ACADIAN

MANAGED VOLATILITY: RISK REDUCTION IN A LOW VOLATILITY ENVIRONMENT

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For our global managed volatility strategies, the historically quiet equity market conditions that persisted through early 2018 posed two challenges for our risk reduction objective: 1) Reducing beta had diminished benefit in lowering the equity portfolio's overall volatility. 2) Currency volatility became a more important driver of the investment's total risk.

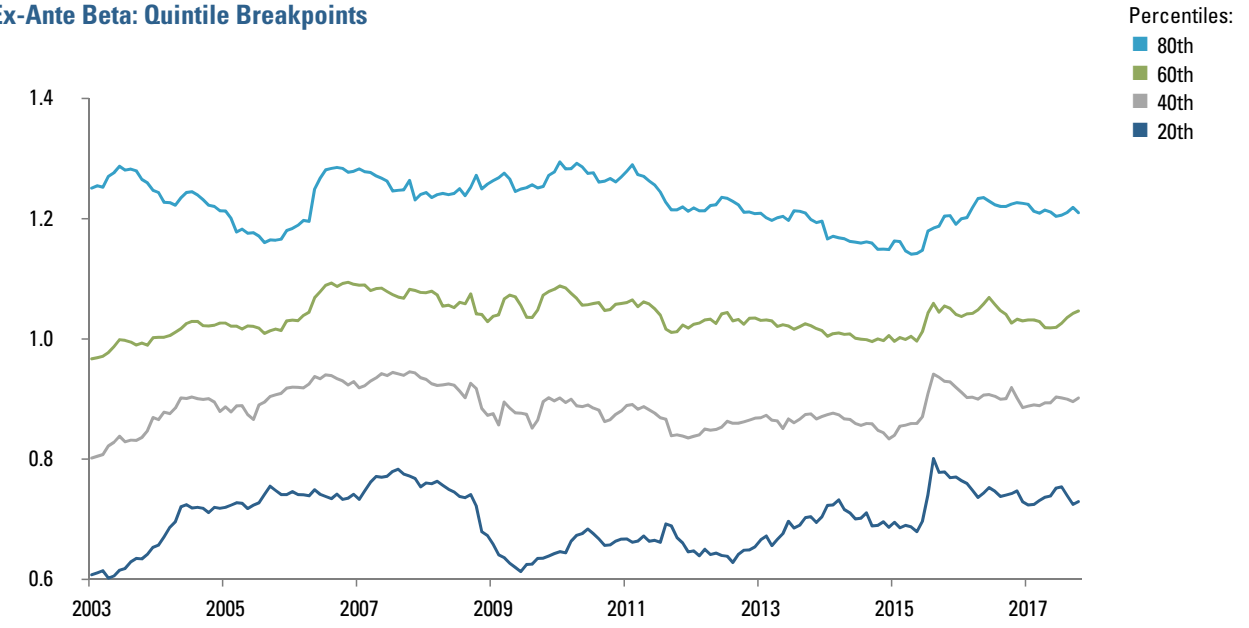
Although equity volatility has normalized in recent months, a return to a more subdued market environment remains a reasonable possibility. In this brief note, we discuss the impact of a low-volatility equity environment on risk reduction. We address how low equity volatility accentuates the impact of currency translation issues, which are of particular relevance to investors whose base currency denominates only a small fraction of the benchmark. We offer currency hedging-based approaches that aim to restore the expected degree of risk reduction.

A FIRST CHALLENGE TO RISK REDUCTION

Portfolio *beta* reduction depends on the cross-sectional spread in individual stock betas, i.e., the range of available betas at any point in time. This spread may change over time based on market conditions, as demonstrated in Figure 1, which plots beta quintile breakpoints within an ACWI-based universe. Nevertheless, in a global mandate, in our experience, the spread is generally wide enough to allow for material reduction in portfolio beta versus the cap-weighted benchmark.

FIGURE 1

Ex-Ante Beta: Quintile Breakpoints



Source: Acadian. Cap-weighted 20th, 40th, 60th, 80th percentiles (risk model based on local currency returns). Global ACWI universe, market cap. >$100mm. For illustrative purposes only.

Yet while we have fairly tight control over portfolio beta, success in portfolio *volatility* reduction likely will also depend materially on the level of realized market volatility. To see why, consider the ratio of portfolio to market variance, which we can express as follows:

$$\frac{\beta^2\sigma_m^2 + \sigma_\varepsilon^2}{\sigma_m^2}.$$

where β is the portfolio's beta, σ_m is the volatility of the market, and σ_ε is the portfolio's idiosyncratic volatility.

Together with the denominator, the numerator's first term suggests that the portfolio's beta has a fixed effect on volatility reduction, regardless of the level of market volatility. But there is also a residual component of portfolio volatility that isn't scaled by beta, and it typically turns out to be fairly stable in a well-diversified portfolio, often around 2-3%. So when market volatility is low, risk derived from sources other than the market factor tend to account for a greater share of total portfolio volatility, diminishing risk reduction benefits from lowering beta.

A SECOND CHALLENGE TO RISK

Foreign exchange risk arises in the context of global managed volatility strategies because investors must translate returns earned in various local markets back to their base currency. Currency translation may contribute material risk to base currency returns, especially if that currency represents only a small fraction of the global benchmark. While currency translation issues are relevant to any global equity investment, in the managed volatility context they present special complications for risk reduction.

