

INSIGHTS

The Power of “Ampersand”: Looking Under the Hood

In a recent Webinar, we introduced the Equinox “Ampersand” concept.¹ Here, we try to provide not just a recap, but a more in-depth “under the hood” look at some of the details of the structure, to which we could not do justice during the relatively short Webinar. We also try to address some of the questions and concerns we have heard.

The Backdrop: Hedging Equity-Related Risk

Stocks generally make up a significant part of most investor portfolios, be they institutional or individual. Investors have been taught, and have come to believe, that stocks are a good investment for the long run, and their realized historical returns appear to support this story. What is sometimes overlooked, particularly during prolonged bull market runs, is that returns are high because they must compensate investors for the high degree of risk equity investing entails.

Most investors seek to mitigate stock risk by investing a part of their portfolio in bonds. The historically low correlation between stocks and bonds leads to

diversification benefits: the risk and the return of a stock/bond portfolio are lower than those of just stocks. However, the reduction in risk is generally greater than the reduction in return, resulting in a higher risk-adjusted return.

Despite these diversification benefits, a traditional stock/bond portfolio, such as the prototypical “moderately aggressive” 60/40 portfolio still derives more than 90% of its overall risk from stocks. Thus, while less risky than a 100% stock portfolio, 60/40 may be unlikely to distinguish itself during an equity market crisis like the one we experienced in 2007-08. Simple analysis shows that the risk and return of portfolios comprising just stocks and bonds are dominated by stocks until the allocation to them is



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AMPERSAND
PORTFOLIO
SOLUTIONS

¹Please also see the companion paper, *Enhanced Portfolio Diversification: The Power of “&,”* where we first introduced the Ampersand concept.

Definitions of Terms and Indices can be found on page 10.

FOR INSTITUTIONAL USE ONLY. NOT FOR USE WITH THE PUBLIC. No amount of diversification or correlation can ensure profits or prevent losses. An investment in managed futures is speculative and involves a high degree of risk. Investors can lose money in a managed futures program. There is no guarantee that an investment in managed futures will achieve its objectives, goals, generate positive returns, or avoid losses.

DEFINITIONS OF TERMS

Definitions

Annualized rate of return (AROR) is the geometric average return for a period greater than or equal to one year, expressed on an annual basis or as a return per year.

Annualized standard deviation (ASTD/ASStdDev) is the standard deviation multiplied by the square root of the number of periods in one year. Standard deviation of return measures the average deviations of a return series from its mean, and is often used as a measure of risk.

Beta is a measure of the volatility, or systematic risk, of a security or a portfolio in comparison to the market as a whole.

Collateral Support Annex (CSA) is a legal document which regulates credit support (collateral) for derivative transactions.

Collective Investment Trust (CIT) is operated by a bank or trust company and handles a group of pooled trust accounts.

Commodity Trading Advisor (CTA) is a US financial regulatory term for an individual or organization who is retained by a fund or individual client to provide advice and services related to trading in futures contracts, commodity options and/or swaps.

Correlation Coefficient is a statistical measure of how two investments move in relation to each other.

Exchange-Traded Fund (ETF) is a marketable security that tracks an index, a commodity, bonds, or a basket of assets like an index fund. Unlike mutual funds, an ETF trades like a common stock on a stock exchange.

Max Drawdown is the maximum loss from a peak to a trough of a portfolio, before a new peak is attained. It is an indicator of downside risk over a specified time period.

Risk-adjusted return is a concept that refines an investment's return by measuring how much risk is involved in producing that return, which is generally expressed as a number or rating. Risk-adjusted returns are applied to individual securities and investment funds and portfolios.

Sharpe Ratio is a measure that indicates the average return minus the risk-free return divided by the standard deviation of return on an investment.

Skew can be mathematically defined as the averaged cubed deviation from the mean divided by the standard deviation cubed.

Total Return Swap is a swap agreement in which one party makes payments based on a set rate, either fixed or variable, while the other party makes payments based on the return of an underlying asset, which includes both the income it generates and any capital gains.

Unit Investment Trust (UIT) is an exchange-traded mutual fund offering a fixed (unmanaged) portfolio of securities having a definite life.

Index Descriptions

The **S&P 500® Total Return Index** is widely regarded as the best single gauge of the US equities market. This world-renowned index includes 500 leading companies in leading industries of the US economy.

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The Ampersand Concept: A Recap

Adding both diversifiers and hedges to a portfolio may be a more efficient and effective way to diversify, and to lower the portfolio's equity-related risk. This still leaves us with a dilemma: in order to diversify meaningfully, the allocations to diversifiers and hedges need to be meaningful—on the order of 30% to 50%. Traditionally, to make these sizable allocations, investors have had to ask the question: which holdings from my portfolio do I sell in order to make room for the diversifiers and hedges?

This is what we call the **"Limitation of Or"**: investors are faced with the choice between investing in stocks and bonds OR investing in alternatives. There is potentially a large opportunity cost in allocating 40% to alternatives: 40% of the portfolio's stocks and bonds need to be sold, and the potential return they may earn in the future has to be forgone. In a bull market such as the one we have been in since 2009, this opportunity cost can be significant, and the decision to sell stocks could lead to considerable "buyer's remorse."⁵

We believe the Equinox Ampersand strategy addresses the "Limitation of Or." As the name indicates, we seek to harness the **"Power of And."** Our objective is to enable investors to maintain exposure to stocks and bonds markets while simultaneously obtaining meaningful diversification through futures-based hedging and diversifying strategies. Some expressions, albeit somewhat cliched, describe this approach well: it seeks to make the pie bigger, or to let investors have their cake while eating it too.

