Research

Factor investing considerations

Questions and Answers

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Table of contents

Introduction

FTSE Russell has produced a series of papers that examine topical factor investing issues. This note consolidates the main findings. Readers interested in the details are encouraged to refer to the original papers [1, 2, 3, 4].

Portfolio construction methods are many and varied, particularly when it comes to the creation of portfolios exposed to common factors, such as, Value, Size and Quality.[1] Multi-factor construction techniques are typically categorized into Top-down and Bottom-up. Top-down and Bottom-up approaches can lead to different outcomes. Therefore, it is important for investors to be able to make a meaningful comparison between these two alternatives.

Top-down portfolios are constructed using combinations of single factor portfolio "sleeves", in particular Selection and Weighting (S&W) – a technique that ranks stocks by a single factor score is often employed. Stocks that are ranked above a specified threshold are included in the single factor portfolio. A variety of weighting schemes may then be overlaid on this selection to form a single factor portfolio. Weighting schemes range from simple equal weighting, to risk weighting to fundamental weighting, as used in the FTSE RAFI indexes. Top-down multi-factor portfolios may then be constructed from simple combinations of the individual single factor sleeves.

Bottom-up approaches are equally varied. They range from optimized offerings to composite factor approaches, in which individual factor scores are combined to form a composite factor. The composite factor may then be used with a S&W technique or optimization to yield a multi-factor index.[2] A common feature of Bottom-up approaches is that each stock is weighted after simultaneous consideration of all of its factor attributes.

In a multi-factor context, a key consideration is the dilutive effect on the levels of factor exposure that arise from Top-down combinations of single factor sleeves. We examine the efficiency of Top-down combinations of single factor portfolios and the FTSE Russell Bottom-up Tilt approach, which simultaneously considers all of a stock's factor exposures. The efficiency of each approach is assessed from the perspective of the level of diversification after the factor exposures of each approach are set equal to one another.

In this paper we address questions that are frequently asked by clients. We focus on S&W and compare it to the Bottom-up FTSE Russell Tilt approach. We cover a number of topics including; Is one approach superior to another? How should one formulate a fair comparison? What is the role of correlation? Can diversified weighting schemes help?

We examine these issues from both a theoretical [1, 3] and empirical perspective [2], highlighting the importance of making like-for-like comparisons between different factor portfolio propositions when evaluating factor products.

[1] The factor definitions used throughout this document are set out in the FTSE Global Factor Index Series Ground Rules [5].
[2] This is considered Bottom-up as factor scores are combined in order to construct the final multi-factor index in a single pass.

Question 1: Why are factors important?

Factor investing is based on the premise that the factor exposures of a diversified portfolio are the key determinants of its performance and risk outcomes. The diversification qualification is important if factor pay-offs are not to be subsumed by idiosyncratic risk.

The validity of factor investing, therefore, rests on the truth of the following statement:

- Diversified portfolios that differ significantly in terms of stock composition and or weighting, but which have identical factor exposures, should exhibit similar performance and risk outcomes.

In other words, for diversified portfolios, factor exposures matter, but individual stock weights do not. To test this hypothesis, we create a S&W Quality factor portfolio, by selecting the top 50% of stocks ranked by their Quality scores and equal weight the selected stocks. We measure the realized on and off-target factor exposures of the resulting portfolio.

We then use the FTSE Russell Tilt approach to overlay identical levels of factor exposure on the underlying FTSE USA market-capitalization weighted benchmark to match all the factor exposures of the S&W Quality factor portfolio.

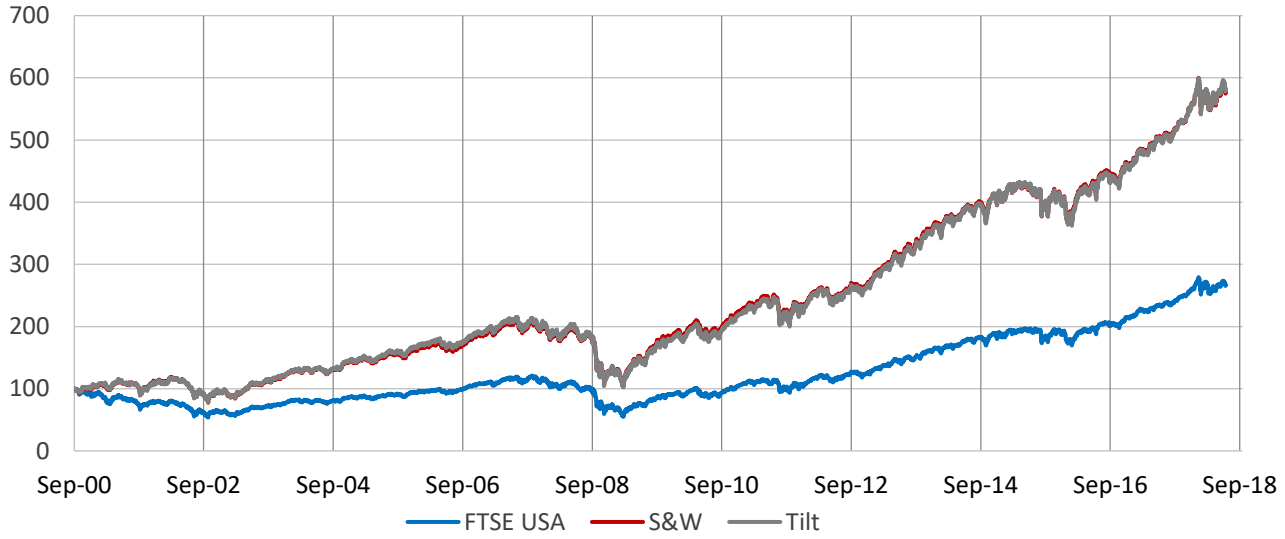
Firstly, we observe that the S&W Quality portfolio is effectively a multi-factor portfolio, with exposures to Quality, Value, Momentum, Low Volatility (negative) and Size (see Figure 1). The Size exposure is a direct consequence of the equal weighting scheme applied to the selected stocks. The portfolio therefore has Quality exposure but also multiple off-target exposures.

