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QUARTERLY ' INSIGHTS

WHEN TRENDS END IN A RUSH

Why the long-term benefits of trend-following outweigh the short-term pain associated with sudden trend reversals

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Executive summary

In this note, we show that abrupt market reversals, while impossible to predict, are by construction an integral risk associated with a medium-term trend-following strategy. Such a reversal happened in March 2023 when a quick and significant upheaval in short-term interest rates and government bond yields across all durations led to one of the most challenging months in years for the trend-following industry.

We revisit those events from a medium-term trend-following perspective, providing an estimate of the positioning dynamics throughout March as well as the asset class return attribution for the SG Trend Index. We show that March 2023 had all the attributes of a classic trend reversal shock with nowhere to hide. While the reversal was extreme in many ways, we compare the results with past trend reversal shocks, highlighting their similarities.

Additionally, we outline the importance of a reactive risk management process, which is responsible for a large part of a trend-follower's position adjustments in response to such extreme market moves.

We show that the rewards for accepting such short-term reversal risk are best quantified over a longer-term, typically quarterly timeframe. Indeed, unlike equities, trend-following offers an attractive long-term positive return combined with a highly desirable right-skewed quarterly return distribution.

We conclude that the attractive long-term positive and right-skewed return characteristics of trend-following can be viewed as an economic compensation for accepting the painful risk of unpredictable short-term price reversals.

March 2023 – a historically challenging month for the trend-following CTA industry

In March 2023, the trend-following CTA industry suffered a historic setback with the SG Trend Index posting a loss of -7.7%[1] after a banking crisis took investors and depositors by surprise[2]. In a matter of days, financial markets shifted away from the battle against inflation to a risk-off tone and a flight to safety, with all eyes on the potential implications of the collapse of three major US lenders. A brutal repricing of central bank expectations took place in bond and interest rates markets, leading both short- and long-term interest rates to drop massively. The price rallies observed across several futures markets were some of the biggest single-day movements ever recorded in more than 40 years, leading to sharp losses for most trend-following programs.

In this note, we examine these short-term losses from a long-term historical perspective and relate them to the intrinsic long-term risk and return characteristics of a trend-following approach. We assess the March 2023 performance of the trend-following CTA industry and estimate the relative contribution in March 2023 of each of the major asset classes that form part of the investment universe of a typical trend-following CTA. We also share our estimate of the trend industry's asset class positioning in terms of risk and net notional exposures prior to the onset of the crisis, and at the end of March 2023. Additionally, we study the relationship between the risk allocation of individual instruments prior to March 9 and their returns over the next five days (between March 9 and 15), during which the bulk of the trend reversals occurred. We further highlight the importance of risk management and portfolio construction to successfully navigate such an environment characterized by a sudden spike in market risk and a fast change in cross-asset correlations. Given its magnitude, we assess how this event differs from previous trend reversals. This leads us to put such short-term reversals in the context of the attractive longer-term return characteristics of trend-following. For that purpose, we review the differentiated return and skewness characteristics of trend-following across different timeframes, from one day up to a full calendar year.

Short positions in rates and government bonds accounted for the majority of a CTA's losses in March 2023

In order to estimate the contribution of each major asset class to the overall performance of the trend-following CTA industry in March 2023, we rely on our internal trend-following replication model, which has been designed to replicate the positions and returns of the SG Trend Index[3] as closely as possible.

Our estimated asset class return attribution for the index in March 2023 is provided in Figure 1. First, with a return contribution of -6.3%, Fixed Income and Interest Rate (FIIR) positions were responsible for the majority, or more than 80% of

[1] Source: Société Générale. The SG Trend Index is an industry benchmark designed to track the largest trend-following programs.

[2] On March 8 2023, Silvergate, a bank heavily tied to the crypto economy, announced it was shutting down after a massive run on its deposits. The same day, the larger US-based Silicon Valley Bank announced significant losses on its investment portfolio and a plan to raise fresh capital. Only two days later, the bank collapsed into FDIC receivership, making it the second-largest bank failure in US history. This sent shockwaves across financial markets amid concerns that other banks could be in similar trouble and that contagion could set in. A sell-off in global bank stocks and a historic rally in interest rates unfolded, that would be further exacerbated on March 13 after the forced closure of another US bank, Signature Bank.

