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Managed Futures and the AC-DC Effect or Highway to Prosperity?

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Managed Futures – A True Alternative in Turbulent Markets

Recent developments have not only driven numerous financial markets to record highs, but also significantly increased correlations between various asset classes. Following one of the longest bull markets in history, current price levels and the co-movement behaviours of traditional asset classes suggest reduced expected returns and diversification benefits in future. The question, therefore, is whether investment strategies exist that still provide an attractive risk/return profile and consistent diversification benefits.

The hypothesis and aim of this paper is to demonstrate that the unambiguous answer is yes! The risk premia of - as well as correlations between - asset classes are time varying, and strategies that dynamically adjust to changing attractiveness and co-movements can harvest positive returns in various market

environments. However, these strategies inherently need to be highly liquid in order to allow for dynamic exposure management. One type of alternative strategy that combines liquidity with adaptiveness is a managed futures strategy. Accordingly, this paper elaborates on the differences in the risk/return profiles of traditional balanced mandates and a long-only risk-balanced managed futures strategy. It shows that the latter is well suited to withstand adverse bond or equity market conditions. We call this the asset class diversification contribution (AC-DC) effect of long-only managed futures strategies. This relatively robust risk/return profile is mainly attributable to its broad and adaptively weighted investment universe, as well as a systematically managed total exposure.

Data and Methodology

Using a broad set of different asset classes and a long data history, we analyse the risk/return

profile of a long-only managed futures strategy alongside two classical, statically balanced portfolios. We simulate a long-only managed futures strategy (LOMF) that combines momentum and carry with a risk budgeting engine. The idea is that various asset classes provide long-only, yet time-varying risk premia. The strategy measures the current attractiveness of these risk premia based on momentum and carry. The more attractive an asset class, the bigger the position in the portfolio. In order to spread market risk evenly, a risk budgeting engine adjusts the positions by examining both the volatility of and co-movements between the individual assets. The more risk a specific asset exhibits, the smaller its position in the final allocation. To dynamically adapt the exposure to a specific target risk, leveraged positions are allowed. Rebalancing is daily, factoring in transaction costs.

The benchmark consists of a classical capital-weighted portfolio that is always fully invested 60% in bonds and 40% in equities. We hereinafter call this portfolio the traditional benchmark (TB). While it still represents the point of reference for many institutional investors, its focus on only two asset classes foregoes significant diversification benefits. Therefore, we additionally simulate a portfolio invested 50% in bonds, 40% in equities and 10% in commodities and call it the diversified benchmark (DB).

Both benchmarks are rebalanced on a monthly basis. To factor in various scenarios, we first compare the change in yield level with the average return delivered by the different strategies over a fixed 12 month time window. In order to attain stably underpinned scenarios in the analysis, we divide the evolution of yield into quintiles. The same concept is then applied to changes in equity markets.

Interest Rate Scenarios vs. Empirical Risk/Return Characteristics

What basic findings does this empirical analysis bring to light? Let us first focus on the interest rate scenarios. The top section of (Exhibit 2, next page) compares the interest rate change over 12 months with the average return from the individual asset classes under different yield scenarios. The returns from bonds are significantly inversely correlated with changes in interest rates. Equities benefit from falling yields but, on average, maintain gains even during periods of strong interest rate increases. We attribute this to the fact that interest rates are usually positively correlated with the business cycle and, therefore, corporate profitability. Commodities and gold live up to their reputations as inflation hedges, if one takes interest rate levels as a proxy for inflationary pressures. They gain the most during periods of rising yields and associated inflation.

How well did the various asset allocation strategies exploit the diverse characteristics of the different asset classes to generate a stable performance? To glean an answer, the middle section of Exhibit 2 and Exhibit 1 show the average 12 month returns of the strategies. All three strategies obviously prefer falling over rising interest rates. For that matter, the traditional benchmark correlates most negatively with interest rates due to its significant bond exposure. The diversified benchmark tempers that dependency somewhat, benefitting during times of rising yields from gains by commodities. What's striking is that the long-only managed futures program outperforms both benchmark strategies under almost all scenarios and especially in the cases of the strongest yield increase and yield decrease.