A simple way to understand the Ampersand approach is in terms of "extended diversification." In a traditionally diversified portfolio, the sum of the allocations to various asset classes is constrained to 100%.⁶ Thus, an initial 60/40 stock/bond portfolio that is diversified by allocating say 40% to alternatives might become, for example, a 36/24/40 stock/bond/alternatives portfolio. An Ampersand portfolio, by contrast, is not similarly constrained: it might be, for example, a 60/40/40 portfolio, where the original 60/40 stock/bond allocation is preserved, while adding significant and meaningful "notional" exposure of 40% to alternatives such as diversifiers and hedges ("notional trading level" or "notional exposure" is a somewhat tricky concept that we will address in a subsequent section, and which we have discussed in detail elsewhere).⁷ The opportunity cost of

diversification or the "Limitation of Or" that we discussed has been avoided by utilizing the "Power of And": the portfolio retains its stock and bond exposures AND gains meaningful exposures to diversifying and hedging strategies.

How Ampersand Works: The Structure

The key driver of the Ampersand solution is that there is no need to sell stocks and bonds in order to access diversifying and hedging strategies that trade futures and/or forward contracts. As these programs can typically be accessed by posting anywhere from 10% to 25% of their notional value as margin or collateral, the stocks and/or bonds in the investor's 60/40 portfolio can themselves be posted as collateral (likely with a small "haircut," depending on the exact situation).⁸ Thus, Ampersand can be viewed as an "overlay" approach, where the alternatives are overlaid on top of the stock/bond portfolio, **without the need to sell any stocks or bonds.**

A variant of this approach is currently employed by many mutual funds that use unfunded Total Return Swaps to access CTA trading programs. A portion of the fund's assets are posted as collateral, using a tri-party Collateral Support Annex (CSA). For example, a multi-strategy CTA mutual fund could post collateral with a third-party custodian, at which point the fund would access the returns of a diversified portfolio of futures trading strategies using Deutsche Bank's dbSelect platform, via an unfunded Total Return Swap. Under the terms of the swap, the mutual fund in this example would receive from (or pays to) Deutsche Bank any trading profits (or losses), after accounting for fees payable to the traders as well as swap costs. One of the main features of Ampersand is that, unlike the mutual fund in this example, which posts cash (money market funds) as collateral, an Ampersand portfolio could post a combination of securities such as stocks, stock exchange-traded funds (ETFs), bond ETFs, Treasury securities, etc., which may continue to earn returns.

Thus, using the "Power of And," investors can continue to maintain their original 60/40 exposure to stocks and bonds, while overlaying on top of that, for example, 50% "notional exposure" to futures trading strategies. By exploiting this "extended diversification", it becomes possible to harness the true benefits of diversification as expounded by Modern Portfolio Theory.

⁵Exceptions are 130/30 types of portfolios, although one could argue that 130% long and -30% short still adds up to only 100%. Ampersand extends that concept greatly, as we shall see.

⁷For details, see *Enhanced Portfolio Diversification: The Power of "&,"* where we first introduced the Ampersand concept.

⁸For example, if investment-grade bonds or liquid ETFs are used, 90% or more of their market value can generally be used as collateral, representing a haircut of less than 10%.

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The summary statistics for the benchmark and Ampersand portfolios are shown in the table below.*

	Benchmark Portfolio	Ampersand Portfolio
AROR	5.48%	13.03%
Annualized Standard Deviation (AStdDev)	9.73%	9.84%
AROR/AStdDev	0.56	1.46
Sharpe Ratio (1%)	0.46	1.22
Max Drawdown	-35%	-13%
Skew	-0.92	-0.26
Beta vs S&P 500	0.62	0.42

attributable to the following sources:

- Additional return from fixed-income investments: about 90 bps
- Alpha from diversifiers: about 290 bps
- Alpha from dynamic hedges: about 370 bps

While this is a very significant increase in the return, it is

important to understand that projecting future returns and alpha based on history is a difficult process, fraught with pitfalls, even though we have tried to be conservative in most of our assumptions. In addition, we have not taken into account any fees for constructing and accessing the Ampersand overlay, since these are likely to be case-specific. With all these caveats in mind, even if the realized alpha were 200 to 300 basis points lower than shown here, the results would still be quite impressive. Of course, the actual alpha added will depend on the performance of the trading programs selected as well as the size of the overlay.

