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Multi-asset credit investing: A quantitative framework

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The fixed income investment landscape has changed significantly over the past several decades. The traditional focus on government bonds and investment-grade corporate debt has given way to more diverse approaches that incorporate high yield bonds, leveraged loans, preferred securities, emerging markets debt, securitized credit and private credit.

Credit assets have become indispensable for institutional investors — whether it is insurers matching assets to policy liabilities, endowments balancing current spending with long-term growth, or pension funds seeking to meet their obligations. Credit has the potential to enhance portfolio yields, diversify risk exposures and generate returns that can help meet a wide range of investment objectives.

The expansion of the credit universe, however, brings complexity. Each credit sector exhibits different risk and return characteristics, correlations, liquidity profiles and sensitivity to various economic and market factors. A quantitative asset allocation framework that provides a consistent and repeatable process can help guide portfolio construction to take advantage of diversification benefits, to provide a more analytical understanding of risk and to identify investment opportunities over time.

This paper outlines a framework for multi-asset credit investing, grounded in best practices from institutional portfolio management, to help investors manage allocation across a rapidly expanding credit universe. The paper offers a disciplined approach to portfolio construction and risk management. However, while quantitative techniques guide strategic and tactical allocation, successful portfolio implementation also relies on the experience, judgment and ongoing research of active managers.

The following sections detail the characteristics of various credit sectors, outline the quantitative allocation framework and demonstrate how this approach can be tailored to specific investment outcomes.

THE EVOLUTION OF MULTI-ASSET CREDIT

A systematic approach to multi-asset credit begins with understanding the distinct characteristics of each credit sector, what they bring to portfolios and the conditions that brought them together. For this paper, sector refers to any major segment within the credit universe — such as high yield corporate bonds, commercial mortgage-backed securities or middle market direct lending. Figure 1 highlights some of the different investment attributes across a selection of sectors.

The interest in these assets under the banner of multi-asset credit is largely due to the seismic market, regulatory and economic changes during and after the 2008 global financial crisis. Unprecedented market dislocations revealed compelling relative value opportunities. Regulatory changes forced banks to reduce lending activities. Persistent low interest rates drove investors to seek yield across a wider investment universe.

Investors began to recognize the complementary attributes of these formerly separate credit segments. High yield bonds, for example, deliver high levels of income with high levels of liquidity. Along with attractive yields, emerging market debt provides access to diverse risk exposures in fast-growing economies. Securitized credit offers further diversification with structural protections through tranches and credit enhancements. Asset-backed securities (ABS) provide exposure to consumers through auto loans, credit cards and student loans. Commercial mortgage-backed securities (CMBS) offer access to real estate sectors including office, retail and industrial. Collateralized loan obligations (CLOs) link to a variety of different industries while providing opportunities to target a desired risk-return profile through the structure.

Direct lending (which is a category of private credit) is also helping to create jobs, build businesses and fuel economic activity. It gained traction as an important and additional source of capital after the financial crisis for middle market companies investing to expand operations. And in rising rate environments, direct lending along with broadly syndicated loans could help protect portfolios because, typically, they are floating rate and senior in capital structures.

Figure 1: Features of selected multi-asset credit sectors

	High yield corporates	Broadly syndicated loans	Securitized credit	Emerging markets debt	Preferred securities	Middle market direct lending	Middle market junior capital
	Debt issued by below investment grade-rated companies	Floating-rate debt issued by below investment grade-rated companies	Securities with claims on a pool of underlying loans or assets	Sovereign and corporate bonds issued by entities in emerging markets	Hybrid instruments that sit between debt and equity	Directly originated loans to middle market companies	Sits between senior debt and equity
Yield target*	6-9%	6-9%	5-11%	5-9%	5-9%	9-11%	11-14%
Liquidity	High	Moderate / High	Low / Moderate	Moderate	Moderate / High	Illiquid	Illiquid
Secured	Varies	Yes	Yes	Varies	No	Yes	Varies
Rate sensitivity	Moderate	Low	Low / Moderate	Moderate / High	Moderate	Low	Low / Moderate
Volatility	High	Moderate	Moderate	Moderate / High	Moderate / High	N/A	N/A

Source: Nuveen internal research, for illustrative purposes only.

