Invesco

Asset Manager Model Portfolios
Inaugural Invesco Models Benchmarking Study



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EXECUTIVE SUMMARY

Invesco Models Benchmarking Study

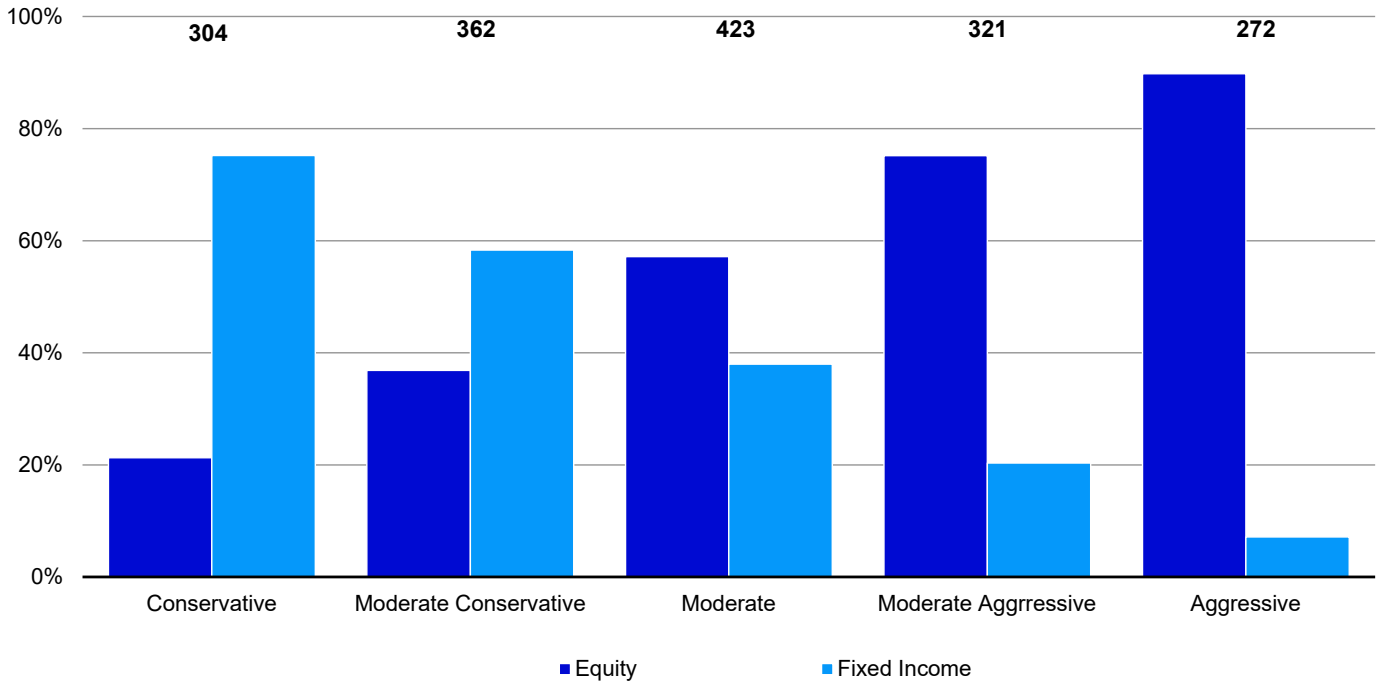
Introduction & Methodology

The inaugural Invesco Asset Manager Models Benchmarking Study provides a comprehensive analysis of asset manager model portfolios, offering valuable insights into allocation strategies, risk profiles, fee breakdown and performance metrics. We utilize Invesco proprietary tools to provide a risk factor lens across model portfolios and present example case studies to encourage ideas and discussion.

Model universe (as of 10/31/24)
1,682 models comprised of 2,128 unique funds in five Morningstar categories (Conservative, Moderate Conservative, Moderate, Moderate Aggressive and Aggressive)*. All models total 2,911, spanning ~70 categories.

By leveraging these insights, asset managers can strategically utilize ETFs & other vehicles seeking to enhance returns, diversify risk, and improve overall portfolio efficiency.

Model Count & Asset Allocation Mix

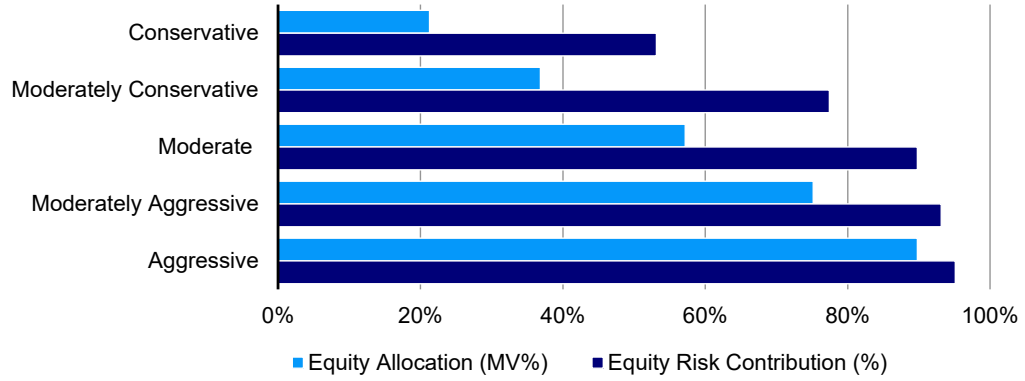


*Source: As of 10/31/24. Model category definitions are as defined by Morningstar (performance & holdings are self-reported to Morningstar).