[3] Our SG Trend Index replication model relies on a representative investment universe of 97 of the most liquid exchange traded futures contracts across equities, government bonds, short-term interest rates, currencies, and commodities.

the losses. Second, with equities, currencies and commodities contributing -1.4%, -0.5% and 0.5%, respectively, there was literally no place to hide, as none of the other asset classes was able to offset the negative contributions from bond and interest rate futures.

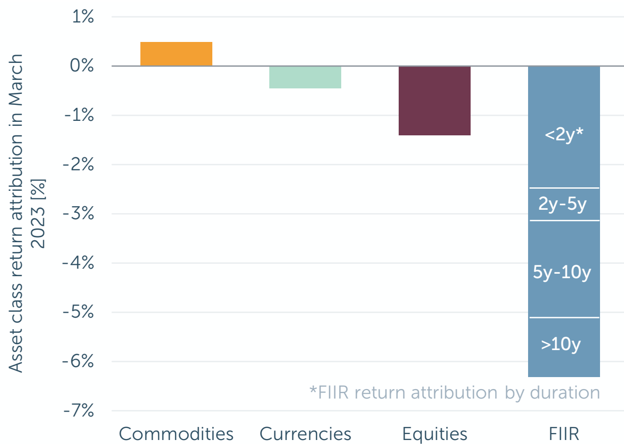

Figure 1: Asset class return attribution of Quantica's SG Trend Index replication model in March 2023. Source: Quantica Capital.

Additionally, as can be further seen from Figure 1, FIIR related losses were not concentrated in just a few markets, but widespread across different durations (up to thirty years), while no single group of instruments contributed in a statistically abnormal way compared to others.

Pre-crisis trend positioning and the impact of extreme reversals

Why did the interest rate shock have such a strong impact on the performance of trend-followers in March 2023? In the following section, we review our estimated positioning of the trend-following industry heading into the March crisis event and dissect the impact on returns during the five days during which most of the price reversal took place.

In the weeks before the crisis, the persistent rise in interest rates led major trend-following programs to build short positions across most FIIR futures. Our replication model indicated short positions in all 23 FIIR futures that are part of the investment universe considered. Additionally, weaker trends recorded across the other major asset classes during the first two months of 2023 led trend-followers to allocate a larger portion of their overall risk budget to FIIR than to equities, commodities, and currencies. This is illustrated in the replicated risk attribution as per March 8, shown in Figure 2. Indeed, one day before the crisis struck, around 85% of the total portfolio risk (in terms of the proportion of the portfolio variance explained) was held in FIIR futures with an aggregate net 10-year duration equivalent notional short exposure of -135% in the asset class.

