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INSIGHTS

ARE TREND-FOLLOWING CTAs TRULY LONG VOLATILITY?
A DEEPER DIVE BEYOND THE VIX

Quantifying the relationship between asset class volatility regimes and trend-following returns.

#16 | 5 DECEMBER 2023

Executive summary

This note quantifies the asset class return contribution and total performance of a medium-to-long-term trend-following strategy during different asset class volatility regimes, and not only restricted to equity volatility. Our lookback period from 2000 to 2023 covers bull markets, bear markets, market crises and quiet times of generationally low volatility across all major asset classes.

Starting with equity market volatility, we show that all three (low, normal, and high) VIX Index regimes contribute positively to a medium-to-long-term trend-following strategy's returns. We highlight that the average trend-following contribution during low and high VIX quarters are higher than during normal VIX quarters. While the average trend-following returns in the low- and high-VIX regimes are higher than in normal VIX regimes, asset class attribution reveals surprisingly different return drivers during the two extreme volatility regimes.

The VIX only measures expected U.S. equity volatility, and using realized volatility across a diversified range of markets shows a result that is generalized across asset classes: low volatility regimes are more conducive to overall trend-following returns. Extending the analysis beyond equity volatility to bond, commodity, and currency volatility is important because on average, the overlap between periods of high or low volatilities for these asset classes is less than 50%. 2023 has demonstrated this very well with above average bond volatility but below average equity volatility. We show that as with the VIX Index, both high and low volatility regimes for all asset classes have contributed positively. In addition, and maybe counterintuitive to some, periods of low volatility tend to deliver higher overall returns than periods of high volatility. This result is consistent across all asset classes.

Going one step further, we investigate asset class return contributions with respect to each asset class's volatility regimes and again find consistent results for all four asset classes: the trend-following opportunity set is well-balanced amongst asset classes during normal volatility regimes, whereas both high and low volatility regimes create highly divergent opportunities between asset classes.

We conclude that trend-following CTAs are well suited to provide strong "smart diversification" characteristics during different volatility regimes for all four asset classes.

Introduction

Liquid alternative investment strategies are often assumed to be explicitly or implicitly "long volatility" and to have a better opportunity set when market volatility is high. In that context, volatility is often defined as equity volatility, usually measured by the level of the VIX Index[1]. The logic is that higher volatility means larger market price moves, which naturally increase the profit (and loss) potential for a strategy going long and short. In this note, we focus on a very specific alternative investment strategy: a typical medium-to-long-term trend-following program and examine how its returns are related to the volatility of the four underlying major liquid asset classes: equities, bonds, currencies, and commodities.

We start by quantifying the relationship between overall trend-following returns and the level of the VIX Index and break down the contribution from each asset class during the different VIX regimes.

While strategic risk allocations to equities do vary between trend-following managers, the equity weight is typically not higher than a third of the portfolio risk over the long run. This analysis would therefore not be complete without looking at the relationship between overall trend returns and the volatility regimes specific to the other liquid asset classes that make up the investment universe of a typical trend-following CTA.

We therefore quantify the overall historic returns of a generic trend-following approach during different volatility regimes for equities, bonds, currencies, and commodities.

Our findings provide a clear answer to the question of whether a diversified medium-to-long-term trend-following strategy requires a specific volatility regime to be successful.

Periods of high, normal and low VIX levels see positive returns for a medium-to-long-term trend-following strategy

To quantify the relationship between different market volatility regimes and the overall performance of a trend-following strategy, we rely on our generic trend-following model, which has been designed to closely track the returns of the SG Trend Index[2]. The investment universe can be found in Appendix 1. We perform a "smart diversification" or regime conditional return attribution analysis[3] at a quarterly frequency. We define three different market volatility regimes - Low, Normal and High, based on *non-overlapping quarterly averages* of the VIX Index, a proxy for expected near-term equity volatility, and calculate the average return and the annualized return contribution of a trend-following program during each of the three regimes[4]. Figure 1 shows the breakdown of

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[1] The VIX Index is a calculation designed to produce a measure of constant, 30-day expected volatility of the U.S. stock market, derived from real-time, mid-quote prices of S&P 500 Index call and put options. Source: Cboe.

[2] The SG Trend Index is designed to track 10 of the largest trend-following CTAs (by AUM) which meet a list of criteria (as defined by SG), and be representative of the trend-followers in the managed futures space. The SG Trend Index is equally weighted, and reconstituted annually. The Index is not directly investable. Source: Société Générale.

[3] To show the smart diversification benefits, we calculate p.a. trend-following returns during different regimes. The regimes are inferred from an arbitrary benchmark, in this case the VIX Index, and are classified into a High, Low or Normal volatility regime, according to whether they belong to the top 16%, the bottom 16% or the middle 68% of all quarters, respectively. The 16% threshold is chosen to represent the percentile on each side of one standard deviation of a normal distribution. For more information please refer to our paper "60/40 Portfolios and the Need for Smart Diversification".