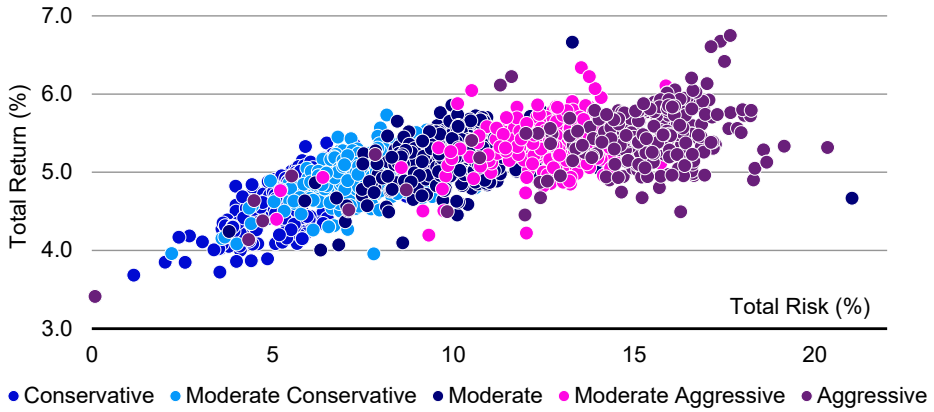
EXECUTIVE SUMMARY

Invesco Models Benchmarking Study

Risk Contribution%[1]



Risk vs Return[1]



Key Findings from the Invesco Benchmarking Study

1. **Equity risk dominates:**
   Equity risk is the largest contributor to total risk across all model types, ranging from 55% in conservative models to 95% in aggressive models (while allocations range from 24% to 91% by market value). This highlights the substantial influence of equity market fluctuations on overall portfolio risk. Understanding factor weights can offer valuable insights for more deliberate equity exposure decisions.
2. **Factor and sector exposures are not what you would expect:**
   Models are underweight the IT sector, as well as factors like quality, growth, and momentum relative to popular market capitalization weighted benchmarks, indicating a conservative approach to factor exposures. ETFs can serve as an efficient instrument to dial up / down factor exposures.
3. **Higher risk, higher returns (in this sample):**
   Conservative models have lower median returns (1-year: 5.90%, 3-year: 0.77%, 5-year: 2.79%), while aggressive models have higher median returns (1-year: 15.13%, 3-year: 4.73%, 5-year: 9.06%), reflecting their respective risk profiles and powerful broad market performance. (Source for returns: Morningstar
4. **Index ETFs are popular model vehicles; keep an eye on active ETFs**
   Index ETFs constitute a significant portion of model assets in the study (55%), while active ETFs average 8%. Over ~1,300 active ETFs3 have been launched since 2019, indicating substantial runway for active ETFs to increase their presence in model portfolios.[2]

1. Source: Risk Contribution and Total Risk as defined by MSCI BarraOne. Total Return based on Invesco Capital Market Assumptions. An investment cannot be made directly into an index (or a Morningstar category). **Past performance is not a guarantee of future results.** All data as of 10/31/24. 2. Source: "Active ETFs, A Growing Trend" – Envestnet, PMC 2025

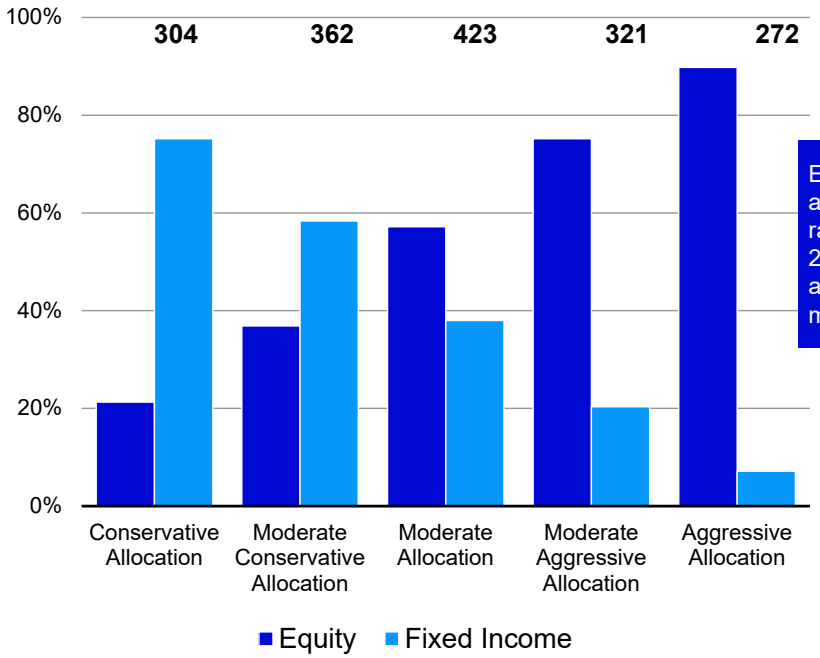
Asset manager models industry snapshot
Benchmarking in a diffuse landscape

1

Models Landscape – Snapshot

Comprehensive study
1,682 models, 2,128 unique funds, five categories.

Total Model Count & Asset Allocation Mix



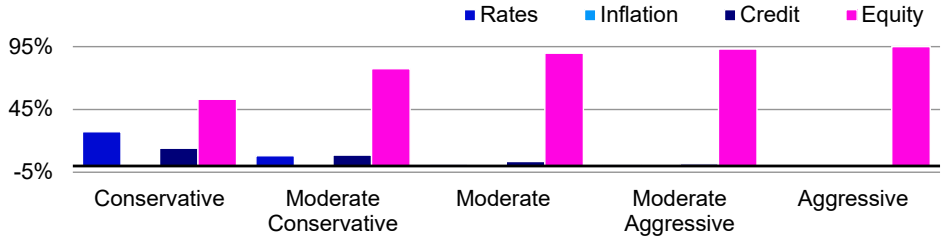
Equity allocations range from 24% to 91% across the five model types…

