Dec. 31, 2024.

To test the value of diversification over longer periods, we used US stocks and US investment-grade bonds as a baseline for a basic 60/40 portfolio. We used the same asset classes cited in Exhibit 2 to test the performance of a more diversified portfolio over rolling 10-year periods starting in 1976.

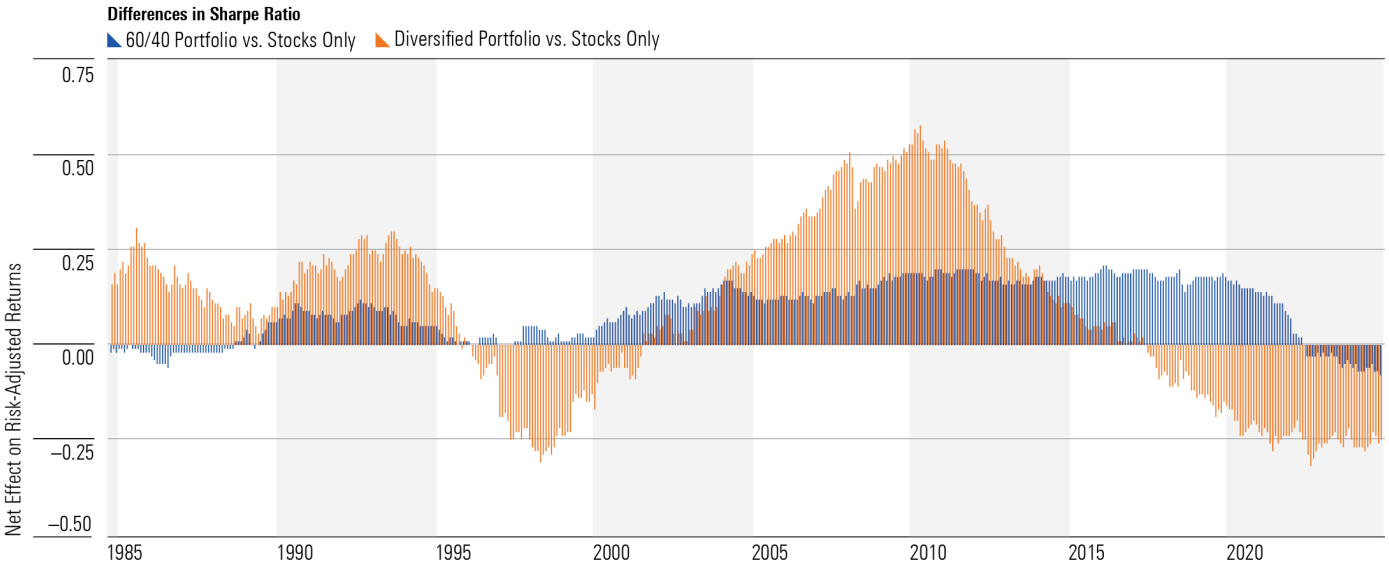
Exhibit 4 Risk-Adjusted Returns (Sharpe Ratio)



Source: Morningstar Direct. Data as of Dec. 31, 2024. The rolling 10-year Sharpe ratios are for stocks only, a 60/40 portfolio, and a fully diversified portfolio. Both portfolios assume annual rebalancing.

Although a broadly diversified portfolio improved risk-adjusted returns (as measured by the Sharpe ratio) versus an all-stock portfolio during most rolling 10-year periods between January 1976 and August 2017, the diversified portfolio posted weaker risk-adjusted returns over most periods since then. The basic 60/40 portfolio, on the other hand, fared better than the stocks-only benchmark about 83% of the time going back to 1976 and came out ahead of the more broadly diversified version in every rolling 10-year period since the period starting in early 2005.

Exhibit 5 Net Effect on Risk-Adjusted Returns



Source: Morningstar Direct. Data as of Dec. 31, 2024. The chart shows the difference in rolling 10-year Sharpe ratios for a 60/40 portfolio and a fully diversified portfolio versus a stocks-only benchmark. Both portfolios assume annual rebalancing.

Diversification's recent struggles mainly reflect the confluence of strong returns for US stocks and core US bonds and weaker results for international stocks and more specialized assets during most of the period from 2000 through 2024. In addition, market correlations often converge during periods of market crisis, which happened across most major asset classes (with Treasuries and cash the notable exceptions) when stocks tumbled in 2022 and early 2020.

Correlations have also trended up over longer periods for some major asset classes, which reduces the value of diversification. Correlations between US and non-US stocks, for example, have significantly increased over the past 10 years. Even areas often touted for their diversification benefits, such as REITs, have moved in tandem with the broad US equity market more often than investors might expect. As a result, the correlation between the diversified portfolio and the Morningstar US Market Index has generally trended higher than it was in some previous periods; the correlation coefficient between the two stood at about 0.93 for the three-year period ended in December 2004.

Exhibit 6 Rolling Three-Year Correlation Trend: Diversified Portfolio vs. Morningstar US Market Index

Source: Morningstar Direct. Data as of Dec. 31, 2024.

The key question now is: Will a plain-vanilla stock and bond blend continue to dominate, or can a more diversified approach add value? The answer depends largely on the macro environment, which went through a significant shift starting in late 2021. In contrast to the low inflation and generally declining interest rates that defined most of the previous three decades, both inflation and interest rates have reversed course. As a result, correlations between stocks and bonds have remained positive since 2021, reducing the benefit of basic portfolio diversification.

As we discuss in the sections devoted to historical contexts, positive stock/bond correlations would probably persist during an extended period of higher interest rates and/or inflation. Even during periods when stock and bond correlations are positive, however, Treasuries and other high-quality bonds can still improve risk-adjusted returns when added to an equity-only portfolio. The upshot: Investors looking to build diversified portfolios don't necessarily need to venture too far beyond the basic mix of larger-cap stocks and high-quality bonds.

In this paper, we take a deep dive into how different asset classes performed in the past couple of years, how correlations have changed, and what those changes mean for investors and financial advisors trying to build well-diversified portfolios.

Key Portfolio Implications

- Cash has diversified portfolios better than Treasuries in recent years, especially as interest rates have trended up. Retirees who are in drawdown mode should consider employing cash and short-term bonds alongside their intermediate- and longer-duration core bond holdings.

- Lower-quality bonds have generally been poor diversifiers for stocks, demonstrating that they are best used as supplemental holdings or equity alternatives. Even municipal bonds have had a fairly high correlation with stocks, suggesting that even investors who value their tax-saving features should consider augmenting them with cash and US government bonds for diversification and ballast during equity market shocks.

- International stocks fell behind the US market again in 2024, and both rising correlations and weak longer-term performance over the past 10 to 15 years might have some investors questioning whether international diversification is still worthwhile. Over longer periods, though, non-US stocks don't always move in lockstep with the US market and have still provided diversification benefits.

- In contrast to correlation trends for most other asset classes, correlations for commodities have generally trended down in recent years. However, the wide range of returns for various commodities in any given year often makes them difficult to use effectively in a portfolio.

- Performance for most equity investment styles, sectors, and factor indexes has been closely aligned with the overall market, limiting their usefulness as portfolio diversifiers.

- Not every asset type with a low correlation coefficient is worth adding to a diversified portfolio. For example, cryptocurrency's extreme volatility makes it difficult to live with, while private investments' inherent lack of liquidity makes them impractical for investors planning to fund a goal at a specific point in time. Similarly, leveraged and options-based strategies can be used to increase or decrease a portfolio's risk profile but typically don't improve portfolio diversification.

Learning From History

Interest-Rate Pivots

Until recently, investors had grown used to a steady decline in interest rates, punctuated by modest Federal Reserve efforts at recalibrating them to lower levels. It wasn't until 2022 that the central bank's 2% inflation target met with economic necessity and resulted in seven substantial hikes to the federal-funds rate, followed by four more modest hikes in 2023. Despite widespread market expectations for multiple rate cuts in 2024, the US central bank ended up reducing rates only three times during the year, bringing the rate down to a range of 4.25% to 4.50%. The yield on the 10-year Treasury finished the year almost 150 basis points higher than when it started, partly in response to an upsurge in government debt issuance.

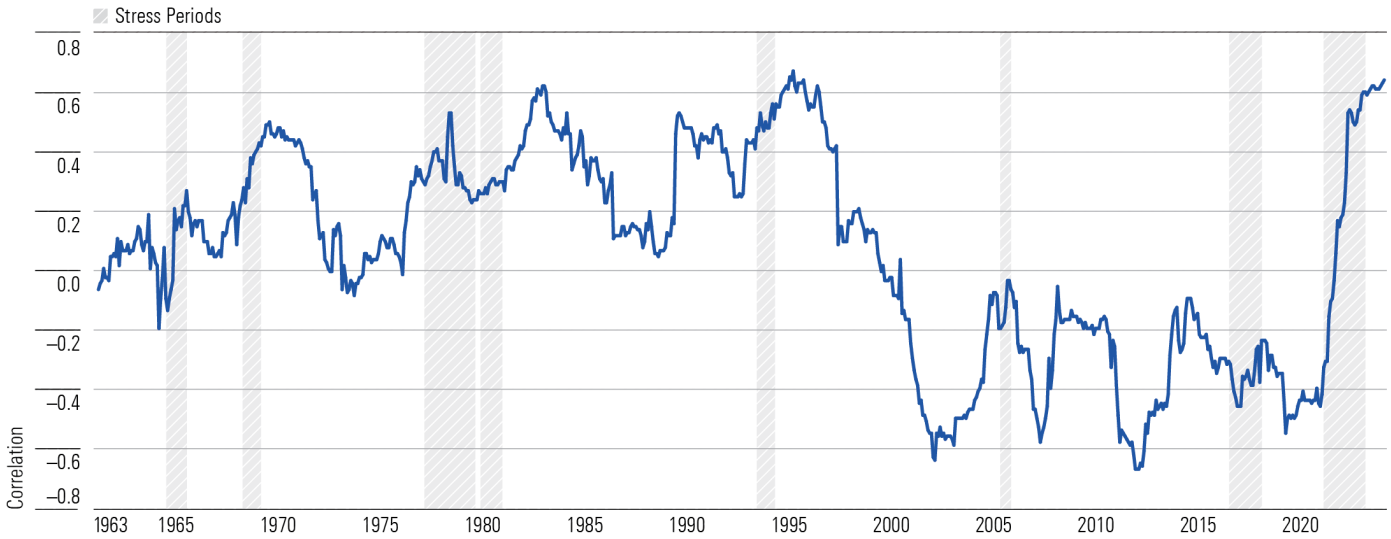
When the market expects borrowing costs to climb, correlations between stocks and bonds typically increase. From a mechanical perspective, cash flows are discounted by investors at higher rates, thereby decreasing the current value of both stocks and bonds. Moreover, higher interest rates often damp consumer and corporate spending, which in turn can slow the economy and reduce corporate profitability. While all fixed-rate bonds are usually stressed in this situation, longer-maturity bonds that carry significant duration (a measure of interest-rate risk) are at the greatest disadvantage when rates climb.

During periods of stable or falling rates (which was the typical situation over most of the previous six decades), a bond's duration is an advantage rather than a liability. For US Treasury bonds—highly liquid and with minimal credit risk—duration heavily and positively influences prices when rates are stable or declining. Investors accept the lower returns of a US Treasury bond for the ballast that it usually provides when riskier assets sell off. But during periods of rapid rate increases, the very structure of a US Treasury bond negatively affects its price, and its correlation with stocks can increase precisely at a point when both asset classes are experiencing losses. As a result, US Treasuries provided little reprieve to diversified portfolios in 2022. Correlations between stocks and bonds remained high in both 2023 and 2024.

But correlations are dynamic, and the relationship between stocks and bonds varies depending on context. Over the past 60 years or so, policymakers sought to keep the economy stable during four widely acknowledged monetary policy regimes—the Great Inflation, Volcker Reform, the Great

Moderation, and Zero Interest-Rate Policy, or ZIRP—but each did so in different ways.[3] During the Great Inflation, targeted interest-rate hikes helped stabilize the business cycle but led to double-digit inflation. Federal Reserve Chair Paul Volcker inherited this situation and aggressively targeted the money supply to moderate inflation and instill trust in prices; his dramatic action unapologetically slowed the economy and is referred to as the period of Volcker Reform.

Exhibit 7 Historical Fixed-Income Correlations and Interest-Rate Pivots



Source: Morningstar Direct. Data as of Dec. 31, 2024. The rolling three-year correlation is between the IA SBBI US IT Government Index and the IA SBBI US Large Stock Index through 2002; data after that point is based on the rolling three-year correlation between the Morningstar US 5-10 Year Treasury Index and the Morningstar US Market Index.

The next 25 or so years saw the Federal Reserve move to simultaneously stabilize prices and maintain lower inflation levels, but this Great Moderation coincided with significant financial deregulation. Ultimately, it culminated in the proliferation of complex derivative investments that magnified debts, stoked mistrust in banks, and led to a liquidity crunch starting in 2007. To stabilize the economy and slow the crisis, the Federal Reserve aggressively dropped short-term rates to near zero and purchased US Treasuries and (unprecedented up until that point) agency mortgages to keep bond market yields low as well. ZIRP and successive rounds of quantitative easing led to a nearly 15-year period of low borrowing costs. Outside of the US, some central banks even experimented with negative interest rates.

How Interest-Rate Pivots Affect Correlations

What do correlations look like across these monetary policy regimes? As shown in Exhibit 8, no two are the same. In three of the four described, the correlation coefficient was positive, though noticeably more modest (0.02) during the Great Moderation than during the Volcker Reform (0.35). As expected, the correlation was negative during ZIRP, given the precipitous decline in rates. Over the single six-decade period, the correlation coefficient between stocks and bonds registered at a modest but positive 0.07.

3 These periods are based on William T. Gavin's "Monetary Policy Regimens and the Real Interest Rate" published in the Federal Reserve Bank of St. Louis Review, Second-Quarter 2018.

But during a more concentrated period, such as 2022, 2023, and early 2024, these reassuring diversification benefits seem misplaced. Why? Within each of these schemes are concentrated periods of interest-rate pivots. They are short, intentional, and reflect a realized increase in borrowing costs. Essentially, the rate regime resets. Here, we've defined these moments as months when both the 10-year US Treasury yield and the effective Federal Open Market Committee rate increased by 10% or more, year over year. There are eight of these pivots in the six decades mentioned above. And with the exception of the ZIRP era, in each of the four established monetary policy periods, pivot correlations are often noticeably higher than their respective regimes. These are moments when rates move higher, bond prices move lower, and correlations rearrange.

Exhibit 8 Risk, Returns, and Correlations: Interest-Rate Pivots

	Great Inflation			Volcker Reform			Great Moderation			ZIRP		Great Unknown	
		Pivot 1	Pivot 2		Pivot 3	Pivot 4		Pivot 5	Pivot 6		Pivot 7		Pivot 8
	Jan 1965 to Oct 1979	Jun 1966 to Jan 1967	Aug 1969 to Jul 1970	Nov 1979 to Oct 1982	Aug 1978 to Jan 1981	May 1981 to Mar 1982	Nov 1982 to Dec 2008	Sep 1994 to Jun 1995	Jun 2006 to Jan 2007	Jan 2009 to Feb 2022	Jun 2017 to Mar 2019	Mar 2022 to Dec 2024	Mar 2022 to Apr 2024
Correlation Coefficient													
Stocks	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Bonds	0.24	0.51	0.57	0.35	0.24	0.67	0.02	0.80	0.20	–0.24	–0.29	0.71	0.71
60/40 Portfolio	0.98	0.99	0.98	0.94	0.94	0.96	0.97	0.99	0.93	0.99	0.99	0.98	0.99
Diversified Portfolio	n/a	n/a	n/a	0.85	0.80	0.88	0.86	0.94	0.57	0.94	0.95	0.93	0.94
Total Return % (Ann)													
Stocks	5.15	4.14	–19.60	15.60	16.63	–12.32	10.41	21.15	22.53	15.04	11.38	12.02	7.63
Bonds	5.07	7.41	2.99	14.34	4.05	15.32	8.00	10.89	6.32	2.40	1.44	–1.40	–3.87
60/40 Portfolio	5.44	5.87	–10.47	15.52	11.81	–1.78	10.02	17.03	16.02	10.18	7.60	6.79	3.12
Diversified Portfolio	n/a	n/a	n/a	13.05	14.21	–4.10	9.85	10.28	14.46	8.54	5.33	4.12	1.39
Standard Deviation													
Stocks	14.73	15.71	18.87	17.00	16.04	12.61	15.04	8.98	3.57	14.64	13.07	17.74	19.51
Bonds	4.50	4.22	7.44	11.88	10.78	10.02	4.82	5.32	2.44	3.31	2.87	7.81	8.28
60/40 Portfolio	9.23	10.20	12.86	12.56	11.66	10.65	9.30	7.27	2.55	8.48	7.77	13.06	14.23
Diversified Portfolio	n/a	n/a	n/a	12.20	11.77	10.41	8.02	5.89	3.25	8.88	6.99	11.61	12.75
Sharpe Ratio													
Stocks	0.01	0.00	–0.96	0.18	0.36	–2.08	0.40	1.58	4.35	1.00	0.75	0.48	0.26
Bonds	–0.20	0.51	–0.37	0.11	–0.59	0.06	0.63	0.93	0.44	0.58	–0.12	–0.72	–0.96
60/40 Portfolio	–0.02	0.11	–0.92	0.19	0.09	–1.43	0.53	1.45	3.91	1.13	0.75	0.23	–0.01
Diversified Portfolio	n/a	n/a	n/a	0.02	0.27	–1.68	0.59	0.75	2.65	0.91	0.52	0.02	–0.16

Source: Morningstar Direct. Data as of Dec. 31, 2024. Stock performance is based on the IA SBBI US Large Stock Index prior to Jan. 1, 2000, and the Morningstar US Market Index after that date. Bond performance is based on the IA SBBI US IT Government Index prior to Jan. 1, 2000, and the Morningstar US 5-10 Year Treasury Index after that date. The 60/40 portfolio consists of a 60% weighting in stocks and 40% in bonds. The diversified portfolio includes a 20% weighting in larger-cap domestic stocks; 10% each in developed- and emerging-markets stocks, Treasuries, core bonds, global bonds, and high-yield bonds; and 5% each in small-cap stocks, commodities, gold, and REITs. Both portfolios assume annual rebalancing. Returns for periods greater than one year are annualized.

As the Federal Reserve began aggressively raising rates in 2022 (spanning a period from March to December), the correlation coefficient between stocks and bonds was quick to respond. Rather than maintain a period of low rates indefinitely, the Federal Reserve moved quickly to reset rates, faster and higher than it had in decades. While rate increases in 2023 were more moderate and started to reverse course in 2024, the recalibration has remained a significant driver behind higher stock and bond correlations. We refer to this proposed distinct monetary policy regime as the "Great Unknown," and it

begins with the most recent interest-rate pivot in our dataset. Similar to the four monetary policy regimes previously described, the contours of this one reflect the unique challenges of its era: excessive inflation and asset bubbles fueled by excessively low borrowing costs.

Paradoxically, investors should find interest-rate pivots encouraging. Although painful, without these, bonds would lose their long-term diversification benefits. Inflation combined with persistently low rates detracts from a US Treasury bond's income-generating ability. And when rates sit at or near zero, the expectation that they must rise to restore elements of economic equilibrium fuels volatility in bond prices, too. Nobody wants to hold a bond knowing that aggressive rate increases are on the horizon. A higher rate reset now creates better opportunities for bonds later. Indeed, higher bond yields heading into 2023 helped offset losses from continued rate increases during the first seven months of the year.

In addition, painful interest-rate pivots are typically short. Indeed, the rolling three-year correlation between stocks and bonds equaled or exceeded 0.30 in only about 30% of the six-plus decades of monthly data points analyzed here. That's attractive relative to other asset classes often used as portfolio diversifiers, such as REITs, high-yield bonds, and international equities. And between the interest-rate pivots identified in Exhibit 8, it took rolling three-year correlations anywhere from one to eight years to reset to a lower level, but they did eventually fall. Well-diversified portfolios with long time horizons benefit from patience.

