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Bobbing the Tail that Wags Your Portfolio...

Reducing the severity of the negative tail of the return distribution using managed futures

Issue

Recently we have observed much discussion in the popular literature about the low correlation of managed futures programs with other investments normally found in an institutional portfolio. While our own calculations agree with the conclusion that the *average* correlation is low, we have observed what we believe to be a more important issue—a pattern to the correlation of returns through time. We have observed that the correlation is low when the traditional asset classes are enjoying positive performance and significantly negative when the traditional assets are experiencing negative performance.

If this pattern could be shown to persist through time, it would indicate that an institution could reduce the severity of the negative tail of its return distribution by including an investment in managed futures. As it is the threat of this negative tail of the return distribution that dictates the overall structure of the portfolio, managing this element can have a material impact on portfolio performance.

Data

Our analysis utilizes three components grouped into two investments over the period January 1993 through December 2004:

Traditional Portfolio: We constructed a series of monthly returns representing a portfolio of 60% Barra/S&P 500 (with dividends reinvested) and 40% Lehman Aggregate Bond Index. This series is intended to represent the pattern of returns that might be observed in an institutional portfolio.

RPCG Overlay*: This is the RP Consulting Group, Inc. Managed Futures Benchmark in an overlay—not fully funded—investment structure. This represents the monthly returns to an

investment in 15 of the largest trading programs of Commodities Trading Advisors (CTAs). The overlay structure is discussed in detail in a later section.

Analysis

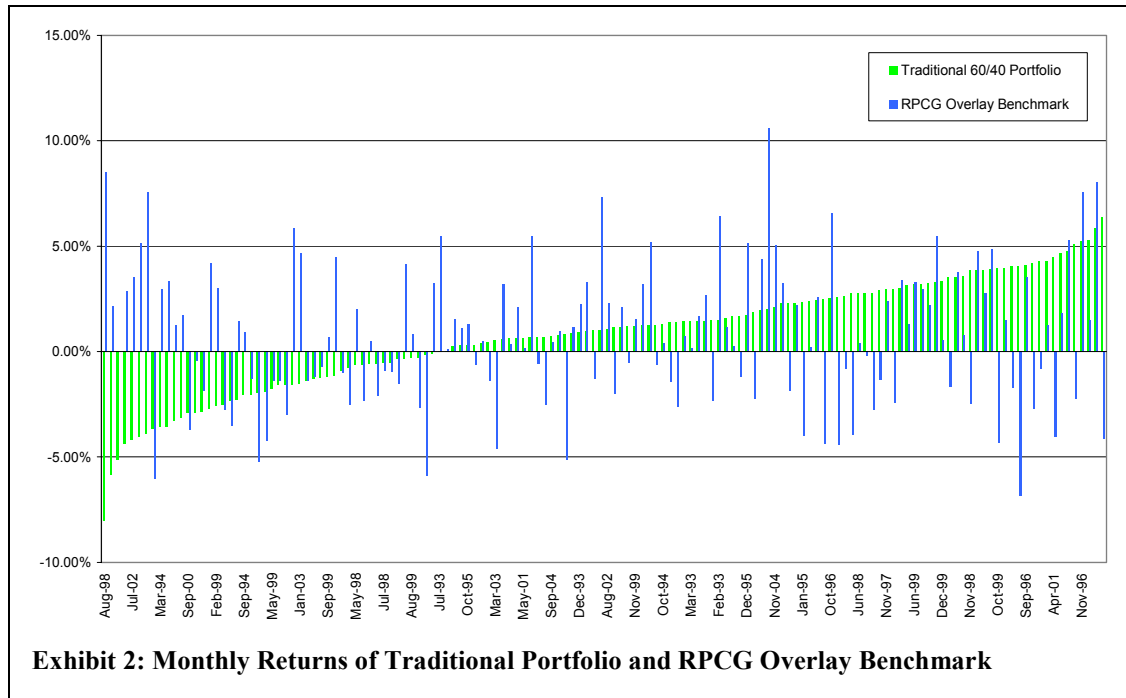
Our analysis seeks to identify any pattern to the relationship observed between the returns of the RPCG Overlay Benchmark and those of the traditional portfolio. We do this by calculating the correlation between the two return series and then graphing the same two return series. To make the graphic display more meaningful, we reorder the return series ranking the returns of the traditional portfolio from their minimum to maximum. This allows us to observe the behavior of the RPCG Overlay Benchmark during different performance conditions of the traditional portfolio.

We calculated the correlations of the monthly returns of the traditional portfolio and the RPCG Overlay Benchmark (**Exhibit 1**). We see that the correlation using all months taken together results in the low correlation normally observed. The more interesting calculation is the significantly negative correlation observed when the traditional portfolio is experiencing negative returns. This would indicate some sort of pattern to the relationship of returns.

