

# ETF use within multi factor portfolios: pure versus benchmarked exposure.

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## Introduction

*"...even for a very simple multi factor allocation schemes ... the choice of single factor ETFs serving as building blocks matters..."*

In this paper we analyze the problem of multi-factor investing from an active fund-of-fund selector perspective, or investors who seek to achieve a diversified exposure to different factors using liquid, transparent and cost-efficient ETFs. We compare Ossiam's European ETF with a clear identified factor exposure (Size, Value, Volatility and Dividend) and ETFs from other providers that track MSCI's factor indices. The main result of this study is that even for a very simple multi factor allocation schemes (as the equally weighting), the choice of single factor ETFs serving as building blocks matters. More precisely, the methodologies underlying Ossiam's ETFs make them more suitable from a multi-factor perspective, as they turn out significantly different from each other and from the capitalization-weighted benchmark. This is less evident for ETFs from other providers that track MSCI's factor indices since, by construction, their methodologies forces them to be closely linked to their benchmark. As such, for a fund-of-fund manager, it is very difficult to find "space" of diversification within the other providers' ETF with MSCI underlying factor indices, as they are all similar to each other and to the benchmark. In other words, these strategies do not respect the underlying factor premium because they aim, among other things, to capture it while being very close to the benchmark. Conversely, Ossiam's ETFs respect and preserve the very dynamic nature of factors' premia, which means that some ETFs will outperform the benchmark (because the underlying factor is) while some will not. In this sense, they are more pure and more suited for multi factor investing.

As we show in this study, for all three allocation schemes we consider (equally weighting, risk parity and momentum tilting) we do not notice any benefit from combining other providers' ETFs, while Ossiam's ETF-based multi factor portfolios are able to achieve both absolute and relative outperformance over the benchmark.

## Single factor ETFs

We consider four European ETFs that mimic the Size, Value, Volatility and Dividend factors, whose methodologies are declined in well-known MSCI's indices over the period January 2009 to December 2017. We also consider Ossiam's European ETFs that are exposed to these factors. For ETFs that were launched after the initial date, we consider as proxy their underlying indices from which we subtract their annual TERs.

	Size		Value		Volatility		Dividend	
	Ossiam	Provider 1	Ossiam	Provider 2	Ossiam	Provider 1	Ossiam	Provider 2
ETF Underlying Index Name	Stoxx® Europe 600 Equal Weight NR Index	MSCI Europe Mid Cap Equal Weighted Net EUR Index	Shiller Barclays CAPE® Europe Sector Value NR Index	MSCI Europe Value Net Total Return EUR Index	iStoxx® Europe Minimum Variance NR Index	MSCI Europe Minimum Volatility Net Total Return EUR Index	iStoxx® Europe Minimum Variance High Dividend NR Index	MSCI Europe High Dividend Yield Net Total Return EUR Index
Benchmark	Stoxx® Europe 600 NR Index	MSCI Europe Net Total Return EUR Index	MSCI Europe Net Total Return EUR Index	MSCI Europe Net Total Return EUR Index	Stoxx® Europe 600 NR Index	MSCI Europe Net Total Return EUR Index	Stoxx® Europe 600 NR Index	MSCI Europe Net Total Return EUR Index
Ann. Performance	13.61%	11.65%	12.57%	8.48%	9.79%	10.23%	9.46%	9.56%
Ann. Volatility	19.21%	18.96%	18.89%	20.46%	12.22%	13.81%	14.43%	18.42%
Sharpe Ratio	0.70	0.61	0.66	0.41	0.79	0.73	0.65	0.51
Max. Drawdown	-26.30%	-29.48%	-23.68%	-31.61%	-18.39%	-21.35%	-26.41%	-32.40%
Beta	1.03	1.00	0.96	1.10	0.60	0.73	0.74	0.97
Alpha	2.71%	1.41%	2.76%	-2.75%	3.43%	2.82%	1.94%	-0.33%
Tracking Error	3.79%	4.81%	6.95%	4.11%	9.03%	6.28%	7.08%	5.03%
Information Ratio	0.80	0.30	0.34	-0.42	-0.09	0.01	-0.16	-0.13

Exhibit 1 : Ossiam's and other providers' ETFs key performance indicators. Source: Bloomberg. Data from January 2009 to December 2017. Calculation by Ossiam. Performances and other statistics are calculated using the official NAVs and, as such, already includes funds' TER. Past performance is not a reliable indicator of future performance. Alphas, Betas, Tracking Errors and Information Ratios are calculated over the ETFs' relative benchmarks. The risk-free rate over the period used in the Sharpe ratio is 0.13% annualized.