Portfolio Implications

Although rising interest rates lead to closer links between stocks and bonds, anticipating the magnitude of a rate rise and the length of time for the climb is difficult. In fact, many professional investors manage strategies as duration-neutral to a chosen benchmark given the difficulty in calling interest-rate changes. Retirees who are in drawdown mode, meanwhile, should consider employing cash and short-term bonds alongside their intermediate- and longer-duration core bond holdings. That way they can pull from investments that are unlikely to experience significant losses in a period of rising rates.

It's also useful to consider diversifying within the bond portfolio. It's challenging to do that without introducing other risks, but investors can often benefit from an actively managed bond strategy with a shrewd, well-resourced manager and a disciplined process. Portfolio managers with the right tools can swiftly adjust their bond portfolios in small but meaningful ways (such as adding broader diversification across sectors or geographies), while an index fund has far less flexibility to sidestep the inevitable.

As interest-rate pivots wind down, it's worth keeping an eye on the changing opportunity set. Now that yields on cash are significantly higher than they were heading into 2022, investors have an opportunity to derisk their portfolios without giving up too much in returns, at least in the short term. And most importantly, it's helpful to keep in mind that diversification benefits accrue, slowly and steadily, over decades and through interest-rate pivots. That is the secret sauce behind the enduring strength of the basic 60/40 portfolio, which has typically generated more attractive risk-adjusted returns than a portfolio of only stocks or bonds over the past six decades.

Recessionary Periods

"Bad losses in bad times." That's what author and investment advisor William Bernstein believes is a key risk for investors: the prospect of having to draw on their investment portfolios due to job loss or some other economic hardship at the same time their portfolios have experienced losses. Building a portfolio that will be resilient in varying economic conditions, including recessions, is a key reason that investors diversify their portfolios.

Recession loomed as a risk factor in 2023 and into 2024, as some market watchers believed that the Federal Reserve would overshoot in its efforts to stamp out inflation. The yield curve inverted, meaning that yields on longer-term bonds dropped below those of shorter-term bonds; such an inversion had historically been a harbinger of recession. Yet recessionary worries generally declined through 2024, thanks to still-robust gross domestic product growth and high levels of employment, and the yield curve returned to a more normal pattern of longer-term bonds yielding more than shorter-term ones. President Trump's tariff policies have stoked recession worries again in early 2025, and some economists have evinced concern about stagflation—the prospect of higher inflation amid slowing growth.

Examining Risk/Return During Recessionary Periods

The economy's inherent cyclicality points to the virtue of building a portfolio that's resilient in the face of varying economic conditions. It's therefore valuable to examine how various asset types have behaved in periods of economic weakness and which assets have helped diversify US equity exposure.

To do so, we examined eight recessionary periods in US history. It's worth noting that the definition of a recession varies. While "recession" is often defined as two successive quarters of negative GDP growth, the National Bureau of Economic Research defines a recession as "a significant decline in economic activity that is spread across the economy and that lasts more than a few months."

Some of those economic downturns were abbreviated, such as the start of the pandemic in February/March 2020, and some were more prolonged, such as the Great Depression in the late 1920s and early 1930s. For each period, we examined the returns, volatility, and correlations of US large-cap stocks, US Treasury bonds, a 60/40 mix of the two assets, and a diversified portfolio including the asset classes discussed earlier.

Exhibit 9 Risk, Returns, and Correlations: Recessionary Periods

	Aug 1929 to Mar 1933	Nov 1973 to Mar 1975	Jan 1980 to Jul 1980	Jul 1981 to Nov 1982	Jul 1990 to Mar 1991	Mar 2001 to Nov 2001	Dec 2007 to Jun 2009	Feb 2020 to Apr 2020[1]
Correlation Coefficient								
Stocks	1.00	1.00	1.00	1.00	1.00	1.00	1.00	n/a
Bonds	0.07	–0.02	0.16	0.65	0.55	–0.56	0.34	n/a
60/40 Portfolio	0.99	0.99	0.88	0.97	1.00	0.99	0.99	n/a
Diversified Portfolio	n/a	n/a	0.87	0.90	0.92	0.95	0.94	n/a
Total Return % (Annualized)								
Stocks	–31.13	–13.12	16.39	10.00	7.64	–7.26	–23.63	–10.10
Bonds	4.94	5.80	8.01	24.76	9.10	6.43	5.14	2.98
60/40 Portfolio	–17.21	–4.36	13.04	15.90	8.60	–1.50	–11.36	–4.81
Diversified Portfolio	n/a	n/a	12.21	12.07	6.53	–2.91	–10.00	–6.93
Standard Deviation								
Stocks	46.27	26.28	20.06	18.66	18.29	21.29	24.71	n/a
Bonds	3.13	4.68	20.17	9.81	3.20	4.03	4.86	n/a
60/40 Portfolio	25.52	14.61	15.65	13.71	11.51	10.83	14.83	n/a
Diversified Portfolio	n/a	n/a	19.19	12.30	9.95	9.47	17.70	n/a
Sharpe Ratio								
Stocks	n/a	–0.70	0.80	–0.06	0.24	–0.53	–1.00	n/a
Bonds	n/a	–0.40	0.17	1.04	1.48	1.24	0.80	n/a
60/40 Portfolio	n/a	–0.75	0.66	0.25	0.40	–0.45	–0.81	n/a
Diversified Portfolio	n/a	n/a	0.50	–0.01	0.19	–0.73	–0.57	n/a

Source: Morningstar Direct. Data as of Dec. 31, 2024. Stock performance is based on the IA SBBI US Large Stock Index prior to Jan. 1, 2000, and the Morningstar US Market Index after that date. Bond performance is based on the IA SBBI US IT Government Index prior to Jan. 1, 2000,
and the Morningstar US 5-10 Year Treasury Index after that date. The 60/40 portfolio consists of a 60% weighting in stocks and 40% in bonds. The diversified portfolio includes a 20% weighting in larger-cap domestic stocks; 10% each in developed- and emerging-markets stocks, Treasuries, core bonds, global bonds, and high-yield bonds; and 5% each in small-cap stocks, commodities, gold, and REITs. Both portfolios assume annual rebalancing. Returns for periods greater than one year are annualized. [1] Correlation, standard deviation, and Sharpe ratios aren't available for the most recent recessionary period because it was so short.

Not surprisingly, stocks frequently contracted during past recessions, losing value in five of the eight periods we examined. Some of those losses were severe, such as the 24% annualized loss for stocks during the global financial crisis of 2007-09. Stocks' poor performance during such periods makes intuitive sense: Weakening economic growth translates into slackening demand and declining earnings growth for many businesses, especially those that sell discretionary goods and services.

In that same vein, bonds logged positive gains in all eight of those same periods of economic weakness. The explanation for bonds' strength during recessionary periods is twofold. The Federal Reserve often cuts interest rates during such periods, which boosts bond prices. Moreover, investors often retreat to safety, stability, and liquidity in periods of economic insecurity (high-quality bonds and cash) and away from assets they perceive to be higher risk (equities).

The 60/40 and diversified portfolios' returns and volatility levels, as measured by standard deviation, tended to fall between those two extremes during economic downturns. The balanced and diversified portfolios didn’t lose as much as the equity-only portfolio, nor did they fare as well as an all-government-bond portfolio would have done during those periods of economic distress. And the plain-vanilla 60% US large-cap equity/40% intermediate-term government-bond portfolio tended to outperform the diversified

portfolio that included exposure to high-yield bonds, smaller-cap stocks, commodities, and other asset classes.

In other words, in an economic shock, the most basic government bonds often serve as effective ballast for equity portfolios. That's borne out by correlation data as well. Bonds' correlation coefficient with equities during recessionary environments ranged from strongly negative (negative 0.70 in the period from March 2001 to November 2001) to more positive (0.65 in the period from July 1981 to November 1982). Bonds have therefore provided a significant diversification benefit, even during periods when stock/bond correlations were relatively high.

Examining the Outliers

Yet as much as the data underscore the benefits of holding a plain-vanilla government-bond portfolio during recessionary environments, a few time periods stand out as outliers and are worthy of further examination. In three recessionary periods—January 1980 to July 1980, July 1981 to November 1982, and July 1990 to March 1991—stocks actually gained ground, and high-quality bonds did, too. In other words, stock market losses and bond market gains aren't a fait accompli in every recession.

It is worth homing in on the two recessions in the early 1980s—the so-called "double-dip" recession—because they have some parallels with the recent past in the US. The Iran-Iraq war in 1980 caused energy prices to surge and led to broad-based inflation: In 1980, the inflation rate surged to nearly 14%. The Federal Reserve's aggressive interest-rate increases led to high unemployment and two economic contractions—a mild recession from January 1980 to July 1980 and a deeper one from mid-1981 through 1982.

Despite those headwinds, stocks managed to post robust gains in 1980 and 1982, contributing to positive returns in both early 1980's recessions. (Stocks did post a loss in 1981, however.) Stock market participants appeared to be looking through the bad news to better times ahead, including an end to rising inflation and interest rates, as well as a recovery in economic growth. They were also cheered by President Ronald Reagan's tax cuts and regulatory rollbacks, among other factors.

Portfolio Implications

Of course, each time period is different, and the current economic environment is almost certainly different from that of the early 1980s. As noted earlier, the economy proved resilient even in the face of inflation and the Fed's 11 interest-rate increases in 2022 and 2023, thanks largely to the health of the labor market and robust consumer spending. In early 2025, recessionary storm clouds have gathered once again; stocks have fallen but US Treasury yields have risen, pushing down bond prices.

Overall, though, high-quality fixed-income assets have been a boon to portfolios in most recessionary environments. That is largely due to lower yields and investors' desire for the stability and safety of fixed income and cash assets during periods of economic turbulence, both of which boost bond prices. While high-quality bonds won't diversify equities in every market environment (see: 2022), they have historically been reliable in periods of economic weakness.

Inflationary Periods

The resurgence in inflation that started in May 2021 made market conditions much more challenging. Supply chain disruptions, a tight labor market, the war in Ukraine, and strong economic growth all conspired to push up inflation from its previously benign levels. The Consumer Price Index rose by more than 7% year over year by the end of 2021 and reached as high as 9% by mid-2022. Inflationary pressures eased during 2023 and 2024, but inflation remained above the Federal Reserve's stated target of 2%.

Higher inflation marked a sharp reversal from the previous regime. For most of the previous 30 years, conditions were unusually benign from an inflation perspective. Aside from a brief increase in the mid-2000s, inflation had generally been running well below its long-term historical average of about 2.6%. Cooler-than-average inflation, in turn, created close to ideal conditions for stock/bond correlations. As discussed earlier, rolling three-year correlations between stocks and bonds were consistently negative (or barely above zero) from November 2000 through 2020.

With those conditions now a distant memory, it shouldn't come as a surprise that correlations between stocks and bonds have sharply increased. The recent uptrend in correlations has been unusually dramatic but not unprecedented, though. The stock/bond correlation has often been positive over other periods of high inflation, generally defined as periods when year-over-year inflation increased by at least 5% and remained high for at least six months.[4]

As shown in Exhibit 10, correlations between stocks and bonds rose during some but not all periods. In general, correlations increased the most during periods when inflation was both high (in the double digits) and protracted (lasting at least three years). The post-World War II era saw an unusually high spike in inflation (driven by the removal of wartime wage and price controls, combined with large numbers of troops coming home), but the increase in consumer prices lasted only about a year. More recently, surging economic growth in China fueled rising consumer prices in 2007 and 2008, but inflation remained below 6% and lasted less than a year.

4 Inflationary periods are based on the parameters described in Neville, H., Draaisma, T., Funnell, B., Harvey, C.R., & Van Hemert, O. 2021. "The Best Strategies for Inflationary Times." https://ssrn.com/abstract=3813202.

Exhibit 10 Risk, Returns, and Correlations: Inflationary Periods

	Apr 1941 to May 1942	Mar 1946 to Mar 1947	Aug 1950 to Feb 1951	Feb 1966 to Jan 1970	Jul 1972 to Dec 1974	Feb 1977 to Mar 1980	Feb 1987 to Nov 1990	Sep 2007 to July 2008	Jun 2021 to Feb 2023
Cumulative Inflation Rate %	**14.79**	**20.99**	**6.64**	**18.87**	**24.46**	**36.92**	**20.32**	**5.79**	**12.13**
Correlation Coefficient									
Stocks	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Bonds	0.18	–0.06	0.02	0.26	–0.08	0.28	0.17	–0.46	0.68
60/40 Portfolio	1.00	1.00	1.00	0.98	0.98	0.97	0.99	0.99	0.99
Diversified Portfolio	n/a	n/a	n/a	n/a	n/a	0.81	0.89	0.88	0.94
Total Return % (Annualized)									
Stocks	–8.88	–7.50	28.93	1.04	–13.24	5.40	7.99	–11.34	–1.56
Bonds	1.53	0.61	0.45	2.42	5.33	1.33	7.55	5.34	–5.46
60/40 Portfolio	–4.69	–4.25	17.63	1.84	–5.38	3.85	7.94	–4.80	–2.83
Diversified Portfolio	n/a	n/a	n/a	n/a	n/a	10.56	6.75	0.51	–3.71
Standard Deviation									
Stocks	16.55	15.41	7.86	13.11	18.34	14.37	18.50	14.24	19.81
Bonds	1.31	0.76	0.38	4.16	4.57	5.67	4.87	2.92	7.46
60/40 Portfolio	9.79	9.24	4.87	8.39	9.98	9.55	12.20	8.01	14.03
Diversified Portfolio	n/a	n/a	n/a	n/a	n/a	9.49	8.73	8.98	12.3
Sharpe Ratio									
Stocks	–0.49	–0.46	5.50	–0.28	–1.06	–0.14	0.12	–1.03	–0.08
Bonds	1.03	0.29	–1.65	–0.72	–0.38	–1.16	0.03	1.14	–0.97
60/40 Portfolio	–0.46	–0.47	5.52	–0.39	–1.19	–0.42	0.10	–0.96	–0.27
Diversified Portfolio	n/a	n/a	n/a	n/a	n/a	0.23	–0.04	–0.19	–0.40

Source: Morningstar Direct. Data as of Dec. 31, 2024. Stock performance is based on the IA SBBI US Large Stock Index prior to Jan. 1, 2000, and the Morningstar US Market Index after that date. Bond performance is based on the IA SBBI US IT Government Index prior to Jan. 1, 2000, and the Morningstar US 5-10 Year Treasury Index after that date. The 60/40 portfolio consists of a 60% weighting in stocks and 40% in bonds. The diversified portfolio includes a 20% weighting each in larger-cap domestic stocks, non-US stocks, and core bonds, 10% each in intermediate-term Treasuries and high-yield bonds; and 5% each in small-cap stocks, commodities, gold, and REITs. Both portfolios assume annual rebalancing. Returns for periods greater than one year are annualized.

The most dramatic correlation upturns took place in the periods from February 1966 through January 1970 (driven by low unemployment and surging economic growth) and February 1977 through March 1980 (driven by soaring oil prices, the oil embargo and related price shocks, and expansionary monetary policies). Correlations ended up in a similar range (0.26 and 0.28, respectively) in both periods. Thanks to the rapidly shifting landscape for both interest rates and inflation, the recent upturn in stock/bond correlations has been even more pronounced.

Portfolio Implications

There are a couple of key lessons to draw from these patterns. For one, the environment for both inflation and interest rates has fundamentally changed. As long as the outlook for inflation and interest rates remains uncertain, the correlation between stocks and bonds will probably remain higher than in the past.

That doesn't necessarily mean investors should avoid bonds, however. Stocks and bonds tend to move more in tandem during inflationary periods, but bonds can still provide significant diversification benefits, as well as play a critical role in providing ballast and reducing risk at the portfolio level. Treasury Inflation-Protected Securities, or TIPS, in particular, can be a valuable tool for hedging inflation risk, especially when they offer positive real yields.

Exploring the Diversification Benefits by Asset Class

Taxable Bonds

Taxable bonds are a broad basket, encompassing high-quality bonds (US government and government-related bonds, asset-backed securities, and high-quality corporates) as well as higher-yielding credits from lower-quality issuers (high yield, bank loans, and emerging markets). These investments have provided varying degrees of effectiveness from a diversification standpoint.

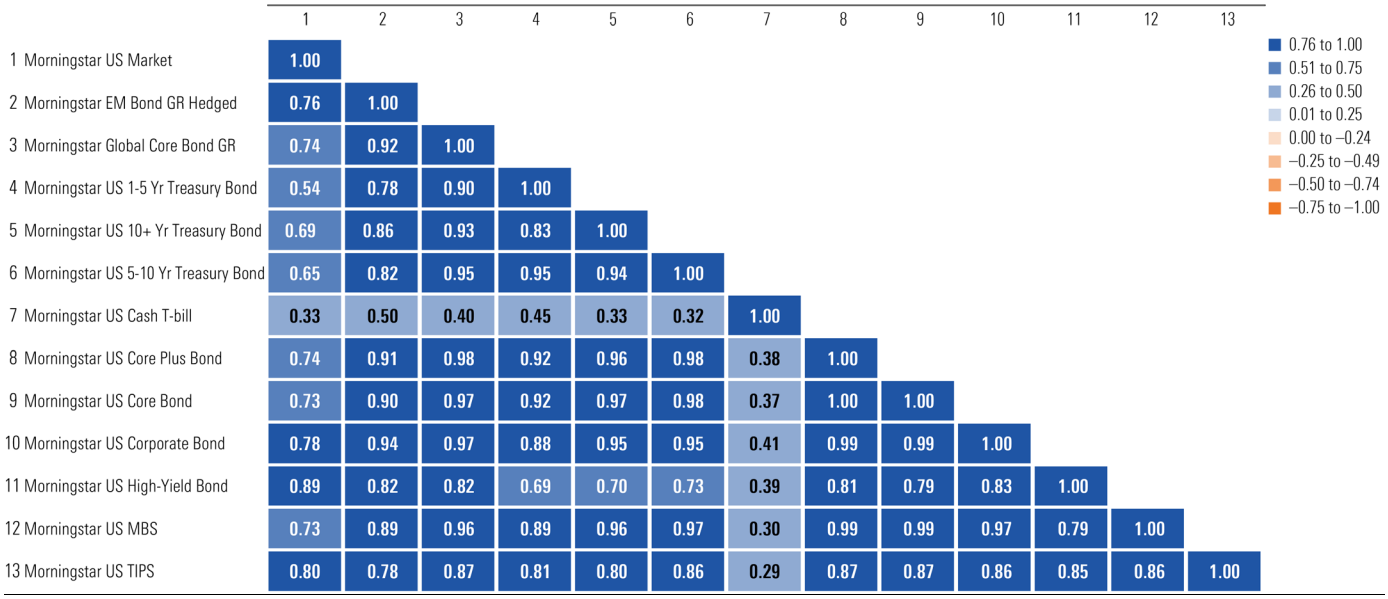
High-quality bonds, especially US Treasury and agency mortgage bonds, have proved the best diversifiers for equity exposure over the past several decades. The reason is intuitive: Demand for Treasuries often spikes when investors are seeking safety. Moreover, interest rates often decline during such periods, which has provided another tailwind for government-bond prices. Cash investments, while not technically under the bond umbrella, have also helped diversify equity exposure.

In contrast, lower-quality bonds have been much less effective diversifiers, often losing less than stocks in market downdrafts but moving more in sympathy with stocks than government bonds. The economic conditions that precipitate stock market downturns (namely, weaker economic growth) often crimp the outlook for the debt-laden issuers of lower-quality credits.

Recent Performance Trends

The distinct and wildly divergent markets of the past three years tested the expectations an investor might have from a fixed-income portfolio. While bond correlations have dramatically increased amid rising interest rates, cash stood out as a reliable diversifier.