	RPCG
Traditional Portfolio (all months)	-0.02
Traditional Portfolio (positive months)	0.02
Traditional Portfolio (negative months)	-0.35

Exhibit 1: Monthly Correlations

The graph (**Exhibit 2**) shows the monthly return values of the traditional portfolio ordered from the minimum return to the maximum, paired with the RPCG Overlay return of the



corresponding month. While the returns to the RPCG Overlay still appear to be somewhat random as indicated by the aggregate correlation computation, it is obvious that positive returns of the RPCG Overlay correspond with the lowest returns of the traditional portfolio.

We questioned if this pattern would persist through time, specifically on a quarterly basis, or would we observe some sort of reversion to the mean as the length of the measurement period was increased. We computed the correlations of the 45 calendar-quarter returns (**Exhibit 3**). Not only do the correlation values appear to persist but they suggest even greater diversification than that observed in the monthly returns.

	RPCG
Traditional Portfolio (all quarters)	-0.09
Traditional Portfolio (positive quarters)	0.26
Traditional Portfolio (negative quarters)	-0.27

Exhibit 3: Quarterly Correlations

As you probably have anticipated, we graphed the same series of quarterly returns to observe if the pattern of returns persisted. **Exhibit 4** provides the quarterly return values, ordered from the minimum return of the traditional portfolio to the maximum, paired with the return of the RPCG Overlay for the corresponding quarter. As the graph shows, the significantly negative correlation during negative performance periods of

the traditional portfolio not only persisted, it appears to have intensified.

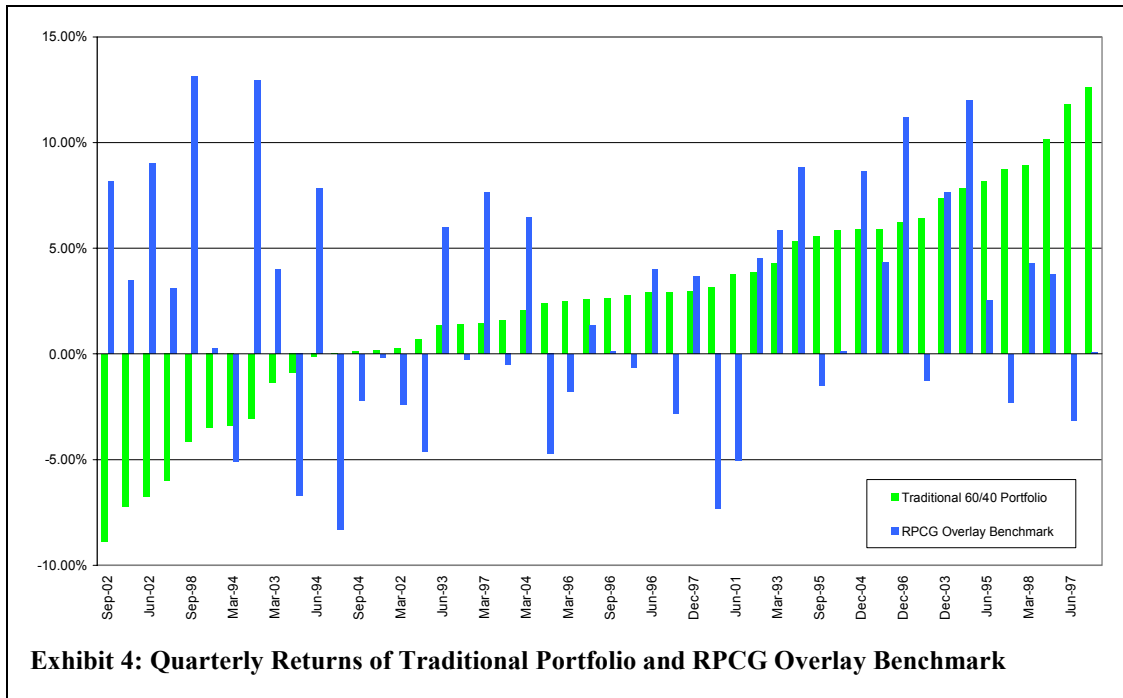
For the purpose of completeness we performed the same tests on the 12 calendar year periods. While the results were consistent with those previously observed, due to the low number of available observations, we must view them with some skepticism. A more relevant issue is how this information could impact your portfolio.

Practical Application

The question is what impact the addition of a managed futures overlay would have had on an institutional portfolio over the 1993 through 2004 investment period. Selecting an arbitrary but realistic 10% overlay size, we combined the monthly returns of the traditional portfolio with 10% of the monthly returns of the RPCG Overlay. We then aggregated these into calendar year values. **Exhibit 5** provides the annual returns of the traditional 60/40 portfolio, ordered from minimum to maximum calendar year return, and the same portfolio including the 10% managed futures overlay for the corresponding calendar year.

