

Volatility Settles Down as Asset Class

In recent years volatility has become an indispensable tool for the fund management industry and moved mainstream recently with major exchanges listing volatility indexes and derivatives. On September 19, 2005, Eurex launched three futures on volatility indexes: the products represent futures on the 30-day implied volatility levels of options on the Dow Jones EURO STOXX 50® Index (VSTOXX®), options on the DAX® (VDAX-NEW®) and options on the SMI® index (VSMI®). Both futures and the underlying indexes allow a fund manager to use volatility as an independent asset class. The following provides an insight to the design and application of these products as well as the recent developments in the regulatory environment which confirms that volatility index futures will become an essential tool for every fund manager.

Characteristics

The interest in volatility is directly related to several of its basic characteristics. In particular implied volatility is considered to be a gauge for uncertainty. It tends to grow during times of economic or political crises and thus reflects the general sentiment of market participants. Another important statistical property is its trend to revert to its historical mean. This means volatility "recovers" from shocks or spikes over time and reverts to its typical levels. In addition, implied volatility tends to be higher than realised volatility. This reflects the general aversion of investors to carry a short option position. Therefore, a risk premium has to be paid to the investor in reward for selling volatility.

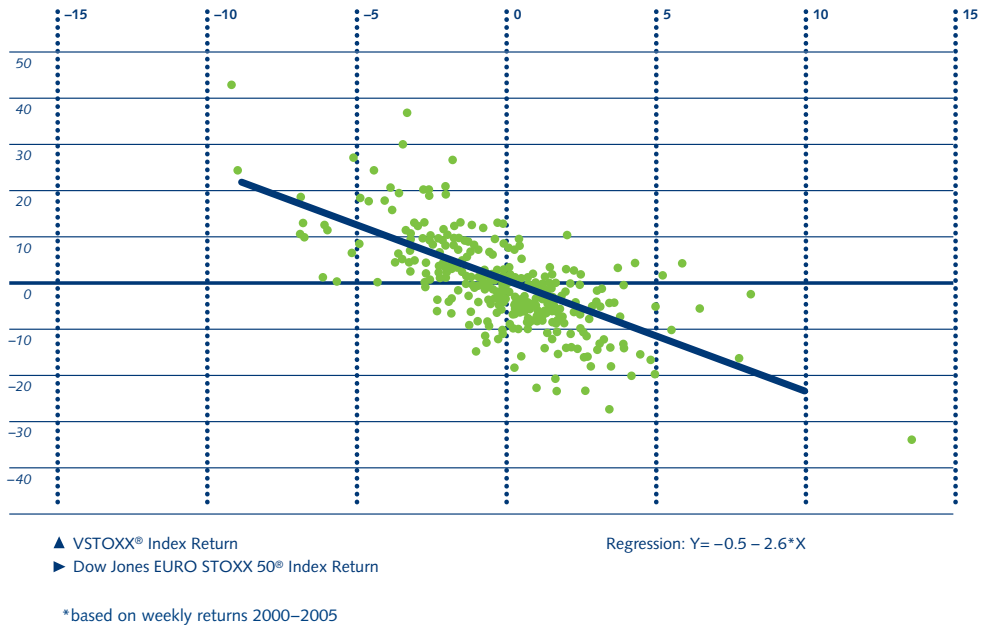
For a fund manager, one of the most important characteristics of volatility is its negative correlation with respect to the underlying equity index. If the equity index rises, volatility tends to fall and vice versa. This property basically lays at the foundation of most of its uses. The negative correlation between an equity index and its volatility assures that a volatility index derivative is a cheap hedge for equity market exposure. In the hedged position, the gain in the volatility index derivative covers the loss out of the equity exposure. By adding volatility as a hedge a portfolio is diversified with a new asset class, generating excess returns and lowering risk.

The demand for volatility hedging is driven by the fact that basically every fund manager is in some sense short on volatility. For example, a passive index tracker is implicitly short volatility since his rebalancing costs increase with increasing volatility. A benchmarked portfolio manager on the other hand is implicitly short volatility since his tracking error increases with market volatility. In general, any long equity investor is short on volatility due to the negative correlation between volatilities and the market returns.