* Target returns are not guaranteed. The target return above is derived from both quantitative and qualitative factors, including historical returns and market conditions and assumptions. Target return is presented to establish a benchmark for future evaluation of performance, to provide a measure to assist in assessing anticipated risk and reward characteristics and to facilitate comparisons with other investments. Any target data or other forecasts contained herein are based upon subjective estimates and assumptions; if any of the assumptions used do not prove to be true, results may vary substantially. The target return is pre-tax and is before fees and expenses. In any given year, there may be significant variation from these targets, and there is no guarantee that the target return will be achieved in the long term.

CONSISTENCY AND RIGOR ACROSS CREDIT SECTORS

With such a diverse opportunity set, investors would be well served by a rigorous and repeatable framework that will allow them to source the best investment ideas and create portfolios to meet their investment objectives.

Furthermore, the breadth of opportunity necessitates input from a range of sector experts. A key challenge for multi-asset credit investing is then ensuring that investment views are consistent across sectors. Positioning in sectors associated with longer durations, for example, should not be at odds with positioning in shorter duration sleeves of the portfolio.

The framework described in this paper aims to provide this consistency. It is built at the index level, which provides a solid foundation for strategic sector allocation. However, real-world portfolio construction and management require qualitative judgments from experienced portfolio managers who can move beyond index-level assumptions. They can identify idiosyncratic opportunities, manage liquidity and scalability limits, and respond to market movements.

PORTFOLIO CONSTRUCTION: A FRAMEWORK FOR MULTI-ASSET CREDIT INVESTING

The following framework reflects the approach to multi-asset credit investing at Nuveen. We believe this robust and comprehensive approach incorporates best practice for investors considering such a strategy. It allows investors to set a strategic asset allocation for their desired time horizon. But as it combines top-down views of economic and market cycles with bottom-up views on specific market- and asset-level fundamentals, it can also be applied to provide shorter-term tactical asset allocations.

Capital market assumptions

Capital market assumptions include both forward-looking return expectations and risk forecasts — specifically, sector covariances — that describe how credit sectors behave together.

Forward return expectations

Figure 2 describes the four components used at Nuveen to calculate return estimates for credit sectors. And, as an example, Figure 3 illustrates the component parts for our high yield corporate five-year forward return.

Figure 2: Calculating forward return expectations

Forward return estimates = yield − estimated credit loss − Δrates MTM − Δspread MTM

where:

Yield	Yield to worst (where available) from credit indexes for the credit sector and subsectors
Estimated credit loss	Derived from credit default rate forecasts and expected recovery rates
Δrates MTM	Estimated price return due to forecasted change in interest rates, using sector duration
Δspread MTM	Estimated price return due to forecasted change in credit spread, using the sector spread duration

Source: Nuveen

Figure 3: Five-year forward high yield corporate return example

Yield	Expected Credit Loss	Δrates MTM	Δspread MTM	Forward targeted Return
6.97	2.55	0.37	0.49	3.56
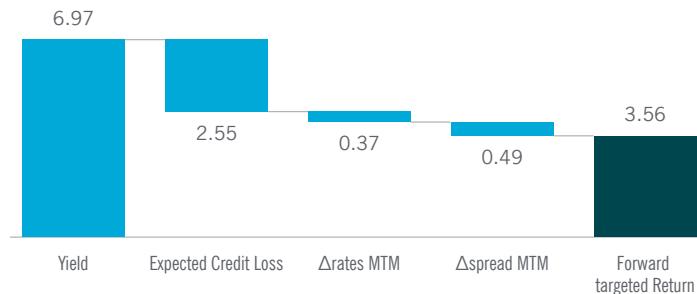
Source: Nuveen as at 19 Nov 2025, based on analysis using the Bloomberg U.S. Corporate High Yield Index. Hypothetical examples are shown for illustrative purposes only and do not represent the performance of any Nuveen investment or portfolio. Past performance does not guarantee future results.