Unlike returns, measures of risk and correlation are more likely to show some persistence over time. We feel

relatively more confident while discussing the improved risk characteristics of the Ampersand portfolio versus the benchmark. Note that the volatility of the two portfolios is

- It is assumed that the same overall equity exposure as before (i.e., 60%) is restored by taking long positions in futures contracts on the S&P 500, Nasdaq, and MSCI World indexes. Again, to simplify the modeling, we assume that the returns on the futures are identical to those on the ETFs. This assumption is probably a touch aggressive, but, depending on the roll cost, by no more than a few basis points per annum, at worst.²⁴
- The first part of the overlay is a basket of "diversified diversifiers" whose historical annualized volatility is about 4%, and whose correlation to the benchmark portfolio is almost exactly zero. The "notional allocation" to this basket is 40%. The returns used are net of management and incentive fees.
- The second part of the overlay is a combination of two dynamic equity hedging programs, with annualized volatilities of about 8% and 15%, and correlations to the benchmark portfolio of -0.60 and -0.40, respectively. Net returns are used, and the "notional allocations" to the two programs are 20% and 30%, respectively.

The annualized rate of return of the Ampersand portfolio is about 750 basis points per annum higher than that of the 60/40 benchmark portfolio. This alpha is roughly

*The returns shown in the table above are hypothetical and do not represent an actual investment. Hypothetical returns are for illustrative purposes only. Past performance is not a guarantee of futures results. Backtested performance does not represent actual performance and should not be interpreted as an indication of such performance. Actual performance for client accounts may be materially lower than that of the index portfolios. Backtested performance results have certain inherent limitations. Such results do not represent the impact that material economic and market factors might have on an investment adviser's decision-making process if the adviser were actually managing client money. Backtested performance also differs from actual performance because it is achieved through the retroactive application of model portfolios designed with the benefit of hindsight. As a result, the models theoretically may be changed from time to time and the effect on performance results could be either favorable or unfavorable.

Source: Equinox Institutional Asset Management, LP
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a market cycle. Equity hedges can also shallow out the portfolio's drawdowns during corrections, and improve the skewness profile of its return distribution by reducing the frequency and magnitude of large negative returns.

In the Appendix, we illustrate this point with the help of a "back test," using historical return data. While it is true that historical returns represent only one realized outcome out of (infinitely) many possibilities, using them means we do not need to make assumptions about volatilities, correlations, and returns: we simply end up using their historically realized values. It should be of some comfort to see that the conclusions of the analytical and data-driven methods are substantively similar.¹¹

Why the Ampersand Overlay Works

The structure of the Ampersand overlay, and how it helps to diversify the original portfolio should be reasonably clear by now. We now discuss how the overlay is designed and why it works.

Diversifiers: It is possible to construct a portfolio of futures trading strategies (also called CTA programs), most or all of which are virtually uncorrelated to stocks and bonds, so that the portfolio itself has almost zero correlations to stocks and bonds, and even to other alternative strategies. An additional benefit of this approach is that, by using strategies that are truly different from one other (as demonstrated by analytical tools such as Principal Components Analysis),¹² the volatility of the portfolio can be significantly lower than that of any of the individual strategies. In our experience, by selecting 12 to 15 relatively uncorrelated strategies, the volatility of the portfolio can be lowered to between 4% and 7%,¹³ based on trading at a "notional level" of 100%. As we have shown in the previous section, this overlay of "diversified diversifiers" adds almost no incremental risk to the 60/40 stock/bond portfolio even when its notional trading level is as high as 40%.

Here is an important point that needs to be understood: **virtually all CTA programs are "standardized" to target a certain long-term volatility.** This may range from a low of around 5%-6% to a high of 20%-25%.¹⁴ To make things more complex, a CTA may offer investors two or more "flavors" of the same trading program, scaled either up or down. For example, a CTA whose standard or "1x" program targets a

10% volatility may also offer "0.5x" and "2x" versions, with target volatilities of 5% and 20%, respectively. Essentially, the number of futures contracts traded in these programs will be half and twice as many as in the "1x" program, so that their expected (gross) returns and their target volatilities will be approximately the same multiples of the "1x" program.¹⁵

Thus, it is not really meaningful to talk about a "50% notional overlay" without examining the underlying programs, their individual volatilities, and their correlations to all the other programs in the basket. It is customary to use 100% notional exposure as a benchmark of sorts, because that is generally what is implied by a CTA program's target volatility: if an investor allocates, for example, \$100MM to a mutual fund that accesses the XYZ trading program, which has a target volatility of 10%, that investor should, in the long term, experience a 10% volatility. This is because the program being accessed by the fund will look to trade all its futures in a size that generates returns such that the \$100MM investment will have a volatility of 10%.

This is the driver of one of the major benefits of the Ampersand approach. On a \$100MM portfolio of stocks and bonds, let's assume an investor wants to overlay a basket of diversifiers with a volatility of only 4%. Recall that we had assumed in our analytical example that the portfolio of diversifiers had a 6% volatility. In this case, the Ampersand approach would recommend that the "notional" level of the overlay be 67%. If this were accessed via a Total Return Swap, it is likely that the amount of collateral, in the form of stocks or bonds or ETFs, would (conservatively) be somewhere between \$10MM and \$15MM. **But the bonds and/or stocks would not need to be sold;** they would simply be "segregated" and/or held in a collateral or trust account, and may continue to earn interest and/or dividends/capital gains.

Dynamic Equity Hedges: Dynamic equity hedging programs are more difficult to find than diversifiers. However, they do exist, and their returns are designed to be negatively correlated to stocks over a market cycle. In addition, their dynamic nature (they seek to lower equity exposure during corrections and to maintain or increase it during rallies) seeks to create less of a drag on equity returns.