Exhibit 11 Three-Year Correlation Matrix: Taxable Bonds



	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Morningstar US Market	1.00												
2 Morningstar EM Bond GR Hedged	0.76	1.00											
3 Morningstar Global Core Bond GR	0.74	0.92	1.00										
4 Morningstar US 1-5 Yr Treasury Bond	0.54	0.78	0.90	1.00									
5 Morningstar US 10+ Yr Treasury Bond	0.69	0.86	0.93	0.83	1.00								
6 Morningstar US 5-10 Yr Treasury Bond	0.65	0.82	0.95	0.95	0.94	1.00							
7 Morningstar US Cash T-bill	0.33	0.50	0.40	0.45	0.33	0.32	1.00						
8 Morningstar US Core Plus Bond	0.74	0.91	0.98	0.92	0.96	0.98	0.38	1.00					
9 Morningstar US Core Bond	0.73	0.90	0.97	0.92	0.97	0.98	0.37	1.00	1.00				
10 Morningstar US Corporate Bond	0.78	0.94	0.97	0.88	0.95	0.95	0.41	0.99	0.99	1.00			
11 Morningstar US High-Yield Bond	0.89	0.82	0.82	0.69	0.70	0.73	0.39	0.81	0.79	0.83	1.00		
12 Morningstar US MBS	0.73	0.89	0.96	0.89	0.96	0.97	0.30	0.99	0.99	0.97	0.79	1.00	
13 Morningstar US TIPS	0.80	0.78	0.87	0.81	0.80	0.86	0.29	0.87	0.87	0.86	0.85	0.86	1.00

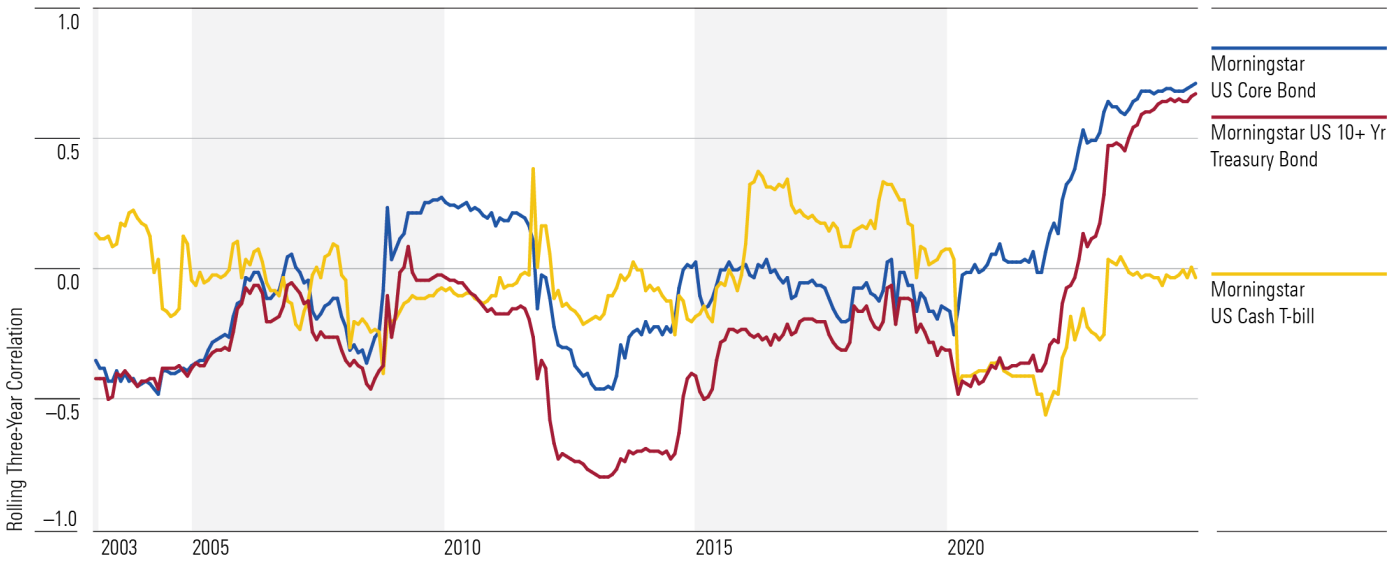
Source: Morningstar Direct. Data as of Dec. 31, 2024.

While both stock and bond prices stabilized in 2023 and 2024 after the painful drawdown in 2022, three-year correlations between stocks and high-quality bonds remain elevated. Treasury bonds, historically among the best diversifiers for US equities, are now positively correlated with US stocks. Longer-term Treasuries look particularly weak as diversifiers over the most recent three-year period. Cash had the lowest correlation with stocks, in part because it was a rare asset type to exhibit positive returns in 2022. Cash investors' yields rose at the very time that stock and bond prices were falling.

Longer-Term Trends

Recency bias might cause an investor to balk at the usefulness of US Treasuries in a portfolio. But over the long term, US Treasuries and other high-quality government-backed fare, such as agency mortgages, remain some of the most compelling diversifiers for a portfolio. When interest rates are stable or falling, these offerings provide a modest but reliable return that balances the volatile swings inherent in stocks. Riskier allocations such as high-yield and emerging-markets debt, on the other hand, serve as poor diversifiers relative to equity.

Exhibit 12 Rolling Three-Year Correlations vs. Morningstar US Market Index: Taxable Bonds



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Portfolio Implications

A portfolio constructed for long-term resilience will be well served by a high-quality government-bond allocation, in particular one with US Treasuries and agency mortgages. The 2022 experience—as well as 2025 thus far—also illustrates the virtue of cash in a balanced portfolio, particularly for investors who are retired and actively drawing upon their portfolios for living expenses. While cash might not earn much over inflation over long periods of time, a modest allocation can provide both safety and liquidity when stocks and bonds fall simultaneously.

As we discussed in the Learning from History section of this paper, patience often rewards a diversified approach. Although bonds served as a source of portfolio pain in 2022, over longer periods and more typical interest-rate backdrops, a high-quality US government-bond sleeve improved diversification more often than it detracted from it. And US Treasuries aren't exclusive in providing this counterbalance. Intermediate-term and short-term maturities of diversified high-quality bonds also provide some refuge when the US equity portion of a portfolio is under duress. Riskier fixed-income subsectors, such as high yield, nonagency mortgages, and emerging-markets debt, are highly correlated with stocks and should be seen as equitylike complements to a portfolio.

Municipal Bonds

Municipal bonds are issued by state and local municipalities to pay for infrastructure and fund other projects such as building hospitals, schools, retirement communities, and airports. Individual taxpayers who purchase municipal bonds can typically exclude the income (though not the capital gains) from their federal taxes. If investors buy bonds issued by their home states and/or municipalities, the income from

the bonds may be tax-free at the state and local levels, as well. Those tax-saving features are most beneficial to investors in higher tax brackets.

Because the states and municipalities that issue these bonds have taxing authority (and can raise taxes to pay their bills), the creditworthiness of high-quality muni-bond issuers is typically considered second only to that of the US government. Unlike the US government, though, state and local governments cannot run deficits. As a result, there have been a handful of municipal bankruptcies—notably Detroit's in 2013 and the Commonwealth of Puerto Rico's in 2017—but they have been relatively rare.

Because of their yields and general price stability, muni bonds have historically done a decent job of diversifying US equity exposure. Their long-term correlations with stocks have tended to be on par with high-quality taxable-bond indexes but not as low as those of Treasuries or cash.

Recent Performance Trends

Municipal bonds' rolling three-year correlations are often negative with US equities, as they were from January 2016 through February 2020, but the pandemic introduced anxieties around how the economies of state and city municipalities would open and what their revenues would look like in a world reshaped by lockdowns. As a result, correlations relative to equities turned positive and have increased steadily since 2020. The interest-rate increases that began in 2022, sending both stock and bond prices tumbling at once, further boosted equity and fixed-income correlations.

Exhibit 13 Three-Year Correlation Matrix: Municipal Bonds

	1	2	3	4	5	6	7	8	9	10	11	12
1 Morningstar US Market	1.00											
2 Morningstar US Core Bond	0.73	1.00										
3 Morningstar US Treasury & Govt Bond	0.67	0.99	1.00									
4 US Fund High-Yield Muni	0.78	0.93	0.89	1.00								
5 US Fund Muni National Interm	0.75	0.93	0.91	0.98	1.00							
6 US Fund Muni National Long	0.76	0.93	0.90	0.99	1.00	1.00						
7 US Fund Muni National Short	0.72	0.92	0.91	0.95	0.98	0.97	1.00					

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

During 2022, as rising interest rates fueled losses across nearly all bond varieties, munis lost less than US Treasuries, agency mortgages, and investment-grade corporate credit. Still, muni correlations with stocks continued to increase. The rolling three-year correlation of munis with the US stock market are roughly in line with those of taxable US core bonds. Munis' correlation with stocks is also substantially higher than the correlation between Treasuries and US equities. High-yield municipal bonds had the closest links with stocks of any muni category, but the correlation was in line with those of investment-grade corporate bonds and lower than those of high-yield corporate credits.

Longer-Term Trends

Since 2000, most muni-bond indexes have exhibited a correlation with equities that was higher than that of US Treasuries and other government-backed fare but lower than investment-grade corporate credits. But in periods of equity market volatility driven by a weakening economy, municipal bonds have decoupled from Treasuries and other US government bonds, likely on concerns that higher unemployment and weak business conditions would hurt tax receipts. For example, the spread between muni yields and US Treasury yields widened significantly in early 2020.

Exhibit 14 Rolling Three-Year Correlations vs. Morningstar US Market Index: Municipal Bonds

Source: Morningstar Direct. Data as of Dec. 31, 2024.

Munis' correlation with stocks has risen sharply since 2020. There are a few reasons for that. One is that nearly all fixed-income assets, including municipal bonds, saw their correlations with stocks jump in 2022. Moreover, the muni market is less liquid than the US Treasury market, and it has often seized up in periods of economic and equity market stress, such as the onset of the pandemic in March 2020. As a result, munis have been less-effective diversifiers for equities than US Treasuries or cash. Across all longer-term time frames, high-yield muni funds were the least effective diversifiers for equities of any muni fund group. That is similar to the trend for high-yield taxable bonds, which are much less defensive and more sensitive to economic stress than high-quality bonds.

Portfolio Implications

As with taxable bonds, it's valuable to keep an eye on the big picture: High-quality munis have typically held up much better than stocks during periods of economic weakness.

That said, over longer periods, munis have exhibited a higher correlation with equities than high-quality taxable-bond indexes, especially US Treasury bonds. That suggests that even investors who value the tax-saving features of muni bonds should consider augmenting them with cash and US government bonds for diversification and ballast during equity market shocks. It also underscores the importance of not using a muni fund as a source of liquid reserves; any bout of illiquidity in the muni market would be an inopportune time to sell. (Investors in high tax brackets can use municipal money market funds in that role.) High-yield munis' higher correlation with equities, meanwhile, indicates that such bonds are best used alongside higher-quality muni bonds (or high-quality taxable bonds) for investors aiming to diversify equity risk.

International Equity

Adding international exposure is one of the first steps toward a diversified portfolio. Even minimalist investors usually carve out a portion of their portfolios for non-US stocks as a supplement to domestic stocks and bonds.

International stocks are subject to many factors that can lead to divergent performance, including local market conditions, currency movements, exposure to different sectors and industries, and political and economic factors. These traits can lead to different performance patterns, both relative to the US market and other international markets.

Recent Performance Trends

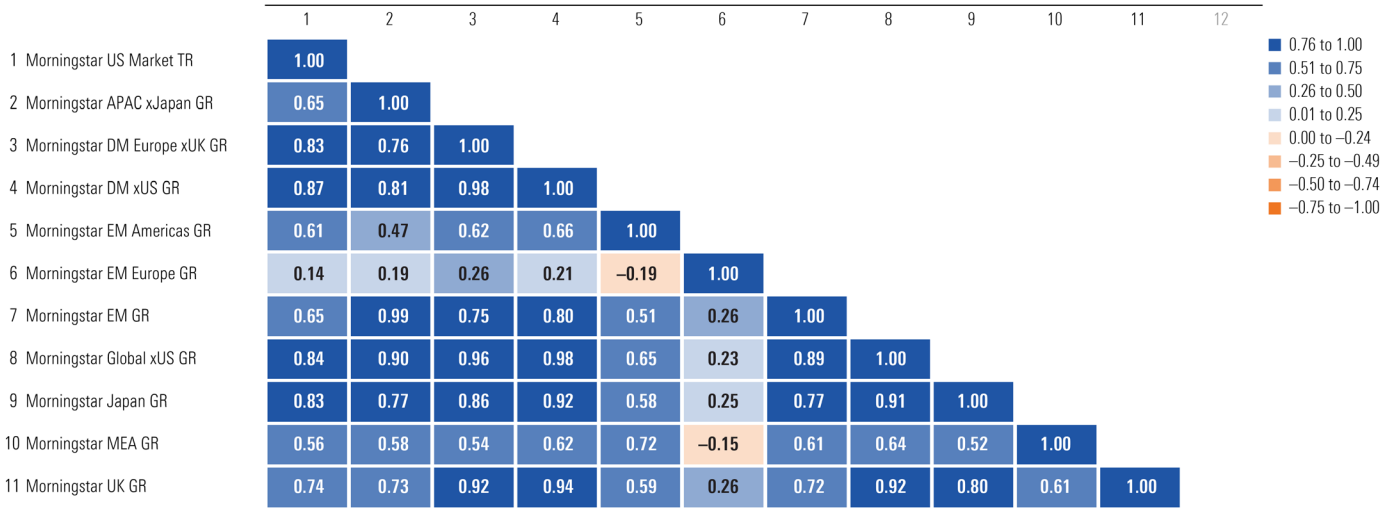
Even though diversifying into non-US stocks makes intuitive sense and modestly reduced the standard deviation of a US-only portfolio over the past three-, five-, and 10-year periods, doing so has often detracted from returns for US-based investors. In eight of the 10 calendar years from 2015 through 2024, the Morningstar Global Markets ex-US Index lagged the Morningstar US Market Index. Non-US stocks held up better than US stocks during the 2022 bear market. But that was a modest victory, and short-lived. As mega-cap US technology stocks led the market again in 2023 and 2024, non-US stock indexes failed to keep up. The Morningstar Global Markets ex-US Index gained about 6% in 2024, compared with a 24% return for its US counterpart.

The Morningstar Emerging Markets Index gained 7% in 2024 versus a 5% gain for the Morningstar Developed Markets ex-US Index. Emerging markets fared worse than developed-markets equities in 2022's bear market, however. China's economic slowdown has weighed heavily on broad emerging-markets indexes, though the Chinese market regained some ground in 2024.

From a diversification perspective, most international stock benchmarks, especially those in developed markets, have been closely tied to the US market over the past three years, as shown in Exhibit 15. Developed-markets equities, especially European stocks, have had the tightest correlation with US

equities. Meanwhile, emerging-markets stocks have tended to have lower correlations with US stocks, and those correlations have generally trended down since 2000.

Exhibit 15 Three-Year Correlation Matrix: International Equity



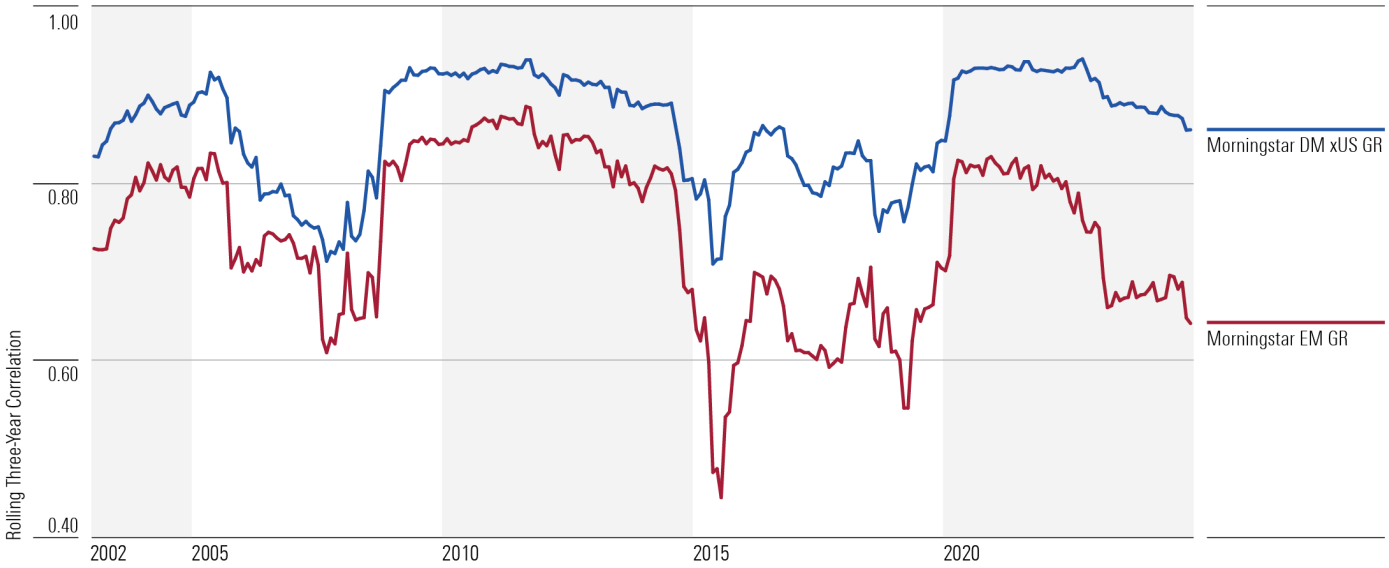
Source: Morningstar Direct. Data as of Dec. 31, 2024.

The small subset of European stocks from markets classified as emerging have had the lowest correlation with the US market over the past three years, with correlations declining significantly in 2022 and falling further still in 2023 and 2024. (At the end of 2021, the three-year correlation of the Morningstar Emerging Markets Europe Index with the US market was 0.82; by the end of 2024, it was just 0.14.) That steep drop in correlations owed largely to Eastern European equities' sharp losses following Russia's invasion of Ukraine in early 2022. Such stocks are just 1.3% of the broader Morningstar Emerging Markets Index, however, and are a negligible slice of the Morningstar Global Markets ex-US Index.

Longer-Term Trends

While non-US stocks, especially those from developed markets, have exhibited a high correlation with the US market in recent years, that hasn't always been the case. As shown in Exhibit 16, correlations between the US and international markets have been lower in some previous periods, such as from 2004 through 2008, when the US dollar was generally on the decline. If the greenback goes into another longer-term slump or if the US sinks into recession but other major non-US markets manage to avoid one, it is conceivable that correlations between US and international markets could again drift lower.

Exhibit 16 Rolling Three-Year Correlations vs. Morningstar US Market Index: International Equity



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Longer-term correlations also demonstrate that emerging markets generally have a lower correlation with US stocks than developed markets do. That's because the types of industries that are especially prominent in emerging markets, particularly energy and basic materials, have declined as a percentage of the US market. In addition, the Chinese economy, which represents roughly 30% of major emerging-markets indexes, follows a different economic cycle than the US does. Finally, emerging markets are more likely than developed markets to be affected by country- and region-specific geopolitical events—political instability, wars, and currency devaluations—that have little to do with the US. Taken together, those features suggest that emerging-markets equities' low correlation with US stocks won't be as fleeting as some of the other correlation trends.

Non-US value stocks have also offered decent diversification relative to US equities. For example, the trailing three-year correlation of the Morningstar Global ex-US Value Index is 0.76 with the Morningstar US Market Index, whereas it's 0.84 for the broad Global ex-US index. The sector composition of the Global ex-US Value Index explains the difference: It holds just 5% in healthcare and 7% in technology, whereas the US Market Index holds 10% and 31%, respectively, in those two sectors. Performance of the Global ex-US Value Index has also been better than the broad-based Global ex-US index over longer-term trailing time periods.

Portfolio Implications

While investors who have diversified internationally haven't much benefited over the past decade, their portfolios have been slightly less volatile relative to a US-only portfolio. The 10-year standard deviation of the Morningstar US Market Index is 15.7, whereas the standard deviation of the Morningstar Global

Markets Index, which includes both US and non-US names, is 15.0. Japan, in particular, has exhibited milder volatility than the US market and other major non-US markets.