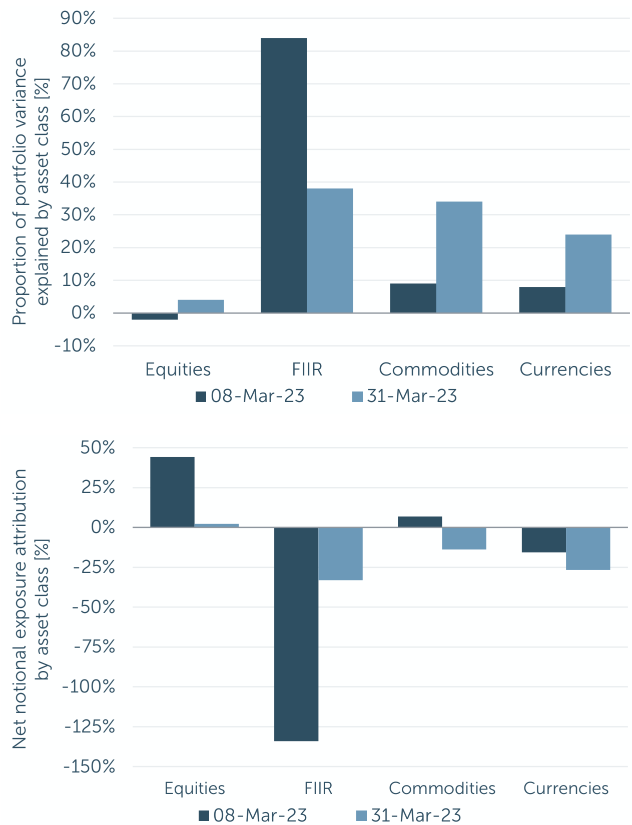

Figure 2: Comparative risk (top) and net notional exposure (bottom) attribution by asset class for Quantica's SG Trend Index replication model on March 8, a day before the onset of the US banking crisis, and March 31, 2023. Source: Quantica Capital.

As these strong trends came to a sudden and unexpected end, trend-following CTA programs were caught wrong-footed and incurred

significant losses. Much of the losses were clustered around a narrow band of five trading days between Thursday, March 9 and Wednesday, March 15. The SG Trend Index returned -10.8% over this short period of time. Among these five days, Monday, March 13 stood out with the SG Trend Index returning -5.6%, its second worst day on record since its inception in 2000[4].

The extent of the reversal is best captured in Figure 3, which shows the five-day return contribution between March 9 and March 15 of each of the 97 instruments in the investment universe as a function of their risk allocation as per March 8 in our SG Trend replication model.

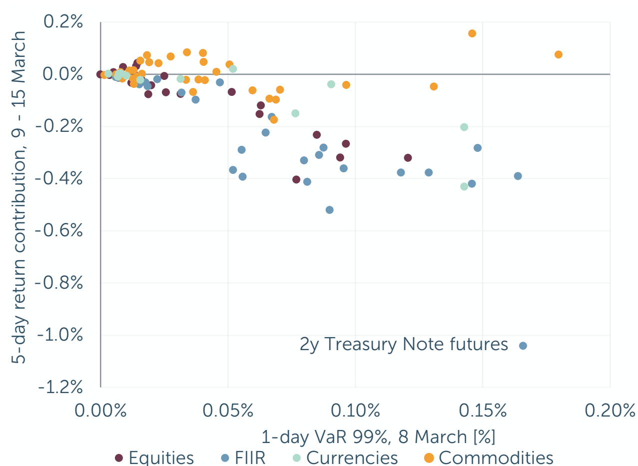

Figure 3: Simulated returns between March 9 and March 15, 2023 of the 97 instruments of the underlying investment universe of Quantica's SG Trend Index replication model as a function of their individual risk allocation as per March 8, 2023. Source: Quantica Capital.

The striking relationship between the risk allocated and the subsequent negative return is a classic illustration of the occurrence of an extreme trend reversal, that was not only limited to FIIR markets, but which reverberated across all asset classes. The interest rate shock translated into a Value-at-Risk shock for many of the positions in the portfolio. In fact, 80 of the 97 instruments in our trend replication investment universe recorded a negative return over that five-day period.

The most significant reversal was in the 2-year Treasury Note contract. Its implied yield plunged by more than 1.3%, from 5.3% on March 8, to below 4% in a matter of days. For comparison, the two-day move of the 2-year US Treasury Note futures between March 10 and March 13, 2023 was more than twice as large as its move recorded on September 15, 2008 when Lehman Brothers collapsed, the day of the largest bankruptcy in US history.

The only positions that offered some diversification were in commodities. Long exposures in precious and base metals together with short exposures in different energy and agricultural contracts contributed positively during the five trading days between March 9 and 15.

The risks and rewards of running a concentrated trend-following portfolio

With the benefit of hindsight, one might question why up to 85% of the overall risk of the biggest trend-followers was allocated to the FIIR asset class (see Figure 2). What would have been the result, if the trend-following industry was running the same amount of risk on each of the four asset classes, FIIR, stocks, currencies and commodities, regardless of the overall trend opportunities identified in each asset class?