Figure 1. Average Active Factor Exposure: S&W Quality (Equal Weight) and Tilt Portfolios

Source: FTSE Russell. Data from September 2000 to June 2018. Data based on the FTSE USA universe.

Secondly, the S&W and factor matched tilt portfolios perform in a similar manner (see Figure 2), despite their very different construction approaches. One may think this is because the two sets of portfolio holdings are closely aligned. However, this is clearly not the case since one need only recall that the S&W portfolio contains half the stocks in the FTSE USA universe, whereas the tilt portfolio contains *all* of them. Indeed, the average two-way turnover required to transform one Quality portfolio to the other is approximately 60% p.a. This suggests that it is factor exposures and not stock weightings that matter.

Figure 2. Total Return USD Performance: FTSE USA, S&W Quality (Equal Weight) and Tilt Portfolios



Source: FTSE Russell. Data from September 2000 to June 2018. Past performance is no guarantee of future results. Data for the S&W and Tilt indexes are derived from the FTSE USA universe and represent hypothetical historical performance. Please see the end for important legal disclosures.

Question 2: How should factor portfolios be assessed?

Consider alternative factor portfolios that purport to satisfy the same set of factor objectives. How should an investor decide which product to choose? Since, at first glance, the products are the "same" the natural tendency would be to make a performance comparison.

However, we have seen that diversified portfolios that are materially different from a holdings perspective, but with identical factor exposures, result in similar performance outcomes. Therefore, we should not be able to distinguish between these products based on performance, if they truly represent the same set of factor objectives.

In practice, given that factors are rewarded and portfolios remain suitably diverse, simple performance comparisons will therefore tend to favor products with more, rather than less, exposure and those with implicit or hidden additional exposures.

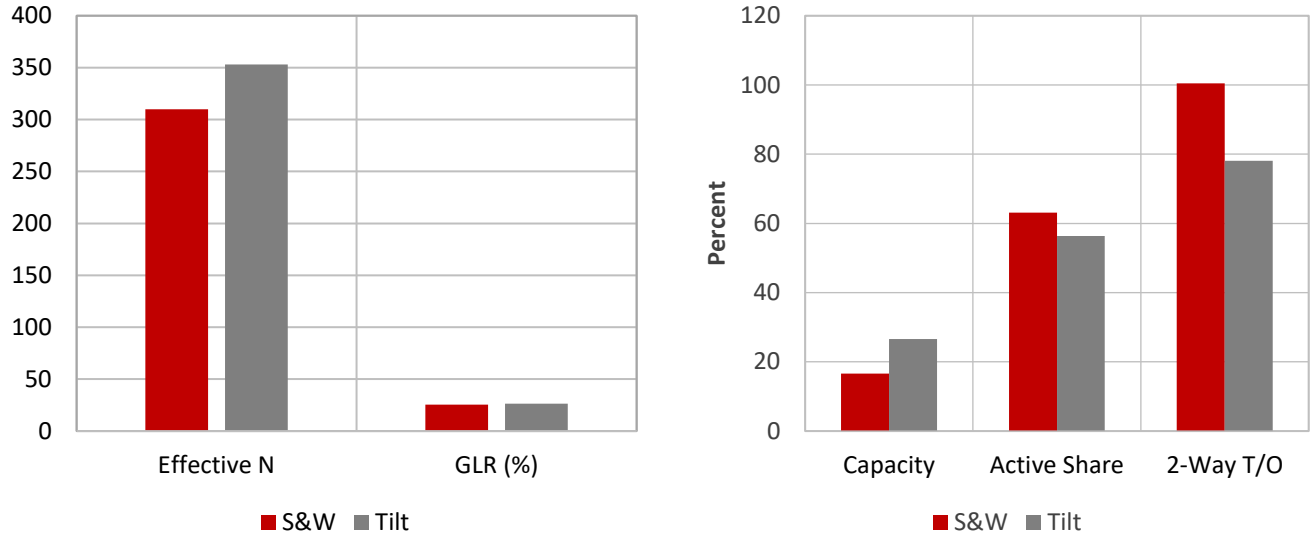
As an example of this, recall from Question 1 that the S&W Quality portfolio design introduces substantial off-target factor exposures that make naïve performance comparisons with other Quality portfolios with limited off-target exposures invalid. Fortunately, we can create a tilt portfolio with factor exposures that exactly match those of the S&W portfolio and once we equalize factor exposures, performance differences themselves largely disappear.