Moreover, the US market has become increasingly growth-tilted: 31% of the Morningstar US Market Index lands in the technology sector as of the first quarter of 2025, for example, whereas just 14% of the Morningstar Global Markets ex-US Index does. A hefty weighting in tech stocks has been a boon for US-only investors as technology names soared for most of the past decade. But in a period in which lower-priced stocks from traditional value sectors lead the way, non-US stocks could outperform and help diversify US exposure.

Because emerging markets have generally had a lower correlation with the US equity market than do developed markets, investors seeking diversification may want to make sure their foreign-stock allocation includes at least some exposure to less-developed markets. And while some specific regions have been better portfolio diversifiers than others, most investors will probably want to shy away from investment vehicles that focus solely on a particular geographic region.

In a similar vein, growth-leaning core and international indexes tend to have a tighter correlation with US stocks than do non-US value indexes. Thus, for investors looking to non-US stocks for diversification from US equities, emphasizing value names overseas while downplaying growth appears to be a reasonable way to go.

US Equity Style Box

US equity exposure can be broadly segmented by market capitalization (small, mid, and large) and style (value, core, and growth), as represented by the Morningstar Style Box. Correlations among US equity groups tend to be high, although small-cap and value stocks tend to be somewhat less tightly linked with the overall market.

The resulting nine boxes go from the relative extremes of large growth to small value. The divergence between these two portions of the style box shows the long-running gap in returns between value and growth stocks on the one hand and large- and small-cap stocks on the other. For many years, the dominant storyline was simple: The larger and growthier the style, the better. That narrative held true nearly every year starting in 2009, as the market recovered in the wake of the 2008 bear market.

Recent Performance Trends

These long-running performance trends have been less consistent in recent years. As the equity market staged a strong rebound in 2023, large-growth stocks—and especially the "Magnificent Seven" group of mega-cap tech stocks—posted the biggest gains. Growth stocks also pulled ahead in 2024; the Morningstar US Growth Index finished the year with a 23.4% return, compared with 13.8% for the Morningstar US Value Index. Value stocks held up much better during the 2022 bear market, though. While the Morningstar US Growth Index suffered a 36.4% loss, value stocks survived the year relatively unscathed, finishing the year with a loss of just 0.7%.

This relatively resilient showing followed on the heels of a strong value rebound in 2021. Value stocks—particularly in sectors such as energy, financials, and real estate—benefited from the strong economic recovery after falling behind their growth counterparts in 2020 and previous years.

Exhibit 17 Three-Year Correlation Matrix: US Style Box Indexes

	1	2	3	4	5	6	7	8	9	10	11	12
1 Morningstar US Market	1.00											
2 Morningstar US Large Core	0.98	1.00										
3 Morningstar US Large Growth	0.92	0.87	1.00									
4 Morningstar US Large Value	0.85	0.86	0.61	1.00								
5 Morningstar US Mid Core	0.93	0.92	0.75	0.90	1.00							
6 Morningstar US Mid Growth	0.93	0.90	0.92	0.70	0.88	1.00						
7 Morningstar US Mid Value	0.85	0.85	0.60	0.94	0.94	0.74	1.00					
8 Morningstar US Small Core	0.90	0.87	0.74	0.88	0.97	0.88	0.92	1.00				
9 Morningstar US Small Growth	0.91	0.87	0.87	0.73	0.91	0.96	0.77	0.93	1.00			
10 Morningstar US Small Value	0.83	0.80	0.59	0.90	0.94	0.77	0.96	0.95	0.82	1.00		

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to −0.24
−0.25 to −0.49
−0.50 to −0.74
−0.75 to −1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

The large versus small narrative has also shifted at times. While the market's biggest stocks dominated the market in 2023 and 2024, they also had more room to fall as valuations dropped during 2022. As a result, the Morningstar US Large Cap Index fared slightly worse than the Morningstar US Small Cap Index that year.

Within the Morningstar Style Box, returns often diverge by a wide margin. In 2024, for example, the Morningstar US Large Growth Index gained 27.8%, compared with just 9.7% for the Morningstar US Small Value Index.

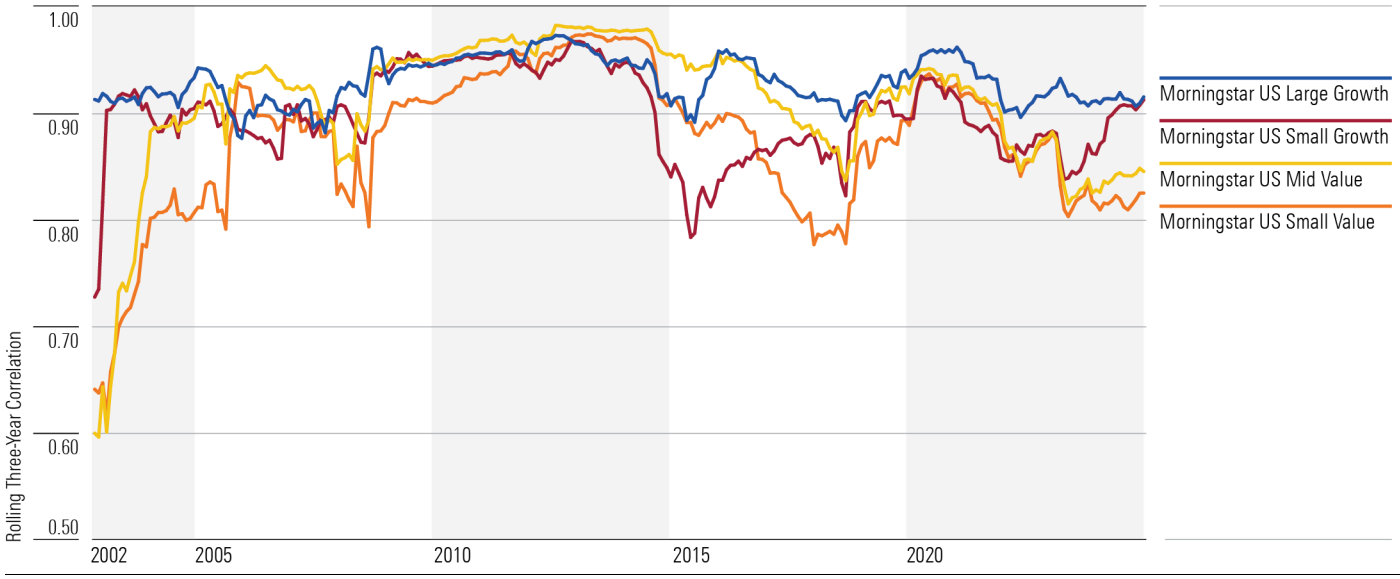
The take-home point is that a high correlation coefficient doesn't translate into similar returns: Correlation measures only the direction, not the magnitude, of returns. Indeed, most of the nine boxes have had high correlations with the broader equity market over the past three years, as shown in Exhibit 17. The Morningstar US Large Core Index had the highest correlation coefficient (0.98) with the broader equity market, while the Morningstar US Small Value Index was the lowest, at 0.83.

While all nine boxes showed close correlations with the Morningstar US Market Index, correlations between individual style boxes were sometimes much lower. Over the trailing three-year period ended in December 2024, the Morningstar US Mid Value and US Small Value indexes had correlation coefficients of just 0.60 and 0.59, respectively, with the Morningstar US Large Growth Index. The Morningstar US Large Value Index also had a relatively low correlation of just 0.61 with its large-growth counterpart over the trailing three-year period.

Longer-Term Trends

Since 2000, correlations for the nine style box indexes have generally trended higher, suggesting that style-based diversification is becoming more difficult. However, there have been some notable divergences. For example, small-cap stocks decoupled from the Morningstar US Market Index to the greatest degree between 2015 and 2018. From October 2015 through September 2018, the correlation coefficient for the Morningstar US Small Value Index fell to 0.78, and the same metric decreased to 0.82 for the Morningstar US Small Growth Index. Overall, correlations for the nine style box indexes were slightly lower in 2024 compared with 2023 and 2022, perhaps reflecting the increasing importance of a small group of mega-cap tech stocks in driving overall market returns.

Exhibit 18 Rolling Three-Year Correlations vs. Morningstar US Market Index: US Style Box Indexes



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Portfolio Implications

These results reinforce the importance of broad diversification. While all nine style-based indexes have had relatively high correlations with the Morningstar US Market Index, they have often shown marked divergence in returns across the group. In recent years, investors have often paid a high price—during both rallies and down markets—for overweighting value at the expense of growth. But the huge performance differential between value and growth during the 2022 bear market is a testament to the value of style-based diversification. Because it's impossible to predict which style will fare best in any particular market, it's prudent to maintain a diversified portfolio and avoid overweighting either value or growth.

Sector Equity

Sector-specific investments focus on a single economic segment, such as technology, healthcare, or real estate. Because they're often weighted by market capitalization, sector indexes are usually heavily tilted

toward the biggest players in that segment. Many investors do not use sector funds at all, relying on broadly diversified equity funds instead. Some investors might employ sector funds to capitalize on industries that they believe are beaten down but due for a recovery or that they think will benefit from secular growth trends, such as healthcare. Alternatively, investors might add sector exposure to provide their portfolios with a higher stream of income (for example, utilities or real estate) or to counterbalance overweightings elsewhere in their portfolios.

Recent Performance Trends

The Morningstar US Market Index soared by 24% in 2024, but performance was widely dispersed. The technology and communications services sectors both notched gains of more than 35%, while the healthcare, basic materials, and real estate sectors posted only modest gains.

Exhibit 19 Three-Year Correlation Matrix: Sector Equity

	1	2	3	4	5	6	7	8	9	10	11	12
1 Morningstar US Market	1.00											
2 Morningstar US Basic Materials	0.85	1.00										
3 Morningstar US Communication Svcs	0.81	0.55	1.00									
4 Morningstar US Consumer Cyclical	0.90	0.74	0.76	1.00								
5 Morningstar US Consumer Defensive	0.73	0.74	0.42	0.55	1.00							
6 Morningstar US Energy	0.43	0.56	0.14	0.27	0.45	1.00						
7 Morningstar US Financial Services	0.85	0.83	0.57	0.73	0.67	0.61	1.00					
8 Morningstar US Health	0.79	0.75	0.49	0.56	0.76	0.39	0.68	1.00				
9 Morningstar US Industrials	0.92	0.92	0.57	0.81	0.79	0.53	0.88	0.79	1.00			
10 Morningstar US Real Estate	0.88	0.87	0.62	0.82	0.76	0.32	0.78	0.76	0.86	1.00		
11 Morningstar US Technology	0.92	0.65	0.88	0.86	0.54	0.20	0.64	0.62	0.73	0.74	1.00	
12 Morningstar US Utilities	0.64	0.71	0.44	0.48	0.68	0.44	0.58	0.61	0.69	0.70	0.46	1.00

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

The Morningstar US Energy Index exhibited the lowest correlation with the Morningstar US Market Index over the past three years. The sector had a correlation of 0.79 with the US market at the end of 2021, but it dropped to just 0.37 by the end of 2023 and sat at a still-low 0.43 at the end of 2024. Meanwhile, the utilities sector—the diversification champ among sectors at the end of 2021—saw its correlation with the US market increase from 2022-24.

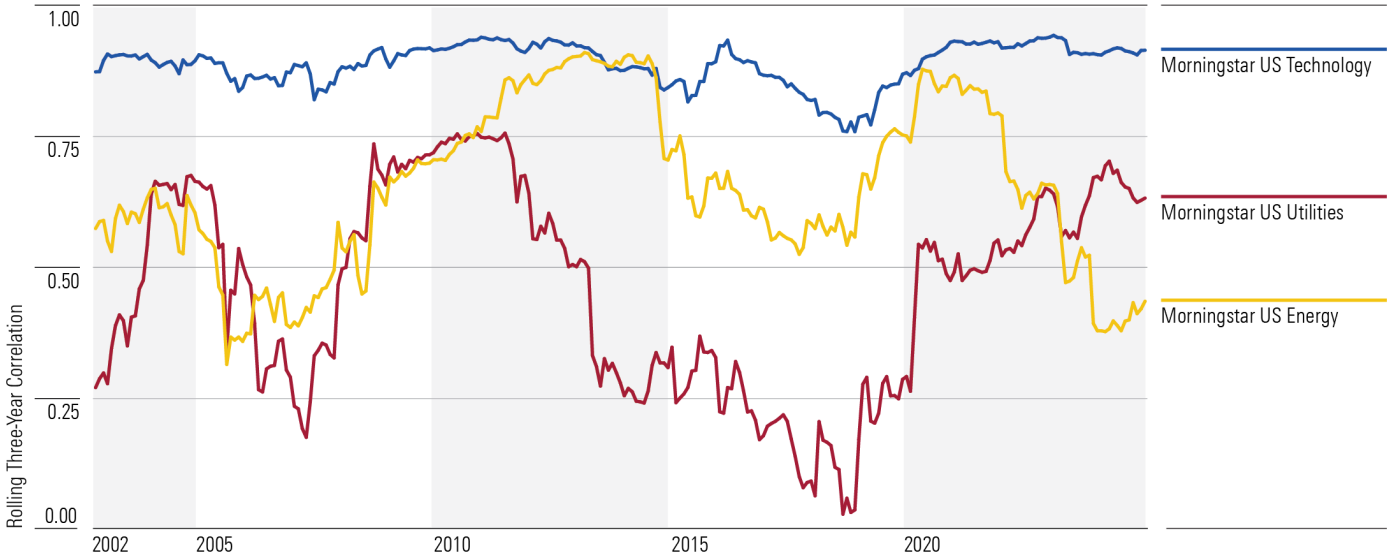
On the flip side, the technology sector has been a notably weak diversifier for investors who already have broad US market exposure. That's not too surprising when you consider that tech stocks consume 30% of the Morningstar US Market Index. Moreover, technology sector indexes tend to be dominated by a handful of companies. Apple AAPL and Microsoft MSFT, for example, make up 35% of the Morningstar

US Technology Index. Consumer cyclical stocks and industrials have also shown a tight correlation with the broad market.

Longer-Term Trends

Over the past few decades, utilities and energy have been the sectors that have performed most differently from the broad US market. From 2022 through 2024, energy stocks decoupled from the broad US market. The consumer defensive sector has also had a somewhat lower correlation with the US market than other sectors. Meanwhile, the technology sector's performance movements have been consistently correlated with those of the broad US market about 90% of the time.

Exhibit 20 Rolling Three-Year Correlations vs. Morningstar US Market Index: Sector Equity



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Some advisors recommend that investors carve out a separate allocation to real estate stocks with an eye toward boosting yield and diversification. The anticipated yield on the Morningstar US Real Estate Index is currently more than double the yield on the Morningstar US Market Index, but the Morningstar US Real Estate Index has been an underwhelming diversifier over long-term periods, with correlations typically hovering around 0.70 and nearly 0.90 recently.

Portfolio Implications

With the exception of utilities and energy, sector-specific indexes have generally exhibited performance that was closely aligned with the broad market. Thus, there doesn't appear to be a strong portfolio construction case for layering on sector-specific exposure in a diversified equity portfolio that also includes exposure to that sector. (Investors may wish to emphasize them for valuation or other factors, but that is a separate issue.)

Utilities have exhibited the lowest correlation with the overall market of any of the sectors over longer time frames. More recently, however, energy stocks have been the best diversifier for a broad US stock portfolio. Both sectors have significantly underperformed the US market over the past 10- and 15-year periods, however. (The Morningstar US Energy Index's 15-year return is the lowest of all sectors.)

Factor Indexes

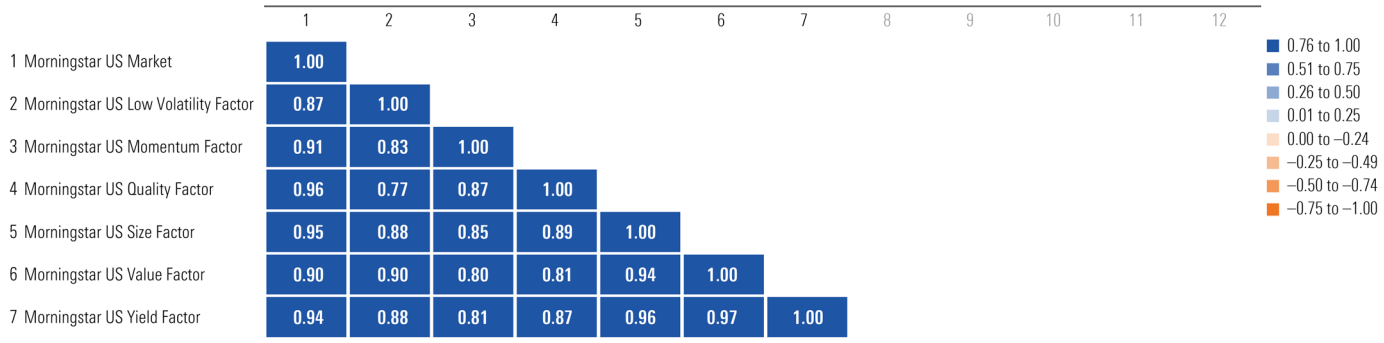
Equity factors are another way of examining the drivers of equity market returns. Since the 1990s, asset managers and other researchers have focused considerable effort on trying to identify additional characteristics (beyond traditional metrics such as sector, market cap, and value/growth) that help to explain investment management styles and resulting performance differences. Theoretically, each factor should have its own set of performance characteristics and succeed or fail in different types of market environments.

Recent Performance Trends

As supporting evidence for this hypothesis, there have been some sharp divergences in performance based on equity factors in recent years. In 2024, for example, the Morningstar US Momentum Factor Index fared best by a wide margin, gaining 43.2% for the year. Value stocks, on the other hand, gained just 13.5% for the year. During the 2022 bear market, the low-volatility, value, and yield factors held up significantly better than the overall market, losing about 6% versus a 19% decline for the Morningstar US Market Index

Factor performance in 2023's bullish market followed a different pattern. Quality was the best-performing factor thanks to the market's increasing interest in reliable stocks with high profitability, low leverage, and consistent earnings, as well as solid earnings results for these firms. On the negative side, stocks in the low-volatility factor index fell behind as interest rates continued rising and technology-related stocks returned to favor.

Exhibit 21 Three-Year Correlation Matrix: Factor Indexes



Source: Morningstar Direct. Data as of Dec. 31, 2024.

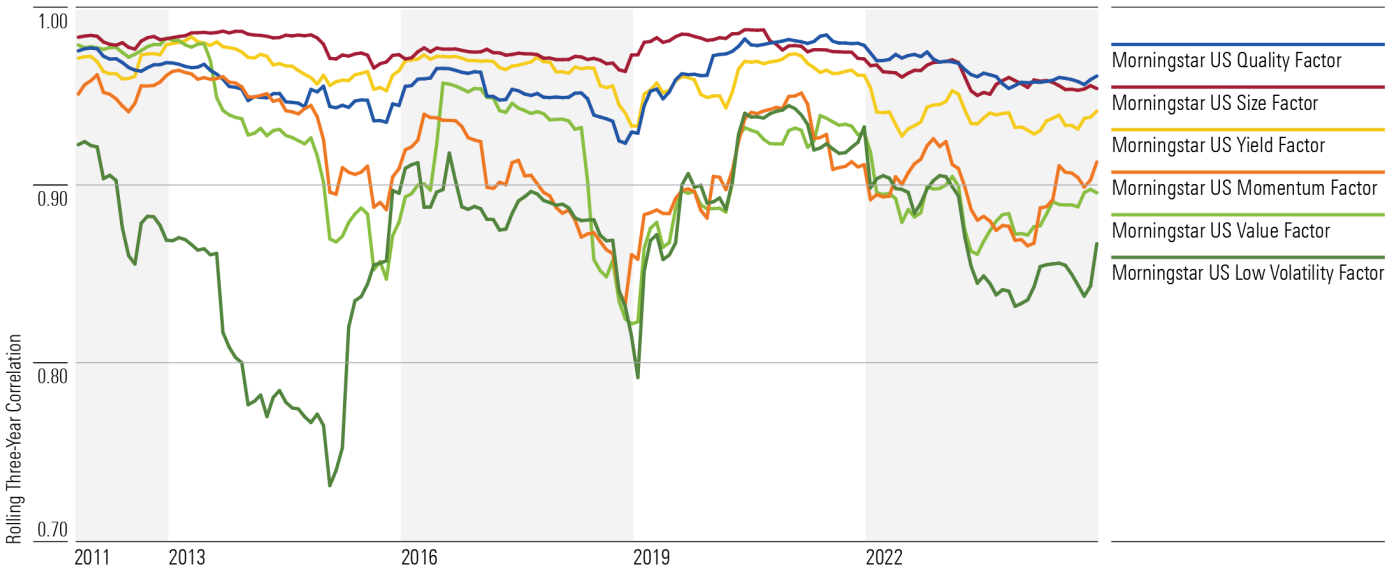
Over the past three years overall, factor correlations landed in a fairly narrow range. The quality factor showed the highest correlation with the broader equity market, followed by the size and yield factors.