Each credit sector requires time series data. Ideally, these time series should be long enough to include at least a full market cycle and periods of significant market stress to show how the sector responds in different market conditions. These are sourced from index providers. However, by definition, some of the more nascent sectors will not have a long data history. Mortgage credit risk transfer and contingent convertible bonds (CoCos), for example, only came to the fore after the global financial crisis, when various financial institutions issued these securities to shore up balance sheets and reduce risk as required by new regulations. The goal for modelling purposes is to have data that demonstrates how the sector behaves in a sufficiently diverse range of interest rate, market and economic regimes.

Data on credit loss or default rates across the different credit sectors is available from ratings agencies, such as Moody's, S&P and Fitch. Sell-side research from investment banks and broker-dealers may also provide forecasts and historical analysis of loss rates for specific sectors.

Interest rate expectations are typically sourced from an institution's internal rates strategist team or through recognized third-party strategy providers, such as investment banks, brokers or consultants. While approaches may differ across organizations, the key is to apply a consistent forecasting methodology that integrates both quantitative inputs — such as forward curves — and qualitative insights — such as policy trajectory and economic outlook — and is aligned with broader portfolio assumptions.

Credit spread forecasts can also be sourced from internal teams or external providers. Typically, the process begins with the assumption that spreads tend to mean revert over time, usually fluctuating within a historical range rather than continually widening or tightening. While longer-term forecasts often anticipate movement toward the mean, shorter-term projections may reflect near-term economic and market conditions.

A commonly used metric for assessing credit relative value is the z-score, which indicates the number of standard deviations from the historical average. However, relying solely on this measure is insufficient; understanding both the size and direction of the difference is essential for developing robust credit spread forecasts.

Insight into the speed of mean reversion can be gained from a credit spread transition probability based on historical data. This provides outcome distributions that help estimate how spreads may change from one period to the next. It is important to test the assumption of mean reversion through simulation modelling, particularly in sectors with shorter data histories.

If a market is experiencing structural change, for example, spreads can reset at a new equilibrium level. Since the pandemic, significant disruption in the U.S. office market reset return expectations and, as a consequence, reset credit spread expectations for commercial real estate debt investments in some locations. Without expertise in this area, understanding shifting market dynamics can be challenging.

Another factor to be aware of is the changing composition of reference indexes and therefore the inferences and conclusions that can be drawn from any analysis. For example, the U.S. high yield index has improved in quality over time. At year-end 2024, 51% of the index was rated BB, compared to 37% in 2004[1]. This leads to questions about whether its spread will revert to historical averages or to a different level given the improved risk profile. Experienced investors need to exercise judgment in these cases.

Risk modelling (sector covariances)

To complete the capital markets assumptions, risk forecasts need to be modelled. This is not just the volatility for each credit sector but also the covariances, which estimate how different sectors may, or may not, move together.

At Nuveen, we use a weighted covariance matrix, which gives more importance to more recent observations. Emphasizing recent observations aims to capture current market dynamics. From this, we develop a forward-looking risk model that can generate risk forecasts for credit sectors and portfolios.

Figure 4 is a visualization of the capital market assumptions for a range of credit sectors generated by the model for a five-year time horizon.

In addition to providing risk and return expectations for various selected credit sectors, this approach also provides insights that take the relationships among those sectors into consideration. It also seeks to ensure the assumptions and resulting risk and return forecasts have quantitative rigor and are consistent across potential portfolios. For example, if long rates are expected to move higher and credit spreads to widen, the model — depending on the various investment objectives and constraints — is unlikely to favor allocations to long-duration sectors and those with historically tight spreads.

Optimizing a multi-asset credit portfolio

The risk and return expectations along with the investor's investment objectives are inputs for a portfolio optimization exercise that will determine asset allocation.