¹³Typically, these would include trading programs utilizing, for example, trend-following, global macro, relative value, pattern recognition, commodities, contrarian, and short-term trading.

¹⁴Of course, there are some outliers, particularly at the upper end, with which we need not concern ourselves.

¹⁵The collateral/margin required to support the trading will also vary proportionately.

¹⁶More than 40 stock index futures are traded on global exchanges, ranging from US large, mid, and small cap to several European, Asian, and Latin American indexes.

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many possible benefits stemming from the dynamic nature and alpha potential of the strategies employed. Again, some may view this as "leverage," but, in fact, it lowers the overall risk of the Ampersand portfolio, and hence is depicted in the chart as a net reduction in the equity exposure of the portfolio.¹⁸

Thus, the Ampersand portfolio can be designed to have the same or lower volatility than the original 60/40 portfolio, but improved drawdown and skew. Of course, investors who wish to take on slightly greater risk (as measured by volatility) can certainly do so. **The Ampersand portfolio can be designed and managed to almost any desired level of risk, from very low to very high.¹⁹**

A caveat: there is clearly no assurance that the concepts discussed here are in any way indicative of what may be achievable in the future, especially as far as expected returns are concerned. Risk, on the other hand, tends to be more stable over time, and it may be much more feasible to manage a portfolio to a risk target, especially with the use of the Ampersand approach. Investors and financial advisors need to do their own modeling and assess their level of desired expected returns and their risk tolerance before opting for an "&" portfolio strategy.

Conclusions

Traditional stock/bond portfolios derive most of their risk from the equity market. For two reasons, this is true even for portfolios that try to diversify risk by allocating to alternative return streams. First, the alternative assets selected (such as real estate, long-short equity, high yield bonds, options strategies, long-only commodities, etc.), often turn out to be more correlated to stocks than meaningful, at least in part because investors and advisors are reluctant to reduce exposure to stock and bonds because of the opportunity cost of being underexposed in a rising market. This problem is what we have called the "Limitation of Or."

We propose as an alternative the Ampersand solution, which utilizes the "Power of And." Instead of selling stocks and/or bonds to gain exposure to uncorrelated return streams, we suggest an overlay approach. Stocks and bonds continue to be held in the portfolio as before, and are used as the collateral for the overlay. Thus, the investor

for the "plain vanilla" equity exposure, this enhancement may be appropriate, and may potentially enhance the overall portfolio return, even after fees and expenses.

Summarizing the Ampersand Approach

The chart below illustrates all the various facets of the Ampersand strategy described above. Starting with a 60/40 stock/bond portfolio, we show how the "Full Monty" Ampersand approach might be implemented. Note that **this is purely illustrative!** In practice, all aspects of the Ampersand portfolio would be customized and implemented in consultation with the investor.

In this regard, it is important to understand and come to terms with concerns about "leverage." Technically, the futures market does offer investors the ability to trade on a "leveraged" basis in the sense that, relative to the notional value of most futures contracts or notional trading levels of most CTA programs, only 5% to 20% is required to be posted as margin or collateral. However, that "leverage" should not be evaluated in and of itself, but in the context of the overall risk of the Ampersand portfolio, as we have shown both analytically and through back-tests.

Doubtless, the Ampersand portfolio can be said to take on greater "exposure" in the following sense:

- We **maintain** the exposure and risk of the original 60/40 portfolio.
- We **add** some exposure to laddered US Treasury securities, which purists may argue is tantamount to "leverage," but which, in fact, hardly adds any risk, given that these bonds are likely to have low volatilities, very low correlations to equities, and are laddered to mitigate duration risk.
- We **add** some exposure to a basket of "diversified diversifiers," which is virtually uncorrelated to the original portfolio, and therefore only adds a small amount of incremental volatility, but may also improve the Ampersand portfolio's return profile (shallower drawdowns and skinnier left tails).
- We **reduce** equity exposure by employing dynamic equity hedging strategies. This can very loosely be viewed as equivalent to a "long-short" equity strategy, without some of its disadvantages, and with

¹⁸By modulating the portfolio's equity exposure (reducing it during market corrections and maintaining or even increasing it during market rallies), the dynamic equity hedges may lower the portfolio's average beta over time, but may potentially add alpha while doing so.

¹⁹Although we have focused on reducing equity-related risk, the Ampersand concept could even be used to provide an overlay of diversifiers atop a 100% fixed-income portfolio, seeking to provide some incremental alpha. The point to bear in mind is that the approach is customizable, both in terms of the strategies picked within it, and in terms of the size of the overlay.

²⁰Of course, the allocation to stocks and bonds can be strategically adjusted over time as in any portfolio.

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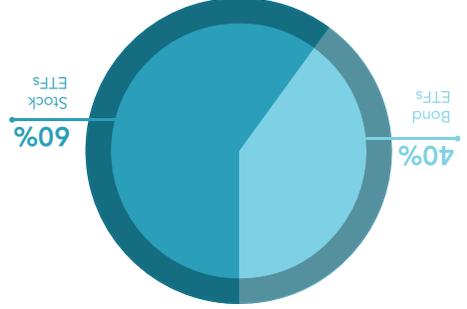
We treat hedges and diversifiers as two separate parts of the overlay because they have different functions. This approach also gives us the flexibility to customize the composition of each basket separately, based on the characteristics of the underlying portfolio; of course, the sizes of the "notional" allocations can likewise be individually customized as needed.