Correlations for the momentum, value, and low volatility factors were a bit lower. Across factors, the lowest correlation was between the quality and low-volatility factors.

Longer-Term Trends

Over time, the correlations for all six factor indexes have generally trended up, as shown in Exhibit 22.

Exhibit 22 Rolling Three-Year Correlations vs. Morningstar US Market Index: Factor Indexes



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Factor correlations have recently landed in a slightly lower range (averaging 0.89 for the most recent three-year period, down from a peak of 0.96). Over the long term, though, factor performance has moved more in line with the overall market, and correlations between factor profile benchmarks have also converged. Now that factors are so widely studied and embraced by asset managers, it's likely the case that so many investors are following the same factors that their performance has become less and less discrete.

Portfolio Implications

A general upward trend in correlations has reduced the diversification value of equity factors. The benefits from diversifying a portfolio by factor have generally been modest. The low volatility factor is a partial exception but still sports a relatively high correlation with the overall market. While some investors might attempt to enhance returns by focusing on factors, a factor-based approach to portfolio diversification looks less compelling.

Commodities

Commodities are traditionally defined as raw materials or other basic ingredients used in manufacturing and industrial processes. As basic materials, they are essentially interchangeable with other commodities of the same type. And because their prices mostly depend on the balance of supply and demand, they often show very low correlations with other classes. They can also be a useful hedge against inflation. Commodities themselves are a major part of most inflation indexes, so it makes sense that their prices tend to rise when inflation is increasing. Some commodities also show seasonal price movement, which can affect returns over shorter periods.

Recent Performance Trends

Rising inflation concerns buoyed the performance of many commodities in 2021, while war, spiking interest rates, reinstated lockdowns, and fears of an impending recession complicated matters in 2022. The next year was even more difficult for commodities, which were heavily influenced by geopolitical events, central bank activity, supply-and-demand dynamics, and the fluctuating value of the US dollar. Though the overall outcome differed, such themes continued into 2024—complicated by amplified tensions around petroleum production, fizzling excitement over a green energy transition, and another incredible year for gold. The Bloomberg Commodity Index gained 5.4%% in 2024, while the Morningstar US Market Index returned 24%.

Exhibit 23 Three-Year Correlation Matrix: Commodities

	1	2	3	4	5	6	7	8	9	10	11	12
1 Morningstar US Market	1.00											
2 Bloomberg Commodity	0.24	1.00										
3 Bloomberg Sub Copper	0.37	0.49	1.00									
4 Bloomberg Sub Energy	0.09	0.84	0.06	1.00								
5 Bloomberg Sub WTI Crude Oil	–0.01	0.59	0.07	0.72	1.00							
6 LBMA Gold Price PM	0.16	0.20	0.56	–0.26	–0.12	1.00						

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

The Bloomberg WTI Crude Oil Subindex and Bloomberg Energy Subindex gained roughly 13.8% and 1.2%, respectively, in 2024—a far cry from the losses both indexes suffered the previous year. In 2024, the price of West Texas Intermediate crude oil experienced close to a $2 net gain. Increased production in the US damped price per barrel earlier in the year. But continuing geopolitical conflicts coupled with extended production cuts from the Organization of the Petroleum Exporting Countries, or OPEC, lifted prices in the last quarter of 2024. Energy's unremarkable return masks a fairly volatile year where fluctuating supply-and-demand dynamics flipped monthly returns between gains and losses. However, the year ended with below-average temperatures, which helped the energy index recover losses earlier in the year.

The same or similar factors are at play in the metals world, but they are amplified by an energy transition theme that didn't play out as many expected heading into 2024. The Bloomberg Copper Subindex returned about 5.5%, about 80 basis points more than it did in 2023, after losing nearly 14% in 2022 because of recession fears around the globe and reinstated lockdowns in China. Near- and future-term appetite has been high owing to infrastructure needs and the shift to electric energy sources—copper could benefit from the energy transition, as the metal is a critical component in electric vehicles and alternative energy sources, like wind and solar power. In 2024, copper prices spiked in early May, with the index returning 13.8% in April. However, demand stalled as copper use in China didn't materialize as property markets weakened. Anticipated tariffs levied by the incoming Trump administration further depressed the outlook for copper in later 2024.

The LBMA Gold Price PM Index delivered another strong year, outdoing 2023's 14.6% return with an incredible 25.5% gain in 2024. In 2023, demand from central banks increased as some governments opted to diversify away from the US dollar, in some cases prompted by geopolitical turmoil, such as the war between Russia and Ukraine, heightened tension related to China and Taiwan, and conflict in the Middle East. Other events such as the regional banking crisis early in 2023 and the threat of the US government defaulting on its debt also drove prices higher during the year. Late in the year, the anticipation of impending rate cuts and a weakening US dollar drove gold prices even higher.

These themes continued into 2024, amplified by the backdrop of the US presidential election and the likelihood that Trump would win the election in November. Many anticipated that the Trump administration's policies would increase debt, which would further weaken the dollar and raise inflation, making gold even more attractive as a safe haven asset. Additionally, the administration's plans for tariffs further strained geopolitical tensions.

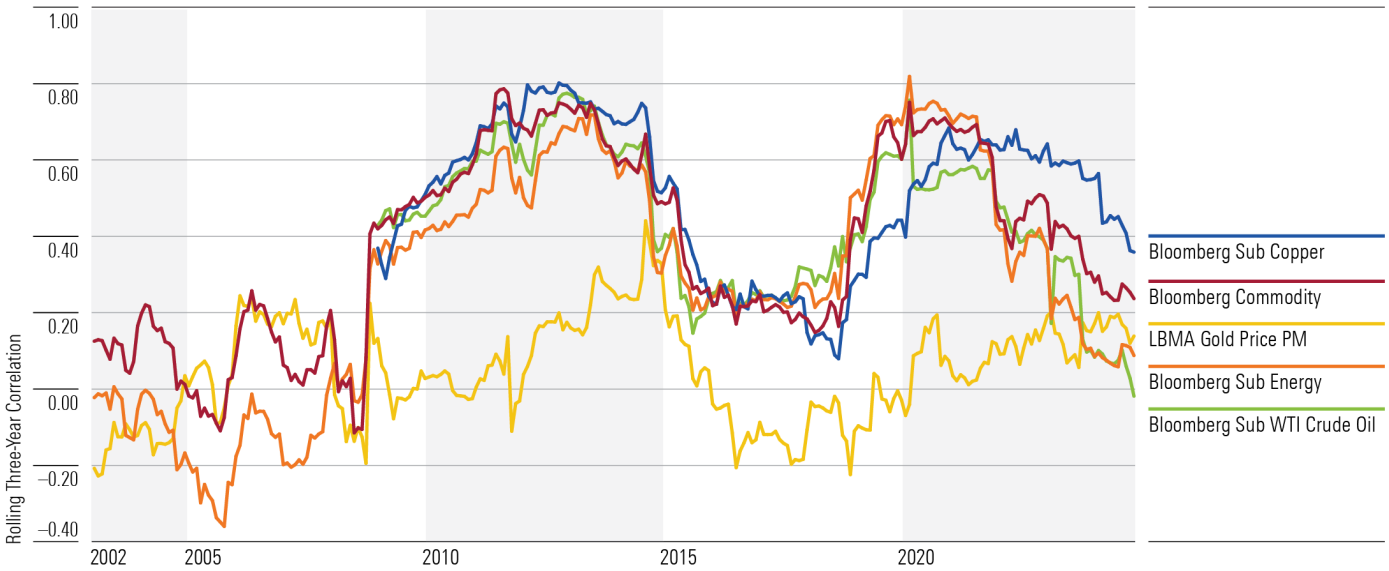
Longer-Term Trends

The Bloomberg Commodity Index's trailing three-year correlation versus the Morningstar US Market Index was 0.24 as of December 2024, which was lower than it was in 2023. During 2021, the index's rolling three-year correlation was markedly higher, starting at 0.70 in January and then coming down to 0.64 by the end of the year, mainly reflecting the impact of the 2020 pandemic panic when commodities correlations spiked. As inflation picked up in 2021, soared in 2022, and persisted in 2023 and 2024, correlations began to fall to more historically typical levels, then below.

The trailing three-year correlations for energy and oil also decreased in 2024. The energy index's figure sat at 0.09—slightly less than one year prior—while oil's number dropped to negative 0.01 from 0.10. These figures are both dramatically lower than they were at the end of 2022, when both index's three-year correlation coefficient to the Morningstar US Market Index was around 0.4. For both indexes, the rolling three-year correlations hovered well above their historic averages in 2021, whereas the 2022 through 2024 numbers were lower. Copper's average three-year rolling correlation over the past decade was 0.43. Correlations remained elevated in 2023, but copper's correlation to broader equity markets came down in 2024, decreasing to 0.36 at the end of the year.

Although the trailing three-year correlation for gold was 0.14 in 2024, which was more than 4 times the average over the past decade (roughly 0.03), gold remains generally the most weakly correlated of the five commodities indexes studied here. In fact, gold had the lowest correlation of any major asset class—excluding cash and 10-year-plus Treasuries—over the trailing periods depicted in the Appendix (see Exhibits A2 through A7).

Exhibit 24 Rolling Three-Year Correlations vs. Morningstar US Market Index: Commodities



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Commodities have served as a strong hedge versus inflation, but the degree to which this may remain the case is uncertain. Several factors—such as complex market dynamics, ongoing supply-and-demand disruptions, political and regulatory factors (negative sentiment toward mining is on the rise, for example), and environmental concerns (mining sites are increasingly more difficult to access)—can at times undermine return expectations. It seems likely that such complicating factors will persist.

Portfolio Implications

Given their low correlations with most other asset classes, commodities often stand out as portfolio diversifiers, particularly during bouts of extreme market stress. While long-term returns relative to other broad asset classes haven't been that compelling, commodities can excel during certain market environments. Notably, gold should continue to fill a valuable role as a buffer against equity market volatility. It is also worth noting that the way investors gain access to commodities (for example, via mutual funds, exchange-traded funds, or futures contracts; and the kind of commodity/commodities held) plays a major role in the potential outcomes. Roll yield and implementation decisions can all have a significant impact on results.

Alternatives

Alternative strategies, as the name suggests, offer something fundamentally different from mainstream asset classes. Morningstar defines these strategies based on their ability to modify, diversify, or eliminate traditional market risks. There is considerable variation between strategies, though, and identifying appropriate benchmarks is tough. For that reason, we used Morningstar's fund categories as proxies for the most common strategies rather than market indexes.

Alternatives classified as diversifiers include the equity market-neutral, event-driven, multistrategy, and relative value arbitrage Morningstar Categories. These incorporate various traditional market risk factors found in equities, alongside nontraditional or alternative risk factors, or betas, to offer a more diversified source of long-term returns. Nontraditional betas include factors such as carry, momentum, and trend, but because these are combined with residual traditional risk factors, they are still exposed to losses during market crashes. The most common strategies in this group—equity market-neutral, event-driven, and relative value arbitrage—typically have less sensitivity to moves in equities markets. And even if those strategies move in the same direction as equities, the magnitude is typically much more muted. In all three cases, portfolio managers tend to trade securities, both long and short, against each other rather than trading against the overall market.

Strategies defined as opportunistic (macro trading and systematic trading) generally focus on absolute returns, meaning they aim for positive returns in all markets and focus more on capital preservation. Managers of these strategies move in and out of long and short positions as opportunities arise. Opportunistic funds tend to lose less in drawdowns but also come with more complexity. Sometimes these managers bet the market will continue moving in the same direction, sometimes they wager it won't, and they often switch or hedge their bets. Market expectations can frequently get caught out of step, so they often use sophisticated risk-management systems to manage their myriad exposures.

Some alternatives are classified as modifiers, which are more correlated with typical risk factors like that of equities but use shorting and/or derivatives to temper losses in struggling markets. Modifiers include categories like equity hedged and long-short equity. Equity-hedged strategies use a variety of measures to protect the value of equity exposure during times of market weakness. Long-short equity strategies hold sizable stakes in both long and short positions in equities, exchange-traded funds, and related derivatives. Such strategies shift their exposure to long and short positions depending on the opportunities they uncover through bottom-up research. Both equity hedged and long-short equity strategies lower an overall portfolio's equity beta (although not to the same degree as diversifiers and opportunistic strategies). So, while these two categories don't officially reside among other alternative category groups, in some contexts, it's fair to consider them alternatives approaches.

Recent Performance Trends

As the Morningstar US Market Index rose 24% in 2024, unsurprisingly, the categories with the strongest link to stocks fared the best with respect to returns—equity hedged and long-short equity returned 11.7% and 12%, respectively, with trailing three-year correlations of 0.99 and 0.96. The diversifier and opportunistic categories delivered returns ranging between 1.4% to 9.1%. Trailing three-year correlations

among those categories varied between 0.83 and negative 0.39. The category with the weakest link to equities, systematic trend, posted the weakest returns in 2024. The relative value arbitrage, multistrategy, and event-driven categories all had medium to high correlations to the market and returned between 3.9% and 9.1% in 2024. Despite event-driven's 0.79 correlation to the US equity market, a challenging regulatory environment depressed mergers and acquisitions activity, considerably narrowing event-driven strategies' opportunity sets. Equity market-neutral, which has a near-zero correlation, returned 9%. Strategies in this category are meant to perform independently of the market. What might evoke some surprise is that the macro-trading category returned only 6% in 2024 and only 2% in 2023, despite that category's correlation to equity markets decreasing over 2024. This was due to its low equity and bond beta—an important consideration when assessing and understanding alternative categories' performances.

Exhibit 25 Three-Year Correlation Matrix: Alternatives

	1	2	3	4	5	6	7	8	9	10	11	12
1 Morningstar US Market	1.00											
2 US Fund Equity Hedged	0.99	1.00										
3 US Fund Equity Market Neutral	–0.07	–0.07	1.00									
4 US Fund Event Driven	0.79	0.77	0.08	1.00								
5 US Fund Long-Short Equity	0.96	0.95	0.11	0.82	1.00							
6 US Fund Macro Trading	0.64	0.60	0.21	0.57	0.69	1.00						
7 US Fund Multistrategy	0.83	0.81	0.25	0.78	0.90	0.87	1.00					
8 US Fund Relative Value Arbitrage	0.76	0.75	–0.03	0.77	0.76	0.64	0.77	1.00				
9 US Fund Systematic Trend	–0.39	–0.45	0.10	–0.34	–0.33	0.28	–0.05	–0.27	1.00			

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

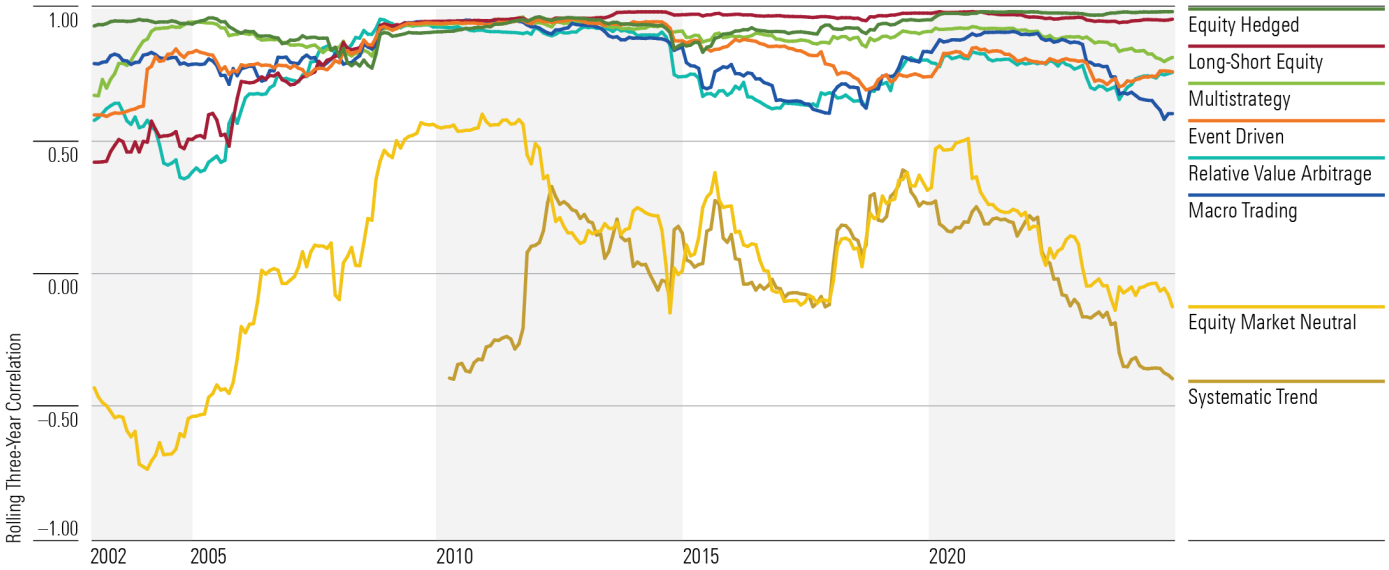
Correlation figures tell us how directionally aligned these alternative categories' returns are with the equity market's returns but do not convey the magnitude of their performance. Thus, it's also helpful to consider their respective betas (computed versus the Morningstar US Market Index), which provide insight into alternatives' degree of sensitivity to equity movements. The nontraditional equity and alternatives categories exhibited three-year trailing equity betas between positive 0.54 and negative 0.22, with the six alternative categories measuring below 0.26—meaning only 26% of their returns could be attributed to moves in the equity markets. With the macro-trading category, for example, based on correlations alone, investors might have expected the category to move in the same direction as equity markets but not to the small degree in which that was the case. By factoring in the equity beta of 0.12, the category's showing in 2024 versus in 2023 makes more sense.

Longer-Term Trends

Over longer periods, correlations have been relatively stable for most categories, but some differences have arisen. In 2024, the three-year correlations for the macro-trading, equity market-neutral, and

systematic trend categories decreased the most, with the latter two shifting deeper into negative territory. Relative value arbitrage and event-driven became slightly more correlated to stock markets, while the equity-hedged, long-short equity, and multistrategy categories' correlations were flatter relative to the equity market. Similarly, the three-year equity betas came down or were roughly flat over 2024. Longer-term, for all but equity hedged, the categories' equity betas were below their respective 10-year average rolling figures. Systematic trend's rolling three-year beta decreased the most through 2024 and differed from its 10-year average by the greatest margin.

Exhibit 26 Rolling Three-Year Correlations vs. Morningstar US Market Index: Alternatives



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Portfolio Implications

Investors seek out alternative strategies for a multitude of reasons, such as reducing drawdowns, seeking a wider range of risk factors or asset classes, or more portfolio stability. In other words, they're not primarily viewed as return generators in bullish markets. Given alternatives' primary purpose to complement and diversify an overall portfolio, it shouldn't come as a surprise that in seven out of the past 10 calendar years, all six alternative categories and the two nontraditional equity categories underperformed the Morningstar US Market Index, often by substantial margins. The benefit of alternatives becomes more evident when one considers intense market selloffs, such as the fourth quarter of 2018, the first quarter of 2020, and the first half of 2022's market correction. The lower equity sensitivity translates into more modest losses during equity market drawdowns and in some cases even positive returns.

