European High Yield for Allocators

Evaluating the use of European high yield within an investment portfolio

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- Investing strategically into high yield corporate bonds can help to supplement yield or income objectives or help to diversify away from traditional stock/bond risks.
- Historically, the higher quality segment of this market has realized better risk-adjusted returns, where inclusion of lower quality names can provide more potential upside particularly in risk-on markets.
- European High Yield returns have historically been quite resilient even in slow economic growth environments. Even in modest negative growth quarters, returns have averaged between 1.5 and 2 percent, or rough 6 to 8 percent per annum over the past 2 decades.
- While distressed market environments can introduce significant price volatility, subsequent returns following periods of spread widening have, on average, fared well for higher yield investments.

Historically, investors have looked to fixed income markets to access higher quality, fixed rate returns to either supplement yield or income objectives or to help diversify away from traditional equity risks that often dominate portfolios. The growth and expansion of credit markets in the past couple of decades has resulted in the tremendous growth of speculative-grade credit, now more commonly known as high yield. Once considered to be a more exotic, non-core fixed income asset class, the European high yield market has matured into a deep, liquid asset class that is now well-diversified across industries and issuers and now serves an important strategic and tactical purpose within most investor portfolios across the risk spectrum. As corporate bond markets have matured, the expansion into higher yielding fixed income has resulted in tremendous growth and maturation of the high yield market in Europe as a core exposure for fixed income investors.

This paper seeks to provide the reader with a broad overview of the Euro high yield market, highlighting the strategic and tactical cases for high yield investing as well as addressing questions around liquidity and market technicals, fundamentals around long-term defaults, characteristics of different segments of the high yield market, and how to think about the component risks of high yield bonds. The main areas of focus of this paper can be summarized into four categories:

1. *Strategic Allocations:* What is the strategic risk and return case for high yield within a portfolio, and what is a reasonable credit risk premium to be demanded by high yield investors?
2. *Characteristics:* What are the underlying characteristics of the high yield market, broken down by industry and by quality? How might shifting allocations based on industry or credit rating impact risk and return characteristics?
3. *Market Timing:* On a more tactical basis, when has it historically made more sense to be opportunistically overweight high yield as an asset class?
4. *Component Risks:* Between the credit spread and risk-free treasury yield, how have these component risks interacted or contributed to the total risk of the asset class?

1 / Strategic high yield

1.1 Historical risk and return characteristics

Relative to other equity or credit asset classes, European high yield markets have historically generated similar levels of risk-adjusted returns. To capture a long enough but representative history of a more established market, we focus our analysis throughout this paper on the previous two decades. Looking at the historical risk and return, the ICE BofA Euro High Yield Index has realized a Sharpe ratio in excess of European equities and modestly lower versus European Investment Grade bonds. Figure 1 shows the historical return, volatility, and Sharpe ratios across these major US equity and credit asset classes.

Figure 1: Returns, volatility, and Sharpe ratio (6/30/2004 to 6/30/2024)

	Euro High Yield	Euro Stoxx 50	S&P 500	MSCI EAFE	MSCI Emerging Markets	MSCI Europe Small Cap	Commodities	Euro Investment Grade	Cash
Return (geometric)	6.05%	5.70%	10.99%	6.30%	7.95%	6.23%	0.42%	2.84%	0.97%
Return (arithmetic)	6.41%	7.01%	11.44%	6.99%	9.17%	7.72%	1.43%	2.89%	0.96%
Volatility (annualized)	10.06%	16.99%	13.85%	13.09%	17.17%	18.03%	14.14%	4.27%	0.46%
Sharpe Ratio	0.43	0.28	0.61	0.37	0.38	0.30	0.03	0.36	-

Source: Bloomberg L.P., DWS calculations as of 6/30/2024.

Looking at returns across asset classes by calendar year, high yield returns have historically been somewhere in the middle, reflecting moderate levels of risk or volatility and relatively high levels of income stability, particularly as compared to equities and commodities. In strong risk-on markets, high yield returns have been quite positive, although not the extent of equities markets, whereas in negative calendar years, high yield has typically experienced less severe drawdowns versus equities. Figure 2 shows the returns across asset classes by calendar year over the past two decades.

Figure 2: Calendar year returns across asset classes (12/31/2003 to 6/30/2024)

2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024 (YTD)
Euro SC 33.3%	EM 53.5%	Euro SC 45.7%	EM 26.1%	Euro IG 9.3%	Euro HY 74.9%	EM 27.5%	Euro IG 3.4%	Euro SC 29.3%	Euro SC 39.7%	S&P 500 13.7%	Euro SC 11.2%	Commodity 15.2%	Euro SC 35.9%	Euro IG 1.0%	S&P 500 31.5%	S&P 500 18.4%	Commodity 36.7%	Commodity 23.8%	S&P 500 26.3%	EM 18.9%
EM 16.4%	Commodity 40.2%	EM 18.6%	Eurostoxx 50 9.6%	Cash 4.0%	EM 73.8%	Commodity 24.9%	S&P 500 2.1%	Euro HY 27.2%	S&P 500 32.4%	Euro IG 13.1%	EAFE 10.5%	EM 14.5%	S&P 500 21.8%	Cash -0.4%	Euro SC 29.5%	Euro SC 14.4%	S&P 500 28.7%	Cash 0.1%	Eurostoxx 50 22.2%	S&P 500 15.3%
Euro HY 14.6%	EAFE 30.8%	Eurostoxx 50 18.0%	S&P 500 5.5%	Euro Treasuries -3.3%	Euro SC 65.4%	Euro SC 21.9%	Euro Treasuries 2.0%	Eurostoxx 50 18.1%	Eurostoxx 50 21.5%	EM 11.5%	Eurostoxx 50 6.4%	S&P 500 12.0%	EM 20.4%	Euro Treasuries -1.1%	Eurostoxx 50 28.2%	EM 8.7%	Eurostoxx 50 23.3%	EAFE -8.8%	Euro SC 17.2%	Eurostoxx 50 10.4%
EAFE 11.6%	Eurostoxx 50 24.3%	S&P 500 15.8%	Commodity 4.8%	Commodity -32.3%	EAFE 27.7%	EAFE 15.2%	Cash 0.9%	EM 16.1%	EAFE 17.5%	EAFE 8.3%	Euro IG 1.6%	Euro HY 9.1%	EAFE 9.8%	Euro HY -3.6%	EAFE 24.3%	Euro IG 5.0%	EAFE 19.7%	Eurostoxx 50 -9.5%	EAFE 14.2%	EAFE 8.6%
S&P 500 10.9%	Euro SC 19.7%	EAFE 13.0%	Cash 4.0%	Euro HY -34.2%	S&P 500 26.5%	S&P 500 15.1%	Euro HY -2.5%	S&P 500 16.0%	Euro HY 10.1%	Euro Treasuries 8.3%	S&P 500 1.4%	Euro Treasuries 4.8%	Eurostoxx 50 9.2%	S&P 500 -4.4%	EM 20.8%	Euro HY 2.8%	Euro SC 15.4%	Euro HY -11.5%	Euro HY 12.0%	Commodity 8.4%
Eurostoxx 50 9.4%	Euro HY 6.0%	Euro HY 11.1%	Euro SC 2.9%	S&P 500 -37.0%	Eurostoxx 50 25.6%	Euro HY 14.3%	EAFE -9.2%	EAFE 15.5%	Euro Treasuries 2.4%	Euro HY 5.5%	Euro HY 0.8%	EAFE 4.0%	Euro HY 6.7%	Commodity -6.8%	Euro HY 11.3%	Euro Treasuries 2.6%	EM 4.6%	Euro Treasuries -13.9%	Euro Treasuries 8.0%	Euro HY 3.1%
Euro Treasuries 7.6%	Euro IG 5.4%	Cash 2.9%	Euro IG 1.7%	EAFE -40.4%	Commodity 15.2%	Euro Treasuries 4.8%	Commodity -10.4%	Euro Treasuries 13.0%	Euro IG 2.2%	Eurostoxx 50 4.0%	Cash -0.1%	Eurostoxx 50 3.7%	Euro Treasuries 2.4%	EAFE -9.4%	Commodity 9.7%	Cash -0.5%	Euro HY 3.3%	EM -15.1%	Euro IG 7.1%	Euro SC 2.3%
Euro IG 7.6%	S&P 500 4.9%	Euro Treasuries 0.6%	EAFE 0.3%	Eurostoxx 50 -42.4%	Euro Treasuries 14.9%	Euro IG 1.1%	Eurostoxx 50 -14.1%	Euro IG 11.0%	Cash 0.1%	Cash 0.1%	Euro Treasuries -0.4%	Euro IG 3.2%	Euro IG 0.2%	EM -10.3%	Euro IG 6.8%	EAFE -1.1%	Cash -0.5%	S&P 500 -18.1%	EM 6.3%	Cash 2.0%
Cash 2.1%	Euro Treasuries 4.0%	Euro IG -0.2%	Euro Treasuries 0.2%	EM -51.2%	Euro IG 4.3%	Cash 0.4%	EM -15.9%	Cash 0.2%	EM -6.8%	Commodity -5.5%	EM -5.3%	Cash -0.3%	Cash -0.4%	Eurostoxx 50 -12.0%	Euro Treasuries 6.3%	Eurostoxx 50 -3.2%	Euro Treasuries -1.0%	Euro IG -18.5%	Cash 3.4%	Euro Treasuries 0.5%
Commodity 0.8%	Cash 2.1%	Commodity -8.7%	Euro HY -2.3%	Euro SC -54.0%	Cash 0.7%	Eurostoxx 50 -2.8%	Euro SC -19.9%	Commodity -2.6%	Commodity -13.4%	Euro SC -6.3%	Commodity -16.1%	Euro SC -1.9%	Commodity -10.6%	Euro SC -19.6%	Cash -0.4%	Commodity -11.1%	Euro IG -3.5%	Euro SC -27.0%	Commodity -11.1%	Euro IG -2.0%

Source: Bloomberg L.P., DWS calculations as of 6/30/2024.

Historical cross-asset correlations show quite intuitive results as well. Whereas high yield corporate bonds are fixed income instruments, the ability of corporations to service their debt is largely a function of corporate earnings and is reflected in stronger positive correlations to equities and weaker correlations to sovereign bonds and cash. Interestingly the European High yield market has exhibited lower correlations to equities than US High Yield, in part reflecting the structurally higher

quality bias in the European market. Figure 3 shows total return correlations across various asset classes over the last twenty years.