The Ampersand "Full Monty" Enhancement

In addition to the Ampersand overlay we have described, which consists of both diversifying and hedging strategies, there is a further enhancement that can be used. Consider a \$100MM 60/40 stock/bond portfolio that initially invests 40% of its assets in fixed-income, which may include a wide range of securities and may cut across the spectrum in terms of maturities, credit ratings, and geography. The remaining \$60MM is invested in equity-related "cash securities," which may include ETFs, individual stocks, stock mutual funds, private equity funds, etc.

This final Ampersand enhancement would involve shifting some (or, in some cases, all) of the equity-related exposure

Moderate Balanced Portfolio



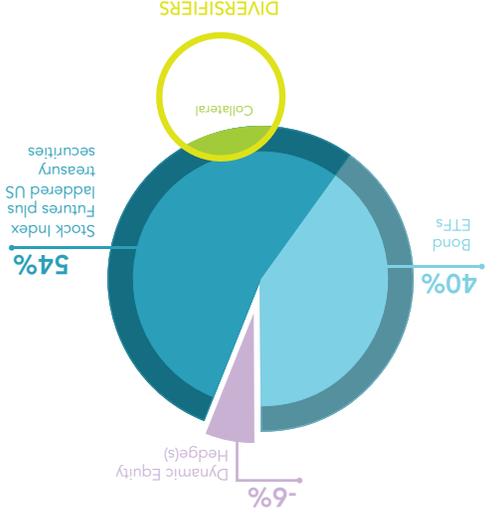
Dynamic Equity Hedges

- Negatively correlated to equities
- Reduce portfolio beta
- Mitigate downside risk
- Potentially add alpha

Stock Index Futures plus laddered US Treasury securities

- Maintain equity exposure while freeing up capital.
- Potentially higher return from futures plus treasuries
- No significant incremental portfolio risk ("leverage")
- Can continue to hold any stocks/ETFs/other not replicable by futures

The Ampersand Portfolio Strategy



Diversifiers

- Customized overlay of futures strategies
- Negotiable components and risk level, suitable for portfolio
- Uncorrelated to portfolio, hence very little incremental risk
- Potentially add significant alpha, net of fees

Collateral

- Small portion of laddered Treasuries (generally 10%-20%)
- Held in name of fund or other investment vehicle
- Margin/collateral for diversifiers, equity hedges and stock index futures

US large-cap equities, which may initially have been obtained via ETFs (such as SPY, IVM, or VOO), could be replaced by a position in E-mini S&P 500 futures contracts. The same strategy could be used to gain exposure to other equity sectors for which exchange-listed futures contracts are traded.¹⁶ This approach has the potential benefit of using capital more efficiently: by selling the stock ETFs, investing the proceeds in, say, 1-5 year laddered US Treasury securities, and using a part of these Treasury holdings as margins for the E-mini S&P 500 and other index futures, the combined returns earned can potentially be higher than the ETF returns would have been.¹⁷ The increase in the overall risk of the portfolio is expected to be minimal, given that Treasury securities of suitable maturities are laddered appropriately, so that they can be held to maturity and rolled as necessary, mitigating unwanted duration risk.

This Ampersand "Full Monty" enhancement may be not always 100% applicable for some stock portfolios, particularly those that they hold private equities, individual stocks, emerging market stocks, etc. However, we feel that,

¹⁷See, for example, the CME Group's publication, *The Big Picture: A Cost Comparison of Futures and ETFs*. Definitions of Terms and Indices can be found on page 10.

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gets exposure to stocks and bonds AND uncorrelated alternatives, rather than having to choose between one OR the other.²⁰

The overlay approach we propose has other benefits. As the strategies and trading programs we propose to use trade mainly futures and forwards, it is possible to obtain sufficient exposure to these alternative streams to truly diversify a stock/bond portfolio and to potentially provide a higher risk-adjusted return, while also significantly reducing the "equity-related" risk of the portfolio. Further, the return streams we propose using have historically had negative correlations to stocks during market meltdowns, thereby providing shallower drawdowns and a smoother ride for investors. In turn, this reduces the likelihood of investors' bailing out of stocks at the worst possible times.

Trading programs constructed and managed by skilled managers can be blended into a portfolio and managed to a volatility target. Some of the strategies used, such as equity hedging programs, can be selected based on the composition of the stock/bond portfolio. An actively managed overlay of this type has the potential to add alpha in the long run, net of the fees paid to the managers of the trading programs. We believe that the providers of such overlays should be confident enough in their own abilities that they offer to charge fees based on the value they add, thus aligning their interests with those of investors.

The proposed Ampersand solution offers investors the potential to diversify their stock/bond portfolios adequately, reducing equity market risk and smoothing drawdowns, while potentially improving the portfolio's risk-adjusted return. Investors can diversify effectively without having to sell their core stocks and bonds, and can choose an appropriate level of risk based on their risk-aversion and life-cycle needs. If the solution is structured creatively, they can achieve these benefits at a reasonable cost. This, in short, is the potential of the Ampersand approach.

