Performance Risk Management

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1 Introduction

Portfolio risk management is generally confined to volatility[1] management & market risk[2] management. Whilst these measures of risk are of significant importance for the portfolio management function, they are measures of deviation from an underlying benchmark[3] in the case of volatility management, or of probability of loss in the case of market risk management. We introduce the notion of **Performance Risk Management** that provides a framework for capturing the risk of absolute or negative portfolio performance.

Performance risk should be of vital importance to portfolio managers because it provides insight into potential loss of capital, which can be extremely deterimental to business outlook as it reduces the asset base and hence reduces the associated revenue, not to mention the challenges it poses in maintaining effective client relations with investors who have apportioned capital to the portfolio management firm.

Trendrating's **Trend Capture** Model captures price trends early, in a robust and highly accurate manner, to offer investors the opportunity to maximise their participation in uptrends and limit drawdowns through minimal participation in downtrends. The Trendrating rating scale ranges from A through D, where ratings of **A** & **B** signal an uptrend whilst ratings of **C** & **D** signal a downtrend.

It is our assertion that portfolio managers should implement robust *performance risk management* by limiting exposure of their portfolios to securities exhibiting negative price trends. This is true in every market phase but of prime importance during bear market phases as they result in loss of capital. Limiting losses ensures that portfolios are in a strong position when the recovery phase begins as they start their ascent due to positive performance from a higher point than portfolios that have experienced deeper drawdowns.

Equity markets exhibit significant return dispersion in all market phases, and Trendrating's assertion is that this cross-sectional dispersion in returns makes a compelling case in support of active management as the opportunity to outperform underlying benchmarks is real.

In order to identify the best performing stocks ex-ante, it is necessary to augment the fundamental and quantitative analysis with well tested trend analytics that can capture momentum in a robust manner. Security price trends can remain detached to underlying fundamentals for significant periods of time as they are not designed to qualify the direction and strength of price trends.

The opportunity to effectively select the winners and limit exposure to losers is real and a new generation of models & technology offer the framework to integrate valuable trend analysis into the investment workflow in a disruption free & seamless manner. We present in this paper a **20 year** analysis of recurrent return dispersion across **four** different investment universes.

2 Bear Market Analysis

As we enter the year **2019** following a very difficult market phase in the latter half of **2018** that itself followed a long bull market, global economic outlook carries significant uncertainty due to economic and political events. Whilst no financial crisis is the same, each crisis bears some similarity to preceeding ones, which implies that market behaviour too follows precedence set in the past. The most recent savage bear market was the one following the year **2007**, and we offer proof of the robust performance risk capture that Trendrating was able to offer its clients, which helped them limit drawdowns and post strong outperformance.

In this section we present tabular results for the drawdown analysis for each of the two regions during this

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[1]Absolute volatility or relative volatility i.e. tracking error
[2]VaR, CVaR, Beta
[3]Risk Asset Portfolio or cash

bear market phase. In **Table 1** & **Table 2**, we delineate the universe of stocks into five groups based on the level of drawdown experienced between **January 01, 2008** and **April 30, 2009** and present the drawdown analytics for each group.

For both regions, Developed Europe & USA, in each drawdown group, the drawdown experienced for the same set of securities using the Trendrating model is substantially lower than that for the buy & hold strategy.

These figures in these two tables demonstrate the strong drawdown reduction that Trendrating can facilitate in both regions that also highlights Trendrating's ability to offer performance risk management on a range of investment universes.

The percentage drawdown reduction at the group level is at least **56.92%** and as high as **88.06%** for the Developed Europe universe.

Drawdown Group (%)	Mean Draw-down (%)	Trendrating Mean Draw-down (%)	Drawdown Reduction (%)	Percentage Draw-down Reduction (%)	Number of Stocks
-20 to 0	-8.98	-3.70	5.28	58.83	17
-40 to -20	-33.14	-14.27	18.86	56.92	79
-60 to -40	-50.82	-12.58	38.24	75.25	162
-80 to -60	-70.07	-12.74	57.33	81.82	184
-100 to -80	-88.56	-10.58	77.98	88.06	92

Table 1: Drawdown Reduction - Developed Europe

The magnitude of drawdown reduction for the USA region is similar to that of Developed Europe.