Figure 3: Correlation matrix (6/30/2004 to 6/30/2024)

	Euro High Yield	Euro Stoxx 50	S&P 500	MSCI EAFE	MSCI Emerging Markets	MSCI Europe Small Cap	Commodities	Euro Investment Grade	Cash
Euro High Yield	1.00	0.68	0.52	0.72	0.67	0.77	0.29	0.67	(0.11)
Euro Stoxx 50	0.68	1.00	0.70	0.91	0.67	0.84	0.21	0.45	(0.06)
S&P 500	0.52	0.70	1.00	0.82	0.61	0.72	0.31	0.45	(0.14)
MSCI EAFE	0.72	0.91	0.82	1.00	0.78	0.91	0.35	0.53	(0.11)
MSCI Emerging Markets	0.67	0.67	0.61	0.78	1.00	0.73	0.40	0.46	(0.04)
MSCI Europe Small Cap	0.77	0.84	0.72	0.91	0.73	1.00	0.32	0.55	(0.12)
Commodities	0.29	0.21	0.31	0.35	0.40	0.32	1.00	0.11	(0.08)
Euro Investment Grade	0.67	0.45	0.45	0.53	0.46	0.55	0.11	1.00	(0.01)
Cash	(0.11)	(0.06)	(0.14)	(0.11)	(0.04)	(0.12)	(0.08)	(0.01)	1.00

Source: Bloomberg L.P., DWS calculations as of 6/30/2024.

One interesting observation, perhaps attributable to the generally higher quality structural bias of the European High Yield market, is the relatively resilient empirical returns event in periods of slow or modestly negative growth. Figure 4 shows the average quarterly returns for the ICE BofA Euro High Yield Index for various ranges of quarterly GDP, where the long-term average is 0.3% and one standard deviation is slightly more than 1.5%. Interestingly, bearing in mind only a sample of two observations, average quarterly returns in strong negative quarters were significantly positive as well.

Figure 4: ICE BofA Euro High Yield Index average quarterly returns at different levels of quarterly GDP growth (6/30/2004 to 6/30/2024)

Quarterly GDP Range (%)	Average Quarterly Return	Observations (#)
< -3.0%	9.62%	2
-3.0% to -1.5%	-18.66%	2
-1.5% to 0.0%	1.24%	15
0.0% to 1.5%	2.29%	56
1.5% to 3.0%	0.73%	4
> 10.0%	2.61%	1

Source: Bloomberg L.P., DWS calculations as of 6/30/2024.

As we establish in the Long View, starting yield levels for fixed income returns are the single most important variable for establishing a strategic return outlook. Comparing starting yield levels to subsequent 3- and 5-year annualized returns, we can demonstrate this relationship in Figure 5. Absent a significant selloff in corporate spreads as experienced during the Global Financial Crisis and, to a far lesser extent, the COVID-19 crisis, higher starting yield levels have generally resulted in empirically strong realized returns.

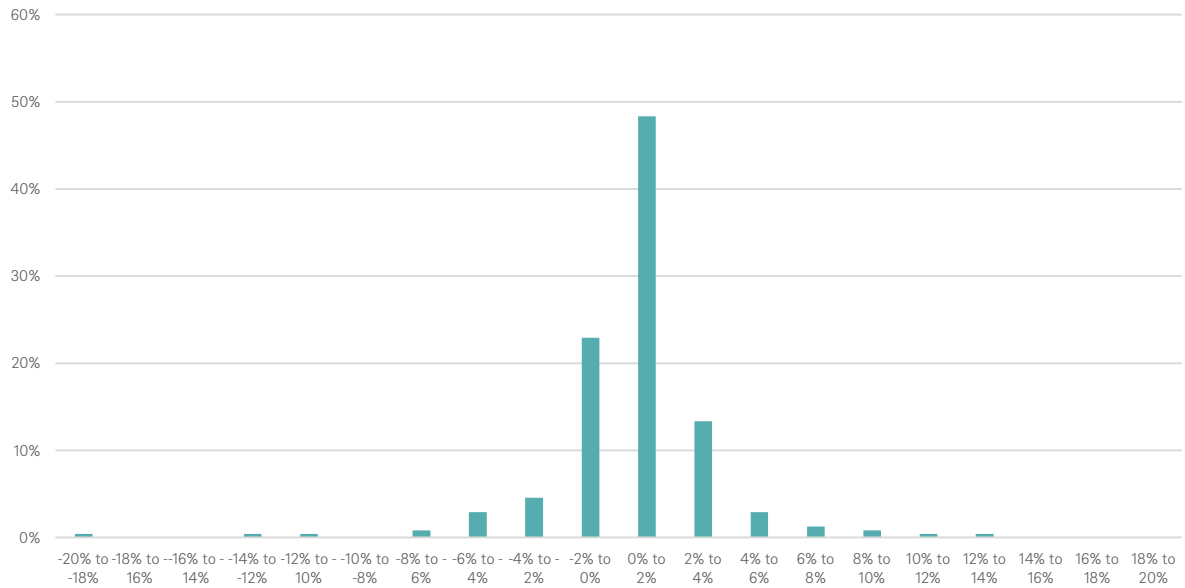
Figure 5: ICE BofA Euro High Yield Index Yield-to-Worst versus next 3-year return, annualized (%) (6/30/2004 to 6/30/2024)

Source: ICE BAML indices, DWS calculations as of 6/30/2024.

1.2 Market size and return distributions

As is the case with less frequently traded financial instruments, European high yield bond prices have historically shown signs of artificial smoothness, as evidenced by the left tail skew of -1.3 in monthly return distributions and by modest positive time series correlations (see Figure 6 and Figure 7).

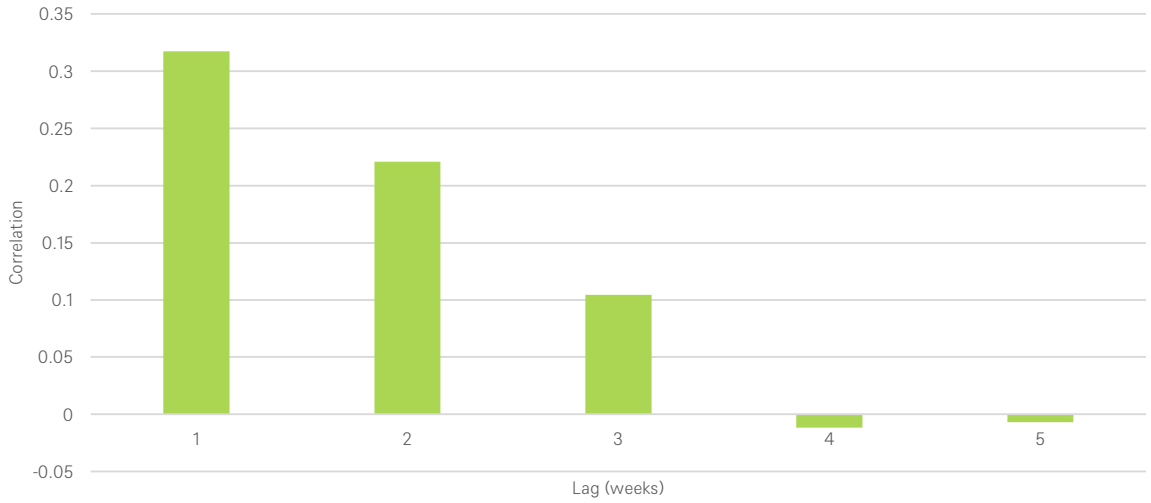
Figure 6: ICE BofA Euro High Yield Index monthly returns show moderate left tail skew (6/30/2004 to 6/30/2024)



Source: Bloomberg L.P., DWS calculations as of 6/30/2024.

Past performance is not a reliable indicator of future results. Forecasts are not a reliable indicator of future performance. Forecasts are based on assumptions, estimates, views and hypothetical models or analyses, which might prove inaccurate or incorrect.

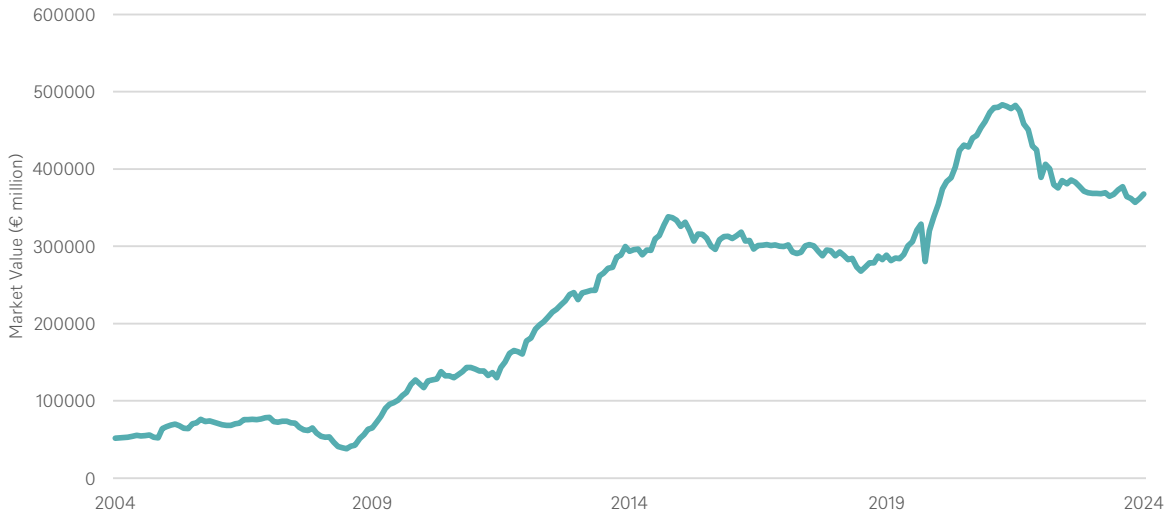
Figure 7: Time series correlation of weekly returns (6/30/2004 to 6/30/2024)



Source: DWS Investment Management GmbH calculations as of 6/30/2024.
*Correlations are calculated using weekly returns.

The overall size of the European high yield market has increased significantly in recent years, with the total market value increasing from under €100bn prior to the Global Financial Crisis to nearly €400bn in 2024 (see Figure 8).

Figure 8: ICE BofA Euro High Yield Index market value (6/30/2004 to 6/30/2024)

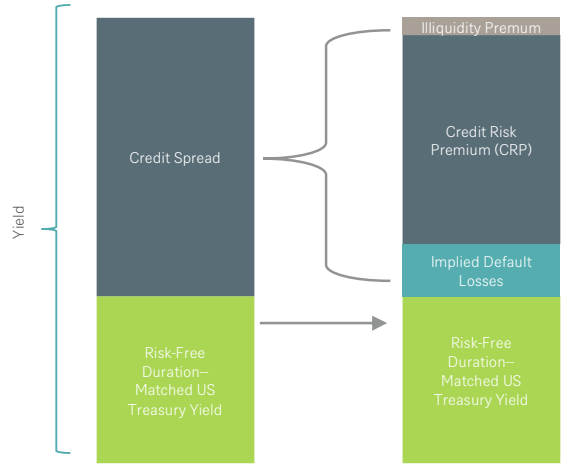


Source: ICE BAML indices as of 6/30/2024.