Consequently, we need to consider additional metrics to conduct meaningful product evaluations. Suitable candidates would be features that are desirable but deteriorate as we increase the levels of factor exposure in a portfolio. An obvious characteristic is the level of diversification. Other important considerations are the ease and cost with which a portfolio may be implemented. This leads us to compare the levels of investment capacity, turnover and active share of each approach that is required to achieve and maintain a set of factor objectives.

In Figure 3, we observe that relative to the S&W approach, a FTSE Russell Tilt portfolio with equal levels of exposure to both the target (Quality) and off-target factors results in more diversified[3] outcomes, with greater investment capacity, and lower levels of both active share and turnover.

[3] Diversification is measured as the portfolio's Effective N and GLR, Effective N ranges from 0 to 100%, reflecting increasing levels of diversification. GLR is the ratio of portfolio volatility to the weighted sum of individual stock volatility.

Figure 3: Diversification and Implementation Properties: S&W Quality (Equal Weight) and Tilt Portfolios



Source: FTSE Russell. Data from September 2000 to June 2018. Data based on the FTSE USA universe.

In [2], we extend this analysis to encompass other popular weighting schemes, including (inverse) Risk Weighting and Financial Statement Weighting with similar results. The application of a factor tilt to a set of market capitalization weights delivers an equivalent factor portfolio that is more diversified with superior implementation characteristics than the S&W alternative.

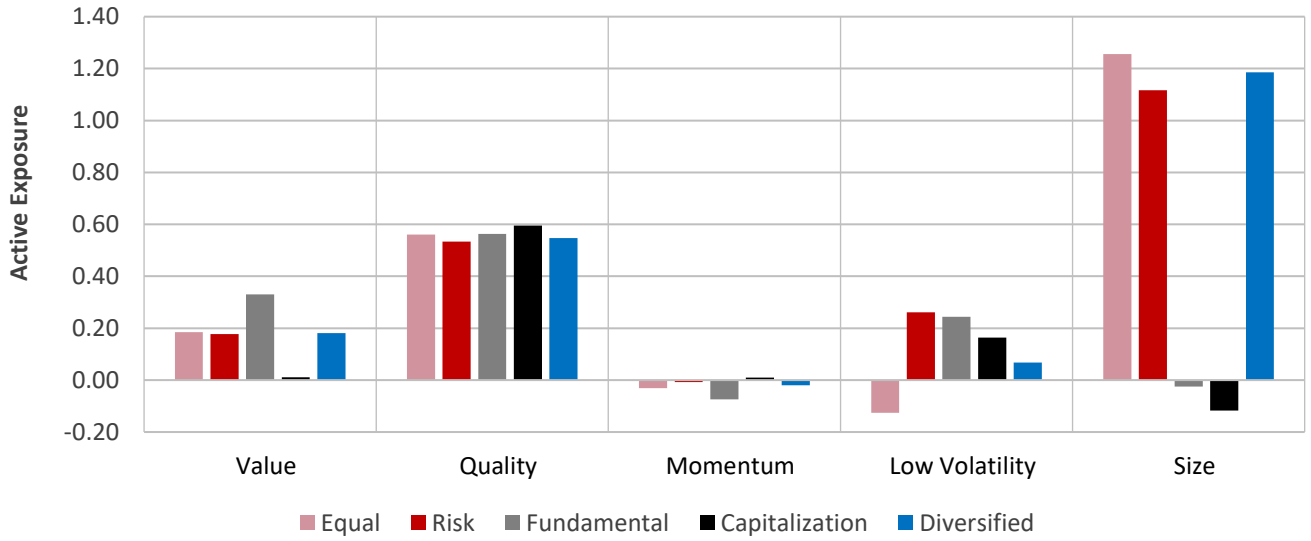
Factor portfolios should therefore be assessed not only on the target *and* off-target factor exposures they capture, but also on their diversification and implementation properties.

Question 3: What is the effect of alternative weighting schemes?

A common question concerns the role of alternative or non-market capitalization-weighting schemes in the construction of factor portfolios. It is perfectly feasible to construct a market capitalization-weighted portfolio in conjunction with stock selection rules that displays active exposure to a desired factor. So what do alternative weighting schemes bring to the table?

It is well known that alternative weighting schemes have implicit and systematic factor exposures associated with them [2, 9]. Figure 4 shows the factor exposures of Quality S&W portfolios constructed for the FTSE USA universe, where the weighting scheme is equal (as in Q1), risk, fundamental, market capitalization or diversified (a 50:50 composite of equal and risk).