Drawdown Group (%)	Mean Draw-down (%)	Trendrating Mean Draw-down (%)	Drawdown Reduction (%)	Percentage Draw-down Reduction (%)	Number of Stocks
-20 to 0	-8.98	-3.70	5.28	58.83	17
-40 to -20	-33.20	-14.31	18.90	56.91	80
-60 to -40	-50.84	-12.70	38.13	75.01	166
-80 to -60	-69.98	-12.52	57.46	82.10	189
-100 to -80	-88.60	-11.64	76.96	86.87	102

Table 2: Drawdown Reduction - USA

The percentage drawdown reduction at the group level is at least **56.91%** and as high as **86.87%** for the USA universe.

The drawdown analysis from the savage bear market that spanned **January 01, 2008** to **April 30, 2009** validates the concept of *Performance Risk Management* as a vital tool for *risk control* in any investment process.

Portfolio managers now have access to a risk management tool that enables them ex-ante, to identify with high accuracy, securities in their investment universe, that are likely to underperform and thereby cause damage to their investment portfolio. Avoiding long positions or long active positions in these securities helps limit drawdowns and thereby increase portfolio performance.

3   Historical Validation of Return Dispersion

Earlier in this paper, we introduced the notion of *return dispersion*, that implies that there is significant difference in the return profile of the best and worst perfoming group of stocks. in this section we present cumulative absolute & relative return charts for the top and bottom quantiles of **four** investment universes, namely *Developed World*, *Developed Europe*, *USA*, & *Emerging World*.

Figure **1a** plots the cumulative absolute return of the top quantile, bottom quantile, & for the universe for Developed World, whilst **Figure 1b** plots the cumulative relative return for the top and bottom quantiles of the Developed World universe.

The absolute cumulative return is as the name suggests, the cumulative absolute return series of each portfolio, whilst the relative return series is the cumulation of the monthly spread between each quantile and its underlying universe. It is quite evident that the top quantile significantly outperforms the bottom quantile and the universe in absolute terms, and also delivers a strongly positive excess return relative to the bottom quantile.

The Trendrating model's primary objective is to help identify these two extreme groups in an investment universe on an ex-ante basis, so that investment processes can focus their stock selection efforts within these two quantiles.

Figure 1: Developed World: Cumulative Return

(a) Absolute Return   **(b) Relative Return**
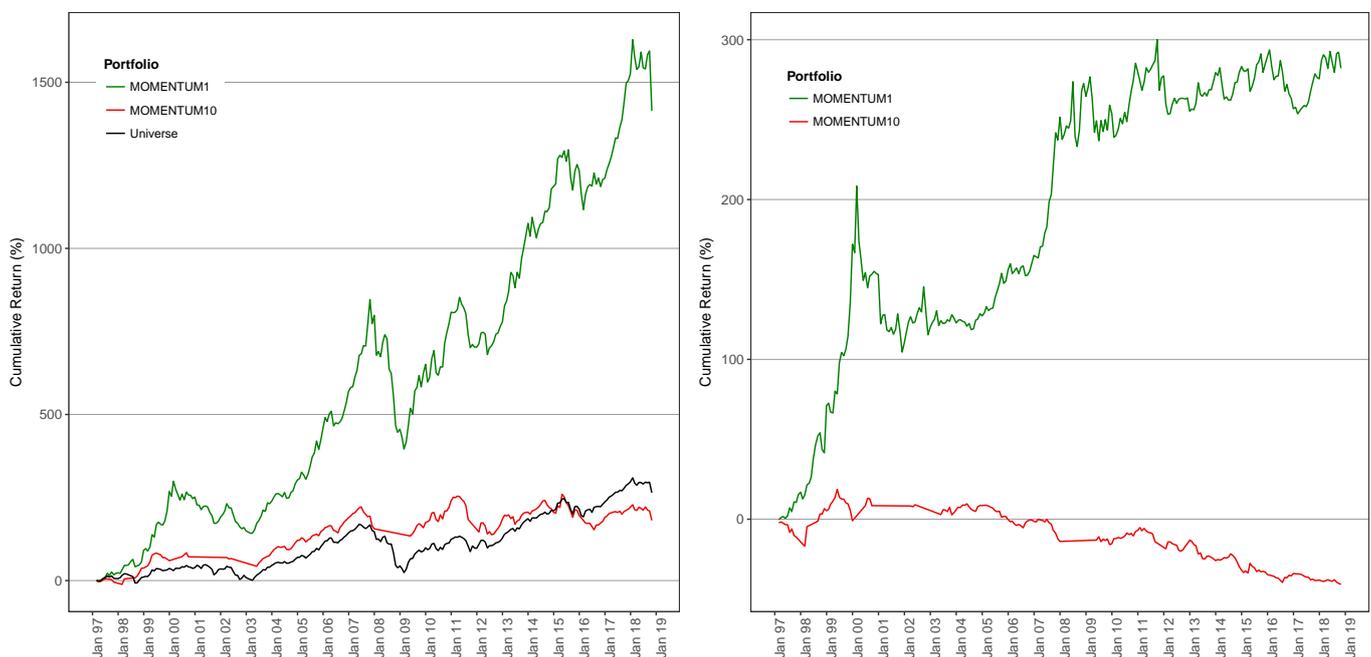
Figures 2a & **2b** plot the cumulative absolute return and the cumulative relative return for the component portfolios in the Developed Europe universe. The story is similar to that of the Developed World universe with top quantile demonstrating an absolute return superior to that of the bottom quantile and to that of the universe, as well as strongly positive relative return whilst the bottom quantile significantly underperforms the universe.