[4] Regular readers will recall our previous Quarterly Insights in which we applied the "smart diversification" concept to bull and bear equity markets. The same concept is now applied to high and low volatility regimes.

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annualized log[5]-returns for trend-following across the three VIX Index regimes over the period 2000 – 2023.

Figure 1: Annualized Log-Return Attribution of a Generic Trend-Following Strategy by VIX Index Regime
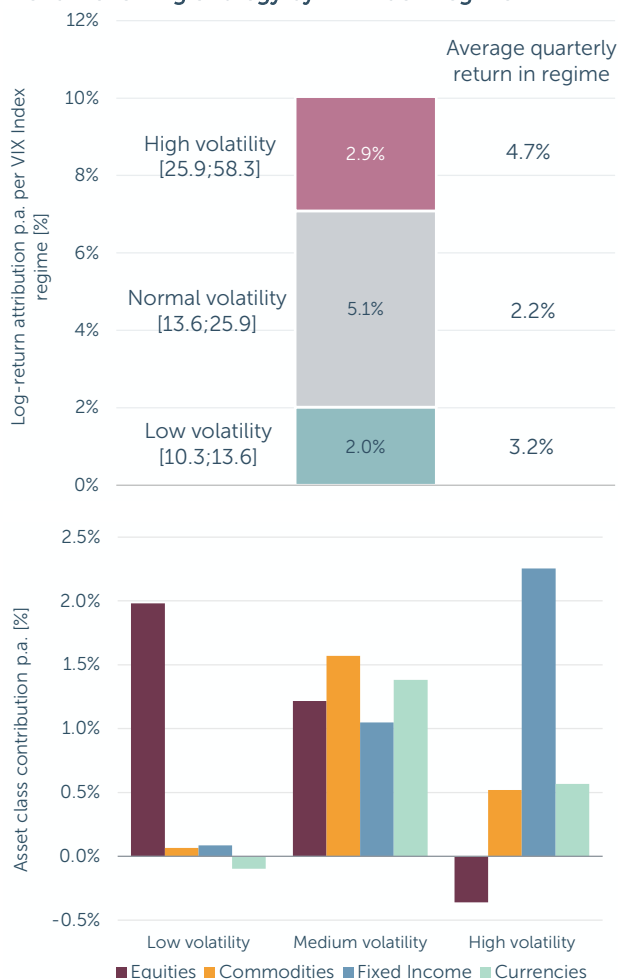

Figure 1: **Top:** Annualized log-return attribution of a generic trend-following strategy across three distinct VIX Index regimes, with corresponding ranges of quarterly averages of the VIX Index for each regime shown in brackets. **Bottom:** Breakdown of return contributions by asset class for each of the low, normal and high VIX regimes. Period: 2000 – 2023. Source: Quantica Capital. HYPOTHETICAL RETURNS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2.

Interestingly, the figure shows that all three VIX regimes (low, normal and high) contributed positively to the overall returns of the trend-following strategy since 2000. Contrary to some

perceptions, trend-following strategy returns are not only realised during periods of high volatility, but also in periods of low and normal market volatility. Moreover, even though 50% of the overall returns are generated during normal VIX regimes (associated with a quarterly VIX average between 13.5 and 26), trend-following returns are on average higher during quarters of high and low VIX (returns of 4.7% and 3.2% on average per quarter, respectively) than during periods of normal VIX levels (returns of 2.2% per quarter on average).

Asset class attribution patterns under VIX regimes

To better understand which asset class is driving strategy performance during the high (highest 16% of quarters) and low (lowest 16% of quarters) VIX regimes, Figure 1 also provides the breakdown of the return contributions by asset class for each of the three VIX regimes.

Strikingly, the asset class attribution is very different under each regime. Indeed, during periods of high VIX (associated with a quarterly VIX average between 26 and 58), the contribution from equities is negative and most of the trend-following returns are generated from fixed income positions, and to a lesser extent from currencies and commodities positions. On the contrary, during periods of low VIX (associated with a quarterly VIX average between 10 and 13.5), almost all trend-following returns are from equity exposures. Finally, during normal VIX Index regimes (associated with a quarterly VIX average between 13 and 26), all asset classes contribute positively, and in similar proportions, to overall trend-following returns.

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[5] The regime conditional attribution analysis is voluntarily done on logarithmic returns and not on simple returns. Logarithmic returns provide the property of time-additivity, which means that the logarithmic returns contributions from different regimes can simply be added together to compute the total logarithmic return over all regimes.

Low realized volatility regimes for equities, currencies, commodities, and bonds tend to contribute more to overall trend-following strategy returns than high volatility regimes

Equity risk is often one if not the main risk factor for any traditional liquid investment portfolio hence there is a natural bias when defining volatility to focus first on equity volatility. However, the strategic risk allocated to equities within a trend-following strategy usually represents no more than a third of total portfolio risk over the long run. The remainder resides in other liquid asset classes such as bonds, currencies, and commodities.