Contract Design

The three new volatility index futures at Eurex are designed to offer a simple way to allow a fund manager to trade volatility as a new asset class. The contract value is EUR 1,000 per volatility index point for the futures on the VSTOXX® and VDAX-NEW® indexes and CHF 1,000 per volatility index point for the future on the VSMI®. A volatility level of 20 percent would thus result in a contract value of EUR/CHF 20,000. If the volatility level would decrease to 19 percent, the contract value would change to EUR/CHF 19,000. The sensitivity of the volatility index futures to one percent change in the volatility level, the so called vega, is thus EUR/CHF 1,000 – this is the only sensitivity the contracts have. They do not react to changes in the underlying market index, so there is no delta. It is this essential property which simplifies the application of the volatility index futures dramatically.

Figure 1: VSTOXX® versus Dow Jones EURO STOXX 50® Index (Return in Percent *)



Product Application

In order to illustrate the application of volatility index futures to volatility hedging in fund management, one can construct the hedge ratio for a portfolio benchmarked to the Dow Jones EURO STOXX 50® Index. The Dow Jones EURO STOXX 50® Index has a negative correlation to the VSTOXX® Index. A regression based on weekly returns of the two indexes over the last five years yields that a one percent fall in the Dow Jones EURO STOXX® Index level triggers roughly a 2.6 percent rise in the VSTOXX® Volatility Index (see figure 1).

If we assume now that the portfolio has a EUR 100 millions exposure to the Dow Jones EURO STOXX 50® Index then a one percent fall in the Dow Jones EURO STOXX 50® Index would result in a loss of EUR 1 million of the portfolio value. In addition, the sensitivity (vega) of the VSTOXX® Index Future to volatility changes is EUR 1,000. By combining this information, we obtain a hedge ratio of EUR 1 million/2.6/EUR 1,000 = 385 futures. This means that a position of 385 VSTOXX® Index Futures with the benchmarked portfolio would have neutralised the implicit volatility exposure of the portfolio, improved the portfolio performance and reduced its risk. As stated previously, if one is long a Eurex Volatility Index Future there is a vega exposure of EUR/CHF 1,000. This vega stays constant up to the maturity, offering the fund manager constant exposure to future changes of the implied volatility level over the lifetime of the contract. Let us assume the fund manager expects a major event at some future date, such as a major political event or a larger change in the interest rates. One would expect that volatility levels will rise around the event date and thus invest in the new future contracts. One would profit from any increase in the implied volatility level realised over the lifetime of the contract with a payout per contract of EUR/CHF 1,000 per one percent volatility increase.

Besides this example, various other applications derive from both the statistical properties of volatility as well as the short volatility positions every fund manager implicitly holds:

- Volatility index futures are a cheap hedge for market exposure and can serve as a protection against event risk.
- Event-driven funds can utilise volatility index futures as a hedge for an incorrectly predicted event.

- An active portfolio manager can reduce his correlation risk by going short volatility.
- Volatility and credit spreads are linked, i.e. as volatility increases credit spreads tend to widen. A fund manager can thus hedge credit exposure with volatility index futures.
- The mean-reverting property of volatility allows the fund manager to generate additional profit from trading volatility index futures by following the trend.
- The availability of several volatility futures covering different markets allows one to trade the volatility spread between these markets.
- Finally, volatility index futures can be used to make pure directional bets on the changes in the implied volatility levels. The creation of the corresponding position with “plain-vanilla” options would be about 10–20 times more expensive.

In terms of risk management a value-at-risk (VaR) analysis for the futures contract would only be based on the distribution of changes in the implied volatility level, there is no exposure to any changes in the market index levels. The contract thus offers a fund manager pure volatility exposure – volatility as an asset class has become a matter of fact.

CESR's Final Advice

Product innovations such as volatility index futures provide fund managers with new options to implement strategies to diversify the portfolio composition. But, until recently, one challenge remained unaddressed. Is the regulatory environment flexible enough to allow the use of volatility index derivatives in fund management?

The final advice of the Committee of European Securities Regulators (CESR) published on January 26, 2006, for the European Commission attempts to clarify the definition of “Eligible Assets for Investments of Undertakings for Collective Investment in Transferable Securities (UCITS)”¹. It thus also aims at addressing the issue of volatility index derivatives as part of the fund management process.