Figure 4: Active Factor Exposures: S&W Quality Portfolios with Alternative Weighting Schemes

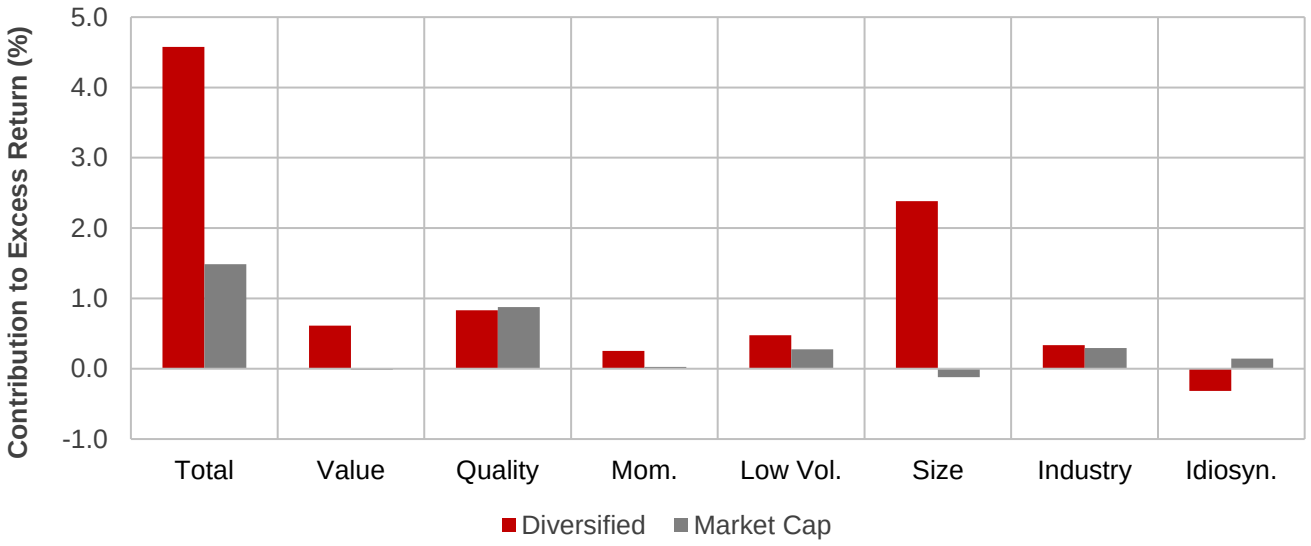


Source: FTSE Russell. Data from September 2000 to June 2018. Past performance is no guarantee of future results. Data are derived from the FTSE USA universe and represent hypothetical historical performance. Please see the end for important legal disclosures.

Recall that Quality is the exposure being targeted. However, all of the weighting schemes, with the exception of market capitalization, introduce significant off-target exposures. Therefore, an answer to the question above is that alternative weighting schemes bring multiple and possibly unintended factor exposures to the table.

Sometimes, it is argued that such exposures are necessary to achieve other non-exposure characteristics. For example, a diversified weighting scheme within a S&W construction is justified by a desire to "reduce unrewarded risk" [10]. Figure 5 presents an excess return attribution comparison for the diversified and market-capitalization weighting schemes that is revealing.

Figure 5: Attribution; Excess Total Return USD; Diversified & Market-Capitalization Weighted S&W Portfolios



Source: FTSE Russell. Data based on the FTSE USA universe: September 2000 to June 2018. Past performance is no guarantee of future results. Please see the end for important legal disclosures.

While the contribution from Quality is approximately the same for both portfolios, there are multiple other factor contributors to the performance of the diversified portfolio. In particular, the contribution from Size actually dwarfs the contribution from Quality. Clearly, these two portfolios perform very differently, with the extra performance of the diversified portfolio arising from off-target factor exposures and not from the elimination of "unrewarded risk". Indeed, the idiosyncratic contribution to return is actually greater in magnitude for the diversified-weighting scheme than for the market-capitalization weighting scheme.

In [2], we also show that it is possible to replicate empirically the factor exposures and performance outcomes of each of these alternative-weighting schemes through the application of appropriate factor tilts to a set of market-capitalization weights. This suggests that it is not something intrinsic or special about the weighting scheme, but rather that it is the implicit factor exposures of such weighting schemes that determine performance outcomes.

In [4], we demonstrate theoretically that the factor exposures of equal, risk (inverse volatility) and fundamental-weighting schemes may be replicated via a simple tilt using a single factor. We then show that we can independently determine the time-varying levels of active factor exposure exhibited by each weighting scheme.

The time-varying factor exposure of a portfolio weighted by a characteristic (e.g. Size, in the case of inverse market-capitalization weights; volatility, in the case of inverse-risk weights; or book-value in the case of fundamental weights) may simply be derived as the log of the cross-sectional standard deviation of the weighting measure. Hence, common alternative weightings schemes can be viewed as indirect, opaque and possibly inefficient means of incorporating factor exposures in a portfolio [2, 4].

All the above lends support to the idea that alternative-weighting schemes used in smart-beta indexes are equivalent to a set of factor tilts.

Question 4: Why is factor purity important?

Investors expend considerable effort identifying appropriate combinations of factors that are consistent with their investment objectives. However, the rewards from such exposures will only be realized if both the expected factor pay-offs materialize and the portfolio exhibits the appropriate factor exposures. In addition to ensuring exposure to the set of target factors, it is also important to limit exposure to off-target factors (see [6] for a discussion)[4].

Returning to the earlier Quality example, we saw that while the S&W Quality portfolio achieves significant Quality exposure, the level of unintentional Size exposure is even greater (Figure 1). This implementation risk will leave an investor disappointed when the anticipated defensive properties from Quality exposure are overwhelmed by the cyclical attributes of Size exposure.

