

MULTI-FACTOR INDEXES MADE SIMPLE

A REVIEW OF STATIC AND DYNAMIC APPROACHES

Multi-factor index fund allocations are increasingly becoming the preferred approach to factor investing. In this paper, we examine the return/risk characteristics of nine static and dynamic weighting strategies over a 36-year period. The results highlight that a simple strategy that equal weights multiple factor indexes has historically

proved more effective than many of the more complex approaches — pointing to its potential as a way to combine factors, especially in the absence of active investment views and skills. However, a dynamic factor weighting strategy based on fundamental signals also has merit if the investor believes she has the insight or skills required.

KEY FINDINGS

- A simple equal-weighted strategy has been highly effective historically. Many simple rules-based and optimization-based dynamic weighting strategies have failed to match its performance after accounting for turnover cost.
- Fundamentals-based approaches have produced attractive risk-adjusted returns in simulation. The three strategies tested here have delivered higher active returns against the equal-weighted strategy, highlighting the potential benefits of exploiting fundamental insights in the construction of a multi-factor index. Such strategies, however, are active in nature and typically come with the extra costs of higher turnover and greater complexity.
- As investors explore multi-factor investing, the equal-weighted strategy index — which we call Simple Diversification — brings simplicity, transparency and robustness to the investment process and can serve as an attractive starting point for factor allocation.

A Six-Factor Simple Diversification Index

A Simple Diversification multi-factor index provides the simplest combination of factors by equally weighting factor indexes. We use six MSCI World factor indexes — Equal Weighted, Value Weighted, Quality, Momentum, Minimum Volatility and High Dividend Yield — to represent six well-researched risk premia. We consider the Simple Diversification a static approach to factor allocation, as the weight for each factor is defined as $1/n$. The multi-factor index captured the long-term risk premia but offered smoother performance than any of the underlying factor indexes, as shown in Exhibit 1. The long-term outperformance and low active correlations among the MSCI Factor Indexes help explain this phenomenon.

While a Simple Diversification multi-factor index may look naïve in terms of construction, it represents a reasonable starting point for investors who want exposure to systematic risk premia but do not have specific views on the expected risk or return of the underlying factor indexes nor the skills to actively manage factor exposures.

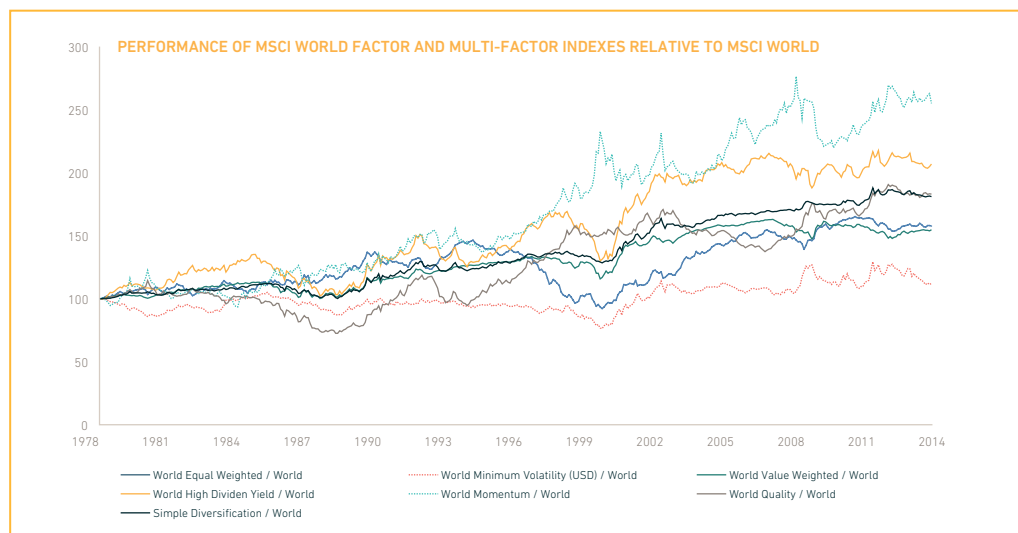
Simple Rules-Based and Optimization Weighting Approaches

Going beyond Simple Diversification in a dynamic multi-factor index requires active views on factors and skills to manage the related exposures. A dynamic factor allocation model adjusts weights regularly — overweighting

factors expected to outperform and underweighting factors expected to underperform. The investment belief is that factors have different return streams and active factor allocation can add value. There are many possible approaches to achieve a dynamic factor allocation. Here, we focus on a few that can be replicated with a set of mechanical rules.

- The Inverse of Variance and Risk Parity strategies can be considered risk-based approaches. The underlying investment beliefs are that overweighting factors with lower volatility or balancing the risk contribution of each factor could improve risk diversification and help achieve better risk-adjusted returns.
- The Inverse of Tracking Error and Tracking Error Optimization approaches add a risk budgeting dimension. The former aims to minimize the tracking error of the multi-factor index without optimization. The latter seeks to maximize the return outcome using mean-variance optimization subject to a tracking error constraint.
- Finally, the Trend Following strategy takes a conventional momentum strategy and applies it to factor allocation.

EXHIBIT 1: SIMPLE DIVERSIFICATION HAS HISTORICALLY OFFERED A SMOOTHER RIDE



Return/Risk Profiles of Simple Rules-Based and Optimization-Based Strategies

The Inverse of Variance and Risk Parity strategies produced risk and return characteristics similar to those of the Simple Diversification strategy during the November 1978 to March 2014 period. This can be explained by the fact that weights of various factor indexes are stable in these two strategies and did not differ from equal weighting. Inverse weighting each factor index based on its tracking error would not have added much value either.