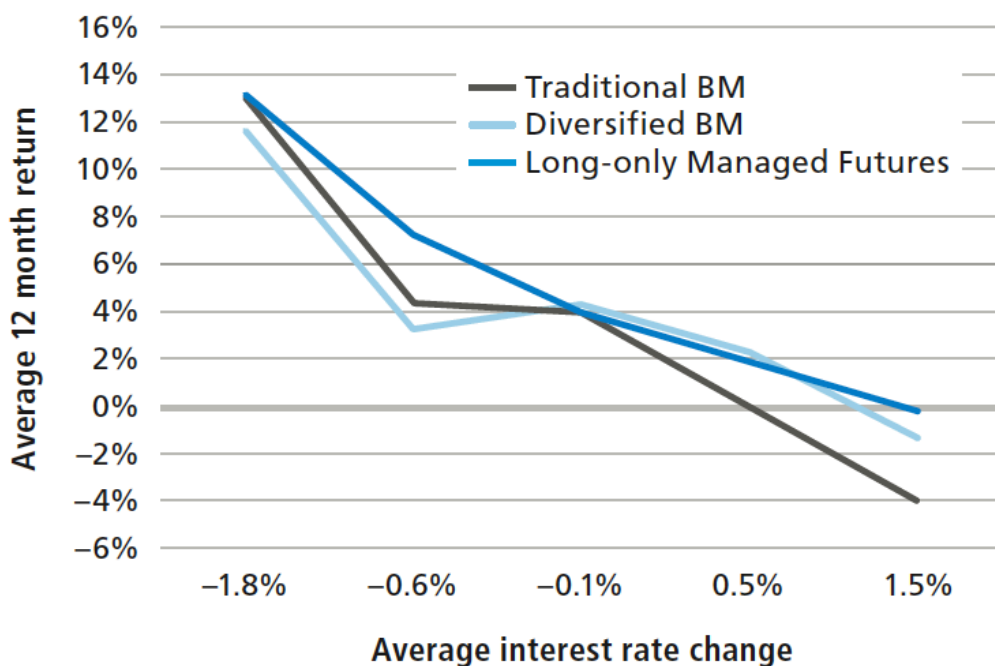


Exhibit 1: Yield Scenario vs. Return Behavior
Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

	Falling interest rates		Rising interest rates		
	1st Qntl	2nd Qntl	3rd Qntl	4th Qntl	5th Qntl
Market environment and asset prices					
Change in interest rates	-1.8%	-0.6%	-0.1%	0.5%	1.5%
Return on bonds	14.3%	5.0%	0.7%	-3.7%	-10.8%
Return on equities	10.9%	3.3%	9.1%	5.9%	6.9%
Return on commodities	1.7%	-6.0%	2.8%	18.7%	18.0%
Return on gold	4.5%	2.3%	3.9%	3.7%	11.0%
Total return and return attribution					
Traditional benchmark (TB)	12.9%	4.4%	4.0%	0.1%	-4.1%
Diversified benchmark (DB)	11.6%	3.2%	4.2%	2.2%	-1.4%
Long-only managed futures (LOMF) ²	13.1%	7.2%	3.9%	1.7%	-0.4%
TB bonds	8.3%	3.0%	0.4%	-2.2%	-6.6%
DB bonds	6.9%	2.5%	0.4%	-1.8%	-5.6%
LOMF bonds	8.1%	4.7%	0.7%	-3.5%	-6.4%
TB equities	0.4%	0.2%	0.3%	0.2%	0.0%
DB equities	0.4%	0.2%	0.3%	0.2%	0.0%
LOMF equities	3.5%	1.4%	1.7%	0.8%	1.7%
TD commodities	0.0%	0.0%	0.0%	0.0%	0.0%
DB commodities	0.0%	0.0%	0.0%	0.1%	0.2%
LOMF commodities	0.6%	0.7%	1.1%	4.1%	3.2%
LOMF gold	0.5%	0.3%	0.5%	0.7%	1.5%
Net exposure data					
Total exposure	2.37	2.67	3.51	3.23	1.99
Bond exposure	1.06	1.35	1.61	1.45	0.66
Equities exposure	0.28	0.25	0.37	0.36	0.38
Commodities exposure	0.14	0.12	0.13	0.16	0.18
Gold exposure	0.12	0.12	0.12	0.14	0.11