We look at individual asset class volatility regimes separately because they often follow their own independent cycles: high equity volatility does not necessarily coincide with high volatility for currencies, commodities and bonds. Appendix 2 shows that extreme volatility regimes between asset classes usually overlap less than 50% of the time.

We now seek to quantify the historic returns of a generic trend-following strategy as a function of the individual asset class volatility regime of equities, bonds, currencies, and commodities. As with the regime conditional analysis on the VIX Index, we perform a regime conditional return attribution analysis based on *non-overlapping quarterly averages* of each asset class's realized volatility[6], and calculate the annualized returns of a generic trend-following program in each regime. Figure 2 shows the breakdown of annualized log-returns for this program across the three different volatility regimes for equities, commodities, bonds, and currencies, respectively, over the period 2000 – 2023.

Firstly, the realized equity volatility attribution breakdown is similar to the one for the VIX in that quarters in low volatility regimes generated better performance on average than in normal volatility regimes, but different in that quarters in high realized equity volatility regimes generated the smallest average returns (of 2.1%), whereas they generated the highest average returns during high VIX regimes (average quarterly returns was 4.7%). A difference in the breakdown

Figure 2: Annualized Log-Return Attribution of a Generic Trend-Following Strategy by Each Asset Class's Own Realized Volatility Regimes
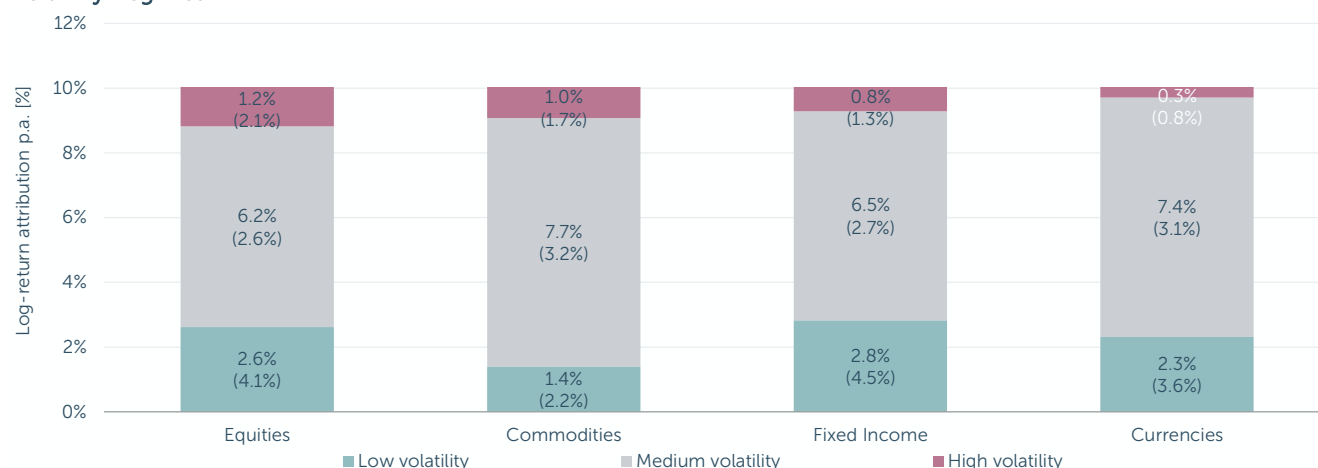
Figure 2: Annualized log-return attribution of a generic trend-following strategy by each asset class's own realized volatility regimes. Quarterly average returns during each regime are shown in brackets. Period: 2000 – 2023. For example, the commodities column represents the attribution of trend-following strategy returns across the three different commodities realized volatility regimes. Source: Quantica Capital. HYPOTHETICAL RETURNS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2.

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[6] Asset class volatilities are calculated as the annualized realized instrument volatility (calculated using an exponential weighted moving average methodology with a 0.94 decay factor), averaged across all instruments in the asset class.

Do thresholds defining a high or low volatility regime make a difference?

The percentile thresholds of highest and lowest 16% of all quarters used to define high and low volatility regimes can be seen as arbitrary. In Appendix 3, we generalize the previous analysis to any percentile threshold, and show how the quarterly average trend-following returns in high and low volatility regimes for each asset class evolves as a function of the percentile threshold chosen, ranging from 5% to 45% of all quarters from 2000 to 2023.

For fixed income, commodities and currencies, low volatility quarters have consistently resulted in higher trend-following returns than high volatility quarters, for the majority of percentile thresholds chosen to define high and low volatility regimes. For equities, the percentile threshold matters more, but the average trend-following returns in high and low regimes are of similar magnitude for all thresholds, and consistently above the average contribution in normal regimes.