²¹One of the dynamic equity hedging programs has a considerably shorter track record (dating back only to 2013). For this strategy, we have used the simulated numbers provided by the CTA.

²²The same tests, however, can be replicated using an index such as the BTOP 50, or a slightly different set of strategies, and the results would be along the same lines as we have shown, both qualitatively and quantitatively. In our defense, we did not pick these strategies based on their (known) past performance: we have been allocating to many of them for more than five years, and in some cases, more than ten years.

²³We have previously suggested laddered US Treasury securities as a relatively low-risk fixed-income investment, but investing in AGG (investment-grade, medium duration) is also a possibility for those seeking higher returns and willing to take on appropriately higher risk.

²⁴For more details, see the CME publication previously cited.

Appendix

Here, we present some back-tested results for an Ampersand portfolio versus a 60/40 benchmark portfolio, using monthly returns for the period from January 2007 to June 2017. The starting point was selected because that is as far back as track records go for almost all the trading strategies used in the overlay.²¹ If a strategy did not exist during some of the early months, we assume a zero return for that strategy for those months.

We urge readers to view these results with considerable caution because they are based on historical returns, and future results are almost certain to be quite different, even though the period studied (more than 10 years) is a reasonably long one. We have picked diversifying and hedging strategies to which Equinox is allocating today; we are aware that this approach is susceptible to the critique of potential "look ahead" bias, as we know how these strategies have performed over the last 11 years.²² We believe it is of some comfort that the results shown here are in line with—and, in some respects, are even better than—the analytically derived results we discussed earlier.

The original 60/40 portfolio is assumed to be invested 40% in the AGG ETF, and 60% in stock index ETFs: 20% each in the S&P 500, NASDAQ, and MSCI World Index. The return on this portfolio is used as the benchmark against which to compare the Ampersand portfolio's returns.

The Ampersand portfolio whose results are presented is constructed as follows:

- The 40% allocation to the AGG ETF is maintained.
- It is assumed that all the stock index ETFs are sold, and the proceeds are invested in fixed-income securities.²³ Since it is cumbersome to model a portfolio of laddered US Treasuries, we assume that the incremental return on these fixed-income securities is equal to half of the AGG return. Of course, this means that some additional risk is taken on, which gets accounted for in the portfolio's return statistics. We believe that this is a reasonable but conservative estimate.

Definitions of Terms and Indices can be found on page 10.

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Note that it is not necessary for the 60/40 allocations to stocks and bonds to be held in a mutual fund. The Ampersand overlay can sit atop a wide range of investment vehicles, such as a separate account or dedicated "fund-of-one," a mutual fund or closed-end fund, a commodity pool, a limited partnership or other private fund structure, a Unit Investment Trust (UIT) or Collective Investment Trust (CIT), or an "exchange fund" vehicle. Each situation will need to be addressed individually.

The Overlay and "Leverage"

As we have been emphasizing, it is important for investors to diversify their portfolios in the true sense of the word. A 100% stock portfolio is an example of an undiversified portfolio, as 100% of its risk is related to a single risk factor: equities. But even a 60/40 stock/bond portfolio, although generally viewed as being "moderately aggressive," is still relatively undiversified in the sense that more than 90% of its risk is attributable to equities. True diversification of equity risk is difficult to achieve without either significantly diluting returns, or incurring large opportunity costs, as we shall see shortly.

We have explained how the Ampersand concept works structurally: as an overlay that sits atop an existing core portfolio. By including in the overlay a meaningful allocation to diversifying strategies, which have low correlations to equities and bonds, it is possible to add potential alpha to the overall portfolio without increasing its overall risk. And by including in the overlay a meaningful allocation to dynamic equity hedging strategies, which are negatively correlated to equities, it is possible to reduce the contribution of equities to the risk of the overall portfolio by at least a few percentage points.

"Meaningful allocations" are a key feature of Ampersand. One concern we have heard is that maintaining the current core allocations to stocks and bonds and adding a meaningfully large overlay on top of them makes the portfolio "too leveraged." Underlying this concern is the misconception that adding an overlay to existing stock and bond holdings must necessarily increase the overall risk of the portfolio. However, this is far from the truth. We can "prove" this analytically, using a simple numerical example. We can also test its validity by using historical return data as a corroborating piece of evidence.

A hypothetical 60/40 stock/bond portfolio has an annualized volatility of about 9.5%, assuming volatilities of

15% and 5% for stocks and bonds, respectively, and a correlation of 0.20.⁷ Let us allocate 40% notional exposure to an overlaid basket of diversifiers, which has a 6% volatility and is uncorrelated to the 60/40 stock/bond portfolio.¹⁰

The volatility of the portfolio would be:

$$[(100\%)^2 * (9.5\%)^2 + (40\%)^2 * (6\%)^2]^{1/2} = 9.8\%,$$

only slightly higher than the original 60/40 volatility, which was 9.5%.

Thus, even if the (full or 100%) overlay has an expected long-term return, net of fees and expenses, of say 300 basis points per annum—an extremely conservative estimate, in our view—a 50% overlay may be expected to add 120 basis points of alpha per annum, potentially improving the risk-adjusted return of the portfolio considerably.