Exhibit 2: Interest Rate Scenarios

Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

What lies behind these different risk/return characteristics? The middle section of Exhibit 2 and Exhibit 3 provide initial answers; for each strategy they compare the returns of the individual asset classes under different interest rate scenarios. Regarding the return attribution for bonds, the findings indicate that the traditional benchmark exhibits the highest interest rate sensitivity in the extreme scenarios of the strongest 20% yield movements both to the up- and down-side. In between, it is the long-only managed futures program that profits the most in an environment of falling interest rates but, at the same time, it suffers the most in a climate of rising yields. The diversified benchmark on the other hand demonstrates the lowest co-movement with bond prices because of its smallest average exposure to bonds. It is worth pointing out the diversification benefits of combining asset classes that the different strategies can exploit when interest rates increase. Concerning the return attribution for equities, it is remarkable that the long-only managed futures program substantially gains from equities when yields jump, while the two benchmarks only benefit negligibly from equities in times of interest rate stress. The same holds true with respect to the commodity return attribution. The long-only managed futures strategy is the one that profits the most from commodities markets, which are a hedge against inflation and yield shocks. Further to that, the dynamically adjusted gold exposure additionally stabilises the long-only managed futures

strategy when interest rates jump. It therefore provides a much stronger diversification by exploiting the inverse correlation between bonds and equities or commodities than the two benchmarks.

To confirm this supposition, the bottom section of Exhibit 2 and (Exhibit 4, next page) show the average exposure of the long-only managed futures strategy under different interest rate scenarios. The overall exposure is the highest when interest rates do not change. It decreases both when yields rise and when they fall. The former effect is mainly driven by a significant decrease in bond exposure; the latter by a reduced investment in all asset classes. While the inverse relationship between bond exposure and interest rate level as well as the positive correlation between commodity exposure and yields intuitively make sense, the exposure pattern of equities is more interesting. Even though equities perform best in the negative interest rate change quintiles, their exposure decreases in these scenarios. This is partly due to the elevated market volatility that often accompanies significantly falling yields during a flight to less-risky asset classes. Another explanation is the negative correlation between bonds and equities, and its impact on the risk contribution to total portfolio volatility. When yields fall, both bonds and equities perform on average positively, resulting in a positive co-movement. Accordingly, the risk contribution of both asset classes increases