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is unsurprising as the VIX represents *expected* near-term large cap U.S. equity volatility - this is related to but different from the average *realized* volatility across the equity markets of a traditional CTA, which generally also include equities in other regions such as Europe and Asia. Appendix 2 provides more information on the differences between the VIX Index and our global measure of equity realized volatility.

Secondly, for all asset classes, trend-following returns have been on average positive in all high, normal and low volatility regimes of these asset classes since 2000.

Thirdly, the total annualized contribution to overall trend-following returns was higher in the low volatility regimes (calendar quarters) for each of the four asset classes than in the corresponding high volatility regimes.

Thus, a trend-following strategy does not necessarily require high equity, bond, currencies or commodity volatility to perform, and periods of low volatility in each asset class tend to contribute more to the overall returns than periods of high volatility.

Trend-following asset class attribution is more uneven during high or low asset class volatility regimes and more broad-based during normal volatility regimes

For completeness, we now look at which asset class is driving the strategy performance during low, high and normal volatility regimes of equities, bonds, currencies, and commodities. Figure 3 provides the breakdown of overall trend-following returns during each of the asset classes' high (the 16% of all calendar quarters with the highest average volatility) regimes; Figure 4 during each of the asset classes' low (the 16% of all calendar quarters with the lowest average volatility) regimes; and Figure 5 during each of the of the asset classes' normal (the remaining 68% of all calendar quarters) regimes.

Strikingly, and similarly to the breakdown obtained in Figure 1 for VIX regimes, asset class return attribution is very different under each volatility regime.

Starting with normal volatility regimes, Figure 5 shows that all four asset classes contributed in very similar proportions to the overall returns of the trend-following strategy.

Figure 3: Each Asset Class Contribution to Overall Strategy Performance in the High Volatility Regime

Figure 3: Each asset class contribution to overall strategy performance in the **high volatility regime** for equities, commodities, fixed income and currencies, respectively, with corresponding ranges of quarterly averages of the annualized realized volatility for each asset class shown in brackets. For example, the equities column shows the return contribution of each asset class when equities are in a **high** realized volatility regime, which is defined by an annualized equity volatility averaging between 26% and 66% during these quarters. Period: 2000 – 2023. Source: Quantica Capital. HYPOTHETICAL RETURNS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2.

Figure 3 shows that high volatility regimes in all four asset classes have all been negative for equity, but positive for fixed income trend-following returns. Conversely, Figure 4 shows that low volatility regimes in all four asset classes have all been positive for equity trend-following returns. During their own high volatility regime, fixed income and commodities generated a positive contribution, while equities and commodities produced a negative contribution. During their own low volatility regime, equities, fixed income and currencies generated a positive contribution, and commodities produced a negative contribution.

More generally, this regime conditional attribution analysis is consistent with our findings when using the VIX Index: normal volatility regimes appear to offer an approximately equal trend-following opportunity set for all asset classes, whereas extreme high or low volatility regimes can for some asset classes create lateral opportunities in other asset classes.

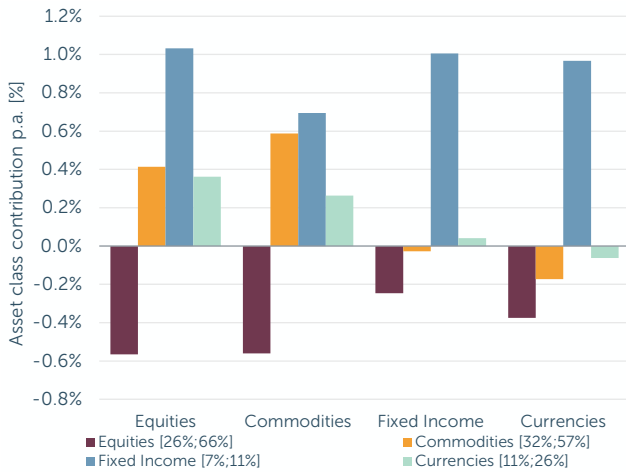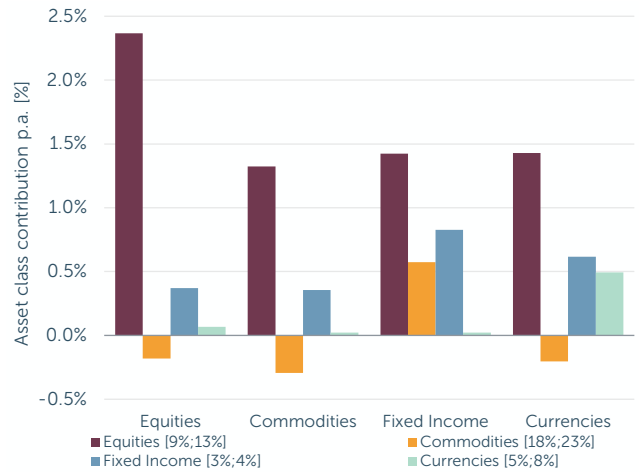**Figure 4: Each Asset Class Contribution to Overall Strategy Performance in the Low Volatility Regime**