Figure 2: Developed Europe: Cumulative Return

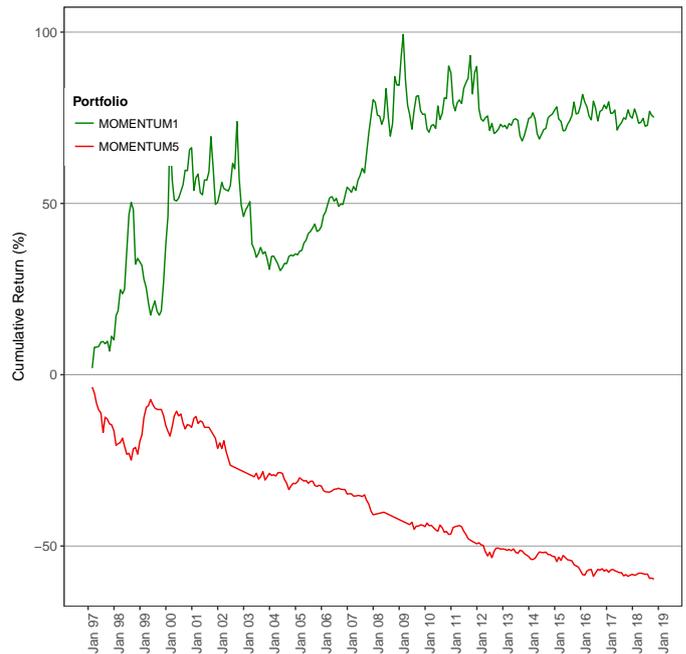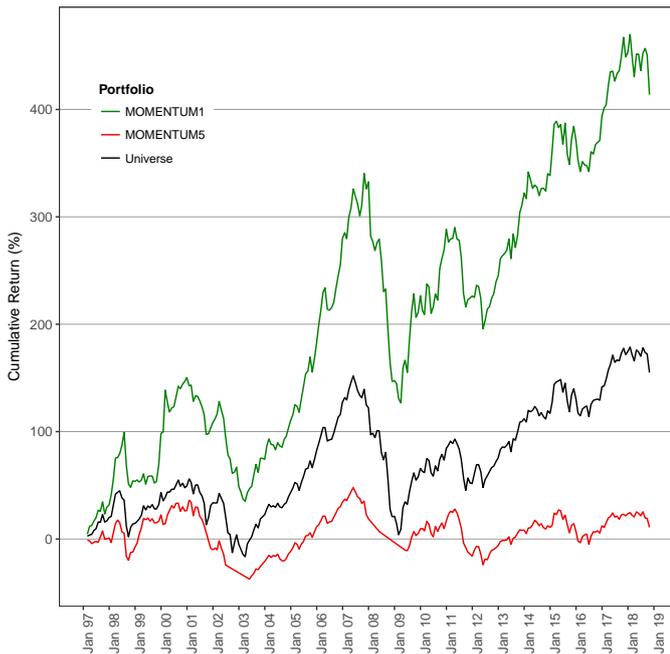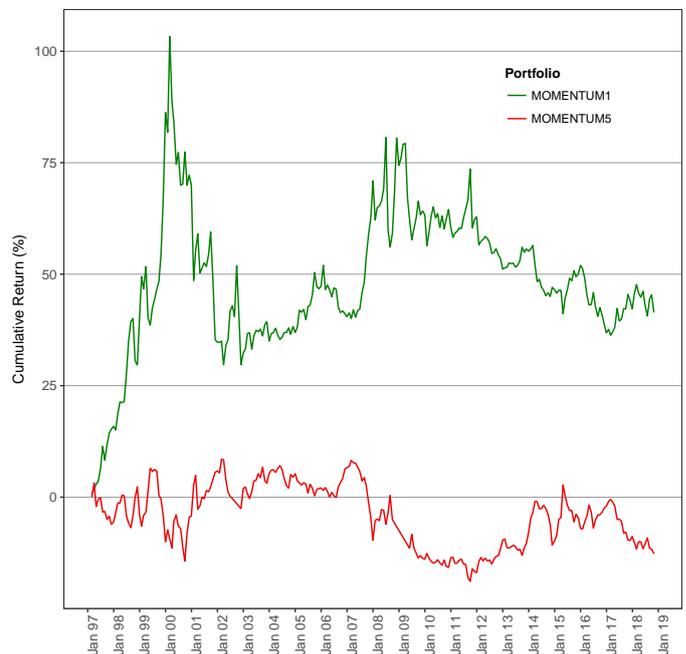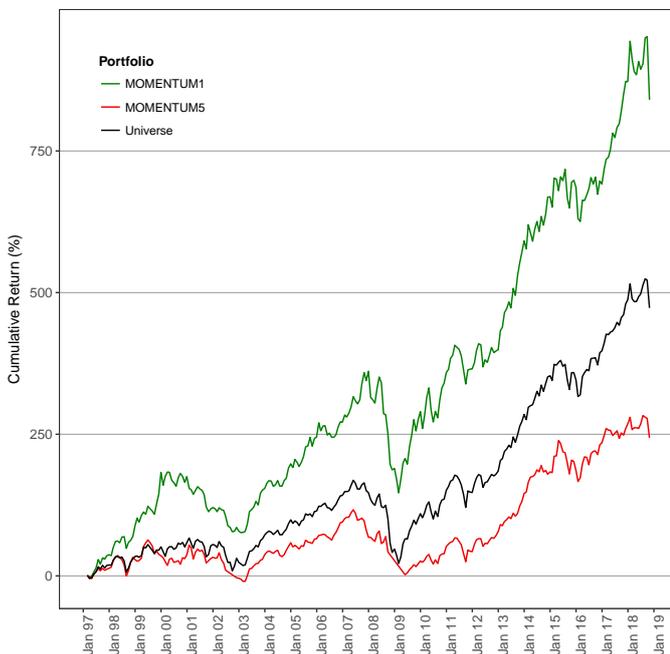**(a) Absolute Return**   **(b) Relative Return**

Figure 3: USA: Cumulative Return

**(a) Absolute Return**   **(b) Relative Return**

Figures 3a & **3b** plot the cumulative absolute return and the cumulative relative return for the component portfolios in the USA universe. The return pattern is similar to that for Developed World and for Developed Europe, providing efficacy that the Trend Capture model has robust discriminatory power across different investment universes and can provide vital information pertinent to security selection to an investment process. As with any model, there will be periods that are challenging, and in our case these are periods where trends are unclear due to extraneous factors, but the model reacts quickly as soon as clarity returns and begins to deliver its long-term outperformance.