Let us look at the effect of adding equity hedging strategies to the mix: suppose we allocate 50% notional exposure to a basket of dynamic hedging strategies that is assumed to have an 8% volatility, and correlations of -0.30 and 0.00 to the stock/bond portfolio and the basket of diversifiers, respectively.

The volatility of this new portfolio is given by:

$$[(100\%)^2 * (9.5\%)^2 + (40\%)^2 * (6\%)^2 + (50\%)^2 * (8\%)^2 + 2 * (100\%) * (50\%) * (9.5\%) * (8\%) * (-0.30)]^{1/2} = 9.4\%.$$

Now, we see that the volatility of the new portfolio, notwithstanding the additional exposure provided by the overlay, is in fact lower than the volatility of the original 60/40 stock/bond portfolio. Again, if the basket of dynamic equity hedges has even a small positive expected return, it can potentially add some alpha and improve the portfolio's risk-adjusted return.

In the hypothetical example, we see, therefore, that adding diversifiers and hedges in the form of an overlay atop the existing stocks and bonds does not, as feared, result in a significant increase in the portfolio's "leverage" or risk. In fact, it should be possible to keep the risk almost unchanged, while potentially increasing the risk-adjusted return on the portfolio. Finally, the contribution of equity-related risk in the new portfolio should now be appreciably lower, especially since we have overlaid hedges which are negatively correlated to equities, and which will lower the effective beta of the portfolio over

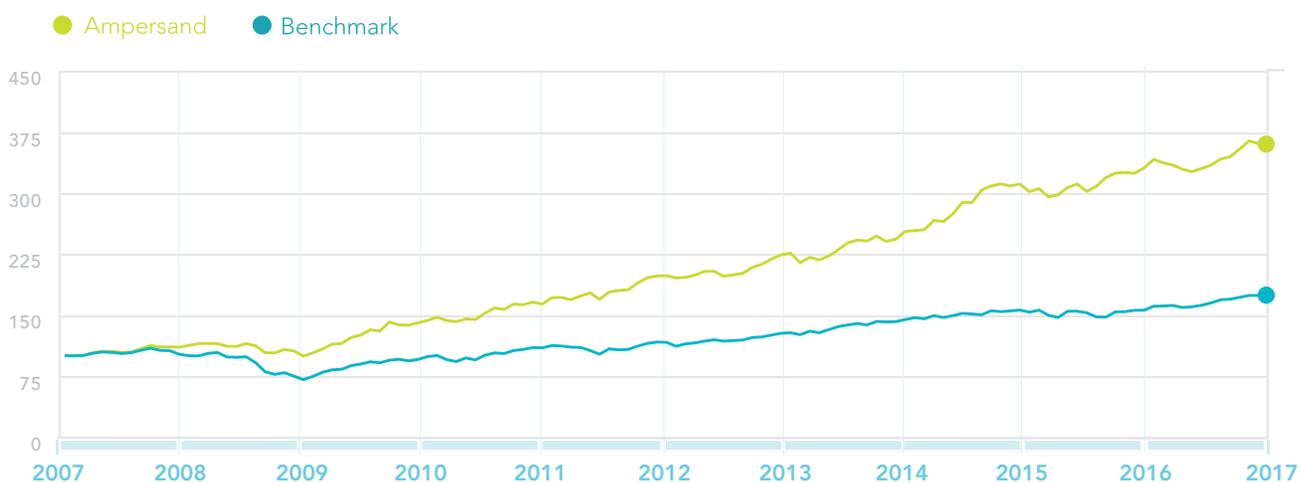
⁷These assumptions are quite reasonable, based on long-term historically realized values.
¹⁰This is for a 100% notional trading level. It is feasible to construct a portfolio of a dozen or more "diversified diversifiers" with about this level of volatility.
¹¹The calculations we show are hypothetical and based on assumptions; actual results will almost certainly vary.
¹²See our paper *Principal Component Analysis: A Tool for Analyzing and Describing CTA Programs*.
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about the same. This seems to justify our contention that the additional Ampersand exposure should not be viewed as adding "leverage" or increasing risk. In fact, the other headline risk measure, maximum drawdown (which it was not possible to address analytically), is almost 70% lower for the Ampersand portfolio (-13%) than for the benchmark portfolio (-35%). The skew of the Ampersand portfolio is also much less negative, indicating that the "left tail" properties of its returns may be superior.

The beta of the Ampersand portfolio relative to the S&P 500 is also much lower, 0.42 versus 0.62 for the benchmark. This can be attributed almost entirely to the two dynamic hedging programs in the overlay, which reduce the average beta over the 10-year period quite dramatically. However, the fact that they also add alpha indicates that the reduction in beta, in fact, happens dynamically: the hedges tend to kick in when they are needed, mainly during market declines, while tending to remain on the sidelines during market rallies.

In the chart below, the VAMI of the two portfolios shows how dramatically the alpha compounds over time. While the performance differential is impressive, the shallower drawdown of the Ampersand portfolio during the 2007-08 period is also quite noticeable.

VAMI, Ampersand vs Benchmark*



To summarize, the results of the "back-test" are quite striking, although they should be treated with the appropriate degree of caution. While it is no doubt somewhat comforting that they are in line with the analytical calculations, out-of-sample long-term experience may ultimately provide proof of the concept.