Figure 4: Each asset class contribution to overall strategy performance in the **low volatility regime** for equities, commodities, fixed income and currencies, respectively, with corresponding ranges of quarterly averages of the annualized realized volatility for each asset class shown in brackets. For example, the commodities column shows the return contribution of each asset class when commodities are in a **low** realized volatility regime, which is defined by an annualized commodity volatility averaging between 18% and 23% during these quarters. Period: 2000 – 2023. Source: Quantica Capital. HYPOTHETICAL RETURNS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2.

Figure 5: Each Asset Class Contribution to Overall Strategy Performance in the Normal Volatility Regime
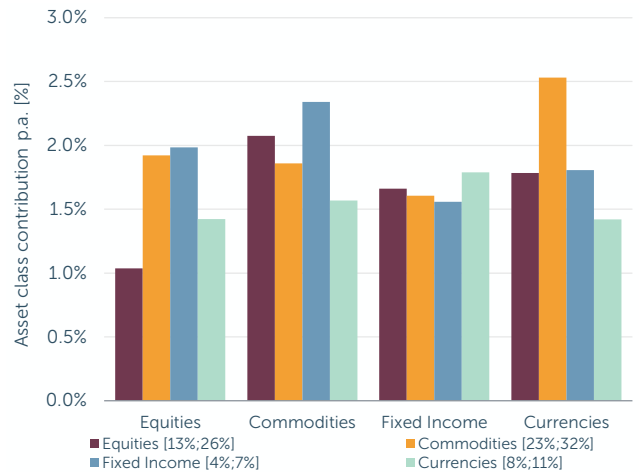
Figure 5: Each asset class contribution to overall strategy performance in the **normal volatility regime** for equities, commodities, fixed income and currencies, respectively, with corresponding ranges of quarterly averages of the annualized realized volatility for each asset class shown in brackets. For example, the currencies column shows the return contribution of each asset class when currencies are in a **normal** volatility regime, which is defined by an annualized currency volatility averaging between 8% and 11% during these quarters. Period: 2000 – 2023. Source: Quantica Capital. HYPOTHETICAL RETURNS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2.

Because a trend-following strategy trades a number of different asset classes, and is often exposed to high, normal and low volatility regimes in different asset classes, it has opportunities to profit from a variety of different combinations of regimes. The high complementarity between asset classes in generating trend return opportunities underscores the importance of diversification when constructing the investment universe of a trend-following strategy. Diversification maximizes a strategy's ability to successfully capture trend opportunities across different multi-asset volatility environments.

CTA portfolio construction risk budgeting

The results presented in this note might surprise some readers but will probably not surprise CTA managers, many of which calibrate position sizes to volatility regimes. An intuitive explanation of how a trend-following portfolio is effectively constructed for liquid markets may provide some useful context. A typical medium-to-long-term trend-following CTA is volatility agnostic because all its positions are built on a volatility risk-adjusted basis: the position in each market is usually sized in risk terms, proportionally to its trend-following signal strength. In this context, the individual volatility of each market does not matter: lower volatility markets (typically fixed income and currencies) are levered up in terms of their notional exposures, and higher volatility markets (typically commodities and equities) are notionally sized smaller so that, for an equal trend-signal strength, the potential profits and losses in each asset class and position are of similar size. To be profitable, a trend-following strategy needs sustained up- (or down-) trends lasting long enough to match the frequency for which the signal is calculated, and this can happen to low and high volatility assets, and during low and high market volatility.

Conclusion

We showed that the returns of a generic medium-to-long-term trend-following strategy can come from both extremely high and extremely low realized volatility periods, and, contrary to the popular perception, even more so during low volatility regimes. As trend-following CTAs typically manage diversified risk exposure across the most liquid asset classes, it is important to note that there has been on average less than a 50% overlap between extreme volatility periods across the different asset classes since 2000. Our initial result, which used the VIX Index as a proxy for market volatility, has been generalized: all volatility regimes in all four asset classes contribute positively.

The overall returns of the generic trend-following strategy do not require high levels of realized volatility and, empirically since 2000, overall trend opportunities have been on average higher during low realized volatility regimes for equities, fixed income, currencies, or commodities.

Finally, trend-following opportunities are more disparate in low and high asset class volatility regimes. In times of abnormally high or low volatility in any asset class, trend opportunities can also be found within the other asset classes that compose the highly diversified investment universe of a trend-follower.