Figures **4a** & **4b** plot the cumulative absolute return and the cumulative relative return for the component portfolios in the EM universe. The return patterns are strikingly similar to those of the other three universes presented earlier, proving that the Trendrating *return capture* framework is robust in identifying ex-ante, the set of best and worst performing stocks with high accuracy.

Figure 4: Emerging World: Cumulative Return

(a) Absolute Return **(b) Relative Return**
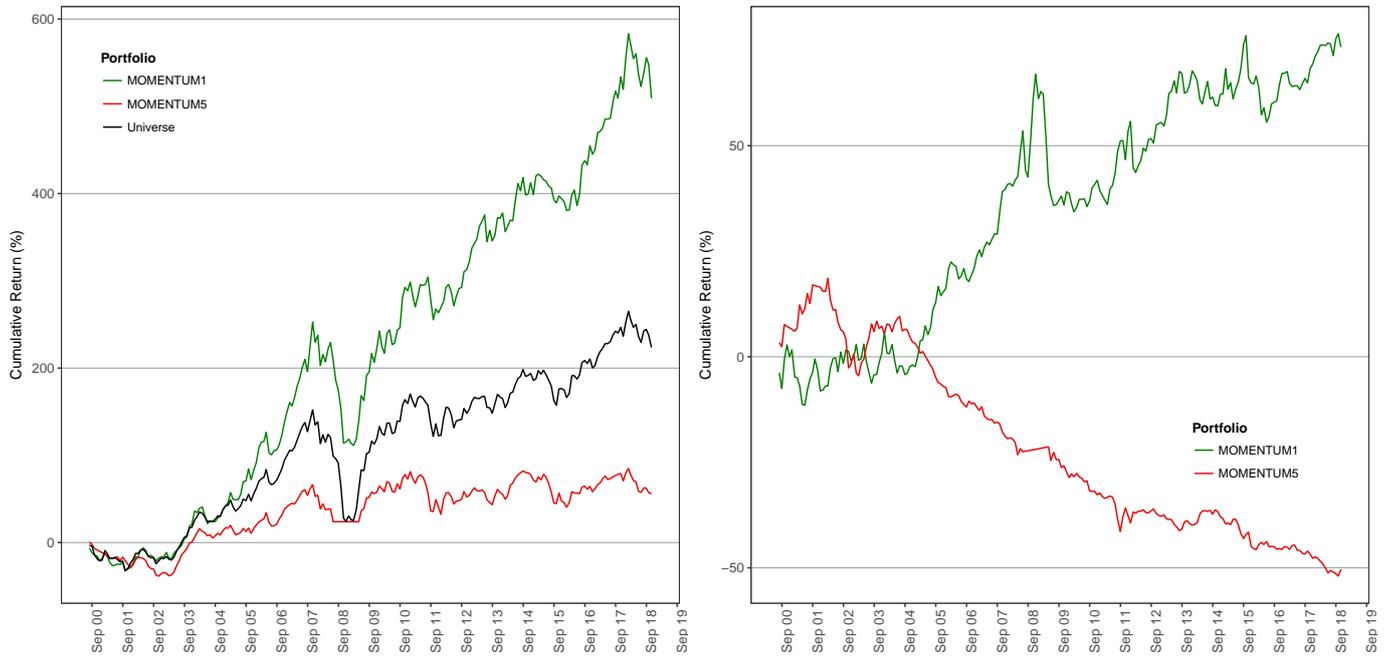
4 Conclusion

Performance Risk Management should be a key element in the toolkit of investment managers & risk managers so that it completes their risk management function because simply implementing volatility risk management and market risk management is not enough. Performance risk management provides guidance as to the directional risk of each security in an equity portfolio as well as of the aggregate portfolio itself. This information facilitates risk and exposure management because investors now have guidance as to the directional risk of the portfolio components and not just of their deviation.

The dispersion analysis demonstrates the significant difference in the return patterns of the best and worst performing groups of securities in any investment universe. The ability to identify these groups ex-ante is crucial to deliver outperformance, and *trend capture* facilitates the process of identifying these two groups, so that investors can position their portfolios accordingly, by selecting long positions from the top quantile of trends whilst avoiding long positions from the worst quantile of trends; vice-versa for short positions.