Annualized Median Returns

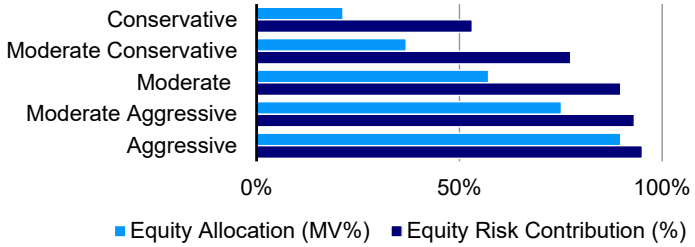
	1Y	3Y	5Y
Conservative	5.90%	0.77%	2.79%
Moderate Conservative	8.11%	1.70%	4.44%
Moderate	10.89%	2.90%	6.24%
Moderate Aggressive	13.03%	3.84%	7.78%
Aggressive	15.13%	4.73%	9.06%

*As of 12/31/24. Source: Morningstar

Risk Contribution%[1]



Equity - Allocation vs Risk Contribution[2]



…while Total Risk contributions are dominated by Equity risk, ranging from **~55% conservative** to **~95% aggressive**

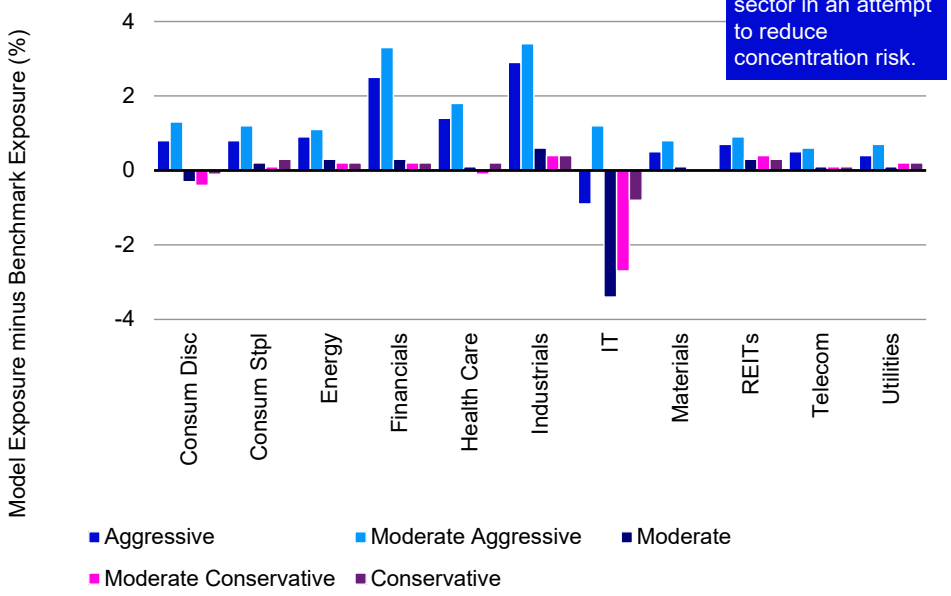
1. As of 10/31/24. Source: Morningstar, MSCI BarraOne, Invesco.
Past performance is not a guarantee of future results.

2. As of 10/31/24. Source: MSCI BarraOne, Invesco.
Risk Contribution as defined by BarraOne Tier One risk factors

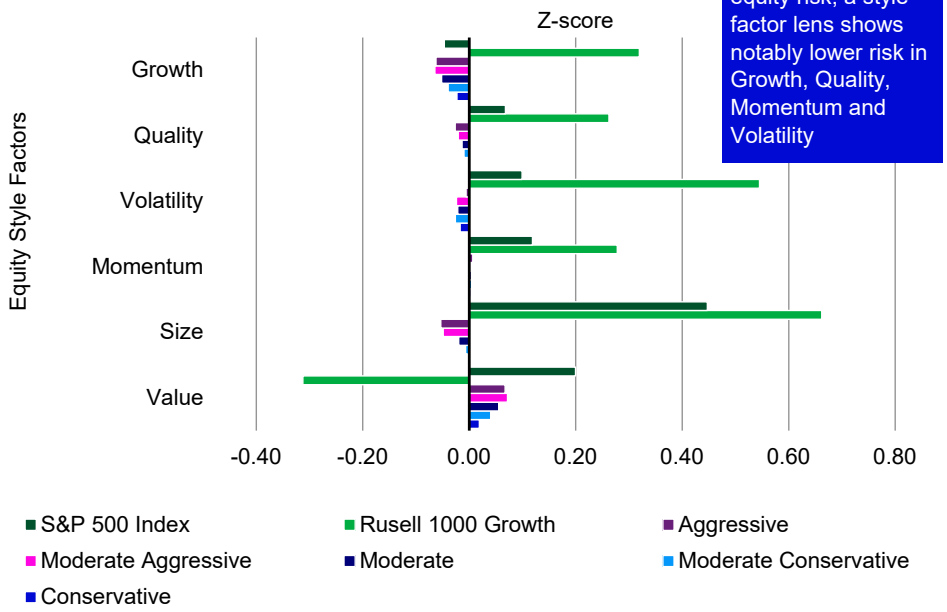
Models Landscape – Snapshot (2)

Sector exposures and factor exposure lens:
IT sector under allocated; Models notably underweight quality, growth & momentum factor relative to S&P 500

Sector Exposures - Model vs Benchmark[1]



Equity Style Factors – Models & Equity Indices[2]