Appendix 1: Investment universe of the generic trend-following strategy

Asset Class	Region	Name	Asset Class	Region	Name
Equities (20)	North America	S&P 500	Fixed Income (17)	North America	CAD Treasury 10yr
		Dow Jones			USD Long 20yr
		Nasdaq			USD Note 2yr
		Russel 2000 (Mini)			USD Note 5yr
		S&P/TSX 60 (Canada)			USD Treasury 10yr
	Europe	AEX (Netherlands)			USD Ultra 30yr
		CAC 40		Europe	EUR Bobl 5yr
		DAX			EUR BTP Italy 10yr
		Euro Stoxx 50			EUR BTP Italy 3yr
		FTSE 100 (UK)			EUR Bund 10yr
		OMXS30 (Sweden)			EUR Buxl 30yr
		SMI (Switzerland)			EUR OAT France 10yr
	Emerging Markets	MSCI EM ICE			EUR Schatz 2yr
	Asia-Pacific	Hang Seng			GBP Gilt 10yr
		HSCEI (China) HKEX		Asia-Pacific	AUD Treasury 10yr
		MSCI Taiwan SGX			AUD Treasury 3yr
		Nifty 50 (India) NSE			JPY Bond 10yr
		Nikkei 225 CME	Commodities (16)	Global	Brent Crude
		SPI (Australia)			Coffee Arabica ICE US
		Topix			Copper CME
Currencies (8)	North America	FX CAD			Corn
	Europe	FX CHF			Gasoil Low Sulfur
		FX EUR			Gasoline
		FX GBP			Gold
	Emerging Markets	FX MXN			Heating Oil
	Asia-Pacific	FX AUD			Lean Hogs
		FX JPY			Natural Gas (Henry Hub)
		FX NZD			Platinum
					Silver
					Soybeans
					Sugar
					Wheat (Chicago)
					WTI Crude NYM

Table 1: Investment universe of the generic trend-following strategy used in this note. Source: Quantica Capital.

Appendix 2: High and low volatility periods are not always happening at the same time across equities, bonds, currencies and commodities

Periods of high and low volatility do not always coincide across asset classes. To illustrate this point, Figure 6 shows the rolling average asset class volatilities[7] for the year 2023 as a percentile of their historical distribution since 2000. There is a wide dispersion between the volatility regimes of each asset class: the average realized volatility of all fixed income futures in our generic trend-following universe has been above the 90th percentile on average for 2023 to September. At the same time, the rolling average realized volatility of all equity index futures has been at 33% over the same period. Put differently, in 2023, fixed income realized volatility has been in the highest 10% of all days, while equity realized volatility has been in the lowest third of all days since 2000.

2023 could be characterized as a "low" volatility year when just looking at equities, a "high" volatility year when looking at bonds, or a "normal" volatility year when looking at currencies or commodities. The divergence has been even more marked for some individual months: September 2023 recorded one of the highest fixed income volatilities (top 20% of all days since 2000) while equities, currencies and commodities all recorded volatilities that ranked within the bottom 20% of all days since 2000.

One way to quantify how the different asset class volatility regimes relate to each other over time is to measure the number of overlapping periods between the different regimes for each asset class.

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[7] Asset class volatilities are calculated as the annualized realized instrument volatility (calculated using an exponential weighted moving average methodology with a 0.94 decay factor), averaged across all instruments in the asset class.

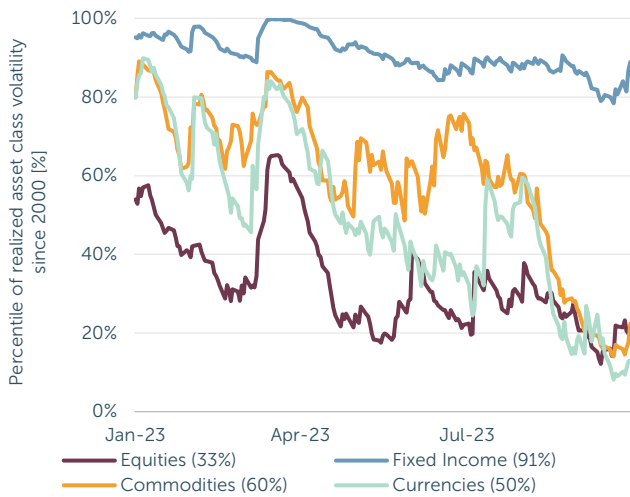Figure 6: Percentile of Each Asset Class Realized Volatility in 2023

Figure 6: Evolution of the percentile of each asset class realized volatility in 2023, calculated using all daily values since 2000. The average percentile value for the year is shown in brackets. Source: Quantica Capital.

Put differently, we want to measure the proportion of high-volatility periods for equities which also qualify as high-volatility periods for bonds, currencies and commodities, and repeat the analysis for low-volatility regimes. To do that, we measure the quarterly average of each asset class realized volatility since 2000 and obtain 95 quarterly periods, which we classify into high or low volatility periods, according to whether they belong to the top 16% or the bottom 16% of all periods, respectively. We then count the percentage overlap between all the high regimes for each asset class and do the same for the low regimes. We obtain a (non-symmetric) matrix of percentage overlap between high/high (bottom left) and low/low (top right) volatility regimes, which is shown in Figure 7.