From a portfolio construction perspective, though, investors must remember that exceptionally low betas have a major impact on portfolio performance even when correlations seem high. Despite trailing US

equities by a wide margin over the past decade, a 20% allocation to several of the diversifier or opportunistic alternative categories would have improved or matched risk-adjusted returns versus an all-equity portfolio or a balanced portfolio. The strategies with the lowest 10-year equity betas—systematic trend, equity market-neutral, and relative value arbitrage—most improved the portfolio's Sharpe ratio.

Private Investments

In contrast to most securities, which are typically traded on an exchange and valued according to rules established by the SEC, private investments involve supplying funds to a business for a dedicated period of time with the hope of (but no guarantee of) enticing future cash flows. In the case of venture capital, it means providing resources for the incubation and development of an idea into a durable business; the probability of failure is high but so, too, are the potential returns. Private equity typically refers to a more developed version of venture capital, where early-stage investment in a company that eventually goes through an initial public offering on a stock exchange may result in attractive upside. Private credit is when investors loan directly to companies that want to avoid the broader capital markets, typically for more favorable covenants than would be available otherwise. Leveraged buyouts, real estate, and real assets also exist under the umbrella of private investments.

And as varied as these private investments are, they share a number of structural characteristics. The first is illiquidity. Once an investment is made, those assets are committed for a significant period of time (often years) before the expectation of a return, in theory giving the management team the space that it needs to make a go of the endeavor. The second is a high barrier to entry for investors, a result of large commitment minimums and high fees relative to those of marketable public securities. The third is complex reporting. Private investments rely heavily on discretion when valuing assets, particularly in the early years when there isn't a market precedent. An industry standard for private-company valuation is an internal rate of return. A benefit of IRRs is that they account for the time value of money—a key consideration given the longer horizons and the illiquid nature of private investing. However, there are limitations: IRRs are calculated on a delay and can be easily manipulated, rather than the clear-cut performance numbers easily derived for securities that must transparently mark to market daily.

As a whole, these defining structural characteristics mean that private investments aren't scrutinized publicly and on a periodic schedule. Instead, they take advantage of built-in patience to give the investments the greatest probability of success. As a result, the pace and magnitude of returns differ from marketable public securities, which contributes to a perception of portfolio diversification. But in practice, many of these private investments are simply leveraged versions of public equity and fixed-income market dynamics.

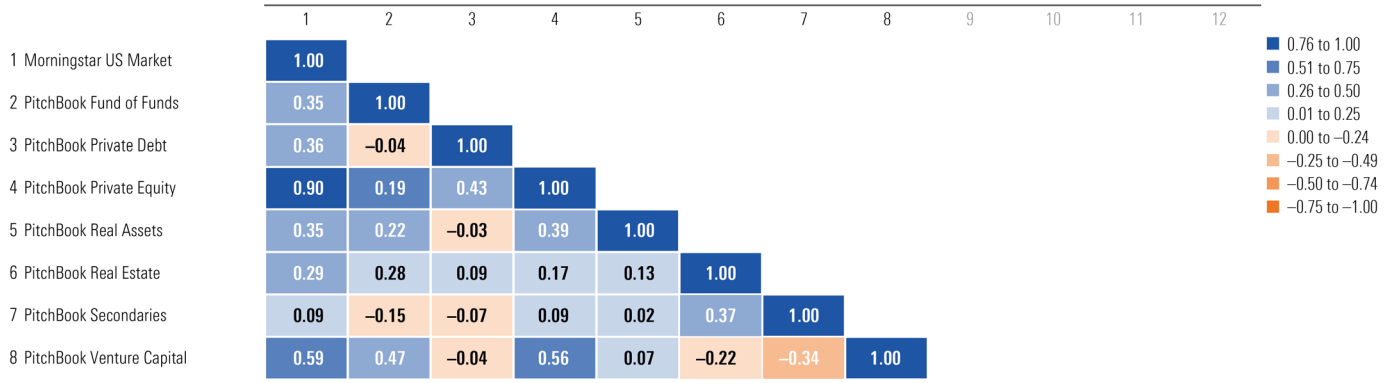
Recent Performance Trends

The quarterly IRRs reported by Morningstar's PitchBook subsidiary represent the general experience of each of these private investment sectors; other indexes cited represent quarterly total returns.

In the wake of the pandemic panic (first quarter of 2020), when the Morningstar US Market Index lost 20.6%, venture capital, private equity, and secondaries (a type of investment that purchases an existing

interest in a company from a private equity company) also suffered losses but at a much more modest level. Aided by their illiquid structures and delayed reporting, these results don't as easily reflect of-the-moment market temperament in pricing. Still, as markets roared in 2021, the same investment sectors benefited from the accompanying euphoria and rock-bottom financing rates. The next two years posed more complicated dynamics for private markets: Rising interest rates, geopolitical tensions, and the banking crisis early in 2023, for example, hindered activity for some private investments and created opportunities for others. Since early 2023, the rolling one-year horizon IRRs rose modestly and have been relatively flat for all seven categories since. Relative to one another, the private investment septet has settled into a narrower range of rolling one-year IRRs after more than four years of heightened dispersion.

Exhibit 27 Three-Year Correlation Matrix: Private Investments



Source: PitchBook and Morningstar Direct. Correlations are based on adjusted quarterly returns of the PitchBook Private Capital Indexes and quarterly total returns of the Morningstar US Market Index. Data as of June 30, 2024.

Weaker growth and higher interest rates ate into private equity's returns in 2022 and 2023, as the cost of capital and leverage increased, and market uncertainty slowed deal-making. The difficult exit environment meant that many private equity firms held on to investments that they would have otherwise sold off, slowing the flow of cash out and then back into the private capital market as investors were unwilling or unable to commit more capital. The environment improved in 2024 with relatively lower borrowing costs, narrower spreads between buyers' and sellers' valuations, and improved deal-making conditions. However, optimism reflected in the higher deal count and total value in the last year warrants tempering. The environment of the previous two calendar years set a low bar for 2024 to overcome. Also, various factors—like climbing federal government interest-rate payments amid deficit spending, potentially higher-for-longer interest rates, and the potential for tariffs to renew inflation's hold on worldwide economies—conjure a more uncertain macroenvironment that could challenge both private and public equity markets.

In 2023, the regional baking crisis intensified banks' reluctance to lend in the rising-rate environment, which widened private debt's opportunity set. As the supply of credit lines from banks slowed but demand remained high, as did interest rates, private-credit yields increased, making for a relatively favorable environment for the asset class. Attractive performance in 2023 and 2024 elicited positive flows to the asset class. Though, as banks become more willing to loan—creating a more competitive

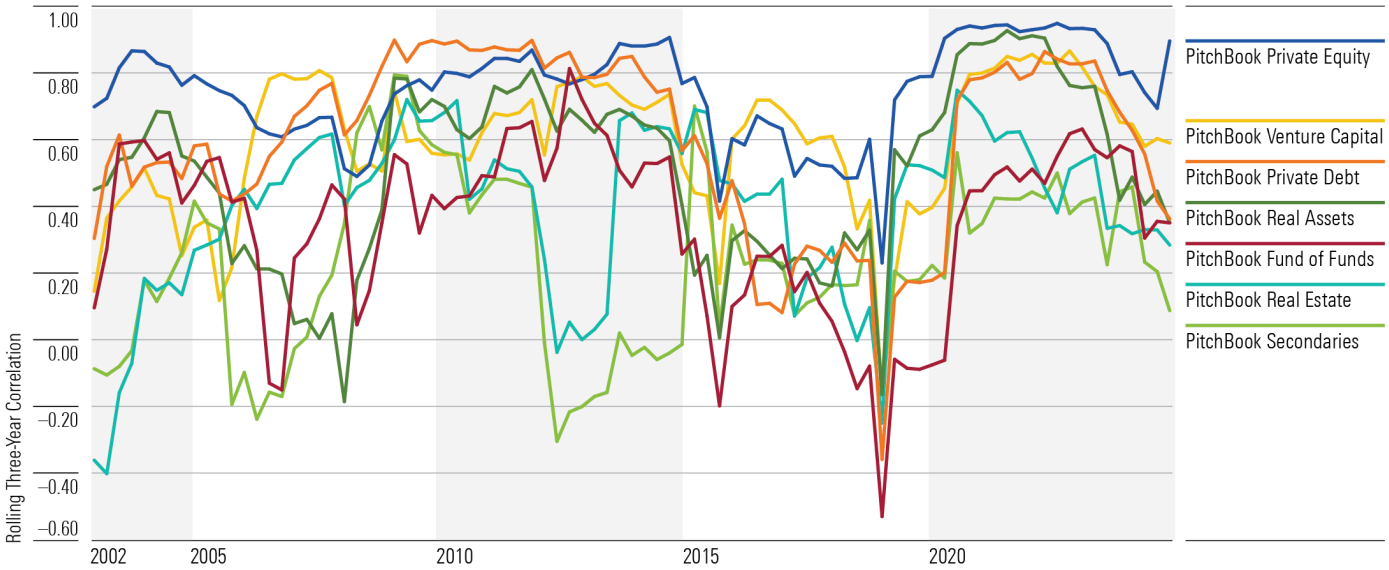
environment for direct lending, a major portion of the private-credit space—and interest rates remain higher for longer—a stressor on recipients of those direct loans—private-credit funds may have challenges up ahead. And if central banks were to cut rates, private credit would look relatively less attractive since such funds mostly use floating-rate loans. Dynamics that can boost or hinder private investments are ample. And while one can say that about any investment option, liquidity constraints and limited transparency make potentially choppy waters even more murky for private investments.

Quarterly returns for private capital indexes (reported by PitchBook) date back to early 2000. Pricing infrequency and variability result in overly smooth results, which can obscure the volatility and correlations of private investments. To account for that, PitchBook also provides adjusted quarterly returns that better capture the investments' volatility, facilitating more representative correlation computations. The pandemic-driven drawdown, ensuing bull market, and then rising interest rates permeated through both public and private markets in the last few years. This resulted in all seven private asset classes considered here exhibiting a higher correlation to the broad public equity market for a stretch. More recently, correlations have been flat or slightly lower for all but private equity as the effect of those shocks settle.

Longer-Term Trends

The rolling three-year correlations between the private investment sectors and the Morningstar US Market Index vary widely and have also shifted dramatically over time. By definition, many of these private sectors are early-stage equities. And relative to other asset classes discussed in this paper, the range of correlations across private investments differs dramatically from quarter to quarter. Rather than reflect reality, these are somewhat products of the structural characteristics of the asset class outlined above.

Exhibit 28 Rolling Three-Year Correlations vs. Morningstar US Market Index: Private Investments



Source: PitchBook and Morningstar Direct. Correlations are based on adjusted quarterly returns of the PitchBook Private Capital Indexes and quarterly total returns of the Morningstar US Market Index. Data as of June 30, 2024.

Still, within private investments, venture capital and private equity are more correlated with marketable equities than private credit, and all three of these typically exhibit higher correlations with publicly traded stocks than real assets and real estate, which are shaped by underlying factors specific to those markets. Secondaries and funds of funds exhibit the lowest long-term average correlations. Those subasset classes are sensitive to the activity of the other private asset classes, so they have a bit more distance from the public markets. However, even with that distance, secondaries' rolling three-year correlation versus the Morningstar US Market Index has ranged from 0.80 to negative 0.31, with an average of 0.23 (measured from early 2000 to mid-2024). On the other end of the spectrum, private equity exhibited a long-term average rolling three-year correlation of 0.76, but that figure has ranged from 0.96 to 0.23, with both ends of the range occurring in the past six years.

Portfolio Implications

Over the long term, the structure of private investments means their cash flows will look different from those of marketable securities, which more swiftly reflect changes in market sentiment in their pricing. This may seem to enhance diversification in a theoretical way, but with such varying correlations across the private-investment landscape and over time, private investments may not provide consistent diversification value. Further, investors who seek private options should remain alert to the risks unique to their underlying investments. Venture capital and private equity, for example, are leveraged and are concentrated equity investments by their very structure. Through longer periods, the potential for those investments is tied to many of the same factors that lift and drag on public equity markets—with amplified risk and return profiles.

While private investments remain a potential source for greater breadth and differentiated (though mostly delayed and leveraged) equitylike return streams, their structure merits caution for individual investors. Without access to the highest-quality endeavors with well-resourced teams to manage those projects, the investment can easily fall apart. This is potentially devastating given that the assets are committed for long periods of time with little recourse if something goes wrong. And while large institutional portfolios with unlimited time horizons and the ability to easily replenish funds may find private investments attractive, an individual investor without those benefits can more practically create diversification with other more liquid and government-regulated asset classes.

Often these offerings are only open to accredited investors, and the high investment minimums are a barrier for many individuals. For investors who are not accredited or don't meet the minimum, there are some other ways to access the private capital market. For example, in the semiliquid space, interval funds and tender offer funds, both of which are closed-end funds under the Investment Act of 1940, can provide access to private investments. Still, though the asset class has garnered more attention of late, thorough due diligence should be exercised to understand the risks before wading into these new waters.

Cryptocurrency

After spending its first decade or so of life as more of a fringe asset class, cryptocurrency started gaining more institutional acceptance in 2020 and 2021. In January 2024, the SEC approved 11 spot bitcoin ETFs, which made cryptocurrency investing more accessible to retail investors and strengthened its credibility as a legitimate asset class. As a result, the value of assets invested in cryptocurrency globally totaled about $2.9 trillion globally as of February 2025. Bitcoin, the oldest and most established cryptocurrency, still accounts for most of the investor interest and assets, but numerous digital currencies have also attracted more attention from both retail and institutional investors over the past couple of years.

Interest in crypto was driven by several factors, including spectacular long-term returns since bitcoin was first minted in early 2009. Bitcoin remains the top-performing asset class over the past decade and has compounded returns at nearly 80% per year over the trailing 10-year period through February 2025. Other key drivers include distrust of national governments and traditional financial institutions, fears that resurgent inflation could be more than transitory, and excitement about the technological potential of digital payments and other innovations related to cryptocurrency, such as blockchain; decentralized finance, or DeFi; and nonfungible tokens, or NFTs. As an asset that exists purely in digital form, cryptocurrency is fundamentally different from other major asset classes.

Recent Performance Trends

However, crypto's potential diversification value has been overshadowed by its extreme performance swings, which have been on full display in recent years. As risk assets continued to rally during most of 2024, the MarketVector Bitcoin Index posted a 122.4% gain for the year, and the MarketVector Ethereum Index gained 47.7%%. Those returns followed on the heels of even better returns in 2023 as digital assets staged a strong rebound from their sharp losses in 2022. As the market sold off risky assets and the high-profile cryptocurrency exchange FTX collapsed, the MarketVector Bitcoin Index dropped about 65% for the year and the broader MVIS CryptoCompare Digital Assets 10 Index lost more than 69% of its value. A series of other crises, including the crash of terra, a popular stablecoin that failed to provide any stability, also shook investor confidence in cryptocurrencies in 2022.

Exhibit 29 Three-Year Correlation Matrix: Cryptocurrency

	1	2	3	4	5	6	7	8	9	10	11	12
1 Morningstar US Market	1.00											
2 MarketVector Bitcoin PR	0.59	1.00										
3 MarketVector DA 10 PR	0.65	0.94	1.00									
4 MarketVector DA 25 PR	0.65	0.91	0.99	1.00								
5 MarketVector Ethereum PR	0.67	0.89	0.95	0.91	1.00							

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

Crypto's performance over the previous few years showed similar performance swings. For example, the MarketVector Bitcoin Index dropped 72.3% in 2018, followed by cumulative gains of more than 1,000% from 2019 through 2021.

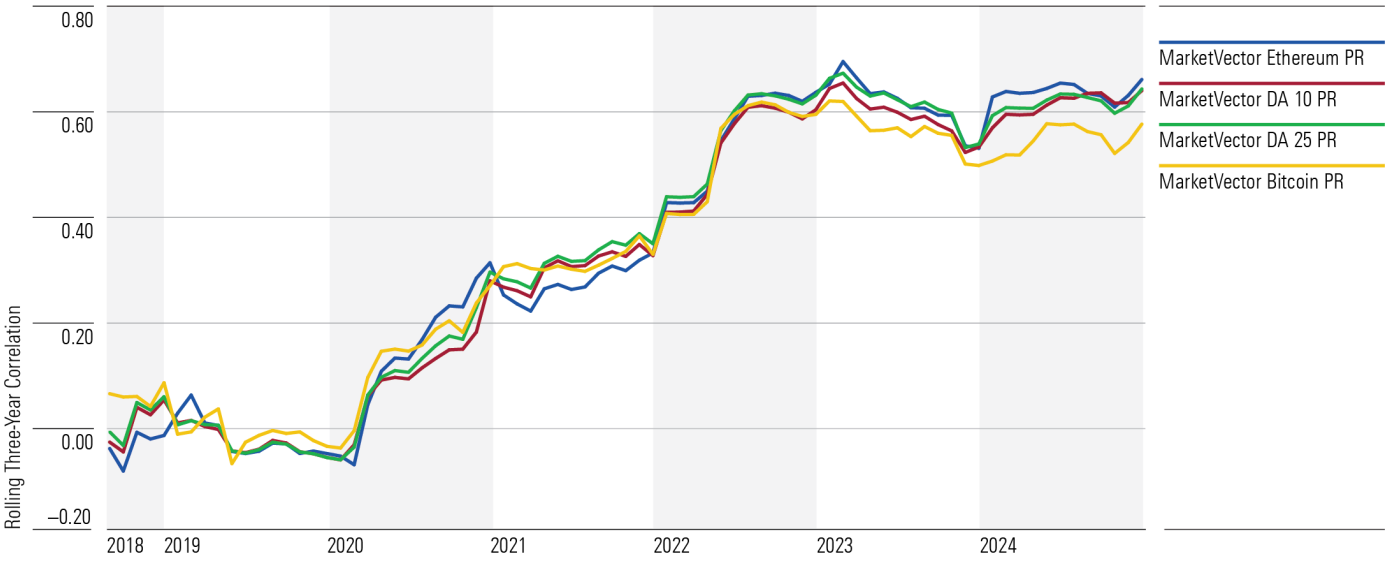
These dramatic ups and downs underscore some of the limits of correlation metrics. Correlations often spike during periods of market crisis, and low correlations don't guarantee that a given asset class will hold up better during market drawdowns.

Indeed, while cryptocurrency has continued to show a relatively low correlation with most major asset classes, correlations have been trending significantly higher. For the trailing three-year period ended in 2024, the MarketVector Bitcoin Index had a correlation coefficient of just 0.58 with stocks (as measured by the Morningstar US Market Index), but that was up from correlation numbers near zero (or even below zero) in some previous periods. While the cryptocurrency market isn't monolithic, cross-correlations between major cryptocurrencies have been higher than each crypto asset's link with stocks. Over the trailing three-year period, for example, the cross-correlation between the MarketVector Bitcoin and MarketVector Ethereum indexes stood at 0.89.

Longer-Term Trends

The recent increase in cryptocurrency correlations continues a longer-term trend. As cryptocurrency has moved more into the mainstream, its correlation with other major asset classes has trended up over time, as shown in Exhibit 30. Bitcoin's correlation with the Morningstar US Market Index has been as low as negative 0.06 for some previous periods but has gradually increased over the past few years. Ether and other major cryptocurrencies have shown similar patterns. Although current correlation numbers are still quite low compared with those of other major asset classes, cryptocurrency's low correlation with traditional asset classes may be a bit of a false flag because of its tendency to spike during market corrections.

Exhibit 30 Rolling Three-Year Correlations vs. Morningstar US Market Index: Cryptocurrency



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Portfolio Implications

Diversification value is one potential reason to add cryptocurrency to a portfolio, but investors should also consider other factors, such as their ability to hold on through crypto's periodic downdrafts. The extreme losses in 2022 are a case in point. Crypto aficionados embracing the "hold on for dear life" mindset have been amply rewarded over time, but investors who are more skittish can easily get whipsawed by extreme short-term price movements.

It's also worth noting that cryptocurrency's volatility profile means that even small doses can have an outsize impact when added to other portfolio holdings. As a result, most investors will want to keep cryptocurrency exposure to a minimum and carve out any allocations from stocks, not bonds.