Conclusion

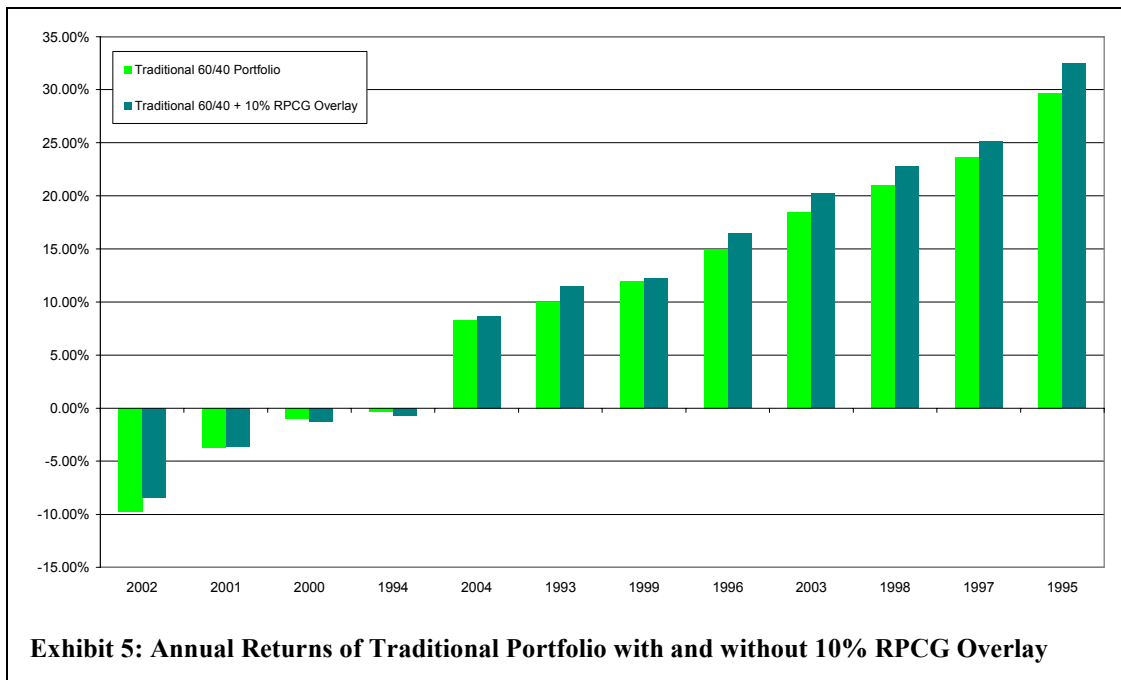
While it is generally accepted that the correlation of returns between a managed futures investment and a traditional institutional portfolio is low, we found a more precise conclusion would be that



the *average* correlation is low. We have observed what appears to be a distinct and persistent pattern to the correlation of returns through time. The persistent negative correlation of returns during periods of negative performance of the traditional portfolio should allow institutions to reduce the severity of the negative tail of the return distribution by incorporating a managed futures overlay investment.

Overlay Structure

In the past, a managed futures investment was structured such that a client desiring a \$10 million USD investment made an allocation of \$10 million of their portfolio to this investment and placed this amount on deposit with a broker/custodian for trading by the client’s CTA. The CTA then would use up to \$1 million of this as good-faith deposits for the futures contract



positions taken in the trading program, and purchase US Treasury Bills with the remaining \$9 million.

While this allocation structure is easy to comprehend, it is not an efficient use of capital. The \$9 million in Treasury Bills provided a return much lower than that generated by the aggregate portfolio and hence had an opportunity cost. There is a more efficient way to make this investment.

Utilizing an overlay structure, the opportunity cost is eliminated. To make the \$10 million managed futures investment, the investor places on deposit with the broker/custodian the \$1 million for good-faith deposits, but retains the other \$9 million fully invested in their existing portfo-

lio. The returns of the managed futures program are then said to be “overlaid” on top of the returns to the aggregate portfolio. This allows a managed futures investment to significantly increase both the efficiency and the rate of return of the traditional portfolio.

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*The Benchmark is a 15 CTA, cap-weighted strategy representative of the return and risk profile of the “average dollar invested” in the managed futures industry at an institutional level, and offers a passive and investable investment alternative. The Benchmark represents over 43% of industry assets and correlates with the most popular industry “index” at approximately +0.96. The “Descriptive Document” detailing the construction and methodological characteristics of the Benchmark is available by request from RP Consulting Group, Inc. Further return and construction information is available through www.rpcg.net.

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