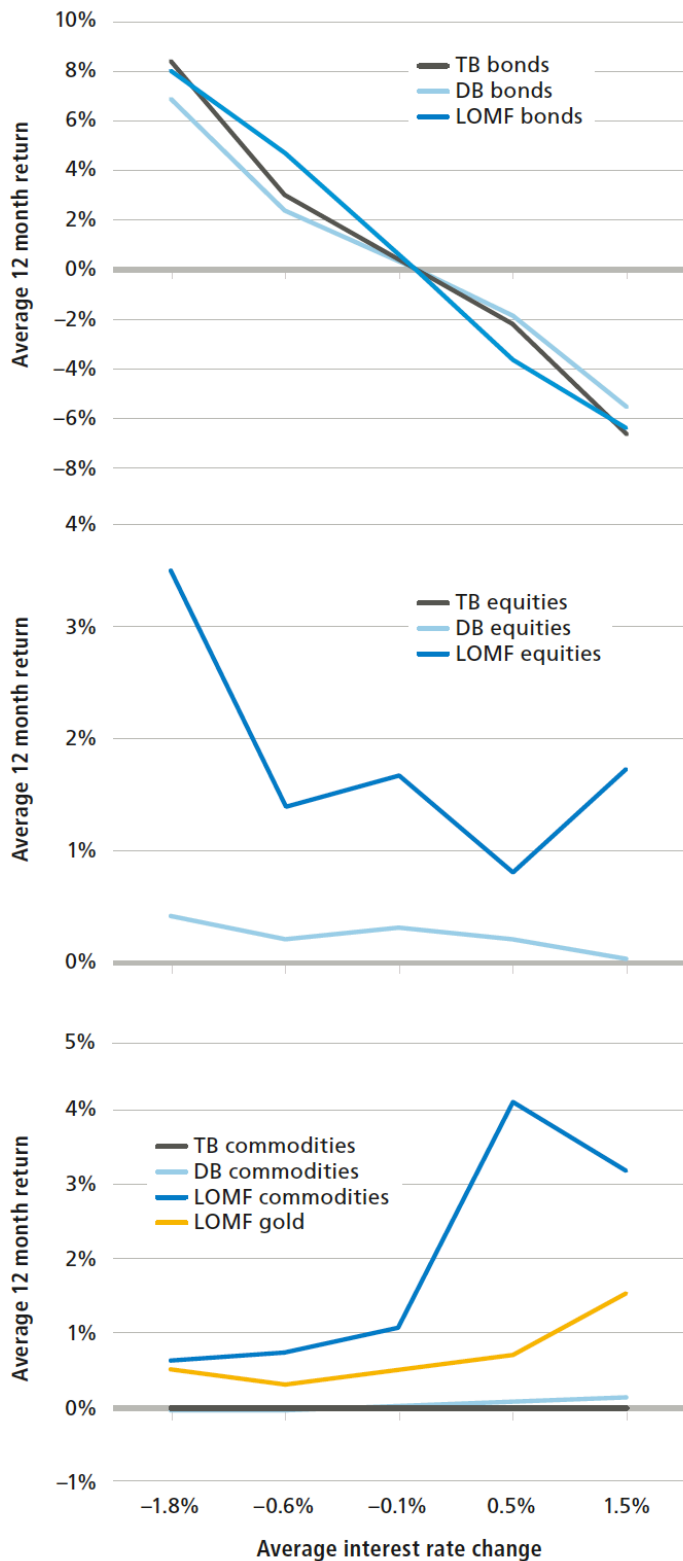


Exhibit 3: Interest Rate Scenarios vs. Return Attribution
 Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

on a ceteris paribus basis. On the other hand, bonds experience losses on average when yields jump, while equities uphold their on-average positive return contribution. Accordingly, the co-movement between these two asset classes becomes negative in higher interest rate change quintiles, reducing their risk contribution to total portfolio volatility – ceteris paribus.

Thus, empirical evidence confirms a negative correlation between the change in the overall interest rate level and returns from the different asset allocation strategies. From a relative perspective, it is the long-only managed futures strategy that copes best with both falling and rising interest rates by dynamically and adequately adjusting its exposure to changing market conditions. The traditional benchmark exhibits the highest interest rate sensitivity, due to its significant bond exposure and lack of diversification into other asset classes. Therefore, its returns almost match the gains of the long-only managed futures strategy when yields plummet, but it suffers the most when they increase. Finally, the diversified benchmark exploits diversification effects from its commodities exposure when interest rates advance and performs comparably to the long-only managed futures strategy in an environment of rising yields. However, unlike the latter, it only partially benefits from its bond exposure when yields decrease, thereby losing relative return in comparison to the long-only managed futures strategy.