*The returns shown in the table above are hypothetical and do not represent an actual investment. Hypothetical returns are for illustrative purposes only. Past performance is not a guarantee of futures results. Backtested performance does not represent actual performance and should not be interpreted as an indication of such performance. Actual performance for client accounts may be materially lower than that of the index portfolios. Backtested performance results have certain inherent limitations. Such results do not represent the impact that material economic and market factors might have on an investment adviser's decision-making process if the adviser were actually managing client money. Backtested performance also differs from actual performance because it is achieved through the retroactive application of model portfolios designed with the benefit of hindsight. As a result, the models theoretically may be changed from time to time and the effect on performance results could be either favorable or unfavorable.

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reduced below 30%. At this point, however, the investor has also ended up sacrificing quite a lot of expected return. **With meaningful diversification of stock risk comes meaningful dilution of portfolio returns.**

One possible way to remedy this situation is to look for "alternative" strategies that have low correlations to stocks and bonds, and can therefore provide greater diversification. Examples of some strategies that have been used over time are: hedged equity, real estate, hedge funds, and long-only commodities. Without going into details, it is worth noting that most of these strategies did not perform well during the Global Financial Crisis: Like the equities they were intended to protect, they also exhibited negative returns. Active futures trading strategies (also known as managed futures or Commodity Trading Advisor (CTA) strategies) were one group that earned its keep during the last crisis (and during some other crises before that, as well) by putting up impressive performance numbers.² This has led some investors to believe that futures trading strategies are hedges for stocks. Others tend to think of them as "crisis alpha" strategies.³

While active futures trading strategies serve as diversifiers that also seek to provide alpha, alternative risk premia strategies have been developed and offered to investors over the last few years. Broadly speaking, these are strategies that seek to provide exposure to sources of returns across multiple asset classes (equities, fixed-income, currencies, commodities). The sources of return (or factors) exploited are generally classifiable as trend/ momentum, carry, and value, but may be extended to size/liquidity, quality, and others. The strategies themselves are generally passive and rules-based, take both long and short positions, and tend towards market neutrality and hence low correlations to most other asset classes. Relative to active alpha-seeking trading strategies, alternative risk premia are promoted as being cheaper, more liquid, and more transparent. Potential concerns mainly center around their ability to produce future returns that are in line with their generally impressive back-tests, and their relatively short live track records. Overall, alternative risk premia strategies combined with active trading strategies may offer investors, particularly fee-sensitive ones, a larger opportunity set of diversifiers.

Although some futures trading strategies and alternative risk premia have displayed negative correlations to equities during crises, most of them are designed to have low (slightly positive or slightly negative) long-term correlations rather than high negative correlations, which is the way we define a hedge. These types of strategies are better classified as **diversifiers**. When added to a portfolio containing stocks and bonds (and perhaps other alternative strategies), they tend to reduce its overall volatility by virtue of their non-correlated nature. However, most investors allocate relatively small portions of their portfolios to these types of diversifiers. Very often, the diversification they achieve may be inadequate, particularly during a serious equity market downturn, as most of the portfolio's risk still stems from equities.

Hedging equity risk is not a simple proposition. Traditional strategies intended to achieve this goal include:

- Market timing (seeking to adjust equity market exposure by switching between cash and stocks);
- Shorting individual stocks (equity long-short, with either a long bias or a market-neutral approach);
- Options strategies (buying index put options).

These approaches generally tend to be ineffective, costly, or inefficient. In terms of market timing, we know of no definitive evidence that it is an effective strategy. With regard to shorting individual stocks, that may be costly because the stocks need to be located and borrowed, and stocks in high demand for shorting (e.g. dotcom stocks during the bubble) often cost a lot to borrow and short. Also, short sellers can get bought in if the borrow dries up. And lastly, buying puts can be costly because the put premium bleeds out over time, and they must be rolled over periodically as they expire. Puts become costly when volatility increases (i.e. when they are most needed). By way of contrast, we believe that dynamic futures-based equity hedging strategies or certain alternative risk premia may afford greater promise.⁴ As they are designed to be negatively correlated to stocks and their "beta" is dynamic (lower during market corrections but higher during market rallies), they are potentially more effective in mitigating downside equity risk, and can truly be classified as **hedges**.

²We have written several papers about the benefits of managed futures; for example, *Harnessing the Potential Benefits of Managed Futures*.
³We have addressed this and other related issues in our paper, *Managed Futures During Equity "Crises" — An Update*.
⁴Refer to our paper on dynamic hedging, *The Long and Short of Hedged Equity Investing*.
⁵Nor is this a problem only for large allocations to alternatives. When the allocation is "too small," investors very often tend to get discouraged when stocks rally, and give up prematurely on the alternative investments.

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A Word About Risk

The purchase of a managed futures investment involves a high degree of risk. Specifically, you should be aware that, in addition to normal investment risks, managed futures investments entail certain risks, including, in all or some cases:

- Managed futures often engage in leveraging and other speculative investment practices that may increase the risk of investment loss.
- Managed futures can be highly illiquid.
- Managed futures are not required to provide periodic pricing or valuation information to investors.
- Managed futures may involve complex tax structures and delays in distributing important tax information.
- Managed futures are not subject to the same regulatory requirements as mutual funds.
- Managed futures often charge high fees



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