1.3 Spreads and default losses

As we highlight in the Long View, yields are the primary driver of long-term returns across most fixed-income asset classes. The same is true of high yield bonds, where yield is comprised of a risk-free component and a spread component that compensates an investor for the risk of issuer default. Due to its more speculative nature–at least relative to investment grade issuers, speculative-rated credit spreads generally embed a risk of the issuer defaulting and the corresponding losses from the partial repayment as well as an additional compensation or return premium for the risk or uncertainty associated with credit loss potential. Figure 9 illustrates the simple decomposition of the yield into its four contributing components: 1. Risk free rate, 2. Credit risk premium, 3. Implied default losses, and 4. Illiquidity premium.

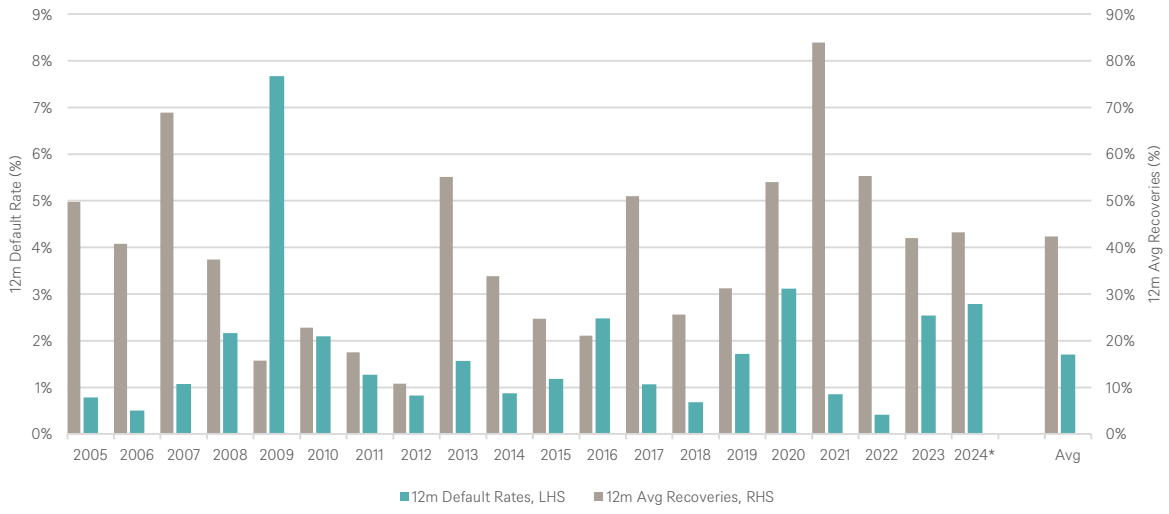
Figure 9: Decomposition of high yield index yield



Source: DWS Investment Management GmbH.

Over the past two decades, the average annual default rate across the high yield universe has been between 1.5 and 2%, with an average recovery rate of around €40 based on a par value of €100. This roughly 60% default loss rate from par combined with the 1.5 to 2% default rates equates to roughly 0.9 to 1.2% default losses per annum assuming par value for the defaulted securities. Figure 10 shows the historical trailing-twelve-months default rate and recovery rate from JP Morgan Research.

Figure 10: Euro high yield ex banks and insurers default and recovery rates (12/31/2004 to 6/30/2024)

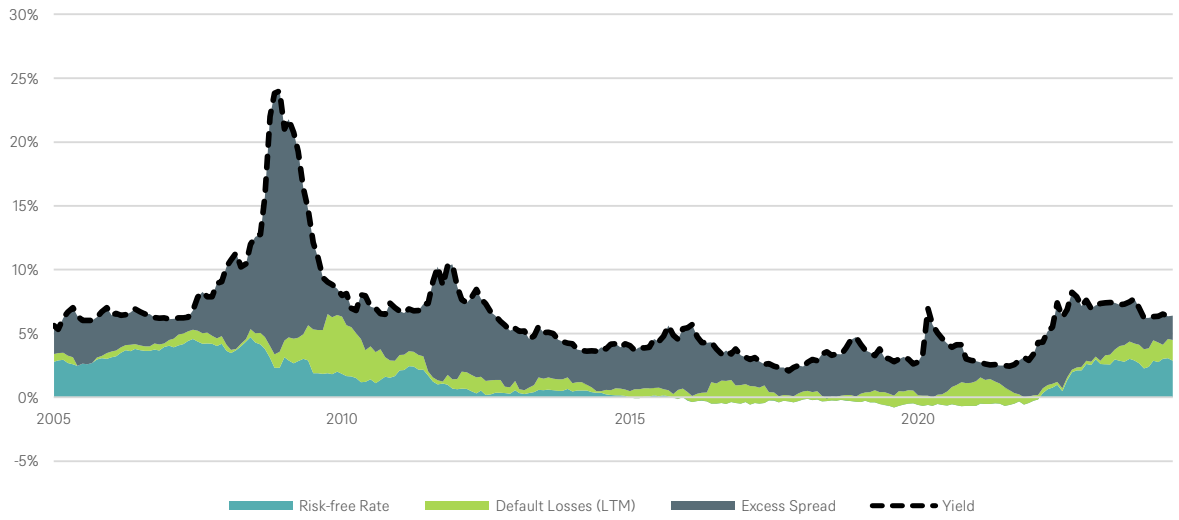


Source: JP Morgan Research as of 6/30/2024.
*Represents previous 12m data as of June 2024.

As we previously discussed, credit investors need to be compensated beyond the credit spread associated with losses from issuer defaults. This additional requirement can be referred to as the "credit risk premium" or the "excess spread". Empirically, we can measure the long-term average excess spread over the default loss rate to get a sense of the average "credit risk premium" demanded by high yield investors. Going through this exercise in Figure 11, we can show the historically realized average credit risk premium is roughly somewhere around 400bps. However, due to the distortion from very high credit

spreads during the Global Financial Crisis but with very low realized default rates, we can also observe about a 350bps post-GFC credit risk premium.

Figure 11: Historical realized credit risk premium (12/31/2004 to 6/30/2024)



Source: ICE BAML Indices, JP Morgan Research, PitchBook Data, Inc., DWS calculations as of 6/30/2024.
*Calculations using 12m non-financials default rate and long term recovery rate of 42% based on data available from JP Morgan Research. Yield and spread data taken from ICE BAML Indices.

Using this average historical credit risk premium, we can utilize our views on default rate expectations over the next year to determine whether we believe the credit risk premium is rich or expensive versus the long-term average. Alternatively, if we assume that the CRP is mean reverting at 3.5% (the post-GFC long-term average), the residual between the options-adjusted spread and that 3.5% CRP can also be interpreted as market-implied default losses. For example, if the current high yield index credit spread is 3.5%, then the market implied default losses would be close to 0%, which represents a very favorable fundamental credit outlook (relative to history) at the current spread level. Assuming par value and an average recovery rate of 40% (default loss rate of 60%), our market-implied default rate is also about 0% given current spreads.

2 / High yield characteristics

2.1 High Yield Ratings

Fundamentally, debt issuers are assessed by ratings agencies based on the likelihood that they repay their debt obligations. High yield, sometimes referred to as speculative grade, ranges in credit rating from BB to C (or in some cases, unrated), with each rating representing between a low and high probability of issuer default. According to analysis from S&P Global Fixed Income Research, between 1981 and 2017, the probability of default over a 5-year time horizon was roughly 6.5% for BB-rated issues and 46.2% for CCC/C-rated issues[1]

Figure 12: Comparison between Fitch, S&P, and Moody's ratings categories and descriptions

Moody's	S&P	Fitch	Rating Definitions (Moody's)
Aaa	AAA	AAA	Minimal risk
Aa1	AA+	AA+	Very lower credit risk
Aa2	AA	AA	
Aa3	AA-	AA-	
A1	A+	A+	Very lower credit risk
A2	A	A	
A3	A-	A-	
Baa1	BBB+	BBB+	Medium credit risk
Baa2	BBB	BBB	
Baa3	BBB-	BBB-	
Ba1	BB+	BB+	Substantial credit risk
Ba2	BB	BB	
Ba3	BB-	BB-	
B1	B+	B+	High credit risk
B2	B	B	
B3	B-	B-	
Caa1	CCC+	CCC+	Very high credit risk
Caa2	CCC	CCC	
Caa3	CCC-	CCC-	
Ca	CC	CC	In or near default, possible recovery
	C	C	
C	SD	DDD	In default, little prospect for recovery
	D	DD	
		D	

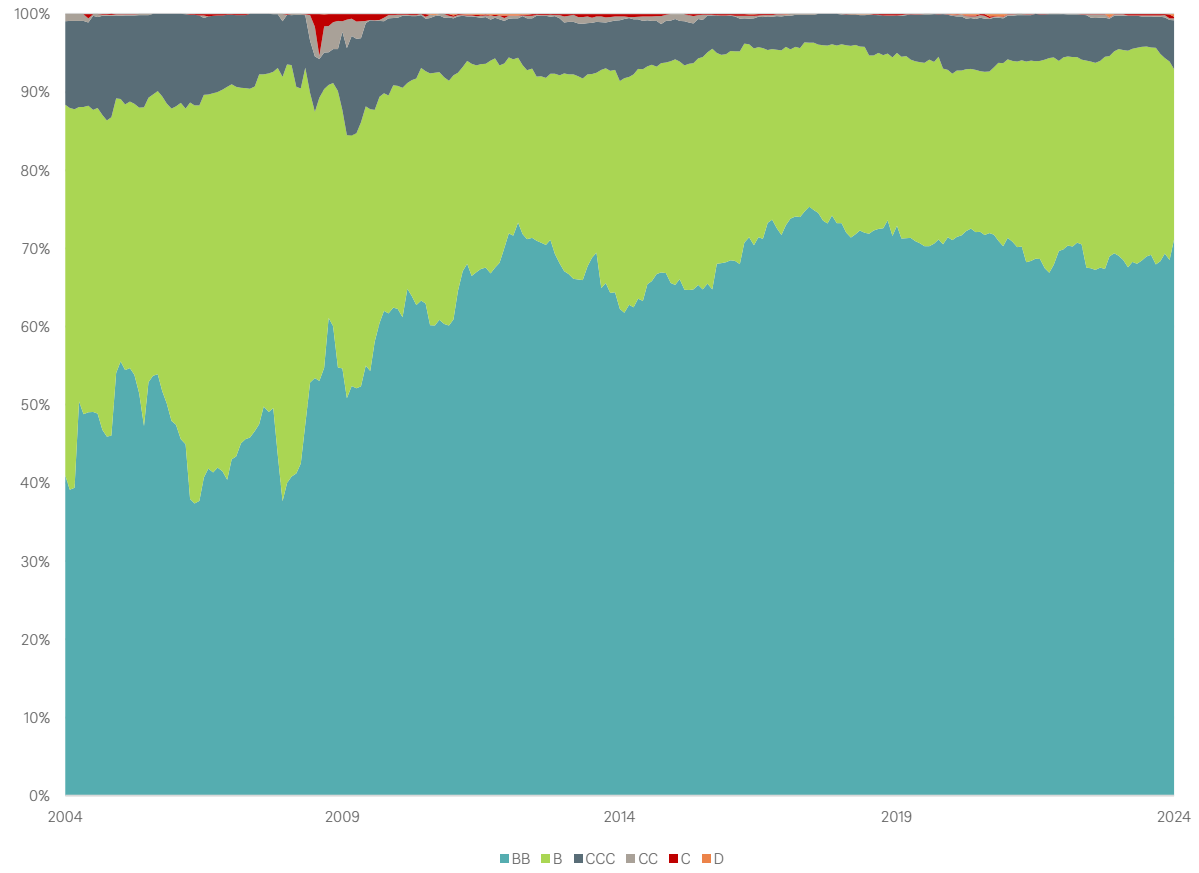
Source: Fitch Ratings Inc., S&P Global Ratings, Moody's Investor Services.