Unsurprisingly, a more risk constrained Trend model would have hypothetically outperformed the unconstrained model by approximately 3.9% in March 2023, as shown in Figure 4. The lower risk allocation to FIIR translates into a less negative return contribution from the asset class, reducing the loss by 4% alone. But as March's losses were not only limited to FIIR markets, a lower relative risk allocation to FIIR markets

[4] The index's so far worst ever return happened on September 4, 2001.

would have provided only a limited short-term benefit to the performance. As Figure 4 further illustrates, the short-term benefits of such risk mitigation are more than offset by longer-term opportunity costs. Indeed, limiting the allocation to FIIR to being only 25% of the overall portfolio risk would have hypothetically reduced the gains of the SG Trend Index from 27.3% to 6.6% for the year 2022 alone. The positive contribution from FIIR positions was reduced by half, from 22% to 11%. Interestingly, the return contribution from commodities also suffered by an equivalent amount of -10% for the year. Not only did the reallocation of FIIR excess risk limit the upside potential of this asset class, it also reallocated to an asset class with limited trend opportunities, hence doubling the pain. Put differently, in one of the most challenging years for long-only 60/40 like portfolios, with both equities and bonds recording double digit losses, restricting the ability of trend-following to deploy risk to where the strongest trend opportunities were, would have significantly degraded its return contribution.

March 2023, however, is a reminder that harvesting these valuable complementary returns comes at the cost of accepting the risk of sudden reversals to the most concentrated risk exposures. While we have admittedly opted for an extreme and likely over-simplistic management of asset class risk, the reality is that every trend manager will have its own specific approach to manage the right balance between its asset class exposures to the downside of sudden trend reversals and capturing the upside of long-term trends.

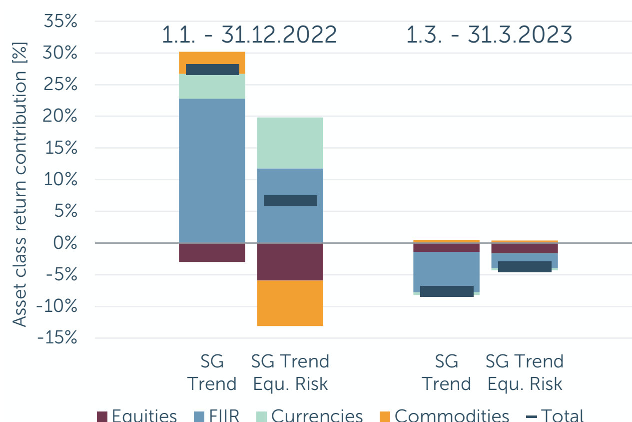

Figure 4: Comparative asset-class return contribution of Quantica's SG Trend Index replication model (unconstrained asset class risk allocation) and the same replication model allocating an equal risk target in each of the four asset classes (equities, FIIR, currencies, and commodities) for two different periods (March 2023 and the year 2022). Source: Quantica Capital.

Accepting the risk of sudden price reversals while tolerating a concentrated portfolio in a group of highly correlated instruments can be justified by using risk management processes that operate at faster timescales than the medium-to-long-term trend signals. This argument is discussed in the next section.

Trend positioning dynamics are driven by risk management in the short-term and by trend-signals in the medium-term

As a response to the adverse market conditions described above, the -135% notional exposure of our SG Trend replication model in FIIR positions on March 8 was drastically reduced to reach -25% at the end of March (see Figure 2). In fact, risk management is responsible for a large portion of the position adjustments carried out by a trend-following program in response to such large moves. We have outlined this in an earlier publication[5] by introducing a simple analytical formula to attribute the change in an instrument's notional exposure to the change in

[5] Quantica Quarterly Insights, "What drives a trend-follower's trading activity?- Understanding the key drivers behind trend-following exposure changes", May 2022.

three key complementary factors across time: its signal or trend-strength, its risk or volatility, and a correlation factor that reflects adjustments due to the applied portfolio construction or risk management methodology. Figure 5 provides the respective attribution of the change in FIIR net notional short exposure in March of the SG Trend Index according to our replication model.