In Figure 6, we attribute the relative performance of the S&W Quality portfolio (red bar) to factor, industry and idiosyncratic effects during the global financial crisis (GFC) of September 2008.

[4] Hunstad and Dekyhayser [6] show that strategies with higher factor purity, measured as the ratio of active risk of intended factor exposure to total active risk, tend to have correspondingly higher risk-adjusted returns. In response Amenc and Goltz [7] argue that factor purity does not matter as factor returns are correlated and this is not seen as an issue. See Question 7 for additional discussion.

Figure 6. Attribution: Excess Total Return USD; September 2008, S&W Quality (Equal Weight) and Pure Quality Portfolios

Source: FTSE Russell. Data as of September 2008. Past performance is no guarantee of future results. Data for the S&W, Tilt and Pure Quality factor indexes are derived from the FTSE USA universe and represent hypothetical historical performance. Please see the end for important legal disclosures.

The attribution shows that, while the defensive characteristics of Quality were rewarded, this was outweighed by the negative pay-off to the unintentional (Small) Size exposure. This results in the underperformance of a defensive strategy that would otherwise be expected to outperform in such an environment.

The FTSE Russell Tilt approach also permits the creation of a Pure Quality portfolio, with identical levels of active Quality exposure to the S&W Quality portfolio and zero off-target exposure to other factors. Figure 6 indicates that such a portfolio has the same pay-off from exposure to Quality and would have provided the expected outperformance and downside protection associated with such a strategy during the GFC. A careful consideration of the implementation risks associated with the incidental exposures of a factor strategy is therefore essential.

One reason a Top-down approach may be preferred by investors is for the apparent transparency it offers. This arises because Top-down multi-factor solutions are constructed as a blend of the relevant single factor solutions (or sleeves), so multi-factor portfolio performance may be attributed to individual portfolio sleeves.

However, this transparency holds true only if the single factor constructions are relatively pure and they have meaningful levels of exposure to the factor of interest. If the single factor portfolio sleeves display significant levels of off-target exposure, then multi-factor attribution across the sleeves is possible, but will not correspond to the attribution of the individual factors.

Figure 6 illustrates the danger when individual factor sleeves do not consist of relatively pure sets of factor exposures. Attributing the negative performance of a multi-factor Top-down portfolio that was built using sleeves constructed with a S&W approach to Quality during September 2008 would be incorrect, as the performance outcome of the Quality sleeve is driven primarily by its exposure to Size.

Factor purity is necessary to correctly attribute factor performance to the individual factor sleeves in a Top-down approach and avoid the implementation regret resulting from a multi-factor portfolio that masquerades as single factor one.

Question 5: What is the best way to create a multi-factor portfolio?

Multi-factor portfolio construction compounds the issues we have highlighted in the construction of single factor portfolios and adds an additional problem resulting from the interaction of factors. Recall that Top-down approaches form portfolios from combinations of pre-constructed single factor portfolio sleeves, while Bottom-up approaches construct a multi-factor portfolio by simultaneously considering all of the factor attributes of interest.

Since a multi-factor Top-down approach uses pre-existing single factor portfolios sleeves, any problem with the single factor portfolio construction is inherited by the multi-factor portfolio when the sleeves are combined. For example, the equally weighted, S&W single-factor portfolios exhibit significant Size exposure. When combined in a Top-down multi-factor portfolio this Size exposure will dominate the multi-factor portfolio outcomes.

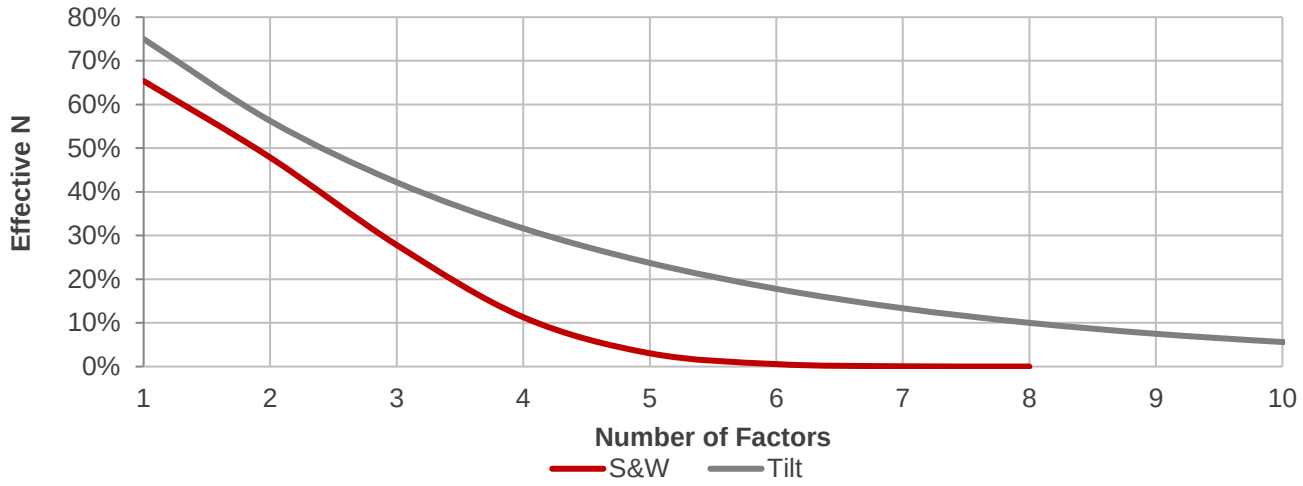
In a multi-factor context, an additional consideration arises from the dilutive effect on the levels of factor exposure that arise from Top-down combinations of single factor sleeves, particularly when factors are negatively correlated. This dilutive effect arises from the simple observation that averaging weights across sleeves results in an averaging of exposures.