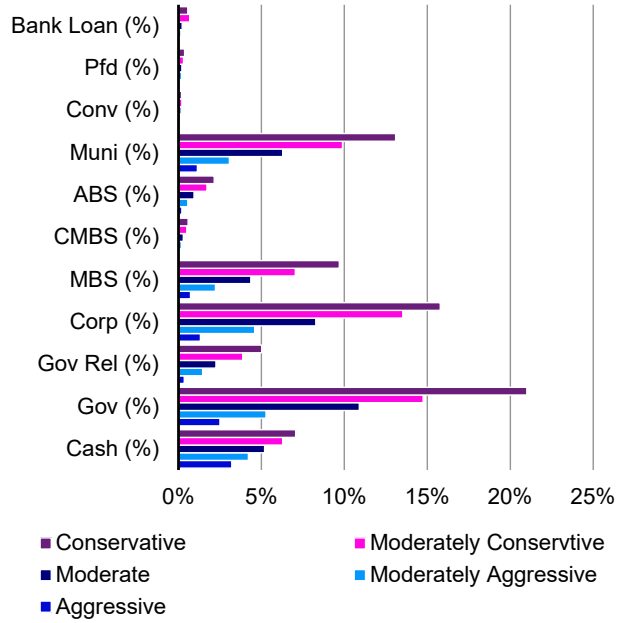
[1]As of 10/31/24. Source: Morningstar, MSCI BarraOne, Invesco.

[2]Source: MSCI BarraOne, Invesco. Z-scores represent quality tilts relative to global equity style factors.

Models Landscape – Snapshot (3)

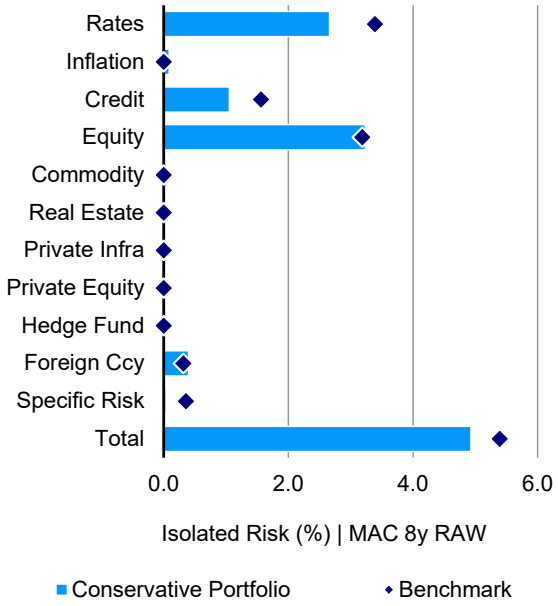
Fixed Income Allocations
Corporate credit, Treasuries, Munis, MBS feature heavily, while non-core (Bank Loans, ABS, CMBS) average 0.5% – 1.6% across models

Fixed Income Sectors*



*As of 10/31/24. Source: Morningstar, MSCI BarraOne, Invesco.

Factor Analysis (Conservative)**



**As of 10/31/24. Source: MSCI BarraOne, Invesco. Risk Contribution as defined by BarraOne Tier One risk factors.

Fixed Income Allocation	
Conservative	78.1%
Moderate Conservative	60.7%
Moderate	40.5%
Moderate Aggressive	23.1%
Aggressive	9.9%

Most models remain underweight risk to fixed income

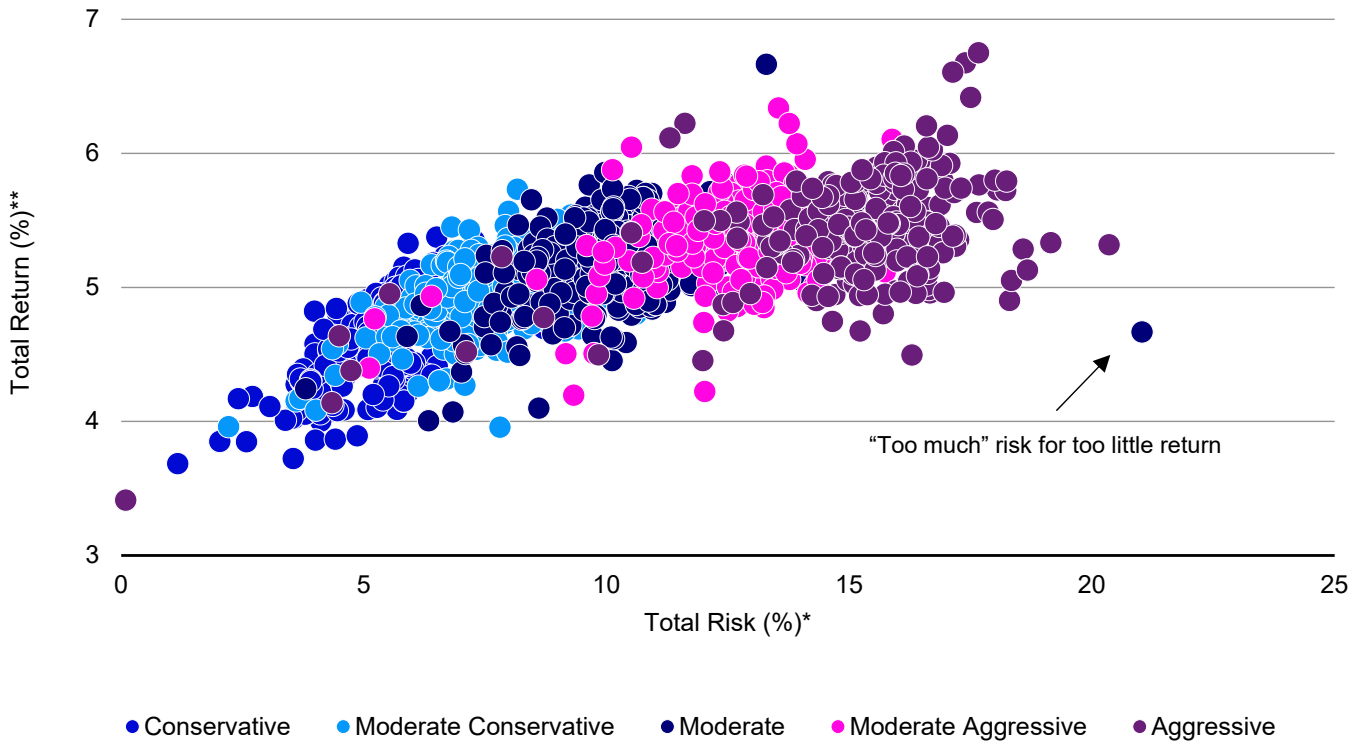
How Invesco can help

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MODELS LANDSCAPE

Risk vs return; How do your models compare?