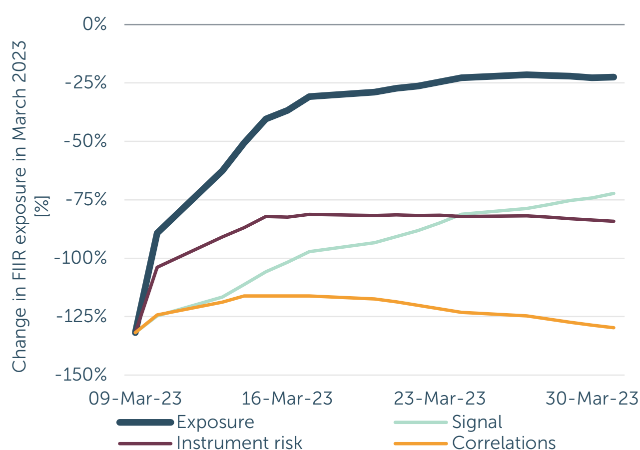

Figure 5: Hypothetical FIIR net notional exposure (10-year duration equivalent) attribution by cumulative changes in trend-strength, instrument volatility, and portfolio-scaling factor for Quantica's SG Trend Index replication model between March 8 and March 31, 2023. The sum of the three factor's cumulative changes equals the changes in net notional exposure at any point in time. Source: Quantica Capital.

In only five trading days, the overall notional exposure to FIIR positions was substantially reduced from -135% to -40%. The majority, or 55%, of the reduction in notional was driven by adjusting positions inversely proportionally to the elevated interest rate volatility. Another 15% of the reduction in notional exposure was driven by sudden changes in the correlation structure. As the underlying trend signals focus on a medium-term tactical investment horizon, only 30% of the notional exposure reduction was driven by signal changes, which were meaningfully slower to incorporate the reversal in global bond yields.

The overall change in the risk landscape led naturally to a reallocation of the FIIR risk towards the other asset classes, mostly towards commodities and currencies (see Figure 2).

Similarities between March 2023 and February 2018

While a five-day return of -10.8% for the SG Trend Index between March 9 and 15 is significant (especially on an *annualized* volatility of 12%), it is truly not unprecedented. For instance, a similar trend reversal event took place during the first week of February 2018, when the SG Trend Index was hit by a weekly loss of -9.6% with similar magnitude. The market environment of early 2018 was driven by rising equity and commodity prices, which led trend-followers to allocate a large portion of their overall risk to these asset classes. A sudden risk-off event without any fundamental cause led to a strong price correction across these markets, causing trend-followers to be caught on the wrong side on most of their positions, as shown in Figure 6.

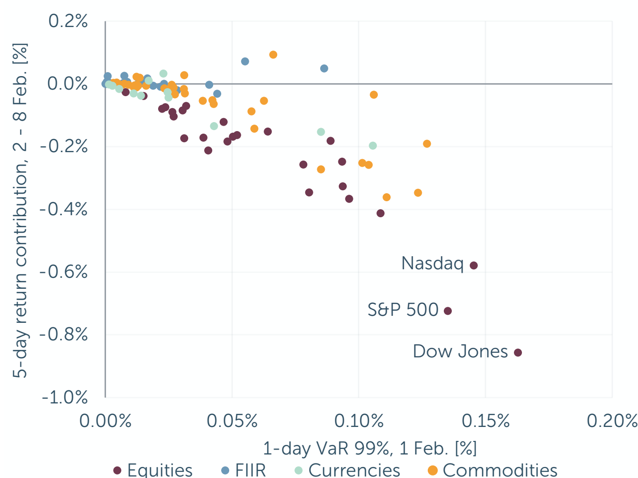

Figure 6: Simulated returns between February 2 and February 8, 2018 of the 97 instruments of the underlying investment universe of Quantica's SG Trend Index replication model as a function of their individual risk allocation as per February 2, 2018. Source: Quantica Capital.

As with the March 2023 reversal, a Value-at-Risk shock in multiple instruments led to a substantial reduction in the long risk exposure of a trend-follower in equity and commodity futures. And as in March 2023, the great majority of the investment universe, in fact 88 out of 97 markets, recorded a negative return in the five days between the 2nd and 8th of February 2018.

March 2023 and February 2018 were by no means isolated short-term reversal events. Other examples of similar, sudden and broad-based trend reversals include March and June 2007, November 2010, September 2019, or July 2017, as can be seen in Table 1.