This dilutive aspect to levels of factor exposure has important ramifications for portfolio construction. In Question 1 we demonstrated the importance of both factors and the level of factor exposure in determining portfolio outcomes. In Question 2 we argued that construction efficiency is important and that this is reflected in diversification and implementation metrics, which are useful when conducting like-for-like assessments of competing factor products.

In [1], we presented a theoretical study of the relative efficiency of Top-down multi-factor portfolios composed of equally weighted single factor S&W portfolio sleeves (Top-down S&W) and the FTSE Russell Tilt multi-factor portfolio construction. We compared the level of portfolio diversification for a given level of factor exposure, while varying the numbers of factors and the levels of correlation between factors. The ability to attain a given level of factor exposure without compromising levels of diversification is an indication of portfolio construction efficiency. Given the dilutive effects on exposure of Top-down approaches, the relative inefficiency of Top-down construction becomes increasingly important if meaningful levels of factor exposure are to be maintained.

Figure 7 shows the levels of diversification (Effective N) of each construction approach versus the number of uncorrelated factors in a multi-factor portfolio for a given level of exposure (roughly half the cross-sectional standard deviation in factor score). The Tilt approach always results in a more diversified portfolio compared to the Top-down S&W approach. Furthermore, the proportionate difference in levels of diversification[5] increases as the number of factors increases.

Figure 7. Effective N Versus Number of Factors for S&W and Tilt Portfolios: Uncorrelated Factors



Source: FTSE Russell. All data is hypothetical and for illustrative purposes only. Please see the end for important legal disclosures.

[5] Diversification is measured as the portfolio's Effective N. Effective N ranges from 0 to 100%, reflecting increasing levels of diversification.

In order to assess the efficiency of each alternative portfolio construction technique in the face of correlated factors, we examine the level of diversification (Effective N) of a three-factor example, where equal amounts of exposure to each factor are targeted. The target level of exposure is again set to approximately half the level of cross-sectional dispersion of each factor. Table 1 indicates that the deterioration in the levels of diversification is particularly marked for Top-down S&W construction method when factors are negatively correlated.

Table 1. Effective N: Three Factor, Equal Amounts of Exposure

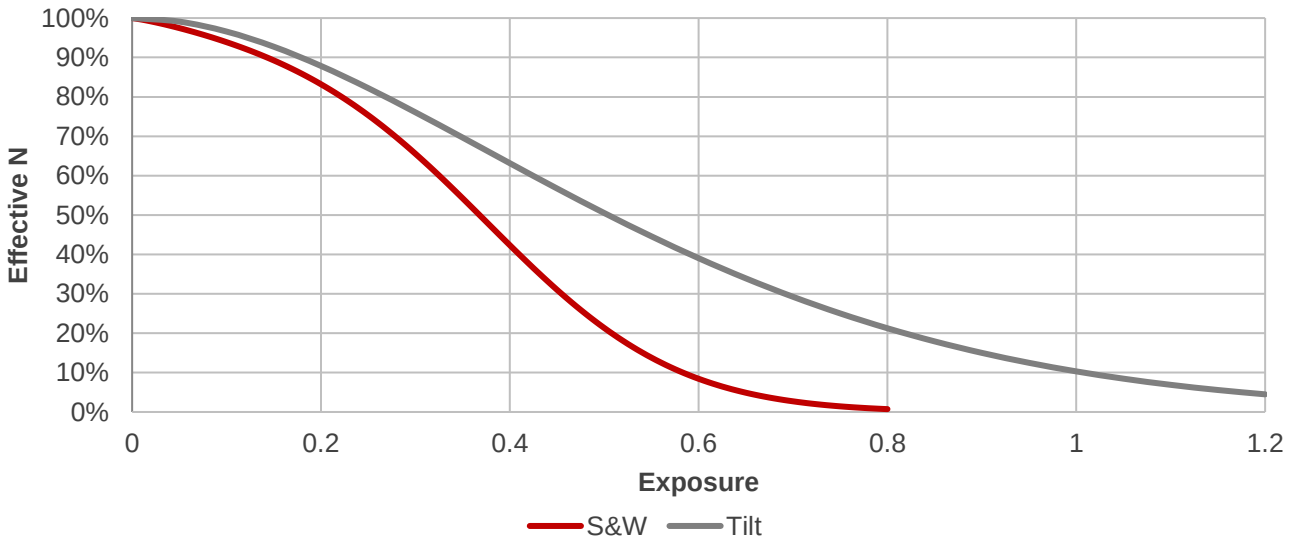
Three-Factor Correlations	Top-down – S&W	Bottom-up – Tilt
+0.3, +0.3, +0.3	54.05%	59.21%
+0.3, +0.3, - 0.3	12.06%	42.97%
+0.3, - 0.3, - 0.3	4.00%	30.61%
- 0.3, - 0.3, - 0.3	0.01%	10.31%

Three factor multi-factor Tilt portfolio and matched levels of active factor exposures using the S&W approach. Diversification is measured by Effective N ranging from 0% (highly concentrated) to 100% (most diversified).