UCITS are specially constituted collective investment portfolios exclusively dedicated to the investment of assets raised from investors. UCITS' legislation² aims to establish a defined level of investor protection. This is achieved through strict investment limits, capital and disclosure requirements, as well as asset safe-keeping and fund oversight provided by an independent depository. UCITS benefit from a “passport” allowing them, subject to notification, to be offered to retail investors in any EU jurisdiction once authorised in one member state.

According to CESR's final advice³ those derivatives may be considered “financial derivative instruments” whose underlyings, amongst others consist of assets listed in Article 19 (1) UCITS Directive and financial indexes. In this context, an index⁴ is admissible, if the index

- Composition is sufficiently diversified,
- Represents an adequate benchmark for the market to which it refers, and
- Is published in an appropriate manner

This means, a derivative on a financial index is principally UCITS-compatible, if the index fulfils index certain criteria. This applies to the construction of the volatility future.

¹ For detailed requirements please see “CESR's Final Advice on Eligible Assets”, page 49–56, Box 13, 14, available on CESR's website: www.cesr-eu.org/images/cesr_barre.jpg.

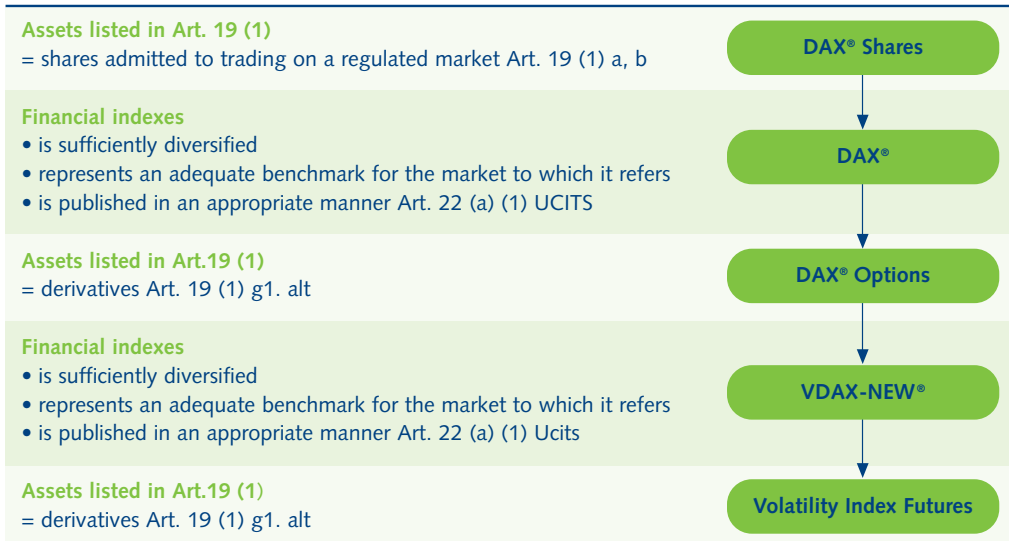
² See Directive 85/611/EEC as amended by Directive 2001/107EC and 2001/108/EC, available on European Commission's website: http://europa.eu.int/eur-lex/en/consleg/main/1985/en_1985L0611_index.html.

³ Taking into account Art. 1 (2) in conjunction with Art. 19 (1) (g) and Recital 13 of Directive 2001/108/EC.

⁴ According to the requirements of Art. 22a (1) of Directive 2001/108/EC on which the CESR final advice is based.

Figure 2 gives an overview on products available at Eurex based on CESR's final advice and outlines how the new products complement the existing pool of products.

Figure 2: Extract from CESR's Final Advice on Assets



Note: Financial derivative instruments mean derivatives whose underlying consists of variations above.

The availability of volatility index futures on Eurex as well as recent changes in the regulatory environment exemplified through the final advice of CESR pave the way for the growth and application of volatility as an asset class. Fund managers now have an indispensable tool to hedge their volatility exposure and generate additional returns at reduced risk. The discussion in the final advice of CESR assures the fund management industry that the time has come to apply products like Eurex volatility index futures to generate new opportunities and gain access to new product groups.

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Further academic studies on Eurex derivatives are available on the Eurex website at www.eurexchange.com > Investors > Institutional Investors > Academic Research. More detailed information is also available from Stefan Engels on T +49-69-211-156 00, e-mail: Stefan.Engels@eurexchange.com.

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