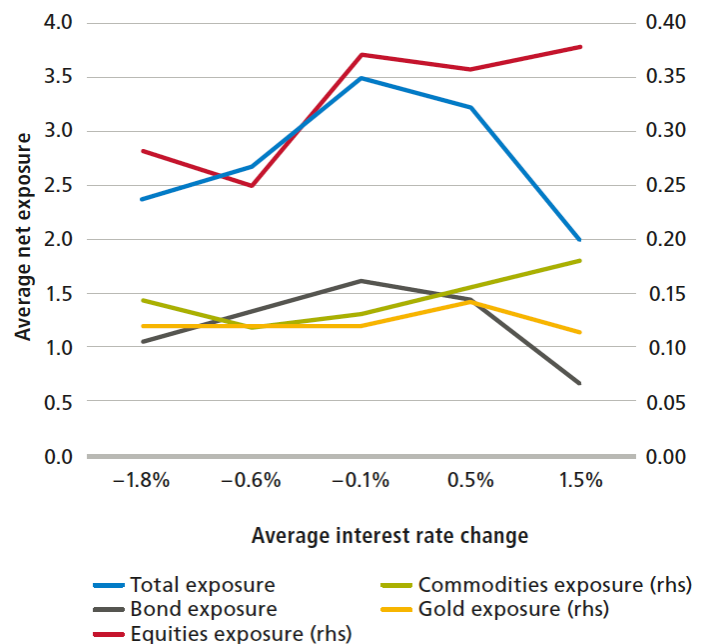


Exhibit 4: Interest Rate Scenarios vs. Exposure
 Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

Equity Scenarios vs. Empirical Risk/Return Characteristics

The question of how each asset allocation strategy has historically performed under different yield scenarios is only one side of the coin. Against the backdrop of record high equity valuations, a similarly pressing question relates to how the strategies have performed in explicit relation to the equity environment.

The top section of Exhibit 6 compares changes in equity markets over 12 months with the average returns from the individual asset classes under different equity scenarios. Interest rates and, consequently, the return from bonds are, on average, inversely correlated with equity markets. The strong performance of bonds in the scenario of the strongest 20% of equity markets is attributable to the 1980s, when both bonds and equities rose. Commodities are not strongly linked to the development of stocks, but tend to perform better when equities rise. Gold on the other hand proves a hedging characteristic by performing better when equity markets are weaker.