Exhibit 1 shows standard performance indicators of Ossiam's ETFs compared to their counterparties from two providers. The Ossiam Stoxx® Europe 600 Equal Weight NR UCITS ETF (for Size) and the Ossiam Shiller Barclays CAPE® Europe Sector Value TR UCITS ETF (Value) clearly outperform ETFs tracking MSCI indices, both in absolute and relative terms. The annualized performances spread between Ossiam's Size and Provider 1's Size is almost 2% (13.61% versus 11.65%) with similar risk profiles, so that in the end both the Sharpe and the Information Ratios are significantly higher for the Ossiam's Size ETF.

For Value the annualized performance difference is more than 4% (12.57% for the Ossiam's Value versus 8.48% for Provider 2's Value), with lower volatility and maximum drawdown. This makes the Ossiam's Value ETF more efficient, as measured

again by Sharpe or Information Ratio. Ossiam iStoxx® Europe Minimum Variance NR UCITS ETF achieves an annualized performance that is 0.44% lower than Provider 1's Volatility ETF, but with lower volatility and lower Maximum Drawdown, so that the Sharpe ratio is slightly higher than Provider 1's, while the Information Ratio is slightly lower but both close to zero. Finally, the two Dividend ETFs (Ossiam's and Provider 2's) are close in terms of annualized performance, but Ossiam's achieves lower volatility given the use of both Dividend and Low Volatility factors, while Provider 2's mainly looks for pure dividend yield. As such, Ossiam's achieves better Sharpe ratio from the significant lower volatility, as well as lower Maximum Drawdowns.

Correlations of daily returns										
Ossiam	Size	Value	Volatility	Dividend		Other Providers	Size	Value	Volatility	Dividend
Value	90.42%					Value	95.08%			
Volatility	85.70%	82.95%				Volatility	91.62%	92.12%		
Dividend	89.96%	87.91%	92.64%			Dividend	91.75%	97.26%	93.40%	
Benchmark	98.07%	93.06%	90.04%	93.34%		Benchmark	96.74%	98.38%	96.12%	96.24%

Exhibit 2 : Ossiam's and other providers' ETFs correlations. Source: Bloomberg. Data from January 2009 to December 2017. Calculation by Ossiam. Past performance is not a reliable indicator of future performance. For the correlation with the benchmark, we use the official ETF's benchmark, as in Exhibit 1.

*"...any multi factor manager who seeks regular outperformance over his benchmark will need real diversification potential from his building blocks. This fact seems to be more pronounced for the Ossiam ETFs than the other providers' ones ..."*

Most importantly from a multi factor perspective is the correlation across different factor ETFs, as shown in Exhibit 2. It is very remarkable that for each pair of Ossiam's ETFs, the correlation is lower than the same pair for the other providers' ETFs. The difference can go from 1% up to almost 10% (for example the Ossiam Value/Volatility correlation is at 82.95% while the same pair for the other providers reaches 92.12%).

This is fundamental from a multi-factor perspective as it insures that the underlying building blocks (the ETFs) that target different factor exposures are sufficiently different to be combined within the portfolio. Moreover, we remark that the correlation of Ossiam's ETFs with their relative capitalization-weighted benchmark is systematically lower than the other providers' ones. These differences are particularly significant for the Ossiam Value and Ossiam Volatility ETFs.

This is also important as any multi factor manager who seeks regular outperformance over his benchmark will need real diversification potential from his building blocks. This fact seems to be more pronounced for Ossiam ETFs than the other providers' ones, and clearly depends upon the methodologies behind the underlying indices.