A real-life counterpart to Row 2 in Table 1, is a portfolio that targets Value, Quality and Low Volatility exposures, where Value is negatively correlated with Quality. The difference in the level of diversification for portfolios with identical levels of factor exposure is substantial: S&W (12.06%) versus Tilt (42.97%).

The three-factor example is extended in Figure 8 to span a range of different exposure targets. The Top-down S&W portfolio is able to maintain reasonable levels of diversification for low factor exposure objectives but becomes increasingly concentrated for higher exposure objectives. The increasing difference in levels of diversification between the Top-down S&W and Bottom-up Tilt approaches indicates that exposure dilution in the face of negative factor correlations is an increasingly significant problem for Top-down approaches.

Figure 8: Exposure and Effective N: Top-down S&W and Bottom-up Tilt: Correlations +0.3, +0.3 and -0.3



Source: FTSE Russell. All data is hypothetical and for illustrative purposes only. Please see the end for important legal disclosures.

In order for the Top-down S&W multi-factor portfolio to maintain higher levels of portfolio factor exposure, the exposure of the component single factor sleeves must be increased, for example by selecting the highest scoring 30% of stocks, rather than the top 50% by Quality score. This further concentrates the component sleeves.

The inherent problem with Top-down combinations of single factor portfolio sleeves is that they are premised on an independent consideration of each set of factor scores with no scope to consider the interaction between such scores. To address these shortcomings, ad hoc multi-factor "loser" exclusion rules may be applied to Top-down portfolios [8]. This is an attempt to solve Top-down construction problems by applying a Bottom-up multi-factor correction technique, but begs the question of why not apply a Bottom-up approach from the outset?

Question 6: How are factor correlations handled by tilting?

Factor correlation may be thought of in two closely related ways. Firstly, the factor scores or stock level characteristics used to form portfolios may be correlated cross-sectionally. For example, Low-volatility stocks are also likely to be high Quality stocks. Secondly, the returns of individual factors may be correlated through time. These two views are related, because if factor exposures drive returns, then the cross-sectional correlation of factor characteristics will lead to correlated factor returns over time.

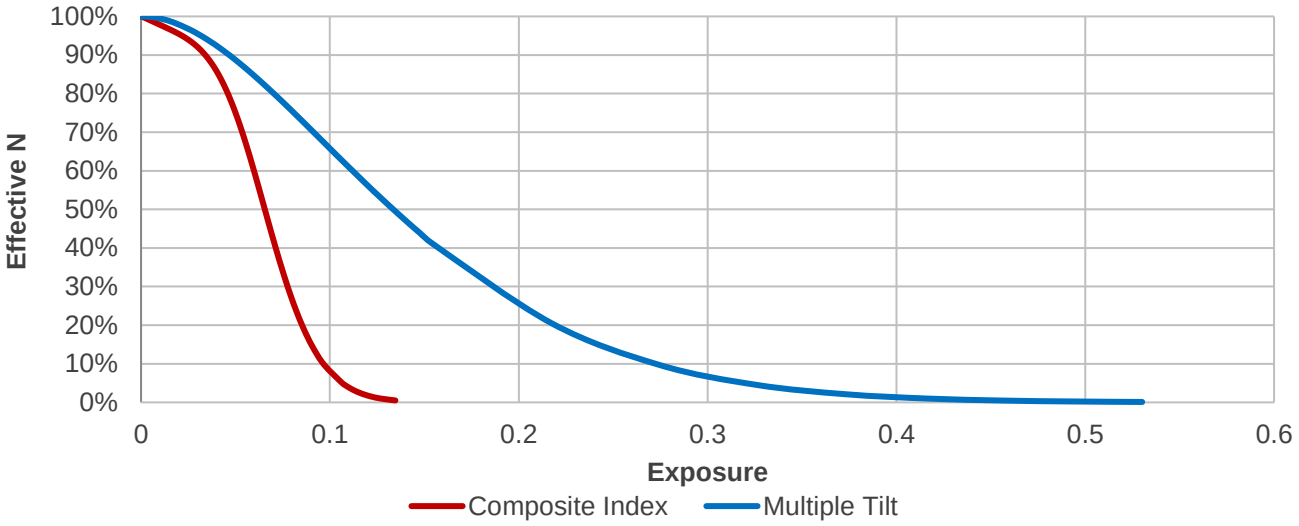
An important implementation consideration for factor investing is the time-varying nature of factor correlations. For example, it is well known that Value and Momentum exhibit a fairly consistent negative correlation that is structural: stocks that are high Momentum, because they have run up in price, will naturally be more expensive (relative to some slowly moving fundamental measure) than stocks that have dropped in price.

However, Momentum's correlations with other factors are less obvious. If, (low) Volatility stocks are sought after and bid up, Volatility can develop a positive correlation with Momentum, even though there is strictly no structural reason for the correlation. This is also true for many other factor pairs. Therefore, future factor correlations are difficult to predict. However, we do know the cross-sectional relationship between factor scores, at the point a portfolio is formed and the FTSE Russell Tilt approach provides a natural mechanism for exploiting this information. This permits the control over both the levels of target and off-target factor exposures in the construction of factor portfolios.