The European High Yield universe, which tends to have a higher quality bias relative to the US High Yield market (as measured by the ICE BofA US High Yield Index), currently consists of a little more than 70% BB-rated bonds, with nearly 22% in B-rated names and the balance primarily CCC. CC and lower make up less than 1% of the index (versus a weight in the US High Yield market of roughly 50% in BB-rated names, 40% in B-rated bonds, and just over 10% in CCC and lower).

In the more nascent years of the European High Yield market, with far fewer issuers and greater industry concentration, the index was more heavily weighted toward B-rated names. However, over the past decade amid a much more mature and diversified universe, the European High Yield market has exhibited a strong quality bias with modest improvements in overall credit quality based on ratings composition. Figure 13 shows the historical ratings composition of the ICE BofA Euro High Yield index.

[1] https://www.livewiremarkets.com/wires/quantifying-the-risk-of-bonds-with-s-p-credit-ratings

Figure 13: High yield ratings composition (6/30/2004 to 6/30/2024)



Source: ICE BAML Indices as of 6/30/2024.

Looking at returns across credit ratings, it's clear that B and CCC-rated securities have not historically generated excess returns commensurate with their higher credit risk and correspondingly higher price volatility. In fact, the BB-rated has generated the higher empirical returns of the three ratings cohorts despite realizing significantly less volatility than either B or CCC-rated market segments. As a result, the Sharpe ratios for higher quality ratings cohorts has empirically argued for a higher quality bias for strategic European High Yield investing.

Figure 14: Returns, volatility, and Sharpe ratio (6/30/2004 to 6/30/2024)

	EURO HY	BB	B	CCC	CASH
Return (geometric)	6.12%	5.84%	6.08%	6.46%	0.97%
Return (arithmetic)	6.47%	6.07%	6.57%	7.78%	0.97%
Volatility (annualized)	10.04%	8.64%	11.32%	16.96%	
Sharpe Ratio	0.54	0.59	0.49	0.40	

Source: ICE BAML Indices, Bloomberg L.P., DWS calculations as of 6/30/2024.

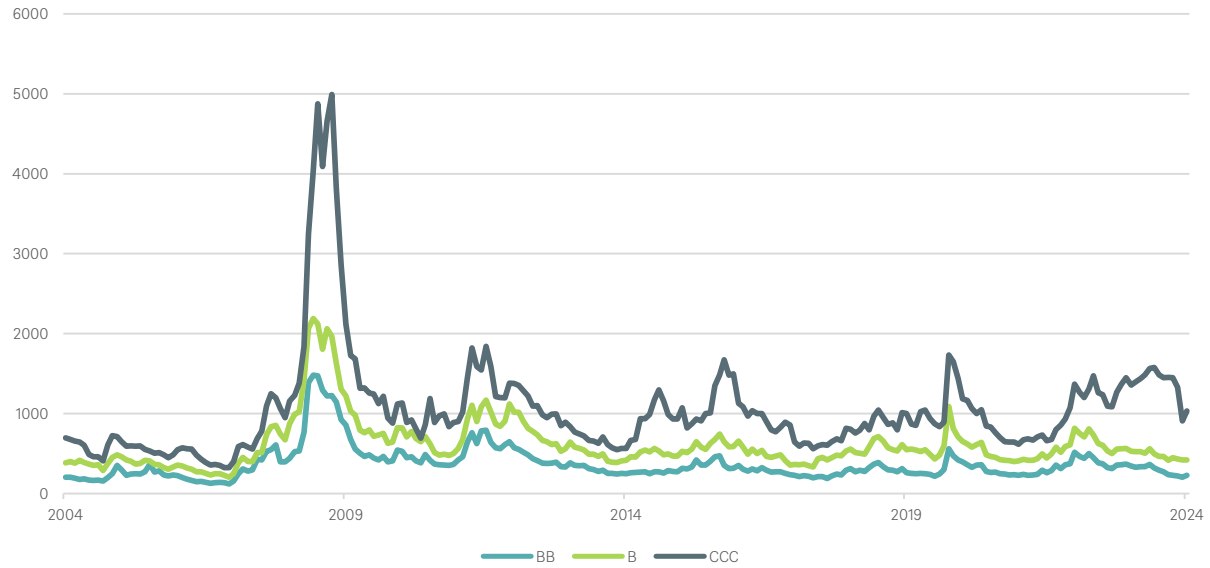
Figure 15: Returns, volatility, and Sharpe ratio (12/31/2003 to 6/30/2024)

	EURO HY	BB	B	CCC	CASH
2004	14.56%	12.39%	14.80%	25.36%	2.10%
2005	5.97%	4.66%	7.15%	9.15%	2.13%
2006	11.10%	9.48%	12.24%	13.62%	2.90%
2007	-2.26%	-2.49%	-1.64%	-1.87%	4.02%
2008	-34.22%	-24.54%	-38.88%	-57.87%	4.00%
2009	74.88%	57.04%	82.25%	112.48%	0.73%
2010	14.26%	11.90%	14.36%	28.38%	0.44%
2011	-2.48%	-0.17%	-4.54%	-15.37%	0.88%
2012	27.21%	24.95%	29.74%	44.02%	0.24%
2013	10.06%	9.46%	10.15%	14.43%	0.09%
2014	5.48%	7.27%	3.75%	-1.51%	0.10%
2015	0.76%	0.61%	0.34%	-0.44%	-0.11%
2016	9.07%	8.40%	11.81%	7.31%	-0.32%
2017	6.74%	6.64%	5.77%	15.72%	-0.36%
2018	-3.63%	-2.85%	-4.33%	-12.38%	-0.37%
2019	11.29%	10.84%	10.43%	22.67%	-0.40%
2020	2.76%	2.81%	-0.32%	10.37%	-0.47%
2021	3.35%	2.26%	4.57%	9.26%	-0.49%
2022	-11.48%	-11.18%	-11.55%	-14.49%	0.07%
2023	12.01%	11.06%	15.34%	7.94%	3.37%
2024 (YTD)	3.13%	3.20%	2.39%	3.85%	2.03%

Source: ICE BAML Indices, Bloomberg L.P., DWS calculations as of 6/30/2024.

Despite constituting the vast majority of the European High Yield index, the long-term spread beta of the BB and B-rated cohorts were actually less than 1. This is perhaps explained by much higher structural spreads in the CCC segment of the market, particularly in the early years of the index which skewed index spreads to a much greater extent in the late 1990s and early 2000s. In the past 10 years, during which the European High Yield market was far more mature, the beta of B-rated names was 1.15.

Figure 16: Comparison of OAS and OAS beta across credit ratings (6/30/2004 to 6/30/2024)



Rating	BB	B	CCC
Beta	0.70	1.02	2.05

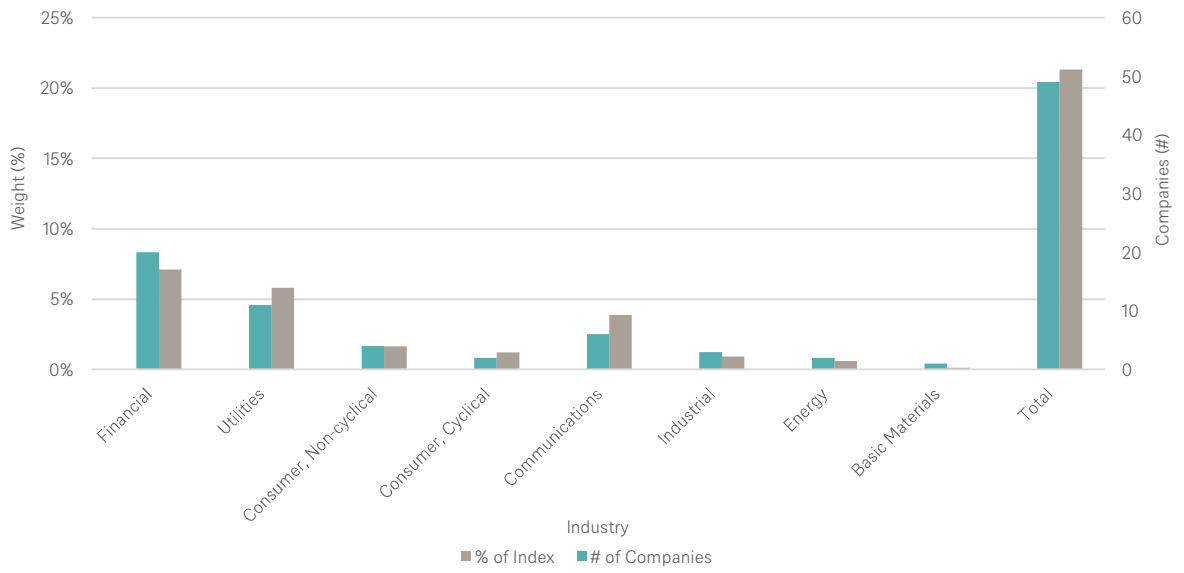
Source: ICE BAML Indices, DWS calculations as of 6/30/2024.

2.2 Hybrid/subordinated bonds

Looking across the corporate credit complex, for many corporate issuers, managing their liabilities can involve issuing debt across their capital stack. What this means, in some circumstances, is that there may be issuer overlap between the IG and HY universes (with senior debt being IG-rated and subordinate debt being HY-rated). In the European corporate credit market, the prevalence of subordinated paper or hybrid bonds is quite significant relative to the US market.