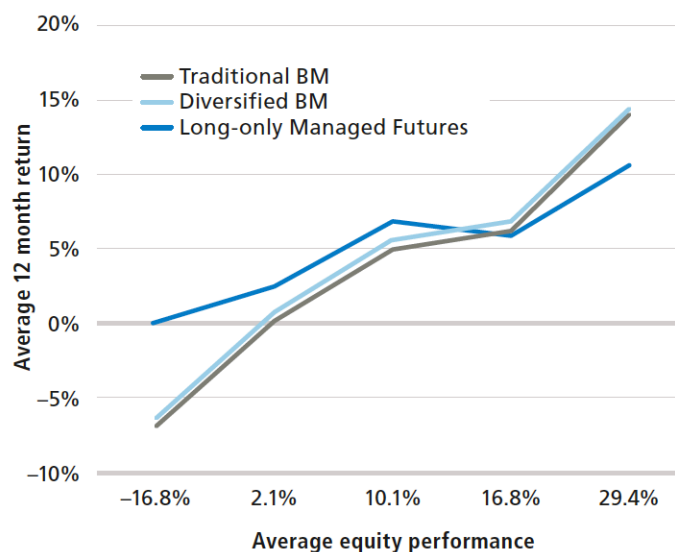


Exhibit 5: Equity Scenarios vs. Return Behavior

Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

	Falling equity markets		Rising equity markets		
	1st Qntl	2nd Qntl	3rd Qntl	4th Qntl	5th Qntl
Market environment and asset prices					
Change in interest rates	0.0%	0.2%	-0.2%	0.1%	-0.6%
Return on bonds	0.0%	-1.6%	1.2%	-0.5%	4.7%
Return on equities	-16.8%	2.1%	10.1%	16.8%	29.4%
Return on commodities	5.7%	5.3%	8.2%	5.9%	8.1%
Return on gold	4.2%	10.0%	9.5%	1.7%	0.8%
Total return and return attribution					
Traditional benchmark (BM)	-7.1%	-0.1%	4.7%	6.1%	13.9%
Diversified benchmark (DB)	-6.6%	0.6%	5.4%	6.8%	14.3%
Long-only managed futures ²	0.1%	2.3%	6.6%	5.8%	10.5%
TD bonds	0.0%	-0.9%	0.7%	-0.3%	2.8%
DB bonds	0.0%	-0.8%	0.6%	-0.2%	2.3%
LOMF bonds	0.3%	-0.5%	0.9%	0.2%	1.9%
TD equities	-7.1%	0.8%	3.9%	6.4%	10.9%
DB equities	-7.1%	0.8%	3.9%	6.4%	10.9%
LOMF equities	-3.6%	-0.4%	2.3%	4.0%	7.0%
TD commodities	0.0%	0.0%	0.0%	0.0%	0.0%
DB commodities	0.6%	0.5%	0.8%	0.6%	0.8%
LOMF commodities	2.9%	2.0%	2.2%	1.3%	1.4%
LOMF gold	0.7%	1.3%	1.2%	0.3%	0.0%
Net exposure data					
Total exposure	1.98	2.81	3.32	3.10	25.0
Bond exposure	1.07	1.25	1.43	1.27	10.1
Equities exposure	0.15	0.34	0.40	0.41	0.36
Commodities exposure	0.14	0.13	0.16	0.15	0.14
Gold exposure	0.12	0.13	0.11	0.12	0.12

Exhibit 6: Equity Scenarios

Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

How does this translate into the risk/return profile of the different strategies? The middle section of Exhibit 6 and Exhibit 5 show that all three strategies significantly benefit from rising equity markets. The capital allocated benchmarks perform best in the two strongest equity market scenarios. However, they fall short of the long-only managed futures strategy elsewhere. Underperformance increases the worse equity markets perform. Only the managed futures strategy is, on average, able to avoid losses when equity markets plunge.

What lies behind these different risk/return characteristics? The middle section of Exhibit 6 and Exhibit 7, next page show that, irrespective of the scenario, the balanced portfolios consistently allocate more capital to equities than the risk-balanced managed futures strategy. Consequently, they benefit more when equity markets rise, but suffer much more significantly when equities fall. Interesting to see is the bond contribution, which looks very similar in the various scenarios for all strategies. Where then does the diversification, that allows the long-only managed futures strategy to compensate for the losses from equities in different equity market conditions, come from? The bottom chart of Exhibit 7 indicates that both commodities in general and gold in particular provide considerable diversification benefits when equity markets are falling. So similar to the interest rate scenarios, it is the long-only managed futures strategy that profits the most from using commodities markets as a hedge.

The bottom section of Exhibit 6 and Exhibit 8, next page show the average exposure of the long-only managed futures strategy under different equity scenarios. Similar to the interest rate scenarios, the total exposure is the highest in relatively smooth markets. It decreases both when equities rise and when they fall disproportionately. The former effect is mainly driven by a significant decrease in bond exposure; the latter, to a certain degree, by a reduced investment in bonds, but mainly by a lower equity exposure. Striking to see is the strong correlation between the performance of equities and the allocation to them. However, the exposure to equities during the strongest bull markets is slightly decreased. Unlike what one would expect at first sight, it is not the bond component that gains the most in attractiveness when equities fall, but rather commodities and gold. This is due to the fact we have already highlighted, that bonds do not show a consistently negative correlation to the different equity scenarios. Accordingly, they can't provide a systematic hedge against equity bear markets.

To recapitulate, empirical evidence highlights that equity performance considerably impacts the different asset allocation strategies. However, in a similar vein to the interest rate analysis, it is the longonly managed futures program that, due to its adaptive nature, copes best with turbulent equity market conditions, while not falling behind unduly when equities rally. The two capital-weighted benchmarks exhibit a very strong sensitivity to equity markets, caused by their significant equity exposures and lack of diversification into other asset classes. Even though the diversified benchmark benefits in all scenarios from its commodities exposure, it is not able to fully exploit the diversification benefits, given that it holds its asset allocation steady across all scenarios.