## Multi Factor

The goal of this section is to show how the characteristics of Ossiam ETFs (efficiency and real diversification) make them well suited for a multi factor portfolio when compared with other providers' ETFs. We do not suggest any specific multi factor allocation scheme, as this is the value added by the manager of a diversified multi factor strategy or the fund-of-fund selector. Indeed, we provide three simple allocation schemes that usually serve as the basis for multi-factor active management. However, even with such a simple allocation schemes, we are able to highlight significant value added by using efficient ETFs with real diversification power. This is even important when the multi factor strategy is benchmarked, since the final multi-factor strategy's value added is significantly lowered when the single factor ETFs are "too" close to the benchmark.

We consider the following three allocation schemes, implemented at the end of each calendar quarter, for both the Ossiam's and the other providers' ETFs.

1. Multi Factor Equal Weight (**MFEW**): it allocates 25% to each of the four factor ETFs (Size, Value, Volatility and Dividend).
2. Multi Factor Risk Parity (**MFRP**): the allocation to each ETF is proportional to the inverse of the realized 6 months volatility. This allocation method will obviously favor low volatility strategies.
3. Multi Factor Momentum (**MFMM**): the scheme allocates to each ETF the weight  $25\% \times (1 + Tilt\%)$  where *Tilt%* depend on the relative momentum of the ETF compared to the others, and it is comprised between -50% and +200%. Weights are scaled to sum up to 100%. This scheme clearly favors the most performing factor ETFs, hence it aligns the multi factor strategy with the most favored factors in the market.

For each allocation scheme we have two multi factor portfolios: one made of Ossiam's ETFs and the other built with the other providers' ETFs. Exhibit 3 collects main performance indicators for these portfolios.

	Benchmark	Multi Factor Equal Weight		Multi Factor Risk Parity		Multi Factor Momentum	
	Stoxx® Europe 600 NR Index	Ossiam	Other Providers	Ossiam	Other Providers	Ossiam	Other Providers
Ann. Performance	10.58%	11.48%	10.10%	10.84%	10.04%	11.12%	10.21%
Ann. Volatility	18.30%	15.52%	17.49%	14.83%	17.01%	15.45%	17.15%
Excess Return over the benchmark	-	0.90%	-0.48%	0.26%	-0.54%	0.54%	-0.37%
Sharpe Ratio	0.57	0.73	0.57	0.72	0.58	0.71	0.59
Max. Drawdown	-25.46%	-22.12%	-27.70%	-21.98%	-26.59%	-21.72%	-27.70%
Beta	-	0.83	0.95	0.79	0.92	0.82	0.93
Alpha	-	2.66%	0.06%	2.45%	0.28%	2.39%	0.40%
Tracking Error	-	4.33%	2.38%	5.01%	2.55%	4.72%	2.90%
Information Ratio	-	0.21	-0.20	0.05	-0.21	0.11	-0.13

Exhibit 3 : Multi factor portfolios based on Ossiam's and other providers' ETFs. Key performance indicators. Source: Bloomberg. Data from January 2009 to December 2017. Calculation by Ossiam. Performances and other statistics are calculated on the official NAVs and, as such, already contain funds' TER. Past performance is not a reliable indicator of future performance. Excess Returns, Alphas, Betas, Tracking Errors and Information Ratios are calculated over the Stoxx® Europe 600 NR Index, although the results would be very similar if we would have used the MSCI Europe Net Total Return EUR Index. The risk-free rate over the period used in the Sharpe ratio is 0.13% annualized.

*“...this is more important when the multi factor strategy is benchmarked, since the final multi-factor strategy’s value added is significantly lowered when the single factor ETFs are “too” close to the benchmark. ...”*

It is noteworthy that the use of Ossiam’s ETFs has been always able to provide higher annualized performances historically when compared with other providers’ ETF-based multi factor portfolios. For example, the very simple MFEW scheme for Ossiam’s ETFs produces an annualized 1.38% performance over the same MFEW from other providers’ ETFs (11.48% vs. 10.10%). As such the excess return of the Ossiam MFEW over the Stoxx® Europe 600 NR Index is 0.90%, while the other providers’ one underperforms by -0.48% annualized. We find a similar behavior for the other allocation schemes, so that the real source of such differences cannot be attributed to the specific allocation scheme we use. From a risk perspective, Ossiam’s ETF-based multi factor portfolios are characterized by lower volatility and significantly lower maximum drawdowns.