The investment objectives should specify what the mandate is trying to achieve. This can be specific return targets or risk tolerances. Any constraints are also key inputs at this stage. These include any minimum or maximum investment levels for specific sectors to reflect investor preferences or ability to size positions in the market. A pension fund, for example, may want to target a specific yield, minimize losses and focus on a very long-term investment horizon, while some insurance investors may have a shorter liability profile and limit exposure to certain sectors due to regulatory capital requirements.

The optimization solves for the investment objective, proposing various efficient portfolio allocations depending on the trade-offs required. To illustrate this, we chose a multi-asset credit portfolio with a five-year horizon and a minimum return target of 6.00%.

The allocation constraints are listed in Figure 5 and include exposure to private assets (in this case, middle market direct lending). It is worth noting that the optimization can be configured for different metrics, such as tracking error or expected absolute returns.

Figure 4: Capital market assumptions for a range of credit sectors
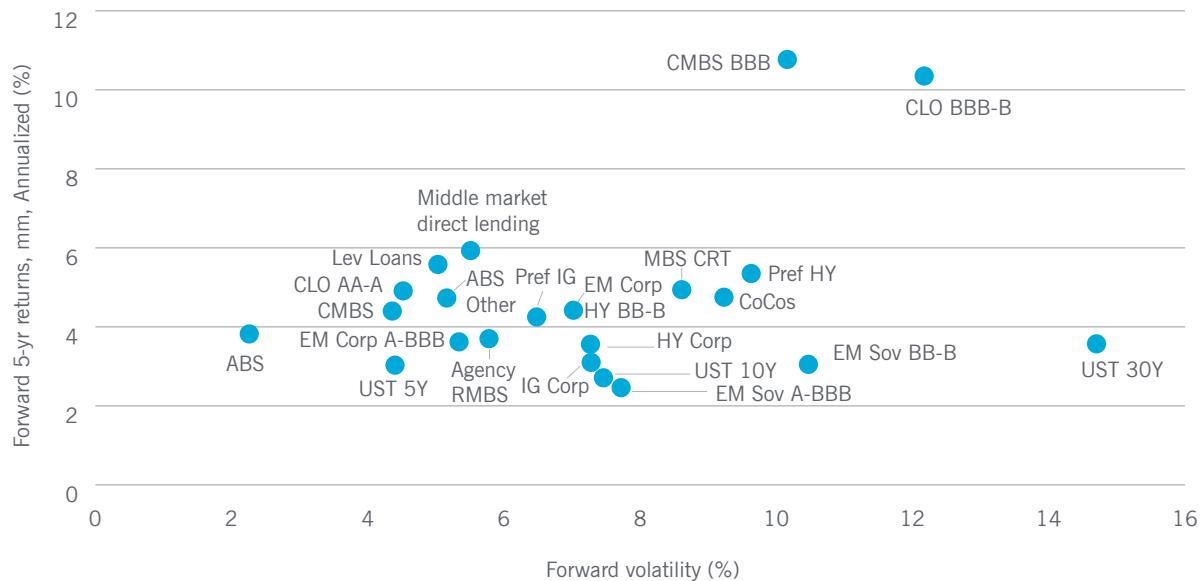
Source: Nuveen, as at 19 Nov 2025

Notes: ABS: Asset-backed securities; Agency RMBS: Agency issued residential mortgage-backed securities; CLO: Collateralized loan obligations; CMBS: Commercial mortgage-backed securities; CoCos: Contingent convertible bonds; EM Sov: Emerging markets sovereign debt; EM Corp: Emerging market corporate debt; HY Corp: High yield corporate; IG Corp: Investment grade corporate; Lev Loans: Leveraged loans; MBS CRT: Mortgage-backed securities, credit risk transfer; Pref HY: High yield preferred securities; Pref IG: Investment grade preferred securities; UST: U.S. Treasuries. See endnote 2.

The optimization exercise proposed six different portfolios detailed in Figure 6. Portfolios one to six are in order of increasing returns and a corresponding increase in volatility. Each portfolio is considered risk-efficient as it respects the constraints while delivering the diversification benefits as determined by the analysis of correlations and risk attributes. Figure 7 details the asset allocations for the efficient portfolios.