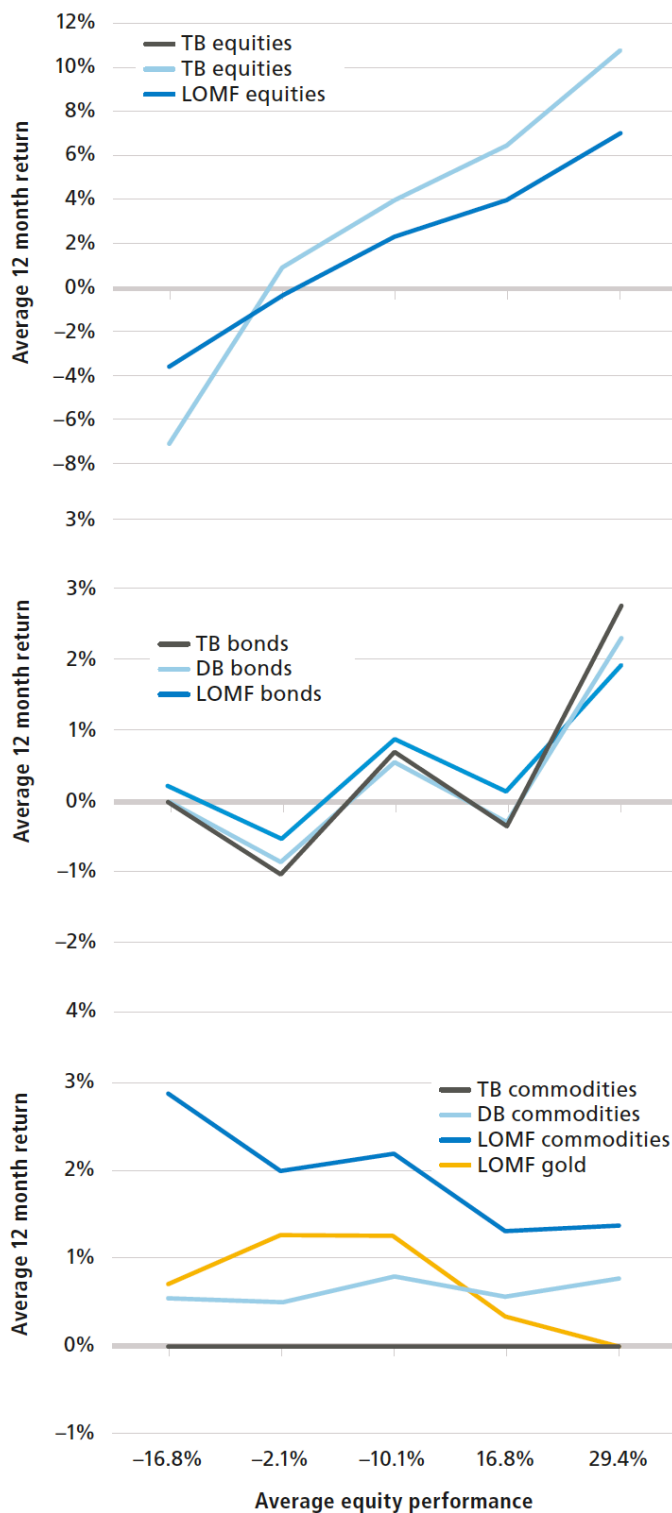


Exhibit 7: Equity Scenarios vs. Return Attribution
 Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