Date	Rolling 5-day returns
05-Mar-2007	-12.3%
15-Mar-2023	-10.8%
08-Feb-2018	-10.6%
30-Jul-2007	-8.8%
16-Nov-2010	-7.2%
16-Mar-2011	-6.6%
10-Sep-2019	-6.5%
03-Jul-2017	-6.4%
06-Jan-2005	-6.3%
11-Oct-2018	-6.3%

Table 1: Worst ten non-overlapping five-day returns of the SG Trend Index since 2005. Returns before 2005 have been excluded as the index exhibited a much higher volatility prior to 2005. Source: Société Générale, Quantica Capital.

Such reversals have all the ingredients to form a most unfavourable market environment for a trend-following strategy. Indeed, the strongest markets trends were all found within a single asset class or correlated group of markets (i.e., government bonds and short-term interest rates in 2023; equities, energy, and metals in 2018), with weaker signals recorded across the remaining asset classes. In such an environment, a trend-follower's overall portfolio risk tends to be more concentrated and less diversified, and therefore more exposed to the downside of any sudden reversal in the prices of the underlying instruments in the most trending asset class.

Daily and weekly trend-following returns are skewed to the left, while quarterly returns are skewed to the right

A pure trend-following strategy is vulnerable to any large and sudden move in a group of correlated instruments. During such an event, its gains or losses are purely a function of its long or short exposure in this group of instruments prior to such move. In fact, historically, trend-following CTA returns have tended to display more pronounced "left tails" than "right tails" on returns measured over shorter-term timeframes such as a day or a week, at least over the past 20 years of data. Figure 7 shows the skewness - a common measure of the asymmetry of a probability distribution - of the SG Trend Index returns calculated across a continuous range of different timeframes, from daily to yearly.

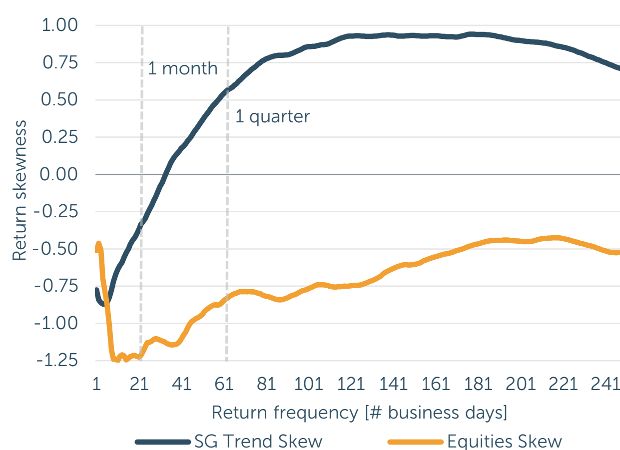

Figure 7: Comparative skewness of returns for the SG Trend Index and Global Equities measured across different timeframes from 1 to 250 business days. Period: January 2005 – March 2023. Returns before 2005 have been excluded as the SG Trend Index exhibited a much higher volatility prior to 2005. Source: Quantica Capital, Société Générale.

The index skewness has been cleary negative for daily and weekly returns (that means its daily and weekly return distributions are skewed to the left). One way to interpret this observation is that large market moves, at least since 2005, have tended to be market reversals rather than trend

confirmations. However, the skewness of the index already converges to zero when measured on the basis of monthly returns, and then becomes significantly positive over longer periods. On a quarterly basis, the returns of the SG Trend Index have displayed a positive skewness of 0.6 since 2005. Finally, the trend skewness is highest at around 0.9 when measured across a semi-annual investment horizon.

Hence, the return characteristics of trend-following become truly attractive when measured over timeframes beyond one calendar quarter. In such case, the distribution of returns becomes highly skewed to the right. A look at the ranking of the best and worst calendar quarter returns of the SG Trend Index confirms the above findings. As Table 2 shows, the top ten calendar quarter returns of the SG Trend Index since 2005 have all been stronger in absolute terms than nine out of its ten worst calendar quarters over that period. On average, the multiplier of the extreme quarterly returns has been 1.5 to 2 in favour of the positive returns. In contrast, equity returns do not show these beneficial right-skewed characteristics.