On average since 2000, there has been less than 50% overlap between extreme volatility regimes of the different asset classes. The amount of overlap between high volatility periods was roughly similar to the amount of overlap among low volatility periods (the average of the values in the bottom left of the matrix in Figure 7 is 45%, the average of the top right part is 45%).

Figure 7: Percentage Overlap of Extreme Volatility Regimes Between Asset Classes

Low/Low High/High	Equities	Fixed Income	Commodities	Currencies
Equities		38%	62%	44%
Fixed Income	44%		31%	50%
Commodities	44%	50%		44%
Currencies	38%	44%	50%	

Figure 7: Matrix of percentage overlap of extreme volatility regimes between asset classes. The bottom left of the matrix represents the overlapping quarterly periods of high volatility regimes, the top right of the matrix represents the overlapping quarterly periods of low volatility regimes. High and low regimes are defined with the 16% quantile of quarterly observations between January 2000 and September 2023 (95 periods). Source: Quantica Capital.

Put differently, if focusing on extreme volatility regimes of solely one asset class, one misses on average more than 50% of the similar regimes of the other asset classes. In the context of a diversified strategy such as trend-following, looking at return characteristics conditional on extreme volatility regimes of equities, bonds, currencies, and commodities is more relevant than looking at it conditional on equity volatility regimes only.

Overlaps between the VIX and global equity realized volatility

Figure 8 contains the same analysis on the overlap of extreme regimes between equity realized volatility and VIX Index values. It shows that the VIX values and the average realized volatility of a diversified set of equity indices do not necessarily share the exact same periods of extreme high and low values. There are two reasons for this: the difference between *expected* and *realized* volatility, and the fact that the VIX Index covers a single region (the U.S.) based on large cap equities while the equity asset class includes other U.S. equity indices, as well as indices covering other regions such as Europe and Asia.

Figure 8: Percentage Overlap of Extreme Volatility Regimes Between Global Equities and the VIX Index

Low/Low High/High	Equities	VIX Index
Equities		75%
VIX Index	75%	

Figure 8: Matrix of percentage overlap of extreme volatility regimes between global equity realized volatility and the VIX Index. The bottom left of the matrix represents the overlapping quarterly periods of high volatility regimes, the top right of the matrix represents the overlapping quarterly periods of low volatility regimes. High and low regimes are defined with the 16% quantile of quarterly observations between January 2000 and September 2023 (95 periods). Source: Quantica Capital.

Comparing realized volatility for the VIX, S&P 500 and 20 global equity indices

Figure 9 shows historical values of the VIX Index, the realized volatility of the index it relates to (S&P 500 futures) and the average realized volatility of the 20 global (U.S., European, Asian and emerging markets) equity indices in our investment universe since 2000.

Figure 9: Realized Volatility of S&P 500 Futures, Average Realized Volatility of the 20 Equity Futures and VIX Index
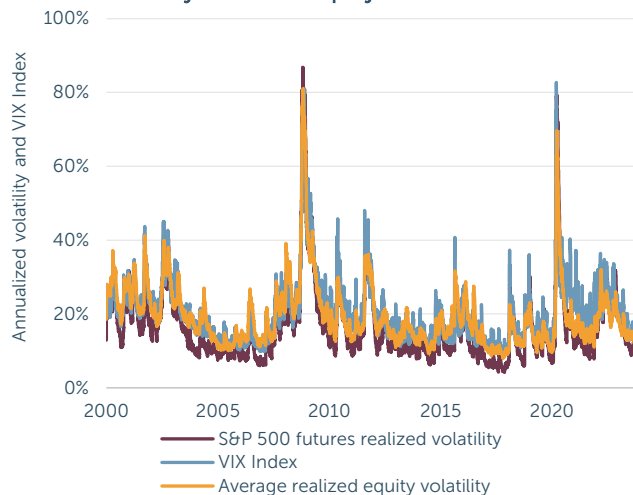

Figure 9: Realized volatility of S&P 500 futures, average realized volatility across the 20 equity futures of our investment universe, and VIX Index values since 2000. Source: Quantica Capital.

Appendix 3: Average quarterly trend-following returns under three different volatility regimes for each asset class defined by different "percentile thresholds"

The percentile thresholds of highest and lowest 16% of all quarters used to define high and low volatility regimes for each asset class can be seen as arbitrary. Figure 10 generalizes the analysis to any percentile threshold and shows average quarterly trend-following returns across all high, low and normal regimes for realized volatility of each asset class, based on different percentile thresholds to define "high" and "low" regimes, ranging from 5% to 45% of all quarters from 2000 to 2023.