There are generally two types of hybrid bonds: 1. Bank subordinated bonds that act as a cushion for senior bonds or 2. Hybrid bonds from corporates that are partially treated as equity by ratings agencies and help to support the senior rating. Hybrid bonds, which were also formally referred to as perpetuals given their very long dated legal maturity, are typically issuer called after 5, 7, or 10 years. Figure 17 shows the weight of these of the hybrid or subordinated bonds within the ICE BofA Euro High Yield index which represent about 22% of the index (compared to about 7-8% of the US HY index) with 32 of the 48 names being financial or utilities companies.

Figure 17: Investment grade overlap across high yield indices (6/30/2024)

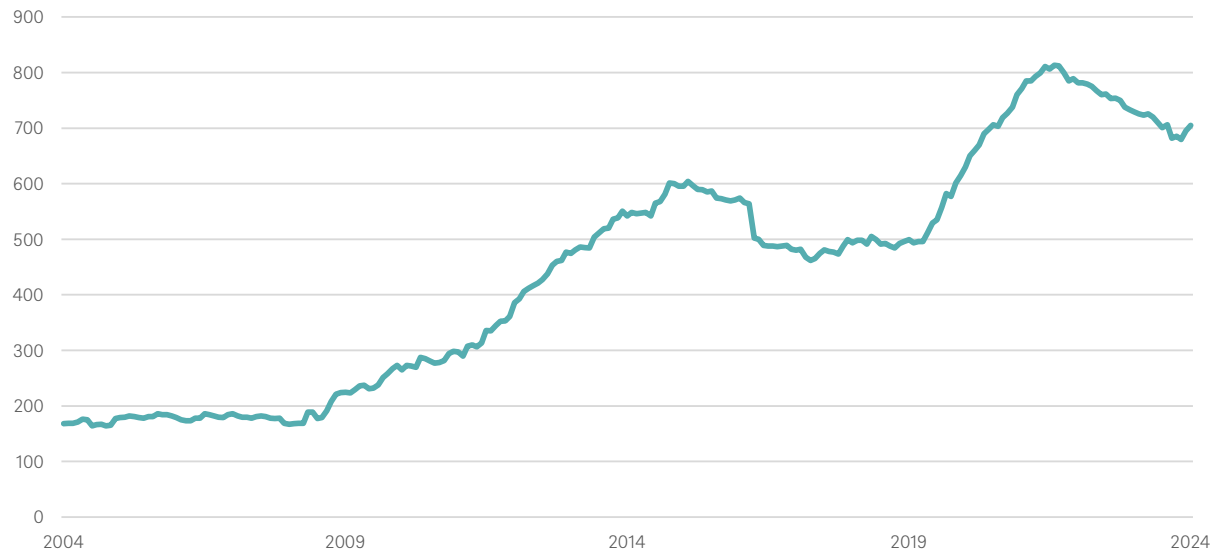


Source: ICE BAML Indices as of 6/30/2024.

2.3 High yield industries

The European high yield market, which has a much shorter history than the US high yield market, has experienced significant industry diversification since its early years. Where the market in the late 90s and early-to-mid 2000s was largely dominated by single-issuer downgrades resulting in significant industry concentration, with the number of constituents in the index now having exceeded 100 until the beginning of 2001. Figure 18 shows the number of constituents in the ICE BofA Euro High Yield index over the past 20 years.

Figure 18: Number of constituents (6/30/2004 to 6/30/2024)



Source: ICE BAML Indices as of 6/30/2024.

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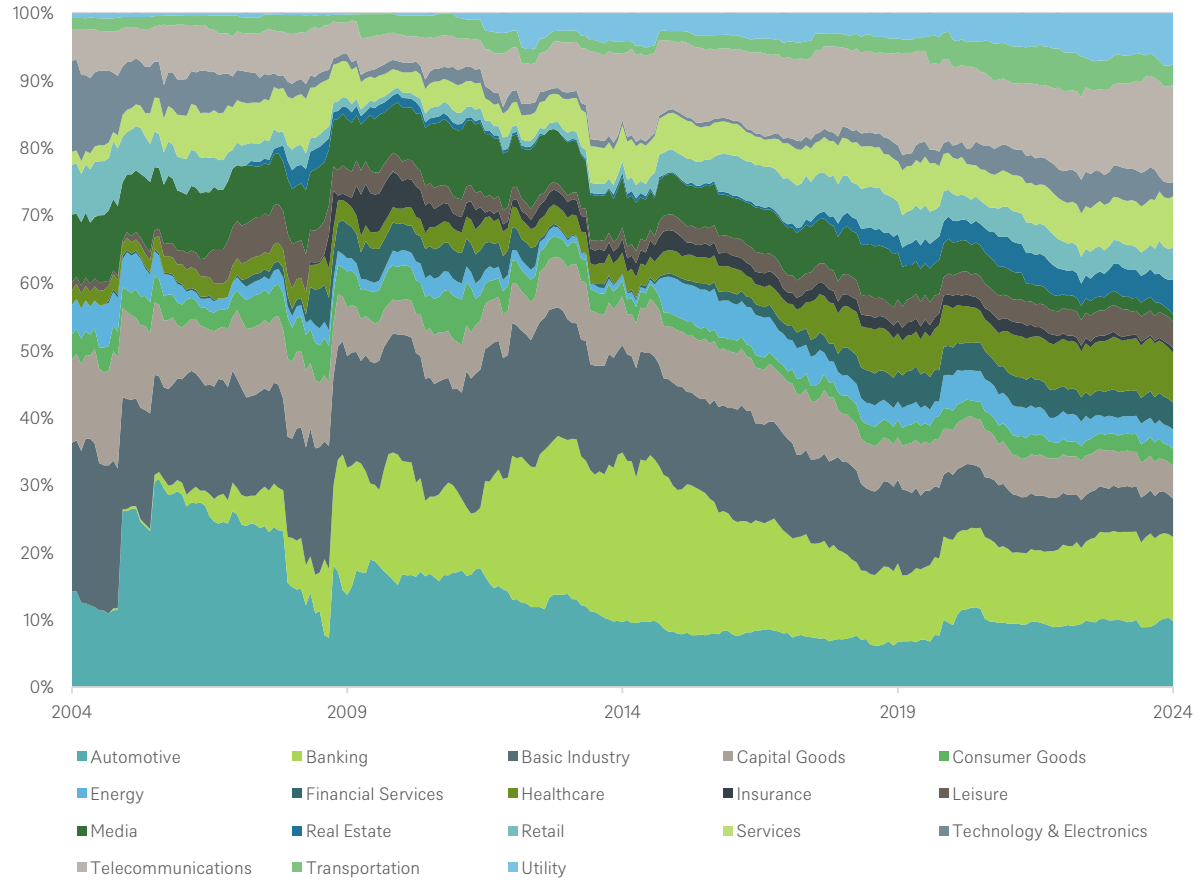
As the European high yield market matured over time, the index industry composition shifted quite significantly toward financial industries, with financial industry weights growing to nearly 30% of the universe immediately following the GFC and still exceeding 22% in today's market. Of that weight, banking still makes up nearly 13% of the index.

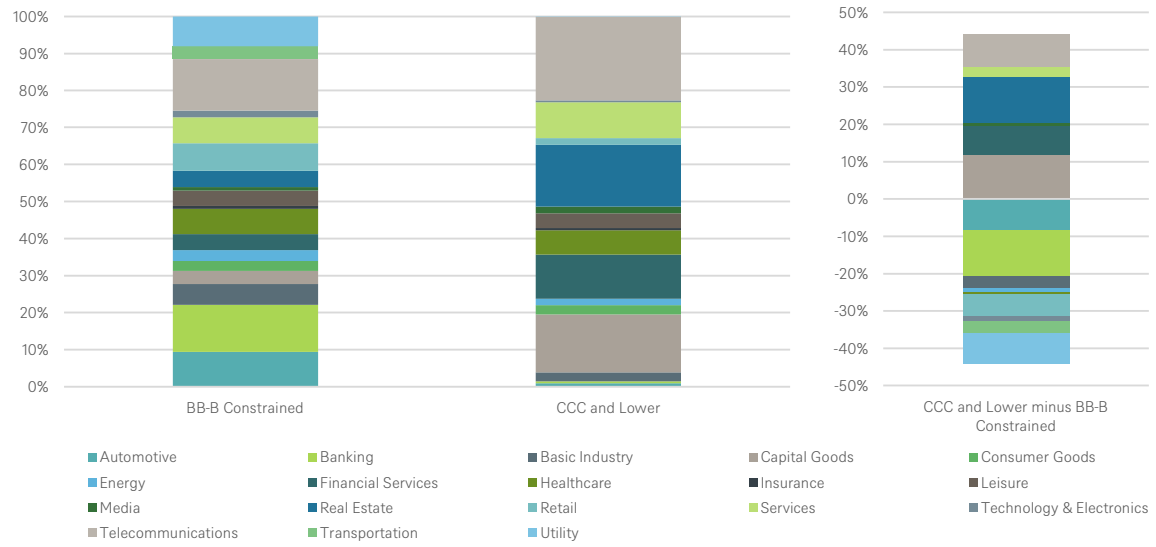
Figure 19: High yield industry composition (%) (6/30/2004 to 6/30/2024)



Source: ICE BAML Indices as of 6/30/2024.

The CCC and lower segment of the market can, at times, be dominated by single issuer downgrades or industry-specific turmoil, which can drive significant differentials in industry composition between higher quality and lower quality indices. Figure 20 shows the most recent industry weightings for the BB-B segment of the high yield market as compared to the CCC and lower segment.

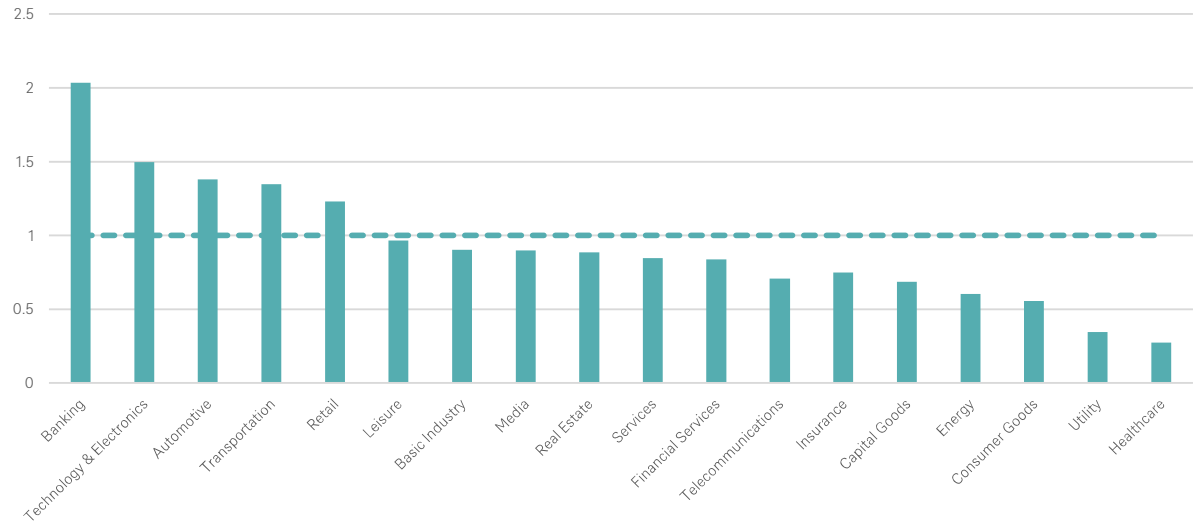
Figure 20: European high yield industry weights by rating (6/30/2024)



Source: ICE BAML Indices as of 6/30/2024.