Leveraged Portfolio Strategies

The two best-performing ETFs in 2024 had gains of 345% and 336%. Both followed the same investment strategy: use leverage to generate twice the daily returns of Magnificent Seven superstar Nvidia Corporation NVDA. Those returns are certainly eye catching, especially compared with the relatively meager 24% return of the S&P 500 in 2024. Leverage can cut both ways, though. Of the 35 ETFs that lost 50% or more in 2024, 33 of them used leverage. Still, the allure of big payoffs has repeatedly drawn investors in, and leveraged portfolios are only gaining in popularity. That doesn't mean they fit into a long-term portfolio, though.

Leveraged portfolios offer investors the opportunity to gain 2 or 3 times the daily return of a wide variety of broad stock and bond indexes, commodities, cryptocurrencies, and individual stocks. There are also inverse versions that make money when the underlying index or asset declines in value. In 2024, 65 new

leveraged ETFs were launched, bringing the total to 552, and assets ballooned to $132 billion, up 30% from the year before.

Unlike other investments discussed in this paper, leveraged ETFs are not designed to be held long term. Most are meant for daily use, as holding them longer can lead to unpredictable performance due to compounding and a phenomenon known as volatility drag. This occurs when daily fluctuations in the underlying index reduce long-term returns—the greater the volatility, the bigger the impact.
For example, imagine investing $100 in two ETFs: one that tracks the S&P 500 and another that seeks to deliver twice its daily return.

If the S&P 500 drops 10% in a day, the standard ETF falls to $90, while the 2-times-leveraged ETF drops 20%, landing at $80. The next day, if the S&P 500 rebounds by 11.1%, the standard ETF gains $9.99, bringing it back to roughly $100. However, the leveraged ETF gains twice the index's return—22.2%—adding $17.76. This brings its total to just $98, still short of the original investment. Depending on the path of the underlying asset's returns, leveraged ETFs can even have a negative return when the underlying asset has a positive return, and vice versa.

Recent Performance Trends

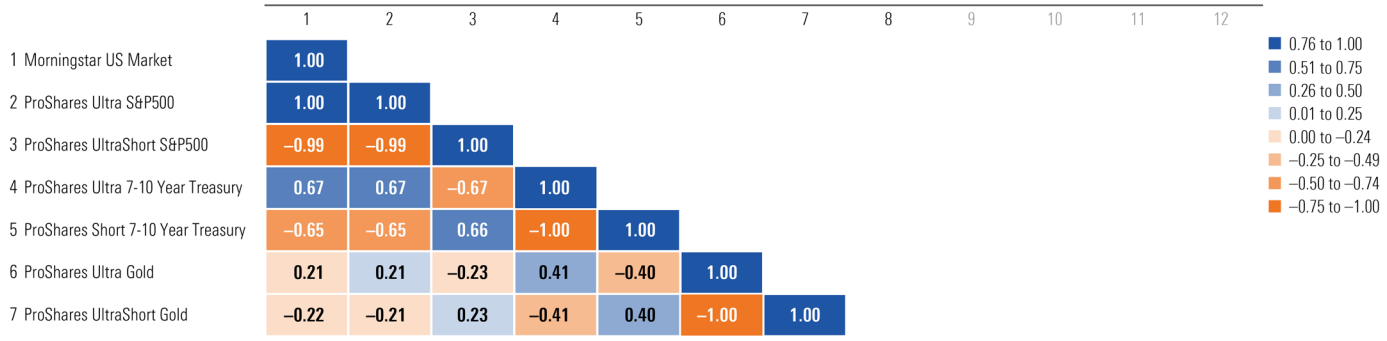
Leveraged portfolios typically come in pairs: one leveraged long version and one short version so investors can take either side of the trade. Performance in 2024 depended on which asset class an investor picked and which side of the trade they were one. This highlights the other, bigger risk, with using leveraged or inverse ETFs regardless of the holding period: predicting returns is difficult.

This section focuses on three asset classes: US large-cap stocks, US Treasuries, and gold. As covered in earlier sections of the paper, the latter two have historically had low correlations to stocks, which makes them good diversification candidates for a portfolio. Since there are no leveraged or inverse indexes, the examples in this section use ETFs as a proxy for these strategies.

In 2024, both US large-cap stocks and gold had positive returns, and the leveraged versions of those asset classes benefited. The ProShares Ultra S&P 500 ETF SSO, which seeks 2 times the daily return of the S&P 500, gained 43% for the year—not quite double the S&P 500's 24% due to daily resetting of the leverage and the volatility drag highlighted above. That's not to say the ETF didn't work as intended and marketed, but it is yet another example of how holding these portfolios for longer than a day can lead to less predictable results. The ProShares Ultra Gold ETF GLL seeks to deliver twice the daily return of gold, and it gained 46% versus the commodity's 25.5% return.

Betting against US Treasuries was also a winning trade in 2024. The ProShares Short 7-10 Year Treasury ETF TBX gained 9% for the year.

Exhibit 31 Three-Year Correlation Matrix: Leveraged Portfolio Strategies



Source: Morningstar Direct. Data as of Dec. 31, 2024. Because there are no indexes available for leveraged and inverse portfolio strategies, we use representative ETFs as proxies for these strategies.

Being on the wrong side of a leveraged or inverse trade can be especially painful. The ProShares UltraShort S&P 500 SDS and ProShares UltraShort Gold GLL lost 29% and 33%, respectively, in 2024. The ProShares Ultra 7-10 Year Treasury ETF UST notched a 7% loss.

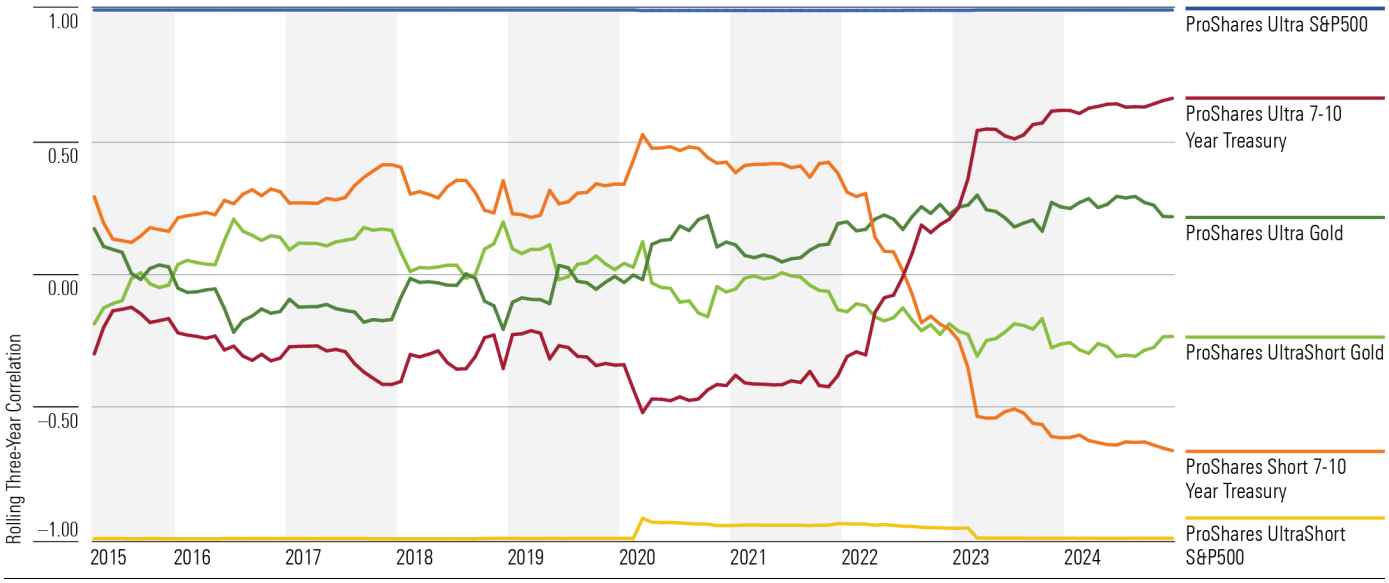
Longer-Term Trends

As highlighted in the Taxable Bonds section, bonds—and by extension leveraged bonds—have become more correlated to stocks as rising interest rates have caused both bonds and higher-priced stocks to sell off at the same time. This breakdown of diversification between stocks and bonds was most pronounced in 2022.

The inverse version of the S&P 500 has consistently had an extremely strong negative correlation to the asset class. Negative correlations can be a signal that an investment would be a good diversifier, but there still needs to be an expectation of a positive return for it to be additive to a portfolio. If an investor's long-term expectations for stocks and bonds are both negative, it might be better to stay in cash than take on that risk. History, of course, says that the longer the holding period for both stocks and bonds the higher the likelihood of a positive return.

The use of leverage or shorting doesn't have much of an impact on the diversification benefits of gold. But getting the timing right is still the biggest hurdle to using those ETFs.

Exhibit 32 Rolling Three-Year Correlations vs. Morningstar US Market Index: Leveraged Portfolio Strategies



Source: Morningstar Direct. Data as of Dec. 31, 2024. Because there are no indexes available for leveraged and inverse portfolio strategies, we use representative ETFs as proxies for these strategies.

Portfolio Implications

Investors should leave leveraged and inverse portfolios to the speculators and day traders. Their daily holding period makes them less predictable when held over longer periods. And although some of the inverse ETFs may appear to have strong diversification benefits, there are more efficient ways to express concerns over the future performance of most major asset classes, like raising cash.

Options-Based Strategies

Strategies that use options to generate income or protect against stock market declines have also become more popular recently. These strategies generally fall in one of two Morningstar Categories: derivative income for those that focus solely on income, and equity hedged for those that use options for protection. Assets in the former category have swelled to more than $111 billion at the end of 2024, up from $7 billion five years ago.

Derivative income strategies sell call options, put options, or both to generate income that's distributed to shareholders. A call option gives the buyer the right to purchase shares at a specific price, and a put option allows the buyer to sell a security at a specified price. Sellers receive a premium for taking the other side of the trade and that's what is distributed to shareholders as income. The trade-off for shareholders is they are giving away potential upside from the equity portfolio.

For example, say a fund owns a stock that's worth $100. If the managers sell a call option on that stock that's 2% above the current price (referred to as out-of-the-money) and the stock price rises to $105, the shareholders make the first $2 of additional return but the remaining $3 of profit go to the owner of the

call option. If the stock doesn't rise above $102 before the call option expires (typically three months), the fund keeps the premium.

Selling puts is less common because it's inherently riskier and with limited upside. A put option allows the owner to buy a security at a set price, and the seller is obligated to honor that deal. Selling a $98 put on our previous $100 stock would net a premium, but if the stock were to fall to $50 before the option expires, that's a loss of $48 less whatever the premium was.

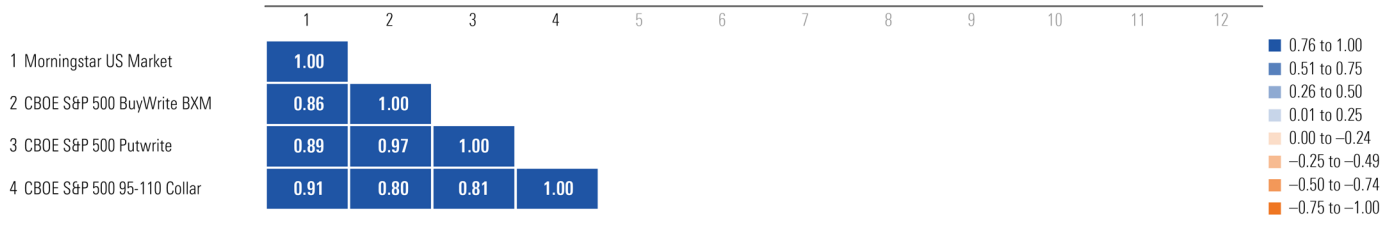
Equity-hedged strategies will typically sell call options to be able to fund buying a put option that protects the portfolio from losses beyond a certain threshold.

An emerging trend is the popularity of buffer ETFs. Buffer ETFs have gained popularity since the 2021 bond bear market, offering downside protection without relying on interest rates. These ETFs use call and put options to define a range of outcomes over a set period—typically limiting losses while capping gains. This structure appeals to risk-averse investors seeking equity exposure with built-in buffers. For example, the iShares Large Cap Moderate Buffer ETF (IVVM) aims to track S&P 500 returns up to a cap—6% in the second quarter of 2025—while shielding the first 5% of losses. Buffer ETFs may reset monthly, quarterly, semiannually, or annually, and must be held through the full term to realize their benefits.

Recent Performance Trends

Options allow investors to get exposure to a security with less upfront money than buying the security outright. When interest rates are higher, this makes buying a call option more attractive since the remainder of the security's price can sit in cash-earning interest. Therefore, it's more lucrative for derivative income strategies to sell call options when rates are higher than lower. That's helped these strategies generate higher income since 2022 when the Federal Reserve started making a series of interest-rate hikes. However, selling call options caps the upside potential for a stock portfolio, and in a strong bull market, like 2023 and 2024, that will cause these strategies to lag market-cap-weighted benchmarks.

Exhibit 33 Three-Year Correlation Matrix: Options-Based Strategies



Source: Morningstar Direct. Data as of Dec. 31, 2024. Because there are no indexes available for leveraged and inverse portfolio strategies, we use representative ETFs as proxies for these strategies.

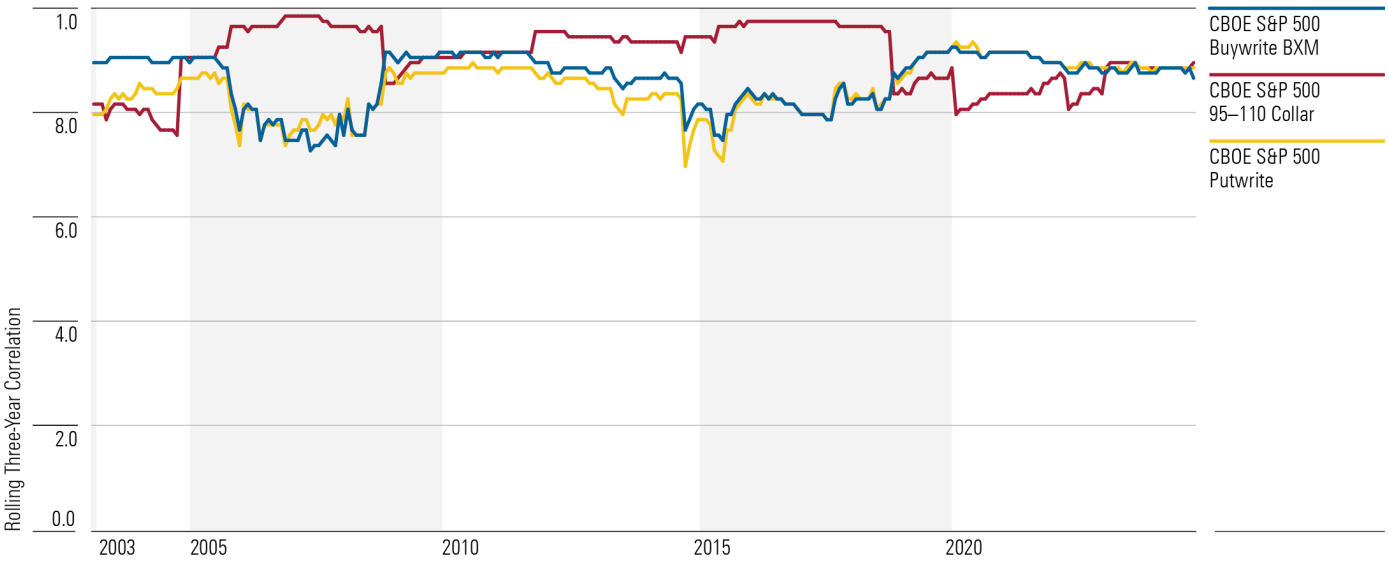
In 2024, the CBOE S&P 500 BuyWrite Index, which replicates selling call options on stocks on the S&P 500, gained 20%, slightly behind the S&P 500's 25% return. The CBOE S&P 500 PutWrite Index gained 18% (put prices tend to decline when interest rates are high, and volatility is low).

Funds in the equity-hedge category will typically sell a call option and use the premiums to fund the purchase of a put option. These collar-strategies cap both the upside of a portfolio and the downside. The CBOE S&P 500 95-110 Collar Index replicates selling call options at 110% of the index's value and buying puts that protect against declines of more than 5%. In 2024, the index gained 21%.

Longer-Term Trends

The performance of options-based strategies is directionally similar to the broader stock market (or whichever universe they use as the foundation of the strategy). The rolling three-year correlations of options-based strategies has been consistently high over the long term. Options can help generate income or define a range of outcomes, but over longer periods their fortunes will follow the underlying asset.

Exhibit 34 Rolling Three-Year Correlations vs. Morningstar US Market Index: Options-Based Strategies



Source: Morningstar Direct. Data as of Dec. 31, 2024. Because there are no indexes available for leveraged and inverse portfolio strategies, we use representative ETFs as proxies for these strategies.

They aren't perfectly correlated though. In bull markets, selling call options will generally lead to lower returns, and in bear markets these strategies may hold up slightly better due to the option premium. For an extreme example, investors can turn to financial crisis. Between 2007 and 2009, the maximum drawdown of the CBOE S&P 500 BuyWrite Index declined 35% while the S&P 500 fell 50%. During the bull market that ranged from March 2009 through the end of 2024, the BuyWrite index captured 60% of the S&P 500's downside and 56% of its upside.

Portfolio Implications

The high correlations exhibited by options-based strategies dull their appeal as a diversifier. Although they do tend to have attractive downside characteristics, those come at the cost of the potential upside from investing in the asset class. Even with high income distributions, derivative income strategies are likely to underperform their underlying asset class over a full market cycle. For income-focused investors, the distributions are taxed as 60% long-term gains and 40% short-term gains. It would be more tax-efficient to focus on total return strategies and sell shares with long-term gains to generate income.

Conclusion

The rise in correlations across many major asset classes in recent years illustrates the complexity involved in building a diversified portfolio. Not only are correlations constantly shifting, but they often rise during periods of market volatility. As a result, while broad portfolio diversification led to slightly lower losses during 2022, this approach has often failed to add value when compared with an equity-only portfolio or a plain-vanilla mix of stocks and bonds.

The shifting landscape for both interest rates and inflation further complicates matters. After decades of relatively low inflation and generally declining interest rates, both measures have continued showing signs of a fundamental regime change. As a result, the previously ideal conditions for stock/bond correlations are no longer in place, and correlations between stocks and investment-grade bonds have remained positive since 2022. That, in turn, reduces the diversification value of bonds from a portfolio perspective.

The major changes in US tariff policy, which were still in flux as of April 2025, have also added significant uncertainty to the investment landscape. If the "Liberation Day" policies are enacted as originally envisioned, they would fundamentally shift the global economy from one that embraces free trade to a regime of fragmented, adversarial relationships defined by a limited set of economic goals focused on reducing the trade deficit and protecting US industry. This regime change has the potential to upend many previously established performance patterns.

Even so, the basic arguments in favor of diversification still hold. Even as stock/bond correlations have moved higher, they're still low in absolute terms. And our analysis of previous stress periods for inflation and interest rates suggests that stock/bond correlations have rarely increased above 0.60, and then only during the most acute periods of rising rates and/or inflation. That means the diversification case for adding bonds to a portfolio remains intact, even if some conditions for fixed-income holdings are less favorable than in the past.

In addition, as Exhibit A1 (on the following page) illustrates, asset classes that are winners in one year often sink to the bottom in later years. Holding a variety of asset classes helps guard against being overly exposed to an area that falls out of favor. As discussed above, asset classes with lower correlation coefficients can also reduce a portfolio's risk profile. Finally, holding a diversified portfolio helps investors expand the opportunity set and ensure they do not miss out on areas that can enhance long-term returns, such as international stocks.

Note: One of the authors has ownership positions in the following securities mentioned in this report: AAPL and MSFT.