Solving for the highest risk-adjusted return (as measured by the forward Sharpe ratio[3]), portfolio six has the optimal allocation, with a return of 6.20%. While portfolio six represents an optimal allocation under the given assumptions and constraints, it should be viewed as a starting point for discussion. Experienced portfolio managers will further refine allocations by considering real-world factors, such as sector liquidity, scalability and specific investment opportunities or risks not fully captured by index-level data.

Figure 5: Portfolio allocation constraints

Sector constraints	Min	Max
High yield corporate	20%	60%
Emerging markets sovereign BB-B	2%	15%
Emerging markets corporate high yield BB-B	2%	15%
Leveraged loans	5%	25%
Contingent Convertibles (CoCos)	2%	10%
Preferred high yield	2%	10%
Asset backed securities (other)	0	10%
Commercial mortgage-backed securities BBB	0	10%
Collateralized loan obligations BBB-B	0	10%
Mortgage-backed securities CRT	0	10%
Middle market direct lending	0	35%

Source: Nuveen. For illustrative purposes only.

Figure 6: Risk and return characteristics for efficient portfolios

Model portfolio	Forward return	Forward volatility	Yield (%)	Duration	Fwd Sharpe ratio
1	5.11%	5.50%	7.45	1.45	0.26
2	5.25%	5.52%	7.55	1.53	0.28
3	5.50%	5.60%	7.68	1.69	0.33
4	5.75%	5.76%	7.96	1.48	0.36
5	6.00%	6.05%	8.13	1.44	0.38
6	6.20%	6.29%	8.24	1.44	0.40

Source: Nuveen. The efficient portfolios are hypothetical and for informational purposes only. Hypothetical examples do not represent the performance of any specific investment and actual returns received in the future may differ materially. Past performance does not guarantee future results.

Figure 7: Efficient portfolios' asset allocation and forward Sharpe ratio
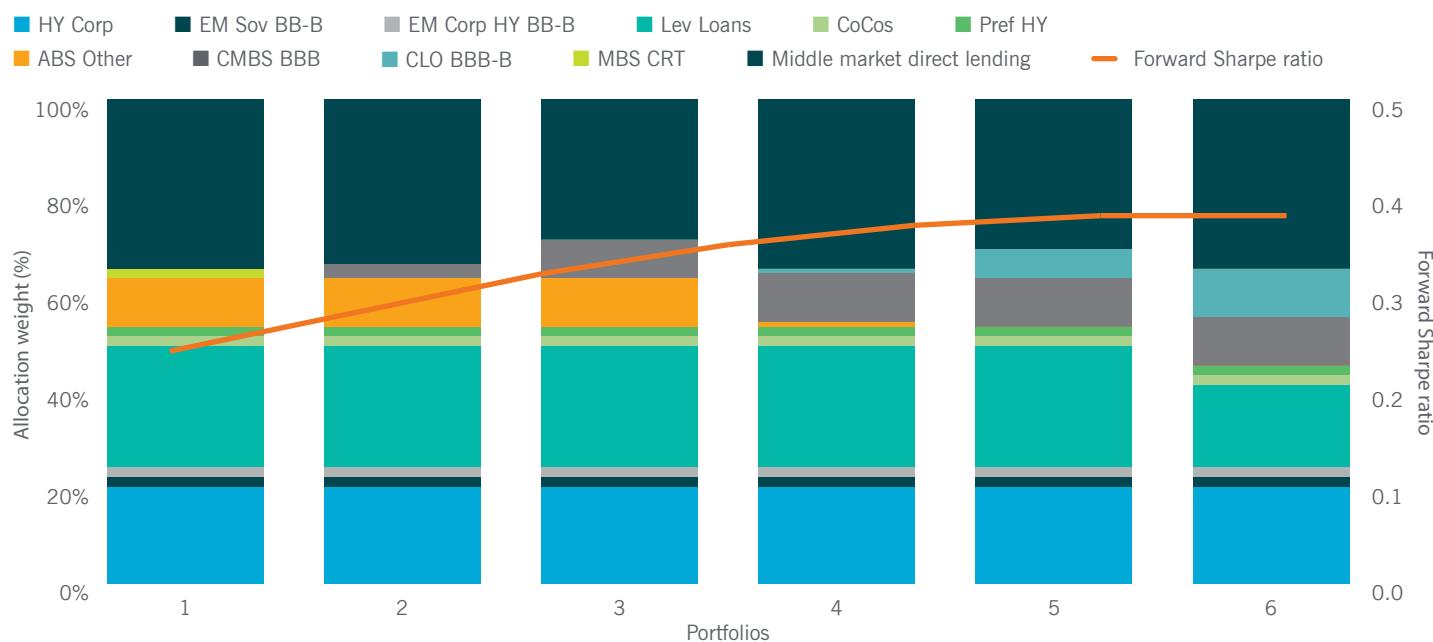
Source: Nuveen. The efficient portfolios are hypothetical and for informational purposes only.