For the three Ossiam’s ETF-based multi factor portfolios, the Sharpe ratio is in the range 0.71-0.73, while the other providers’ ones are in the range 0.57-0.59. Furthermore, we remark that usually Ossiam’s ETF-based multi factor portfolios have lower betas and significantly higher alphas. Once again, given the intrinsic similarity of the other providers’ ETFs with their benchmark (and by consequence with the benchmark used in this analysis) it is very difficult for such multi-factor portfolios to outperform it. For this to be true, the multi factor allocation scheme should be very efficient and “smart”, with a significant timing component (forecast and invest in the best factors). Even if this is extremely difficult to achieve over time, eventually this hypothetical allocation scheme would make better use of its ability by choosing Ossiam’s ETFs, as they are naturally more diverse, with lower pairwise correlation.

Indeed the same allocation schemes with Ossiam’s ETF usually have the double tracking errors with the benchmark, again a sign of the space the multi factor strategy has in selecting and exploiting the differences in factor performances. Conversely, the other providers’ ETF-based multi factor portfolios struggle to generate tracking error, because each underlying ETF is, by construction, too close with the benchmark. As such, generating alpha by combining these ETFs requires a great deal of timing. Exhibit 4 shows this very fact: when one uses other providers’ ETFs, it is difficult to produce an output noticeably different from the benchmark.

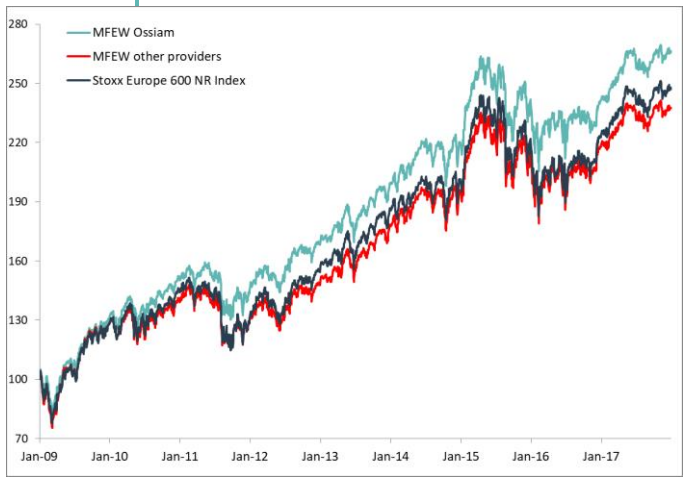


Exhibit 4: MFEW portfolios based on Ossiam’s and other providers’ ETF. Portfolios levels are set at 100€ at inception. Source: Bloomberg. Data from January 2009 to December 2017. Calculation by Ossiam. Performances and other statistics are calculated on the official NAVs and, as such, already contain funds’ TER. Past performance is not a reliable indicator of future performance.

**Conclusion**

*“...Ossiam’s ETFs are constructed to be exposed to specific factors without consideration of the tracking error with the benchmark. This choice makes them well suited for multi factor portfolio....”*

When it comes to multi factor investing, it is highly recommended to use low cost, efficient, liquid and transparent ETFs to achieve exposure to different factors. Nevertheless, it is also important to make sure that the chosen ETFs are sufficiently different from each other (and complementary) to expect any diversified allocation among them to produce smooth and robust outperformance over time.

This study shows that factor-based ETFs that are designed, by construction, to be close to their benchmark are not well adapted for multi factor investing. Indeed one should look at more “pure” factor ETFs that allow large deviations from the benchmark, giving to the multi factor manager the space and the possibility to allocate and discriminate across factors. As a matter of fact, Ossiam’s ETFs are constructed to be exposed to specific factors without consideration of the tracking error with the benchmark. This choice makes them well suited for multi factor portfolio, enabling sufficient factors’ diversification the possibility of real outperformance over the benchmark.

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