Ex-ante Total Risk vs Return



Source: Morningstar, MSCI BarraOne, Invesco. **Past performance is not a guarantee of future results.**

For a given level of ax-ante risk, how do your anticipated returns compare?

Conversely, for a given level of return, is your model potentially running too much risk?

Layer this with fees & instrument type to optimize – Invesco can help

*Total Risk – Ex-ante Total Risk as defined by BarraOne and is expressed as the standard deviation of the portfolio's returns and combines systematic and idiosyncratic risks, using a factor model to decompose and quantify risks.

**Return as defined by Invesco Capital Market Assumptions. This is a forward-looking measure of potential returns.

ASSET MANAGER MODELS LANDSCAPE

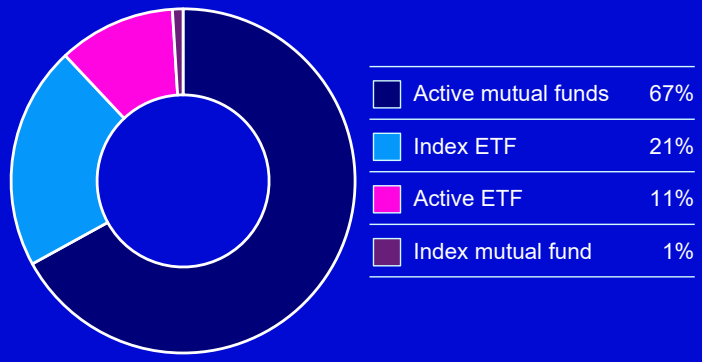
Asset allocation & fees, by fund type

Index ETFs are a significant part of allocations, while active mutual funds drive fee revenues

	Conservative Allocation	Moderate Conservative Allocation	Moderate Allocation	Moderate Aggressive Allocation	Aggressive Allocation
ASSET ALLOCATION MIX					
Active ETF	11%	8%	8%	7%	8%
Index ETF	49%	50%	58%	57%	60%
Active Mutual Funds	36%	38%	30%	31%	27%
Index Mutual Fund	2%	2%	2%	2%	3%
FEE MIX					
Active ETF	0.36%	0.39%	0.42%	0.42%	0.41%
Index ETF	0.10%	0.12%	0.13%	0.13%	0.14%
Active Mutual Funds	0.55%	0.64%	0.68%	0.72%	0.72%
Index Mutual Fund	0.07%	0.08%	0.16%	0.11%	0.09%
Weighted Fees	**0.29%**	**0.34%**	**0.31%**	**0.33%**	**0.32%**

As of 10/31/24. Source: Morningstar, MSCI BarraOne, Invesco. “Asset Allocation Mix” totals will not round due to cash allocations

Fee Budget - Instrument Type



ETF Usage

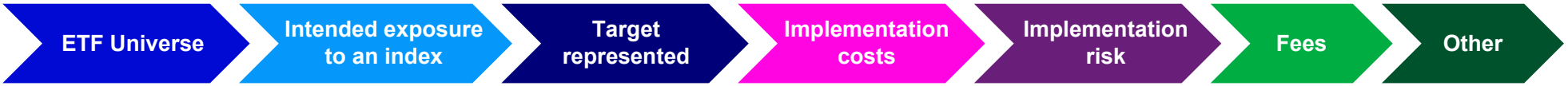
Active ETFs average 8% of total assets while Index ETFs make up on average 55% of total assets. Most surveys point to additional ETF usage**

ETFs comprise

63% of assets in model portfolios, but 32% of the fee budget. Active mutual funds average 33% of assets, and 67% of the fee budget.

*As of 10/31/24. Source: Morningstar, MSCI BarraOne, Invesco.
**Source: Cerulli, “U.S. Asset Allocation Model Portfolios 2024”. 45% of ETF providers expect active ETFs as a major driver of ETF growth over the next 12 months.

We can assist with your ETF selection process



Key criteria for ETF selection

We understand there is a stringent process to ETF selection for both active and index-based strategies, and it is not as simple as picking the cheapest product in a category. We can work with you to determine the best product to fit your goals. Whether that is replicating the performance of an asset class while minimizing tracking error as much as possible or maximizing potential outperformance with a higher tracking error strategy.

We can help you understand the liquidity picture of various products and look to reduce implementation costs. Beyond performance, fees, and implementation costs, there are numerous other considerations we can review with you before picking the right strategy; such as the size of the fund, optimal rebalancing, taxes, and the ability to harvest the revenue from securities lending.

Liquidity

We aim to help you minimize implementation costs when it comes to ETF selection.

Fees

While the expense ratio is an important consideration, we aim to help you understand the all in cost for the strategy you choose.

Tracking error

Tracking error is a critical metric when trying to understand how much a given vehicle deviates from its intended benchmark.

Other

Optimal rebalancing to minimize trading costs, tax implications, securities lending revenue to offset fees, and minimum size.

Source: Invesco as of October 30, 2024.