Optimization techniques are typically employed when investors have a set of objectives and constraints they want in their portfolios. But optimization can be complex, requiring accurate risk and return inputs. The Tracking Error Optimization multi-factor index outperformed the cap-weighted benchmark but underperformed other multi-factor strategies including Simple Diversification. It also had the lowest information ratio in the study.

The only rules-based strategy that outperformed the Simple Diversification strategy is the Trend Following approach. It produced slightly higher return/risk and information ratios, suggesting that factor indexes exhibited some forms of momentum behavior that could be exploited. However, it would have experienced greater variations in factor weights and hence higher index turnover.

The Fundamentals-based Approach

The Fundamentals-based approach to multi-factor indexing refers to the systematic implementation of fundamental or valuation-based investment strategies following specified rules or algorithms. Its core tenet is that fundamental data contain important signals that can be used to understand the drivers of volatilities and correlations among assets, as shown in Exhibit 2.

While using valuation or a measure of quality to weight each factor index is a rational approach, we recognize that each factor premium may be better captured by a different fundamental signal. For instance, the Minimum Volatility Index has historically delivered superior risk-adjusted returns during high volatility regimes. A volatility indicator such as the VIX may provide a better signal to help manage the volatility factor exposure. Thus, we can anchor different factor exposures to relevant signals. We call this the “Blended Factors” approach.

Return/Risk Profiles of Fundamentals-Based Strategies

Historically, the use of valuation or other fundamental signals would have improved the performance of multi-factor indexes without significant increases in the total risk, as shown in Exhibit 3.

EXHIBIT 2: EXAMPLES OF FUNDAMENTALS-BASED STRATEGIES

Multi-Factor Strategy	Investment Belief	Possible Approach	Weighting Scheme
Valuation Based	Factor indexes may become overcrowded and/or expensive which may impair performance	Overweight cheap factor indexes/underweight expensive ones	Normalized current E/P level*
Quality Based	Factor indexes with higher ROE will outperform ones with lower ROE	Overweight high ROE indexes/underweight low ROE ones	Normalized current ROE*
Blended Factors	Factor indexes perform well when the underlying signal is strong	Weight each factor index based on the strength of its underlying signal	Normalized E/P spread* (Value) Normalized effective number of stocks* (Size) Normalized ROE spread* (Quality) Normalized D/P spread* (Yield) Normalized VIX (Low Volatility) Normalized past 6-month momentum* (Momentum)

* Compared to its own history

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We make the following observations:

- Valuation-based and Quality-based multi-factor indexes produced similar risk and return characteristics over the November 1978 to March 2014 period, but the Valuation-based index produced a higher information ratio and a lower maximum active drawdown.
- The Blended Factors multi-factor index provided the strongest return, outpacing the Simple Diversification strategy by 100 basis points without a significant increase in risk.
- The simulated performance suggests that an investor might have been able to add value to a multi-factor portfolio by managing factor exposures with the right signals.

EXHIBIT 3: PERFORMANCE OF FUNDAMENTAL SIGNAL STRATEGIES

	MSCI World	Simple Diversification	Valuation-Based	Quality-Based	Blended Factors
Total Return* (%)	10.6%	12.4%	13.0%	12.9%	13.4%
Total Risk* (%)	15.1%	13.9%	13.9%	13.8%	14.0%
Return/Risk	0.70	0.90	0.94	0.93	0.96
Maximum Drawdown	-53.7%	-52.0%	-51.9%	-51.5%	-49.7%
Active Return*		1.9%	2.4%	2.3%	2.9%
Performance Drag (bps) **		26.3	39.0	38.5	44.8
Active Return (Net of Performance Drag)		1.6%	2.0%	1.9%	2.4%
Tracking Error*		3.3%	3.9%	4.2%	3.7%
Information Ratio***		0.49	0.52	0.46	0.65
Maximum Active Drawdown		-10.7%	-9.7%	-12.2%	-10.9%
One-way Index Turnover ****	3.0				
Separate Mandates		35.4	63.8	64.5	76.1
Combined Mandate		26.3	39.0	38.5	44.8

* Annualized gross return (USD) from 11/30/1978 to 03/31/2014

** Performance drag calculated based on annualized two-way index turnover for combined mandate assuming a transaction cost of 50bps

*** Information Ratio is calculated using active return (net of performance drag)

**** Annualized one-way index turnover for the 05/31/1999 to 03/31/2014 period

CONCLUSION

There are many ways to construct multi-factor indexes. We use nine weighting strategies to proxy different investment approaches and examine the return/risk characteristics over a 36-year period. The results highlight that a Simple Diversification approach to constructing multi-factor indexes has historically proved more effective than many of the more complex approaches — pointing to its potential as a way to combine factors, especially in the absence of active investment views and skills.

Dynamic factor allocation strategies have their merits as well—particularly for those with the requisite views and skills. The Blended Factors strategy would have provided the best overall return/risk profile among the dynamic strategies analyzed. In considering whether to manage a multi-factor index via a simple equal weighting or more dynamic weighting strategies, the decision depends on investors' investment beliefs and process and — critically — whether they are confident of possessing the insight or skills to manage factor exposures dynamically.

If you'd like to read more about any of these subjects, please visit [msci.com/resources/research_papers](https://www.msci.com/resources/research_papers) for the full version of this research paper.

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