To understand why, consider a simplified example, where an U.K. investor holds a hypothetical U.S. managed volatility portfolio (MV).[1] We can express the portfolio's variance (volatility squared) in the investor's home currency as a combination of local market volatility and currency effects:

$$\sigma_{mv}^2 + \sigma_c^2 + 2\sigma_{mv}\sigma_c\rho_{usd:gbp},$$

where σ_{mv} is its volatility in local currency (USD), σ_c is USD:GBP fx volatility, and $\rho_{usd:gbp}$ is the correlation between fx and local equity returns.

Expressing the benchmark's sterling variance in the same fashion, simply replacing σ_{mv} with σ_b, the benchmark's volatility in local currency (USD), we can approximate the variance reduction offered by MV in GBP terms as:[2]

$$1 - \frac{\sigma_{mv}^2 + \sigma_c^2 + 2\sigma_{mv}\sigma_c\rho_{usd:gbp}}{\sigma_b^2 + \sigma_c^2 + 2\sigma_b\sigma_c\rho_{usd:gbp}}.$$

The presence of the correlation term between equities and currency poses a first potential headwind for GBP-based risk reduction, one that is subtle and episodic. To the extent that the USD is a safe-haven currency, we might expect it to appreciate relative to GBP in a material equity sell-off. For the U.K. investor, this natural currency-equity self-hedging effect would dampen both MV and benchmark volatility in GBP terms relative to USD. But this effect would be more pronounced for the higher volatility benchmark. As a result, we'd expect less benefit from risk reduction in GBP terms than in USD.[3]

Subdued equity volatility presents another, more transparent and potentially significant, headwind for volatility reduction. When equity market volatility is low relative to currency volatility, there simply is less benefit from reducing MV's local returns volatility relative to the benchmark's. In the extreme, if σ_b were already negligible, then variance reduction in GBP terms also would be negligible regardless of how material it is in USD.[4] In other words, if the investor is primarily exposed to currency risk to begin with, reductions in local market equity volatility won't have much of an impact.

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[1] Since U.K. stocks represent less than 10% of global equities, currency translation issues facing a U.K. investor holding a purely U.S. portfolio would be of similar magnitude to those implied by a global investment. For a U.S. investor, currency translation issues are less problematic, since they affect only roughly one half of a typical global portfolio.

[2] This is only an approximation because we have assumed that the exchange rate has the same correlation with the local currency returns of both the managed volatility portfolio and the benchmark. In general, we would expect the two correlations to be quite similar, since both portfolios are long U.S. equities.

[3] Technically, if $\rho_{usd:gpb} < 0 \; and \; \sigma_{mv} < \sigma_b,$ then $2\sigma_{mv}\sigma_c\rho_{usd:gpb} > 2\sigma_b\sigma_c\rho_{usd:gpb}$ and $\frac{\sigma_{mv}^2 + \sigma_c^2 + 2\sigma_{mv}\sigma_c\rho_{usd:gbp}}{\sigma_b^2 + \sigma_c^2 + 2\sigma_b\sigma_c\rho_{usd:gbp}} > \frac{\sigma_{mv}^2}{\sigma_b^2}$.

[4] Technically, if $\sigma_b^2 \ll \sigma_c^2$, then $\frac{\sigma_{mv}^2 + \sigma_c^2 + 2\sigma_{mv}\sigma_c\rho_{usd:gbp}}{\sigma_b^2 + \sigma_c^2 + 2\sigma_b\sigma_c\rho_{usd:gbp}}$ would be close to $\frac{\sigma_c^2}{\sigma_c^2}$ and approximately 1.

REDUCING CURRENCY EFFECTS: ALTERNATIVES

For currency sensitive investors, we offer three approaches intended to mitigate currency translation's impact on risk reduction, ordered from least to most aggressive:*

- **Optimize in the investor's base currency:** Building the portfolio with a risk model that incorporates exchange rate volatilities and correlations will likely (1) shift weight to assets denominated in the investor's base currency, reducing the amount of currency translation that must be done, and/or (2) overweight assets in currencies that make negative contributions to risk. For our example U.K. investor, these would likely include global "reserve" currencies, such as USD, CHF, and JPY, whose sterling exchange rates tend to co-vary negatively with global equity returns. We also would advise a prudent constraint on capital deployed to assets denominated in the investor's home currency in an effort to protect against country-specific events, such as Brexit in the U.K. case.
- **Implement a portfolio-level or "share-class" hedge:** A second alternative is intended to deliver the risk reduction benefits experienced by a U.S. investor into a different base currency. The appeal being that U.S. investors likely have less currency translation risk than others since the dollar likely will denominate a plurality of a GMV portfolio. (Probably roughly 50%.) Mechanically, we do this by building the GMV portfolio from the U.S. investor's perspective and then overlay an fx forward to hedge the translation of that portfolio's USD returns into the non-U.S. investor's base currency. Implementation would be particularly simple, possibly outsourced.
- **Full currency hedge:** We can also hedge fx risk associated with all holdings that are not denominated in the investor's base currency. I.e., for our U.K. investor, we can separately hedge USD:GBP risk in U.S. holdings, EUR:GBP risk in euro zone holdings, etc. Implementation is more operationally complex but still well-understood, and we manage such mandates already. We would expect enhanced risk reduction even relative to the unhedged, USD-denominated implementation that we provide in our global composite track record.

CONCLUSION

Global managed volatility strategies may be constructed from correctly identified lower-beta stocks within local markets and yet still deliver less than expected risk reduction. To the extent this is due to unusually compressed volatility, market normalization may address the issue. If the cause is unusual and volatile currency behavior, investors may consider: (1) evaluating historical risk reduction everywhere in the local currency context, or (2) implementing a portfolio construction or currency hedging technique in an effort to protect against the issue.

* Not to be considered investment advice.

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