Case Studies
ETFs as portfolio completion tools

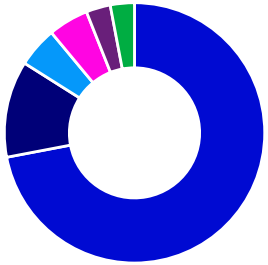


CASE STYDY

Introducing Bank Loans

Goal: Enhanced diversification, improved returns, and lower risk

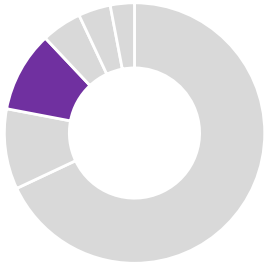
Conservative model sample



US municipals	72%
US large cap	12%
Alternatives	5%
International developed	5%
Balanced	3%
US high shield	3%

Return	3.96%
Risk	4.80%
Return / Risk	0.8

Enhanced conservative model sample

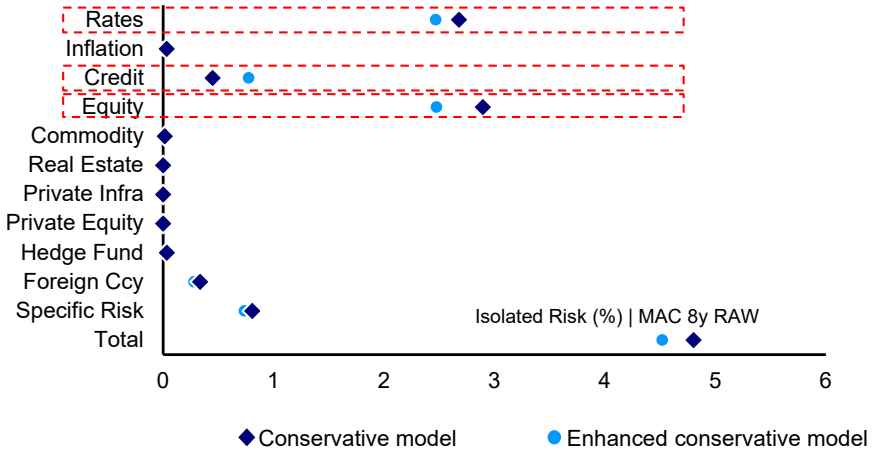


US municipals	68%
US large cap	10%
US bank loans	10%
Alternatives	5%
International developed	4%
Balanced	3%

Return	4.05%
Risk	4.52%
Return / Risk	0.9

Factor analysis

Introducing bank loans provides a more diversified mix of risk exposures



Incorporating senior loans in a portfolio construct

Senior loans can be considered in a portfolio to potentially boost income and diversification while providing some mitigation against rising rates due to the floating rate nature of senior loans

Benefits of senior loans

- Income
- Diversification
- Lower risk capital structure

Source: Invesco Vision as of November 30, 2024. Invesco Vision, designed by Invesco Solutions, is a decision support system that combines analytical and diagnostic capabilities to foster better portfolio management decision-making. See Invesco Vision slide in the disclosures section for additional information. For illustrative purposes only. CMAs are forward-looking, are not guarantees, and they involve risks, uncertainties and assumptions. Refer to the CMA slide for additional information. These CMAs provide broad guidelines for asset allocation and are not used to predict market performance. This information is not intended as a recommendation to invest in a specific asset class or strategy, or as a promise or guarantee of future performance.

CASE STYDY

Examining the momentum factor

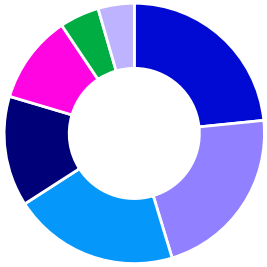
Goal: Increasing exposure to Momentum to improve return outcomes and maintain risk profile

Moderate model sample



International developed	23.4%	Global aggregate	4.9%
US aggregate	20.6%	US small cap	2.5%
US corp.	13.7%	Cash	2%
US value	11%	Return	5.34%
US growth	11%	Risk	10.8%
US core	10.9%	Return / Risk	0.49

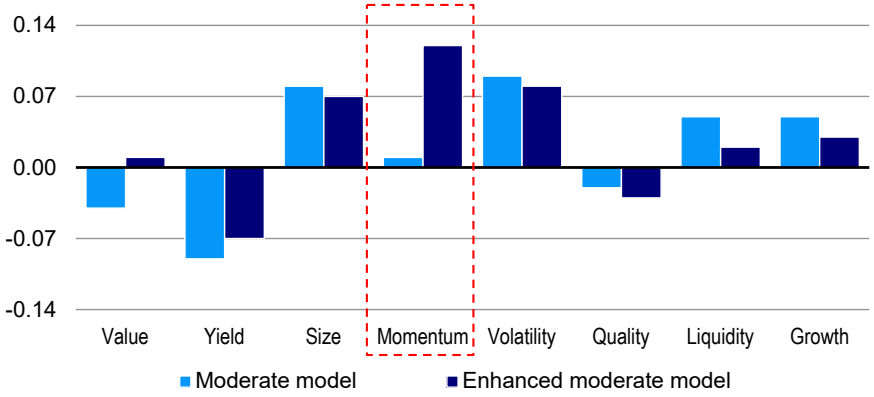
Enhanced moderate model sample



International developed	23.4%	Global aggregate	4.9%
US large (momentum)	21.9%	US small cap (momentum)	4.5%
US aggregate	20.6%	Return	5.52%
US corp.	13.7%	Risk	10.9%
US value	11%	Return / Risk	0.51

Factor exposure

Pronounced exposure to momentum in the enhanced moderate model



The chameleon factor

- Momentum is style agnostic - Depending on the prevailing market trend, momentum can exhibit exposure to and characteristics of growth, value or any combination of the two
- Momentum's dynamic style and sector exposure result in low positive to negative excess return correlations compared to other investment factors

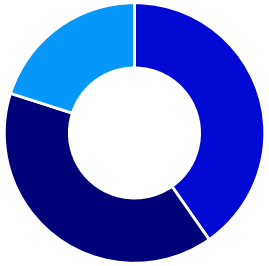
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CASE STYDY