Indeed, Figure 7 shows that being long equities has historically always led to negatively skewed returns across any timeframe between 1 and 250 business days. Combining any traditionally diversified and balanced equity portfolio (e.g., 60/40) with a benchmark trend-following strategy is therefore likely to reduce its intrinsic negative skewness bias over any reasonable investment horizon beyond one month[6].

Worst quarters		Best quarters	
Quarter	Return	Quarter	Return
Q2 2015	-9.4%	Q1 2022	17.7%
Q1 2023	-7.3%	Q2 2007	13.9%
Q3 2008	-6.9%	Q4 2008	12.7%
Q4 2022	-6.1%	Q4 2014	11.8%
Q3 2007	-6.0%	Q2 2022	9.6%
Q1 2014	-5.9%	Q4 2020	8.5%
Q4 2018	-5.1%	Q1 2008	8.5%
Q2 2009	-5.0%	Q3 2014	7.9%
Q2 2017	-5.0%	Q4 2017	7.7%
Q1 2005	-4.9%	Q1 2015	7.6%
Average	-6.2%	Average	10.6%

Table 2: Best & worst 10 calendar-quarter returns for the SG Trend Index. Period 2005 – 2023. Returns before 2005 have been excluded as the index exhibited a much higher volatility prior to 2005. Source: Quantica Capital, Société Générale.

The systematic utilization of medium- to long-term market trends combined with short-term risk management results in a beneficial right-skewed return distribution over any reasonable medium-term investment horizon. Combined with a long-term positive return expectation of trend-following, such return distribution provides an attractive compensation for accepting the risk of short-term price reversals such as the one experienced in March 2023. The ability to consciously accept and efficiently manage short-term reversal risk is a pre-requisite to generate the unique longer-term return characteristics that trend-following is known for.

[6] More generally, the benefits of trend-following have historically been most pronounced in periods of adverse market environments for 60/40 type portfolios, with the positive return skewness offering valuable diversification and risk mitigating benefits. On this topic, please refer to Quantica Quarterly Insights, "All You Need Is Trend - A statistical analysis of the portfolio diversification benefits of trend-following", 30 August 2022.

Conclusion

Trend-following CTAs typically manage a diversified combination of directional risk exposures across the most liquid asset classes. As a result, they face a key short-term risk: the risk of a sudden price reversal in a group of highly correlated instruments. A trend-follower's downside is proportional to the magnitude of the reversal, the number of instruments impacted by the reversal, and the average cross-correlation between the risk positions. We have shown that March 2023 had all the characteristics of a classic trend reversal event. The SG Trend Index, a representative benchmark for the trend-following CTA industry, recorded its second-worst month since 2005, with up to 90% of the losses tied to short positions in government bond and short-term interest rates futures. March 2023 shared many similarities with past short-term reversal events like in February 2018, when a sudden risk-off event triggered a sharp repricing of equity and commodity market expectations translating into a sharp drawdown of similar magnitude for the CTA industry.

We showed that capping the risk concentration in a trend follower's portfolio can mitigate the negative effects of risk reversals in the short run but comes with high opportunity costs in the long run.

Consciously accepting and efficiently managing this type of reversal risk is therefore a prerequisite to successfully capitalize on the most profitable medium-term trend opportunities. A reactive risk management process, that provides the ability to quickly adapt to sudden changes in market volatility and cross-asset correlations, is crucial. Over shorter timeframes, at a daily or weekly frequency, trend-following returns have shared similar negative skewness (characteristic of an asymmetric-to-the-left return distribution) as equity markets. However, unlike equity returns, for periods of one calendar month or more, trend-following returns become positively skewed, displaying a desirable return distribution that is asymmetric to the positive side.

We conclude that the attractive long-term positive return expectation of trend-following, combined with the strongly beneficial positive skewness over any medium-term return frequency, provides an attractive compensation for accepting the risk of painful short-term price reversals such as the one experienced in March 2023.

Since 2003, Quantica Capital's mission has been to design and implement the best possible systematic trend-following investment products in highly liquid, global markets. To the benefit of our investors and all our stakeholders.

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