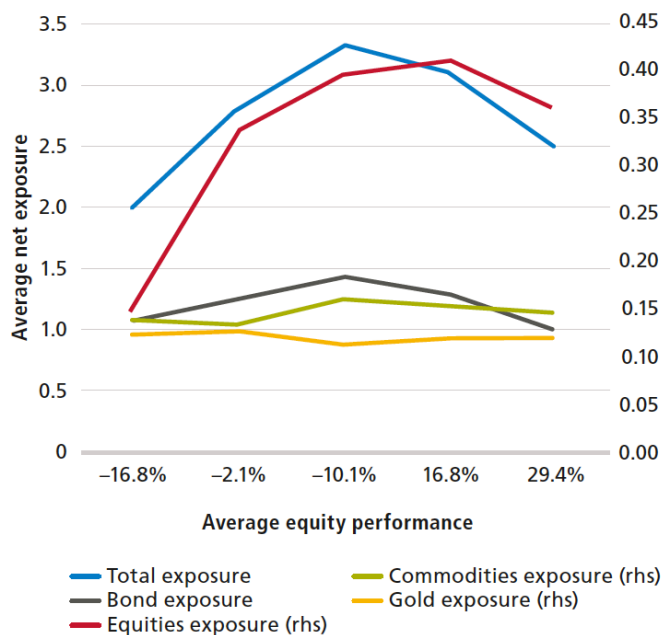


Exhibit 8: Equity Scenarios vs. Exposure

Calculations: Aquila Capital Concepts GmbH, Data base / source: Bloomberg

Conclusion

By means of an empirical analysis that takes the US as a point of reference, we have demonstrated that a long-only managed futures strategy that focuses on balancing the risk contributions within a portfolio and accounts for both momentum and carry effects, is well suited to withstand adverse market conditions, whether these conditions are experienced by bonds or equities. It not only stands up well from an absolute perspective, but also against traditional capital-weighted portfolios over a period that dates back as far as the 1970s. This added value in the risk/return profile is attributable to three main factors:

- The long-only managed futures strategy invests in the broadest investment universe
- The high dynamism of the strategy better exploits the diversified characteristics of the different asset classes
- The definition and targeting of a specific volatility level ensures that the strategy continually adapts its total exposure to the current risk climate by pro-cyclically reacting to opportunities

Despite these favourable findings, it should be noted that, although the long-only managed futures strategy is the one that is the least sensitive to rising interest rates and plummeting equity markets, it still suffers from holding asset classes when they perform negatively. Its attractive risk/return profile is primarily attributable to the fact that other asset classes have been able to offset bond or equity loss phases. This can become problematic particularly in the event of market shocks like the ones in 1994 or 2013, when the correlations between individual asset classes suddenly spiked and thus curtailed the diversification potential within the portfolio. To adequately mitigate the impact of such events, it appears advisable to additionally allow for short positions. We are leaving this point open to be addressed in a future research note.

Authors' Bios



Urs Schubiger,
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Urs Schubiger has comprehensive experience in the research, development and implementation of quantitative investment strategies as well as leading business development initiatives. Prior to founding pprime Capital and being a partner of Achievement AM's Swiss subsidiary, he held senior positions at leading companies including Vescore Ltd, 1741 Asset Management Ltd, Wegelin & Co. Private Bankers and UBS O'Connor. Mr Schubiger holds master's degrees in Mathematics from the ETH in Zurich and in Law from the University of Basel.



Egon Ruetsche, PhD,
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Egon Ruetsche has in-depth experience in the development and modeling of quantitative investment strategies. He was a partner of the Swiss subsidiary of Achievement AM LLC before joining AQ Investment AG. Prior to that, Ruetsche was a senior quantitative researcher and portfolio manager at Man AHL where he developed momentum and carry models and shared responsibility for managing volatility strategies. Ruetsche holds a master's degree in Mathematics and a PhD in Arithmetic Geometry from the ETH in Zurich.



Fabian Dori, CRM, CFA
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Fabian Dori has more than 10 years' experience in fund management and was previously Chief Investment Officer and member of the Management Board of La Roche Private Bank. Prior to this, he was Head of Portfolio Management and a member of the Management Board at 1741 Asset Management, as well as a portfolio manager at Wegelin & Co. Private Bankers. Dori holds a Master's degree in Quantitative Economics and Finance from the University of St. Gallen and is Certified Risk Manager and Chartered Financial Analyst.