Addressing concentration risk

Diversifying with an equal-weight approach

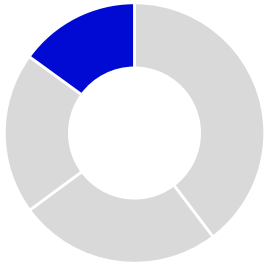
Aggressive model sample



US growth	40.3%
All world equities	39.7%
US large cap core	20.1%

Return	5.05%
Risk	18.43%
Return / Risk	0.27

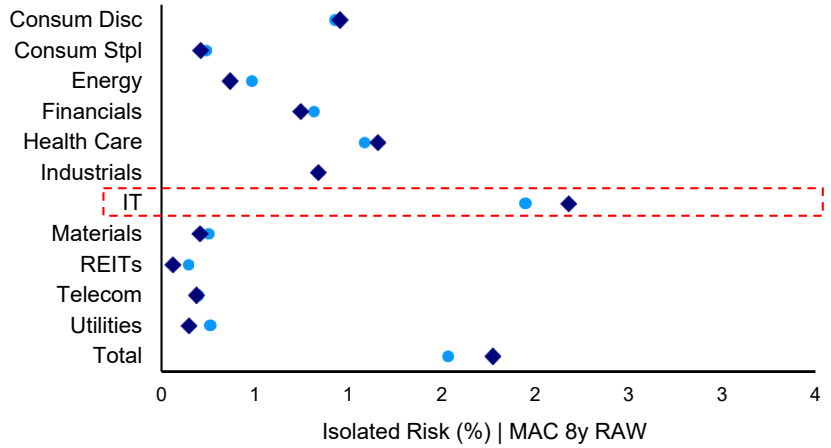
Enhanced conservative model sample



All world equities	39.7%
US growth	25.2%
US large cap core	20.1%
US large cap equal weight	15.0%

Return	5.25%
Risk	18.07%
Return / Risk	0.29

Reducing the growth bias through an equal-weight approach to address concentration risk.



Benefits of an equal-weight approach

Diversify your market cap-weighted core equity strategy

Complement your large cap growth equity strategy

Replace high-fee, underperforming active strategy

Source: Invesco Vision as of November 30, 2024. Invesco Vision, designed by Invesco Solutions, is a decision support system that combines analytical and diagnostic capabilities to foster better portfolio management decision-making. See Invesco Vision slide in the disclosures section for additional information. For illustrative purposes only. CMAs are forward-looking, are not guarantees, and they involve risks, uncertainties and assumptions. Refer to the CMA slide for additional information. These CMAs provide broad guidelines for asset allocation and are not used to predict market performance. This information is not intended as a recommendation to invest in a specific asset class or strategy, or as a promise or guarantee of future performance.

Appendix

Glossary of terms

Term	Description
Risk	Measures the total risk of a security or market. Standard deviation accounts for both market risk and specific risk by measuring the dispersion of returns over time. Risk metrics in our case study are derived from the BarraOne research platform.
Return	Returns are generated through the Invesco Capital Markets Assumptions. Please reference the 'Capital market assumptions (CMAs)' slide for more information
Value	Combination of price-to-book ratio, price-to-earnings ratio, and other fundamental metrics such as dividend yield and value-related factors.
Yield	Measure of a company's profitability relative to its market price, calculated as earnings per share divided by the stock price.
Size	Captures differences in stock returns and risk due to differences in of the market capitalization of companies.

Term	Description
Momentum	Explains common variation in stock returns related to recent (twelve months) stock price behavior.
Volatility	A measure of a security's price fluctuation risk relative to the market.
Quality	Primarily looks at financial metrics like earnings per share, profit margins, and debt-to-equity ratios to assess a company's financial strength.
Liquidity	Captures common variations in stock returns due to the amount of relative trading and differences in the impact of trading on stock returns.
Growth	Measures company growth prospects using historical sales growth and historical and predicted earnings growth.

Source: Invesco.

Models Landscape
Benchmarks Utilized

To illustrate the risk characteristics of model portfolios, we utilized the following benchmarks for each Morningstar category

Morningstar Category	Conservative Allocation	Moderate Conservative Allocation	Moderate Allocation	Moderate Aggressive Allocation	Aggressive Allocation
Benchmark Equity / Fixed Income weight (%)	**20 (or less) /80**	**40/60**	**60/40**	**60/40**	**80 (or more)/20**
Benchmark Details					
MSCI ACWI All Cap	16.0%	32.0%	48.0%	48.0%	64.0%
Russell 3000	4.0%	8.0%	12.0%	12.0%	16.0%
Bloomberg Short Treasury	8.0%	6.0%	4.0%	4.0%	2.0%
Bloomberg U.S. Aggregate	60.0%	45.0%	30.0%	30.0%	15.0%
Bloomberg U.S. Corporate High Yield	8.0%	6.0%	4.0%	4.0%	2.0%
JP Morgan EMBIG Diversified	4.0%	3.0%	2.0%	2.0%	1.0%

Source: Morningstar. As of 10/31/24.

Invesco Solutions Benchmark methodology

The peer-informed benchmarks are derived based on an extensive analysis of Morningstar Models universe categories: Conservative Allocation, Moderate Conservative Allocation, Moderate Allocation, Moderate Aggressive Allocation, Aggressive Allocation.

The goal of the exercise is to arrive at a Neutral Strategic benchmark that reflects the median model's exposures and risks in each bucket above.

The analysis involved cross-sectional (across peers) as well as time series review of the models peers' Equity and Fixed Income holdings.

Equity holdings-based analysis considered look-through exposures on 3 main dimensions: 1) regions/countries (EM, DM, US, Dev ex-US), 2) style bias (Value, Growth, Core), 3) market cap (large, mid, small).