While industry-specific risks factors can be influenced by idiosyncratic economic or market events, as with equity markets, certain high yield industries have empirically demonstrated more defensive behaviors in terms of their credit spreads. Looking across high yield industries, we can show which areas of the market have historically experienced the highest and lowest spread betas, or directional sensitivity to the spread behavior in the broader high yield market. Figure 21 shows the historical spread betas by industry, highlighting the empirically higher spread beta of banking and technology-related industries and the more defensive nature of more stable industries such as healthcare and utilities.

Figure 21: Options-adjusted spread beta by industry (6/30/2004 to 6/30/2024)

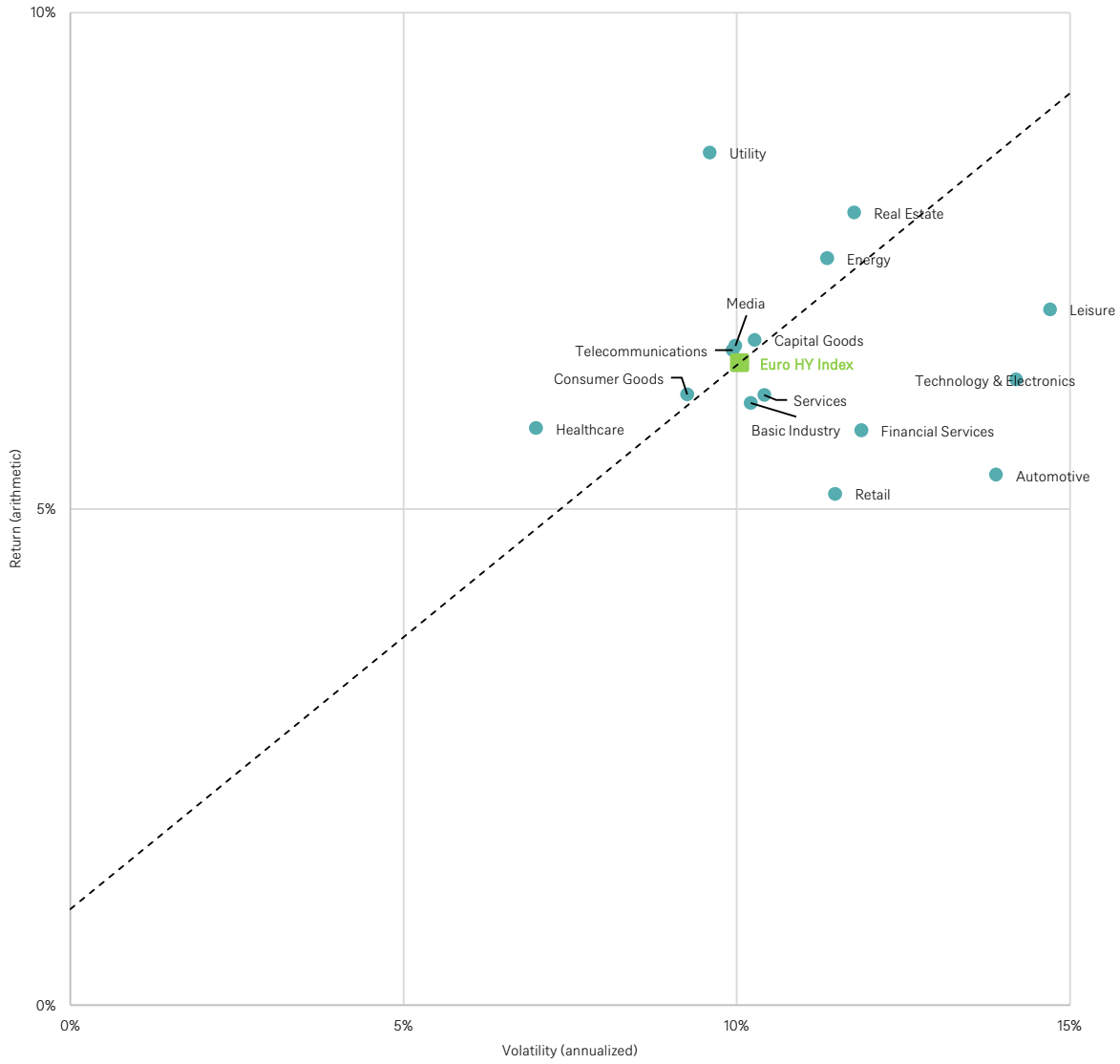


Source: ICE BAML Indices, DWS calculations as of 6/30/2024.
*Beta calculation assumes index OAS for the periods where industry weights were 0%.

On a risk-adjusted return basis, certain industries have also historically fared better than others. Looking at the Sharpe ratios of each high yield industry over the past two decades, defensive industries such as Utilities and Healthcare have realized the

strongest arithmetic excess return (over cash) proportionate to their realized volatility. Automotives, Retail, and Leisure industries, on the other hand, have realized the lowest risk-adjusted returns as shown in Figure 22.

Figure 22: Risk-adjusted return by industry (6/300/2004 to 6/30/2024)

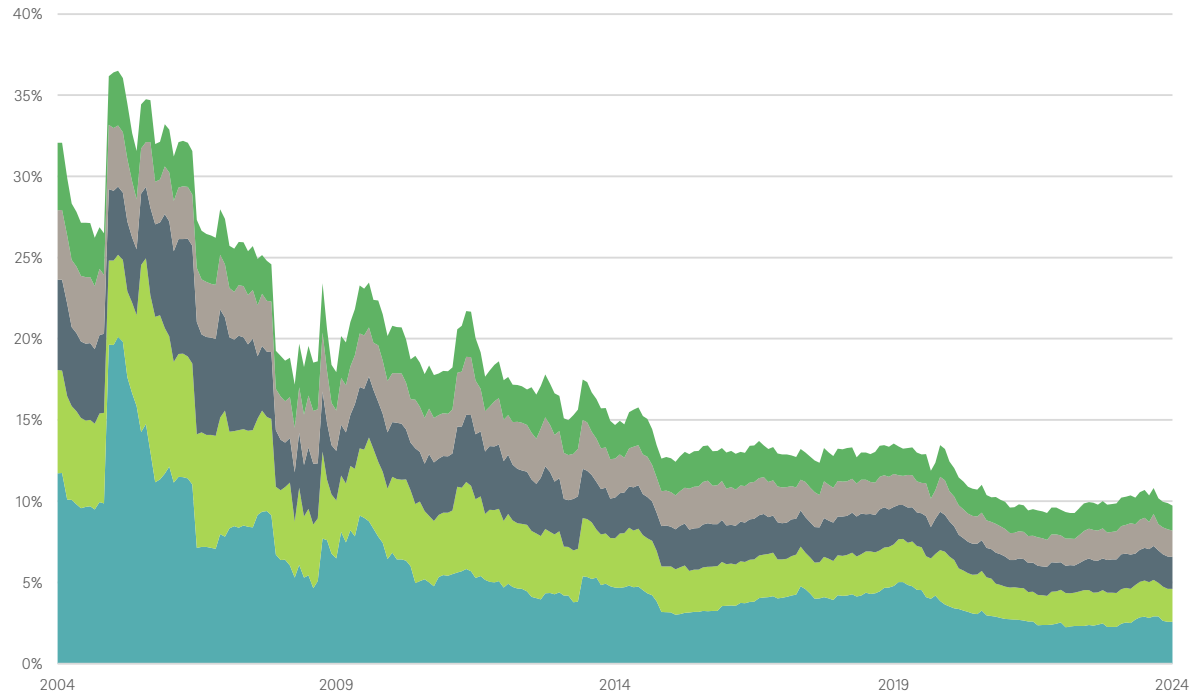


Source: ICE BAML Indices, DWS calculations as of 6/30/2024.
*Insurance omitted as an outlier driven by single distressed company
**Return and volatility calculations assume index return for this periods where industry weights were 0%.

2.4 Issuer concentration risk

The notional value of the high yield bond universe has grown considerable over the past two decades, with the full market value of the ICE BofA Euro High Yield Index growing from just over €50bn in June of 2004 to over €360bn as of the end of June. One consequence of this significant market growth is declining issuer concentration. Looking at the weight of the five largest issuers as a percentage of the index, this weighting has come down gradually over the past two decades, although not in a linear way (see Figure 23)

Figure 23: Concentration of top five largest issuers within high yield (6/30/2004 to 6/30/2024)