Appendix

Exhibit A1 Asset-Class Winners and Losers (Annual Total Return %)

2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
35.98	123.54	1,367.43	1.82	94.28	305.37	58.58	16.09	156.62	122.39
1.73	20.25	35.97	0.13	31.22	24.61	41.06	1.54	26.43	25.53
0.69	17.46	25.54	–0.93	28.53	20.90	27.11	0.44	20.59	24.09
0.62	12.44	21.47	–1.94	25.96	18.77	25.78	–11.09	17.91	10.84
0.02	11.77	15.03	–2.27	23.45	17.78	16.25	–12.96	14.59	8.20
–1.41	11.35	12.66	–3.61	18.56	16.41	12.71	–14.79	13.48	7.41
–1.57	8.30	8.88	–5.05	18.43	8.97	5.24	–17.93	11.92	5.38
–4.44	8.10	8.06	–11.25	14.97	7.50	0.04	–18.46	11.33	5.35
–4.88	3.40	7.30	–12.11	14.33	7.03	–0.02	–19.43	5.31	4.93
–12.11	2.55	3.40	–13.16	8.65	0.54	–1.61	–25.21	5.17	4.75
–13.26	1.41	1.70	–13.93	7.69	–3.12	–4.33	–29.44	2.58	1.36
–24.66	0.22	0.81	–74.00	2.22	–4.69	–4.68	–63.96	–7.91	–6.19

U.S. Stock
- Morningstar US Market
- Morningstar US Small Cap
- Morningstar US REIT

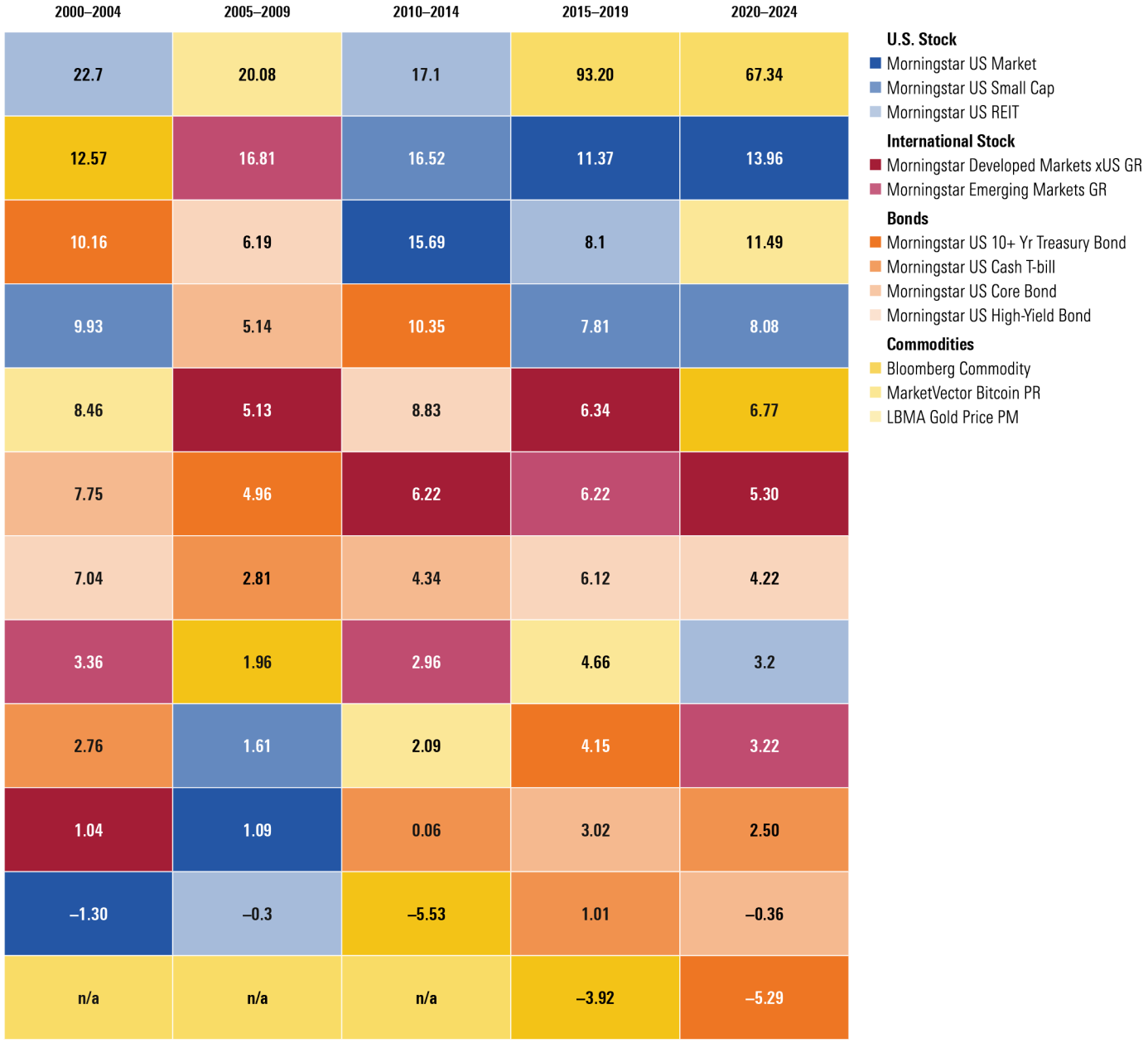
International Stock
- Morningstar Developed Markets xUS GR
- Morningstar Emerging Markets GR

Bonds
- Morningstar US 10+ Yr Treasury Bond
- Morningstar US Cash T-bill
- Morningstar US Core Bond
- Morningstar US High-Yield Bond

Commodities
- Bloomberg Commodity
- MarketVector Bitcoin PR
- LBMA Gold Price PM

Source: Morningstar Direct. Data as of Dec. 31, 2024. All indexes shown are Morningstar benchmarks based on total returns in US dollars unless otherwise noted.

Exhibit A2 Asset-Class Winners and Losers (Annualized 5-Year Return %)



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Exhibit A3 Average Correlation vs US Stocks in Different Macro Environments

	Inflation %		Interest Rate %		Economic Growth %	
	High	Low	Rising	Falling	Weak	Strong
Morningstar US Market	1.00	1.00	1.00	1.00	1.00	1.00
Bloomberg Commodity	0.09	0.35	0.29	0.17	0.20	0.25
LBMA Gold Price PM	–0.06	–0.30	0.01	–0.08	0.09	0.05
MarketVector Bitcoin PR	0.58	0.65	0.30	0.59	n/a	0.28
Morningstar DM xUS GR	0.62	0.92	0.64	0.64	0.73	0.69
Morningstar EM GR	0.71	0.74	0.50	0.72	0.81	0.65
Morningstar US 10+ Yr Treasury	0.14	–0.03	0.39	0.06	0.26	–0.02
Morningstar US Cash T-bill	–0.13	0.31	0.19	–0.02	–0.01	–0.05
Morningstar US Core Bond	0.19	0.14	0.44	0.19	0.28	0.08
Morningstar US HY Bond	0.68	0.67	0.73	0.62	0.68	0.62
Morningstar US REIT	0.79	0.59	0.61	0.62	0.76	0.57
Morningstar US Small	0.87	0.91	0.86	0.83	0.92	0.81

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

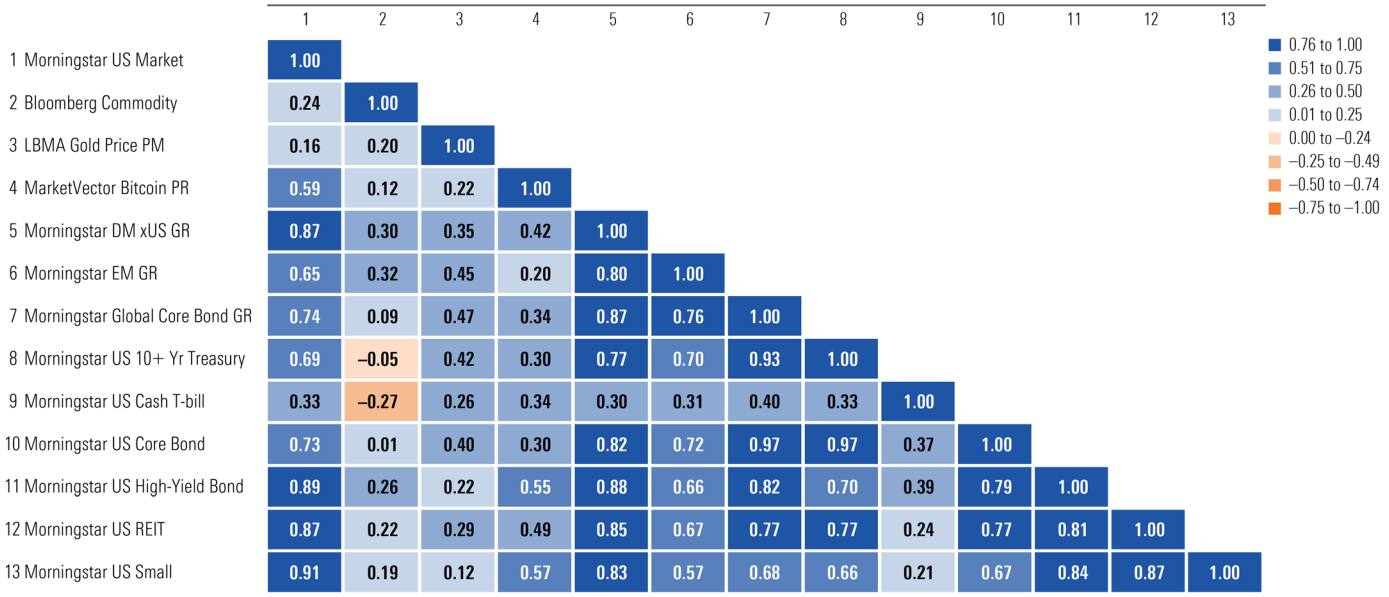
Exhibit A4 Correlation Matrix: One Year

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Morningstar US Market	1.00												
2 Bloomberg Commodity	–0.12	1.00											
3 LBMA Gold Price PM	–0.22	0.30	1.00										
4 MarketVector Bitcoin PR	0.69	–0.15	–0.27	1.00									
5 Morningstar DM xUS GR	0.60	0.12	0.28	0.23	1.00								
6 Morningstar EM GR	0.21	0.31	0.29	–0.04	0.39	1.00							
7 Morningstar Global Core Bond GR	0.53	0.00	0.24	0.01	0.84	0.42	1.00						
8 Morningstar US 10+ Yr Treasury	0.72	–0.05	0.12	0.16	0.79	0.34	0.94	1.00					
9 Morningstar US Cash T-bill	0.20	0.15	0.49	–0.26	0.76	0.24	0.59	0.50	1.00				
10 Morningstar US Core Bond	0.61	–0.01	0.11	0.04	0.79	0.30	0.96	0.98	0.51	1.00			
11 Morningstar US High-Yield Bond	0.66	–0.04	0.21	0.16	0.80	0.41	0.97	0.97	0.46	0.95	1.00		
12 Morningstar US REIT	0.78	–0.21	0.16	0.33	0.76	0.38	0.88	0.92	0.49	0.85	0.92	1.00	
13 Morningstar US Small	0.84	–0.21	0.06	0.73	0.61	0.09	0.60	0.72	0.19	0.62	0.71	0.82	1.00

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

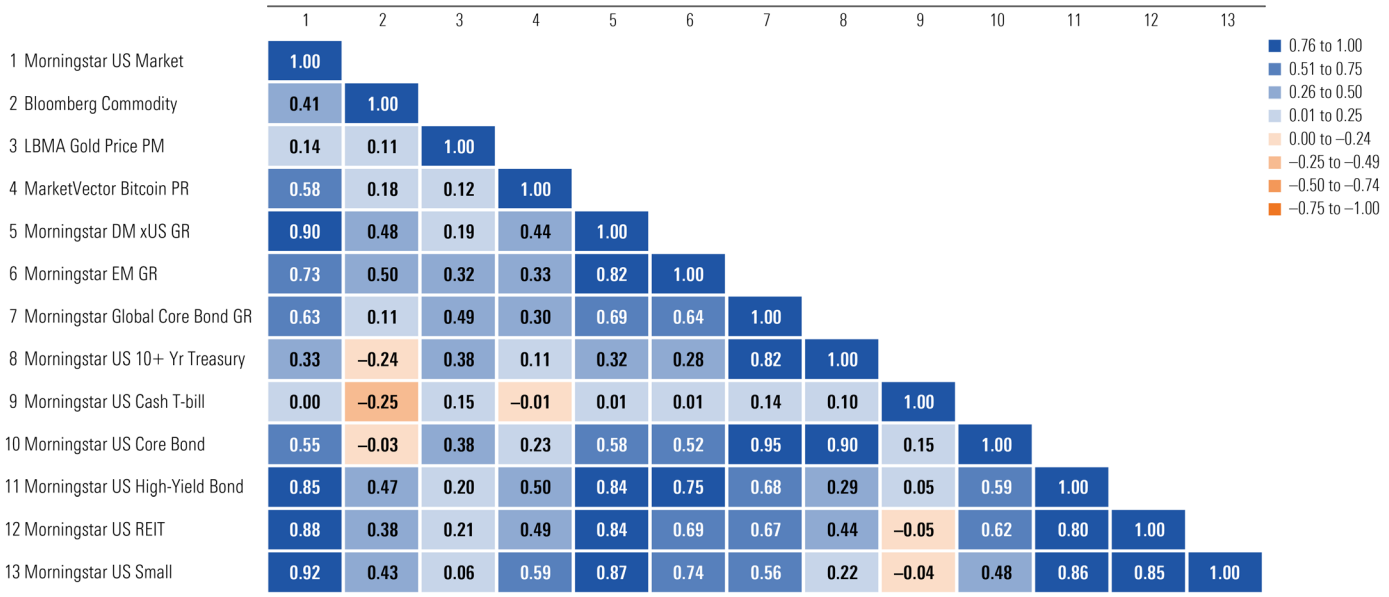
Source: Morningstar Direct. Data as of Dec. 31, 2024.

Exhibit A5 Correlation Matrix: Three Years



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Exhibit A6 Correlation Matrix: Five Years



Source: Morningstar Direct. Data as of Dec. 31, 2024.

Exhibit A7 Correlation Matrix: 10 Years

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Morningstar US Market	1.00												
2 Bloomberg Commodity	0.41	1.00											
3 LBMA Gold Price PM	0.05	0.17	1.00										
4 MarketVector Bitcoin PR	0.34	0.13	0.07	1.00									
5 Morningstar DM xUS GR	0.88	0.47	0.12	0.30	1.00								
6 Morningstar EM GR	0.70	0.51	0.30	0.21	0.81	1.00							
7 Morningstar Global Core Bond GR	0.45	0.11	0.54	0.22	0.54	0.54	1.00						
8 Morningstar US 10+ Yr Treasury	0.11	–0.28	0.41	0.08	0.12	0.12	0.74	1.00					
9 Morningstar US Cash T-bill	0.02	–0.12	0.15	–0.04	0.01	–0.00	0.09	0.06	1.00				
10 Morningstar US Core Bond	0.38	–0.08	0.40	0.15	0.42	0.38	0.90	0.89	0.11	1.00			
11 Morningstar US High-Yield Bond	0.81	0.49	0.19	0.29	0.83	0.72	0.57	0.17	0.04	0.49	1.00		
12 Morningstar US REIT	0.77	0.27	0.17	0.26	0.71	0.57	0.57	0.43	–0.02	0.58	0.70	1.00	
13 Morningstar US Small	0.92	0.41	–0.02	0.30	0.83	0.66	0.37	0.03	–0.03	0.31	0.80	0.74	1.00

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

Exhibit A8 Correlation Matrix: 15 Years

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Morningstar US Market	1.00												
2 Bloomberg Commodity	0.48	1.00											
3 LBMA Gold Price PM	0.09	0.32	1.00										
4 MarketVector Bitcoin PR	—	—	—	1.00									
5 Morningstar DM xUS GR	0.88	0.55	0.16	—	1.00								
6 Morningstar EM GR	0.73	0.57	0.31	—	0.84	1.00							
7 Morningstar Global Core Bond GR	0.41	0.22	0.46	—	0.53	0.52	1.00						
8 Morningstar US 10+ Yr Treasury	–0.10	–0.33	0.26	—	-0.11	-0.09	0.60	1.00					
9 Morningstar US Cash T-bill	0.01	–0.05	0.11	—	0.00	0.00	0.05	-0.00	1.00				
10 Morningstar US Core Bond	0.26	–0.07	0.32	—	0.29	0.27	0.85	0.84	0.05	1.00			
11 Morningstar US High-Yield Bond	0.80	0.51	0.18	—	0.81	0.73	0.57	0.04	0.00	0.44	1.00		
12 Morningstar US REIT	0.76	0.35	0.15	—	0.70	0.60	0.55	0.25	-0.05	0.50	0.72	1.00	
13 Morningstar US Small	0.93	0.47	0.06	—	0.81	0.68	0.34	-0.15	-0.04	0.20	0.78	0.73	1.00

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

Exhibit A9 Correlation Matrix: 20 Years

	1	2	3	4	5	6	7	8	9	10	11	12	13
1 Morningstar US Market	1.00												
2 Bloomberg Commodity	0.46	1.00											
3 LBMA Gold Price PM	0.06	0.38	1.00										
4 MarketVector Bitcoin PR	—	—	—	1.00									
5 Morningstar DM xUS GR	0.88	0.58	0.18	—	1.00								
6 Morningstar EM GR	0.74	0.59	0.30	—	0.87	1.00							
7 Morningstar Global Core Bond GR	0.35	0.26	0.48	—	0.48	0.44	1.00						
8 Morningstar US 10+ Yr Treasury	–0.09	–0.25	0.23	—	–0.09	–0.08	0.61	1.00					
9 Morningstar US Cash T-bill	–0.02	0.00	0.12	—	0.01	0.03	0.06	0.02	1.00				
10 Morningstar US Core Bond	0.23	–0.02	0.33	—	0.27	0.24	0.83	0.84	0.07	1.00			
11 Morningstar US High-Yield Bond	0.76	0.48	0.17	—	0.78	0.73	0.43	–0.04	–0.05	0.35	1.00		
12 Morningstar US REIT	0.77	0.31	0.11	—	0.70	0.59	0.42	0.15	–0.03	0.37	0.72	1.00	
13 Morningstar US Small	0.93	0.43	0.03	—	0.82	0.70	0.28	–0.14	–0.05	0.17	0.75	0.77	1.00

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024.

Exhibit A10 Five-Year Correlation Trends vs. Morningstar US Market Index

	2000-2004	2005-2009	2010-2014	2015-2019	2020-2024
Morningstar US Market	1.00	1.00	1.00	1.00	1.00
Bloomberg Commodity	0.11	0.46	0.65	0.39	0.41
LBMA Gold Price PM	–0.06	0.05	0.15	–0.10	0.14
MarketVector Bitcoin PR	—	—	—	0.09	0.58
Morningstar DM xUS GR	0.85	0.91	0.88	0.85	0.90
Morningstar EM GR	0.75	0.83	0.80	0.66	0.73
Morningstar Global Core Bond GR	–0.04	0.25	0.29	–0.01	0.63
Morningstar US 10+ Yr Treasury	–0.29	–0.05	–0.65	–0.31	0.33
Morningstar US Cash T-bill	–0.15	0.05	–0.02	0.05	0.00
Morningstar US Core Bond	–0.27	0.20	–0.26	–0.17	0.55
Morningstar US HY Bond	0.51	0.77	0.74	0.72	0.85
Morningstar US REIT	0.32	0.83	0.74	0.50	0.88
Morningstar US Small	0.86	0.95	0.96	0.92	0.92

0.76 to 1.00
0.51 to 0.75
0.26 to 0.50
0.01 to 0.25
0.00 to –0.24
–0.25 to –0.49
–0.50 to –0.74
–0.75 to –1.00

Source: Morningstar Direct. Data as of Dec. 31, 2024. All indexes shown are Morningstar benchmarks based on total returns in US dollars unless otherwise noted.

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