Consider the case of a five-factor portfolio, with equal exposure to each factor, where all the factors are negatively correlated with one another. This may be an artificial case but represents a "worst case scenario" from the point of view of portfolio construction.

In [3], we show that it is possible to create such portfolio using a Top-down equal blend of five equally weighted Selection and Weighting portfolios (Composite Index) and a Bottom-up (Multiple Tilt) portfolio. Figure 9 shows how the level of portfolio diversification (Effective N) varies with the magnitude of exposure to each factor.

Figure 9. Exposure and Effective N Profiles: Correlations = -0.2



Source: FTSE Russell. All data is hypothetical and for illustrative purposes only. Please see the end for important legal disclosures.

The important thing to observe is that the diversification of the Bottom-up Multiple Tilt portfolio is greater than the Top-down S&W portfolio for all levels of factor exposure. Moreover, there are levels of exposure, roughly greater than 0.1 (units of standard deviation), where the Top-down S&W portfolio provides no solution with sensible levels of diversification or no solution whatsoever. However, the Multiple Tilt portfolio provides a viable solution for exposure levels that are up to three times the level where the Top-down S&W portfolio fails.

Question 7: Why is factor portfolio construction important?

The above answers are predicated on the ability to build factor portfolios that permit the precise control of multiple factor exposures. Moreover, such portfolios should be well diversified and exhibit favorable implementation properties.

We have seen that one simple multi-factor portfolio construction methodology, the Top-down blending of single factor S&W sleeves, does not allow for the precise control of factor exposures. The single factor sleeves themselves contain multiple, uncontrolled off-target factor exposures with the unsurprising result that Top-down blends inherit this poor behavior. No attempt is made to account for factor correlation between the sleeves and this further complicates the dilutive effects on factor exposure.

An improvement is to create pure factor sleeves and use them in a Top-down multi-factor solution. Conflicting off-target factor exposures would no longer exist and cannot therefore undermine the intended target exposures. However, factor dilution is still present for all target exposures leading to limited or weak multi-factor exposure. Perhaps the biggest irony is that such pure single factor portfolio sleeves themselves require a Bottom-up construction approach.

A preferable approach is to construct multi-factor portfolios from the Bottom-up, from the outset. One particularly transparent, flexible and powerful method is the FTSE Russell Tilt Methodology. It is the portfolio construction method that we have used to address the questions discussed throughout this document.

We have demonstrated that we can target a variety of multiple factor exposure objectives. In particular, we have used this approach to replicate the factor exposures and performance outcomes of other portfolio construction methods. This allows us to demonstrate both empirically [2] and theoretically [1, 3] that the tilt methodology yields a superior portfolio in terms of its diversification and implementation properties.

The FTSE Russell Tilt Methodology therefore demonstrates the importance of factor portfolio construction with its ability to produce flexible and efficient solutions.

Conclusion

We have consolidated the most important points made in a series of four papers on factor portfolio construction. By reviewing the terminology, concepts, and topical issues that are central to discussions of factor investing, we hope to reduce any confusion that surrounds discussions of factor investing. In our view, there are a number of critical points.

The first is that in order to benefit from a factor's performance, an investor needs exposure to the factor, and given the importance of diversification, the more efficient an investors' exposure to the factor, the better. This raises the issue of portfolio construction; some methodologies are more efficient than others.

A second point is that investors need to understand the factor exposure implications of particular construction methodologies in the context of their desired factor exposures. Some supposedly simple methodologies treat factor exposures in a cavalier fashion by ignoring uncontrolled or even persistent exposures to off-target factors. This shortcoming largely negates any supposed advantage arising from simplicity. Other methodologies involving more intricate weighting schemes may merely complicate matters by adding unintended factor exposures through the weighting scheme itself. In our view, a methodology should be transparent, sufficiently flexible to incorporate alternative investment objectives and have "enough" complexity to achieve the goals of persistent exposure to desired factors within a coherent framework.

A final consideration is the need for any factor methodology to be capable of reacting to variations in factor correlation to ensure that exposure objectives are achieved. This ability differentiates methodologies, in terms of the efficiency of their implementation and their ability to limit implementation risks. The FTSE Russell Tilt methodology's control of factor exposures allows the creation of multi-factor portfolios with the desired exposures. However, it also enables the construction of "pure" factor portfolios that can be used as building blocks in Top-down multi-factor solutions that exhibit minimal implementation risk.

A framework that allows the precise control of factor exposures results in a comprehensive investment solutions toolkit that limits exposure to unrewarded risks with a wide variety of applications that include:

FACTOR INVESTING TOOLKIT

Pure Single Factor Solutions	Factor Allocation Objectives	Incorporation of Sustainable Investment Objectives
Top-down constructs	Active exposure targets	Carbons Emission reductions
Factor corrections	Equal exposure targets	Fossil Fuel Reserves reductions
Tactical overlays	Risk weighted exposure targets	Green Revenue uplifts
Factor allocation	Equal risk contribution exposure targets	Target uplift to ESG profiles
Absolute return objectives		Sustainable Development Goals

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