CUSTOMIZING THE FRAMEWORK

The framework can be adjusted to reflect real-life practicalities, allowing investors to explore the trade-offs and how they influence potential outcomes.

Taking advantage of tactical opportunities

Alongside the five-year strategic asset allocation, investors can run a shorter-term optimization exercise to uncover and understand any appropriate tactical exposures. Using a one-year time period, the framework should reveal opportunities arising from prevailing market movements and allow investors to position the portfolio for expected changes in, for example, credit conditions. A shorter horizon allows the investor to express near-term market views and tilt the asset allocation to reflect those opportunities.

Given the potential for portfolio turnover and transaction costs to reduce the ability to achieve investment goals, a constraint may be considered within the framework to limit how much tactical allocations can tilt from strategic allocations. Such a constraint should reflect the views embedded in the investment policy and objective of the portfolio.

Benchmark-relative analysis

Benchmark data can also be included. This allows for portfolios to be analyzed relative to benchmarks, providing insights into risk exposures and sources of yield, for example. It can also provide forward-looking tracking error estimates for the portfolios where consideration is needed. The framework can accommodate standard indexes, such as the Bloomberg Global High Yield Index, and customized indexes, such as benchmarks tailored to a client's specific asset-liability needs. This includes absolute and cash-plus (e.g., SOFR+) benchmarks. Blending of multiple indexes as a benchmark is also possible within the framework.

INVESTING AND MANAGING THE PORTFOLIO

As previously mentioned, the framework is built at the index level. While this facilitates a comprehensive view of how different sectors behave in a variety of market and economic environments, it does not identify the specific investments or securities. An investor needs access to an investment team with proven research and analytical skills to find attractive investments in the selected sector.

Issuer-specific events, for example, can skew an index's yield. A compelling yield on the emerging markets sovereign debt index could be a result of distressed bonds from a single country experiencing a significant fiscal or currency crisis. In these cases, qualitative research and active security selection are essential to mitigate risks and capitalize on market inefficiencies.

Once the portfolio is invested, ongoing monitoring and management are necessary. Effective monitoring requires regular updates to the core components of the capital market assumptions. This includes accounting for any structural changes within the credit sectors and amending assumptions accordingly. An experienced investment team can provide these insights. It will also be able to advise on factors that will inform or influence the constraints, such as realistic time scales for entering and exiting positions, and rebalancing considerations.

CONCLUSION

The quantitative framework presented in this paper provides tools to help institutional investors navigate today's expanded credit universe.

By integrating capital market assumptions, rigorous risk modelling, optimization techniques and practical investment insights, this framework enables institutional investors — whether insurers, endowments or pension funds — to target specific risk-return profiles and investment objectives.

The approach's flexibility allows for both strategic long-term positioning and tactical adjustments, while maintaining consistency across credit sectors to ensure investment decisions remain aligned with overarching investment goals.

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