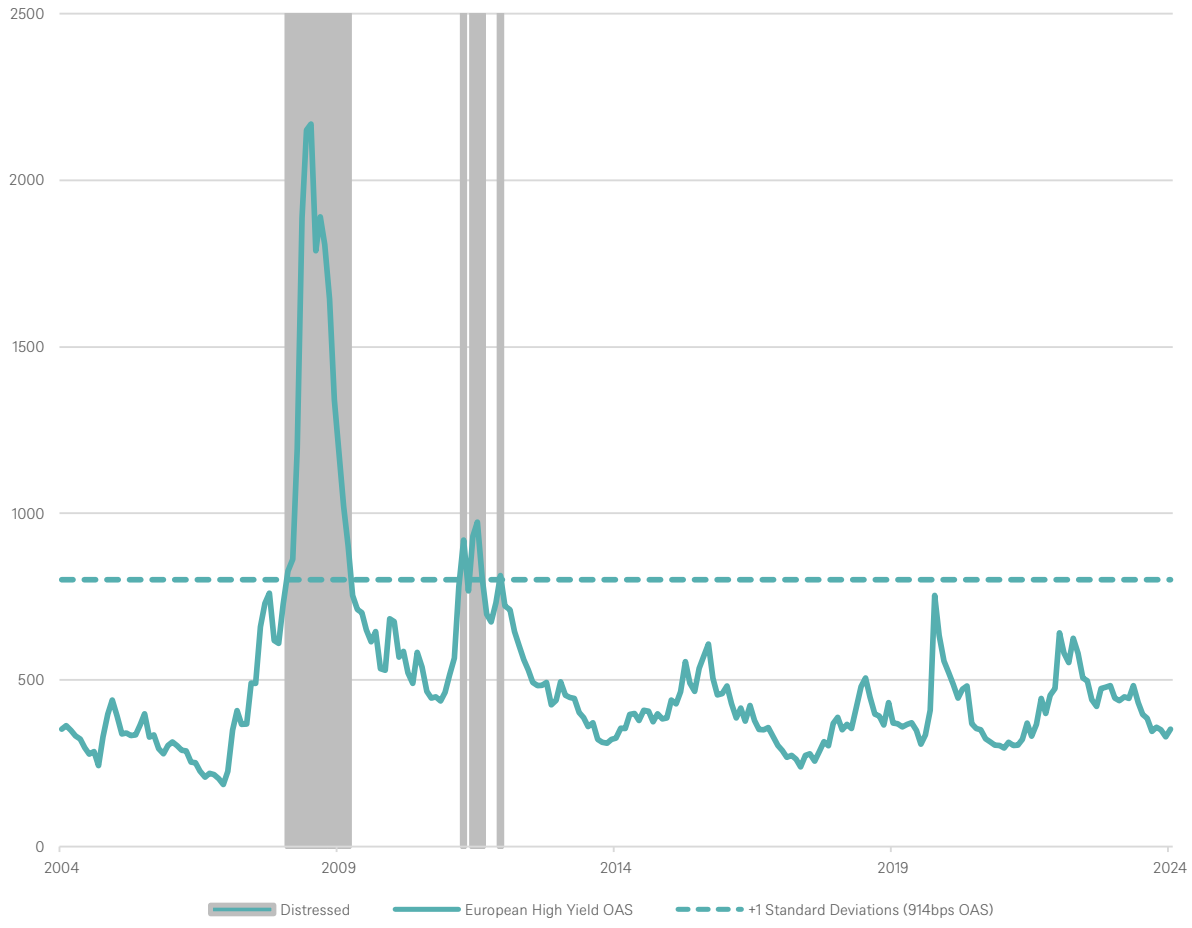
Source: ICE BAML Indices as of 6/30/2024.

3 / Market timing

3.1 Spreads and returns during and following stressed credit environments

In distressed market environments, the extent to which high yield spreads can widen is not uniform across historical bear markets. The average OAS experience in distressed markets is heavily skewed by the Global Financial Crisis when high yield spreads reached over 2000bps, implying around a 30% default rate. While high yield total returns were quite challenging during this period of market turmoil, the realized default rate was significantly lower and the subsequent returns to the asset class were quite favorable for investors. Figure 24 shows how high yield spreads behaved during these periods of financial stress, which we have defined as 800bps or roughly 1 standard deviation above the long-term average spread level.

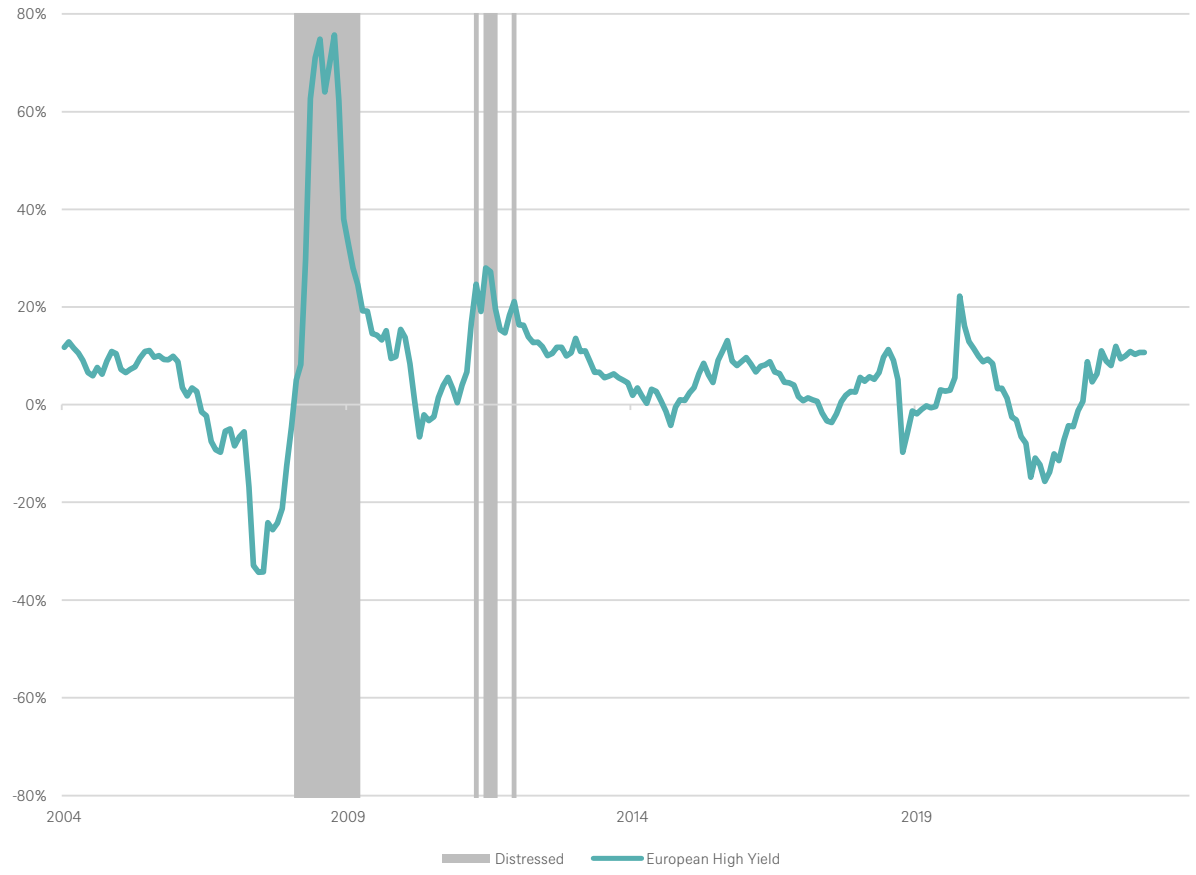
Figure 24: High yield spreads in distressed periods (6/30/2004 to 6/30/2024)



Source: ICE BAML Indices, Bloomberg L.P., DWS calculations as of 6/30/2024.

The widening in credit risk premia has spurred the creation of risk rotation strategies from asset allocators who are looking to take advantage of wide credit spreads. If the peak in spreads can be estimated with any accuracy, monetizing temporarily high credit risk premia following these market selloffs has the potential to help generate favorable investment returns. Figure 25 and Figure 26 show the rolling 12-month returns of segments of the high yield market, average next twelve-month returns have been far more favorable following periods of market distress. As expected, the higher risk CCC and lower segment of the market has captured the most return upside in these rallies.

Figure 25: Rolling 12-month total returns (%) (6/30/2004 to 6/30/2024)



Source: ICE BAML Indices, DWS calculations as of 6/30/2024.

Figure 26: Average rolling 12-month total returns across segments of high yield (6/30/2004 to 6/30/2024)

	European High Yield	BB-B Constrained	CCC & Lower	Cash
Average 12mo Rolling Return	6.74%	6.96%	10.80%	0.88%
Average 12mo Rolling Return (Distressed)	40.39%	40.76%	80.73%	0.68%

Source: ICE BAML Indices, Bloomberg L.P., DWS calculations as of 6/30/2024.

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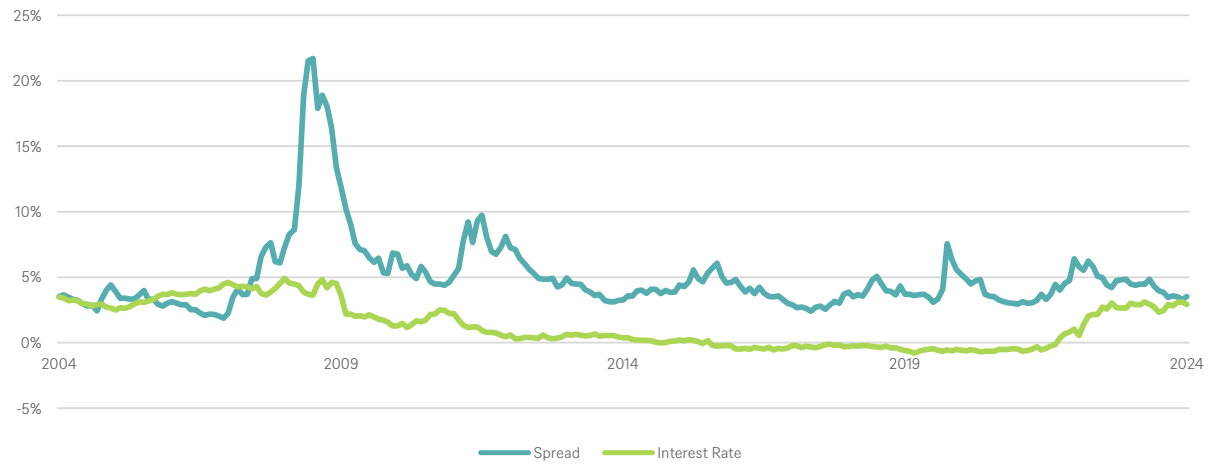
4 / Spreads and interest rates

4.1 Spreads and yields

As previously shown in Figure 9, the all-in index yield of high yield is made up of the spread (consisting if credit risk premium and implied default losses) and the risk-free equivalent yield. Figure 27 shows the historical breakdown of these two components of the index yield.

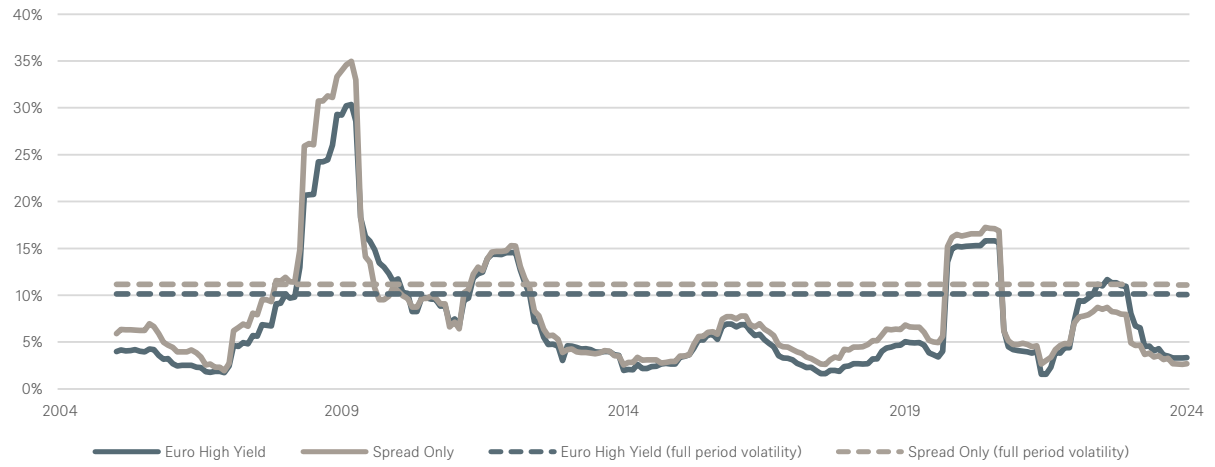
Figure 27: Spread and interest rate contribution to yield (%) (6/30/2004 to 6/30/2024)



Source: ICE BAML indices as of 6/30/2024.