Fixed Income involved analytical assessment of peers' credit risk (primarily utilizing DTS metric (duration times spread)) and interest rate risk (based on duration). The goal of the exercise was to match the median peer on 3 main dimensions: 1) **Fixed Income sectors** (government, quality, risky credit), 2) **regional Fixed Income targets** (US, DM, EM bond) and 3) **DTS and Duration**

Models Landscape
Morningstar Category Definitions

Allocation Categories
The % equity exposure plays role is not solely market weight of equity exposure that is considered. The expected volatility of the model portfolio holds significant weight in category assignment process to account for things such as credit risk, or use of derivatives. If there is higher expected volatility the model portfolio will be placed into a more aggressive category. Each category typically expects funds/models to have a volatility similar to a strategic equity exposure as follows:

Conservative Allocation
Objective: Income & capital appreciation
Strategy: Preservation of capital
Volatility: 15%-30% equity exposure
Indexes: Category Group: Morningstar Mod Tgt Risk TR USD, Category: Morningstar Con Tgt Risk TR USD, Morningstar: Morningstar US Con Tgt Alloc NR USD

Moderate Conservative Allocation
Objective: Income & capital appreciation
Strategy: Preservation of capital
Volatility: 30%-50% equity exposure
Indexes: Category Group: Morningstar Mod Tgt Risk TR USD, Category: Morningstar Mod Con Tgt Risk TR USD, Morningstar: Morningstar US Mod Con Tgt Alloc NR USD

Moderate Allocation
Objective: Income & capital appreciation
Strategy: Balance preservation & appreciation
Volatility: 50%-70% equity exposure
Indexes: Category Group: Morningstar Mod Tgt Risk TR USD, Category: Morningstar Mod Tgt Risk TR USD, Morningstar: Morningstar US Mod Tgt Alloc NR USD

Moderate Aggressive Allocation
Objective: Income & capital appreciation
Strategy: Capital appreciation
Volatility: 70%-85% equity exposure
Indexes: Category Group: Morningstar Mod Tgt Risk TR USD, Category: Morningstar Mod Agg Tgt Risk TR USD Morningstar: Morningstar US Mod Agg Tgt Alloc NR USD

Aggressive Allocation
Funds in allocation categories seek to provide both income and capital appreciation by primarily investing in multiple asset classes, including stocks, bonds, and cash. These aggressive strategies typically allocate at least 10% to equities of foreign companies and prioritize capital appreciation over preservation. They typically expect volatility similar to a strategic equity exposure of more than 85%.
Category Group Index: Morningstar Mod Tgt Risk TR USD
Category Index: Morningstar Agg Tgt Risk TR USD
Morningstar Index: Morningstar US Agg Tgt Alloc NR USD

Source for all: "Morningstar Category for Fund Definitions
For funds available for sale in the United States".

Disclosures

Capital market assumptions (CMAs)

Invesco Solutions develops CMAs that provide long-term estimates for the behavior of major asset classes globally. The team is dedicated to designing outcome-oriented, multi-asset portfolios that meet the specific goals of investors. The assumptions, which are based on 5- and 10-year investment time horizons, are intended to help guide our strategic asset class allocations and should not serve as the basis or primary source for any investment decision. For each selected asset class, we develop assumptions for estimated return, estimated standard deviation of return (volatility), and estimated correlation with other asset classes. Estimates and targets reflecting our various assumptions concerning anticipated results are inherently subject to significant economic, competitive, and other uncertainties and contingencies and have been included solely for informational and illustrative purposes. Forecasts of financial market trends that are based on current market conditions constitute our judgement and are subject to change without notice.

This information is not intended as a recommendation to invest in a specific asset class or strategy, or as a promise or guarantee of future performance. These Invesco proprietary asset class assumptions are passive, and do not consider the impact of active management. As the themes discussed herein may be unsuitable for investors depending on their specific investment objectives and financial situation, and given the complex risk-reward trade-offs involved, we encourage you to consider your own judgment and quantitative optimization approaches in setting strategic allocations to asset classes and strategies. Asset allocation and diversification do not guarantee a profit or eliminate the risk of loss. This material is not intended to provide, and should not be relied on, for tax advice.

References to future returns are not promises or estimates of actual returns a client portfolio may achieve. Assumptions and estimates are provided for illustrative purposes only. They should not be relied upon as recommendations to buy or sell securities. Forecasts of financial market trends that are based on current market conditions constitute our judgment and are subject to change without notice. Estimated returns can be conditional on economic scenarios. If a particular scenario comes to pass, actual returns could be significantly higher or lower than these estimates.

Indexes are unmanaged and used for illustrative purposes only. They are not intended to be indicative of the performance of any strategy. Broad-based securities indexes are unmanaged and are not subject to fees and expenses typically associated with managed accounts or investment funds. It is not possible to invest directly in an index. All estimates in this document are in US dollar terms unless noted otherwise.

Invesco Vision

Designed by Invesco Solutions (Solutions), Invesco Vision is a decision support system that combines analytical and diagnostic capabilities to foster better portfolio management decision-making. Invesco Vision incorporates capital market assumptions (CMAs) developed by Solutions, proprietary risk forecasts, and robust optimization techniques to help guide our portfolio construction and rebalancing processes. Advanced risk management approaches have been incorporated into the system such as de-smoothing of alternative risk factors, multi-asset factor decompositions, in addition to stress test analyses (both historical and hypothetical) to understand the drivers of volatility within our portfolios. By helping investors and researchers better understand portfolio risks and trade-offs, it helps to identify potential solutions best aligned with their specific preferences and objectives.

The Invesco Vision tool can be used in practice to develop solutions across a range of challenges encountered in the marketplace. The analysis output and insights shown here from Invesco Vision does not take into account any individual investor's investment objectives, financial situation or particular needs. The insights are not intended as recommendations to invest in a specific asset class or strategy, or as a promise of future performance. For additional information on our methodology, please contact Invesco.

Important Information

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