Figure 10: Varying Thresholds Used to Define High and Low Volatility Regimes for each Asset Class
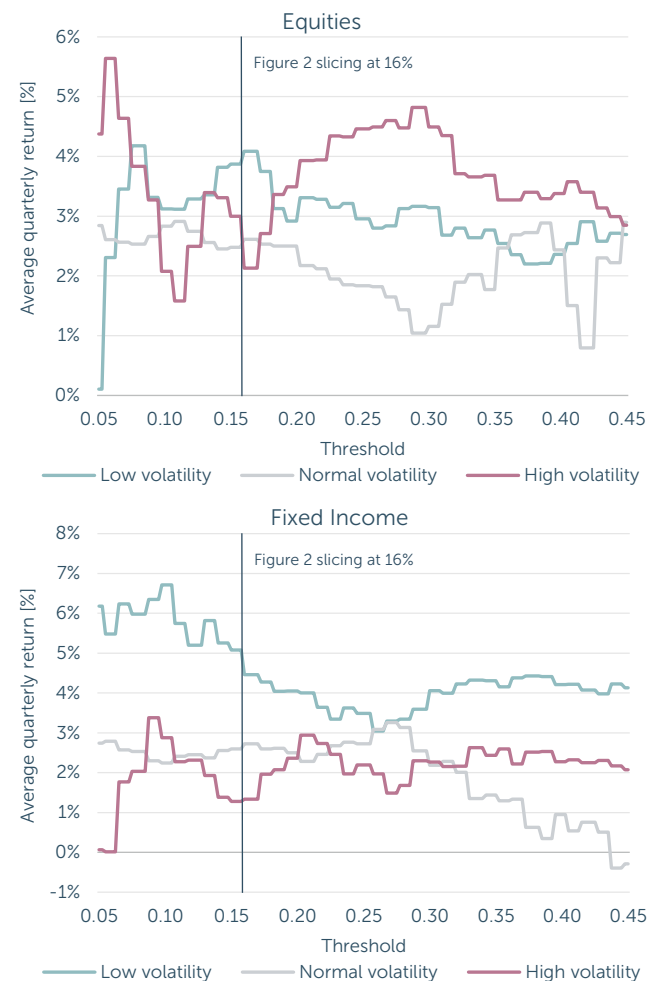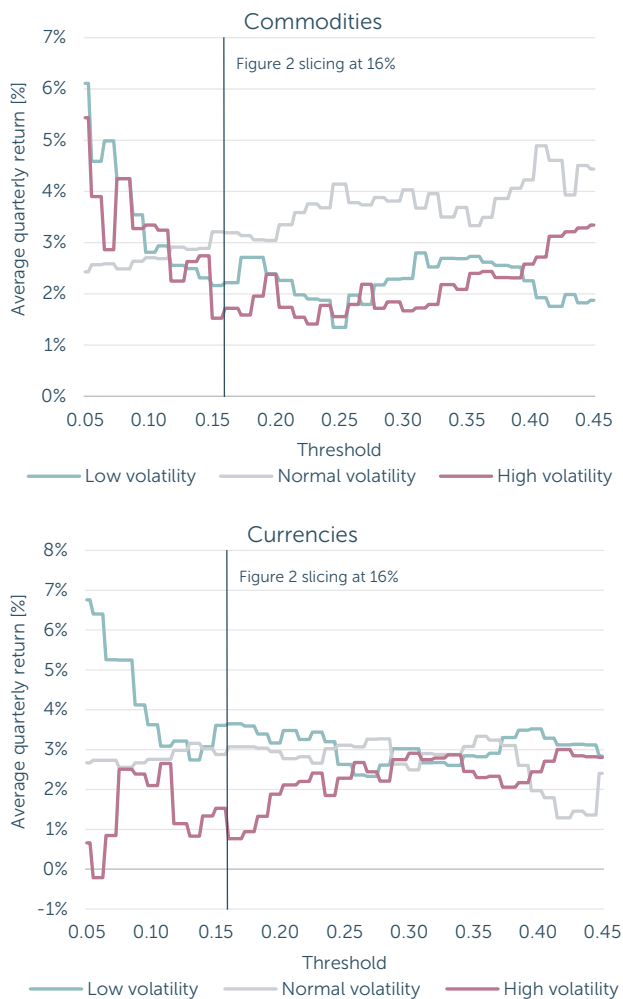
Figure 10: Average quarterly returns of a generic trend-following model for four different asset classes conditional on the volatility regime (high, normal or low) for each asset class and as a function of a range of percentile thresholds from 5 – 45% used to distinguish between high and low volatility regimes. For example, the Fixed Income graph represents average trend-following returns over all quarterly periods in the high, low and normal fixed income volatility regimes as a function of different percentile threshold values. Period: 2000 – 2023. Source: Quantica Capital. HYPOTHETICAL RETURNS. PLEASE SEE IMPORTANT DISCLAIMERS ON PAGE 2.

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