An interesting observation about high yield total returns has been that the volatility of the returns of the cash high yield index has been, on average, actually lower than an interest rate-hedged version of the index. Said otherwise, eliminating the interest rate duration risk of high yield would have, in fact, *increased* the average volatility or risk of a high yield investment (although interest hedging can be more complicated in practice given the callability feature of most bonds). Figure 28 shows the rolling 12-month volatility of both the high yield cash index and an interest rate-hedged version of the high yield index.

Figure 28: Volatility of high yield versus spread-only (6/30/2004 to 6/30/2024)



Source: ICE BAML indices, DWS calculations as of 6/30/2024.

Examining the two component risks and their respective volatilities, we can show the proportion of the spread volatility to the interest rate volatility is roughly 4 to 1, on average. The ratio of these two risks is, however, time-varying, and in particular instances, the interest rate volatility exceeded the spread volatility for short periods of time. Figure 29 shows the 12-month

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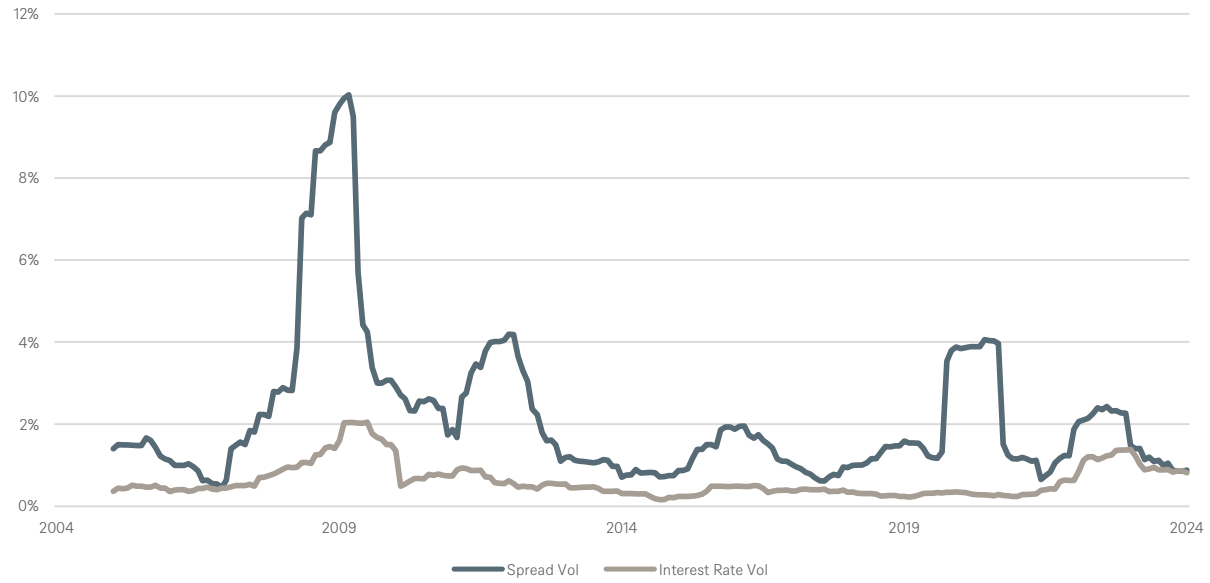
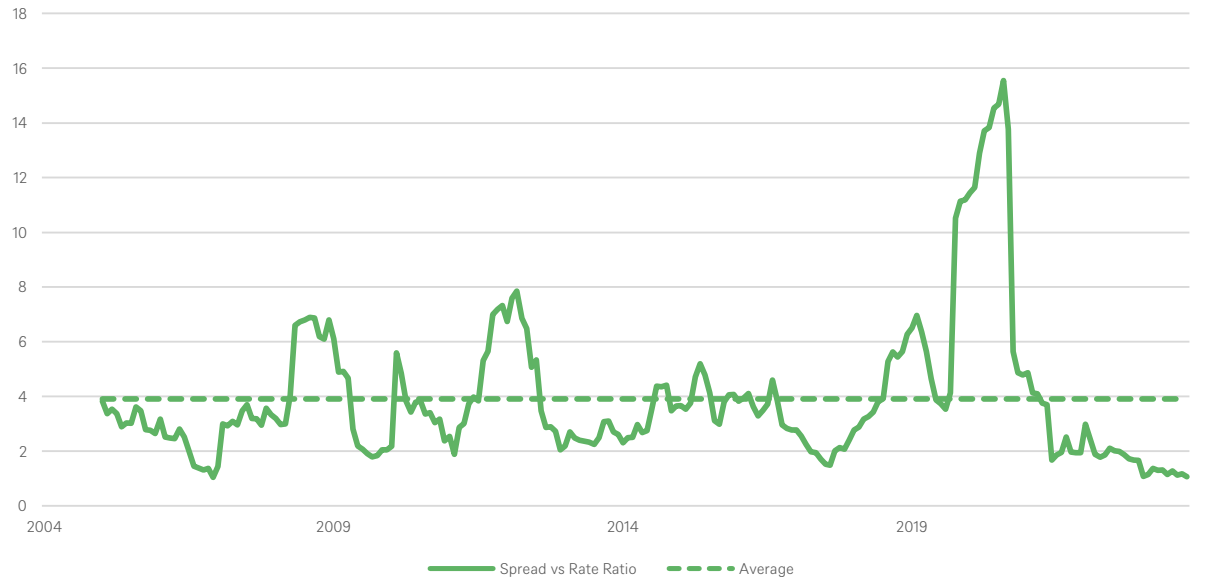
rolling volatility of the spread and interest rate components of the yield and Figure 30 shows the ratio of the volatility of these two component risks over time.

Figure 29: Rolling 12m volatility of spread and interest rate components (6/30/2004 to 6/30/2024



Source: ICE BAML indices, DWS calculations as of 6/30/2024.

Figure 30: Ratio of rolling 12m spread volatility to interest rate volatility of high yield (6/30/2004 to 6/30/2024)

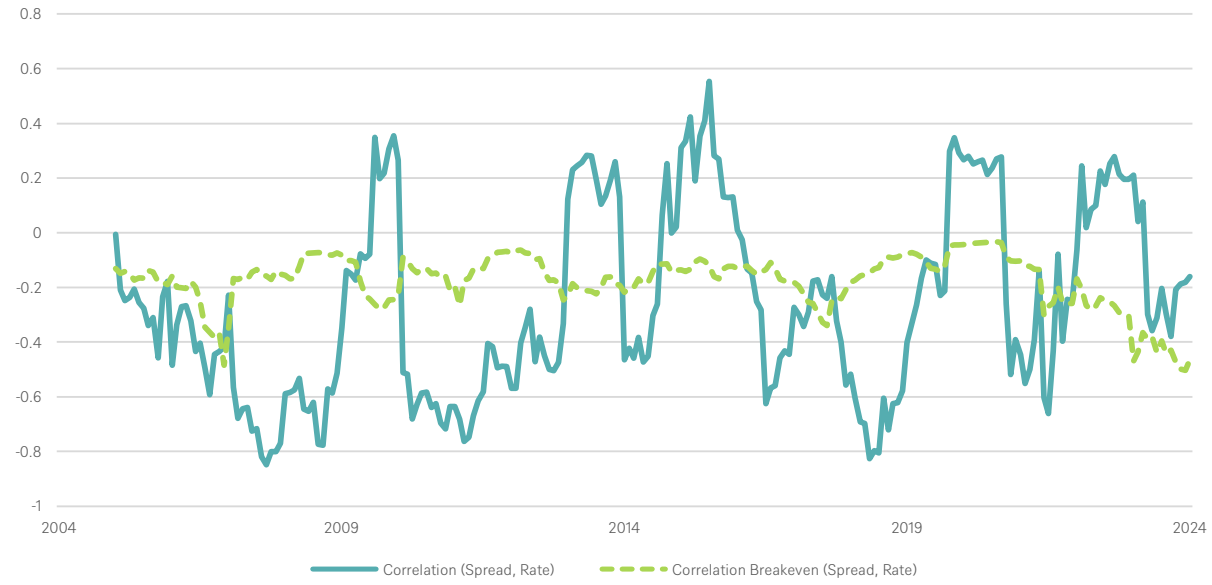


Source: ICE BAML indices, DWS calculations as of 6/30/2024.

When a portfolio consists of two component risks that are additive i.e. the high yield portfolio is exposed to 100% credit spread risk and 100% interest rate risk, the necessary conditions for the two risks to have diversification benefits is significant negative correlations between the two component risks. In Figure 31, periods in which the realized correlation between the spread and risk-free components (teal line) were below the correlation breakeven (green dotted line) denote when high yield

volatility was lower than spread-only volatility. Said otherwise, when the realized correlation was below the breakeven, which happened quite frequently, the interest rate risk of high yield reduced the volatility experience for high yield investors.

Figure 31: 12-month rolling correlation between spread and interest rate risk (6/30/2004 to 6/30/2024)



Source: ICE BAML indices, DWS calculations as of 6/30/2024.

5 / Conclusion

For investors across capital return and income-based strategies, high yield is an integral component of a well-diversified portfolio, offering attractive all-in yield levels that combine risk-on exposures with sensitivity to interest rates. As a fixed income instrument, high yield bonds have realized strong empirical risk-adjusted returns while helping to diversify away from traditional equity or core fixed income-only portfolios. At higher starting yield levels, the higher quality focus on the European high yield market also warrants a constructive longer-term outlook even during periods of moderately slower growth. These characteristics have demonstrated the value of high yield as a strategic allocation in a multi-asset or fixed-income portfolio.

As high yield has gained prevalence in investor portfolios, the size and depth of the high yield market has expanded considerably, allowing both active and index-based approaches to high yield investing to navigate market conditions more easily, particularly when liquidity was more historically challenged. For investors, the ability to dynamically reallocate in and out of high yield has made it easier to express tactical views when yields and spreads have become more attractive.

Furthermore, the depth of the high yield market has also allowed investors to take more nuanced views on their high yield investments. Tilting into or away from certain industries, expressing quality preferences across ratings or spreads/yields to reflect either strategic or tactical market views can potentially help investors more thoughtfully gain exposure to the high yield asset class with greater consideration for management of portfolio opportunities and risks.

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