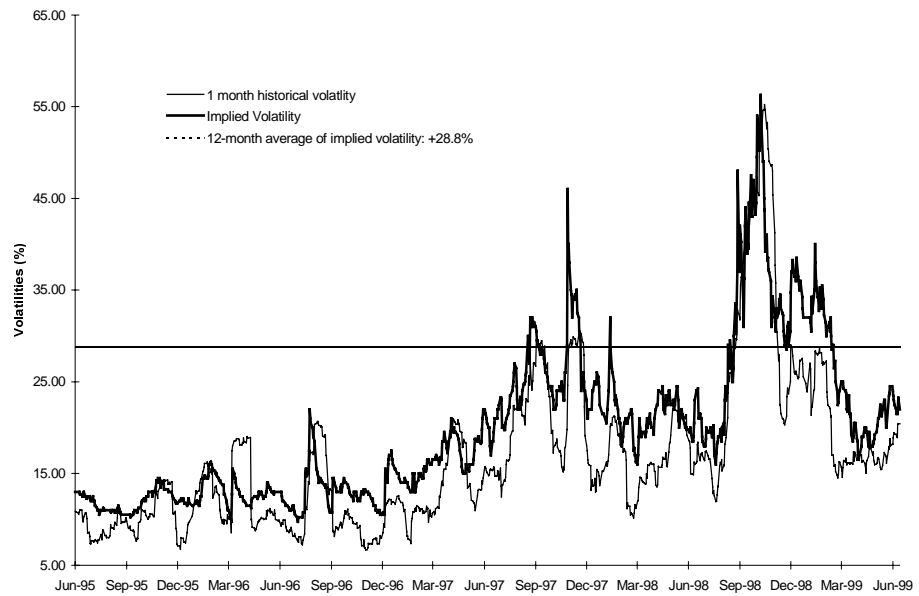

Derivatives

Over the past three months, the Swiss Market Index has traded in a range between 6665 and 7500. Our three-month SMI target is set at 7300, still within the range and indicating sideways moves.

SMI implied and one-month historical volatility

*The graph shows:
(i) one-month historical volatility and (ii) mid-market implied volatility of at-the-money, front-month options (daily data)*



Source: Warburg Dillon Read

As expected, implied volatility dropped in March as investors continued to sell option premium due to the sluggish market outlook. However, amid concerns of increasing interest rates in the US and the expectation of higher credit spreads, implied volatility increased again. Both effects are still in place and a change in volatility is not expected. A neutral volatility forecast and markets trending sideways might suggest that investors should stay away from the equity markets altogether and take the opportunity to take a break. However, the trading range of most underlying instruments is quite wide and investors can take some profits in wing trading.

Are outright options or spreads preferable?

In a sideways trending market investors may want to profit from short-term up- or downswings in the market. The question is whether investors should trade short-term swings with outright options or with option spreads.

A call spread consists of a long call position with a lower strike price and a short call position with a higher strike price. The difference between the purchase of an outright call and a call spread is that with the latter the investor sells some upside potential for a lower premium paid up-front. The pay-off structure of the call spread is therefore capped if the spot increases

above the strike price of the call sold at expiration compared to the outright call position.

Conversely, the put spread consists of a long put position with a higher strike price and a short put position with a lower strike price. The difference between the two strategies is that with a put spread the investor sells some downside potential for a lower premium paid up-front. The pay-off structure of the put is capped if the spot falls below the strike price of the put sold at expiration compared to the outright put position.

For all strategies it is possible to calculate a break-even point, as shown in the table below.

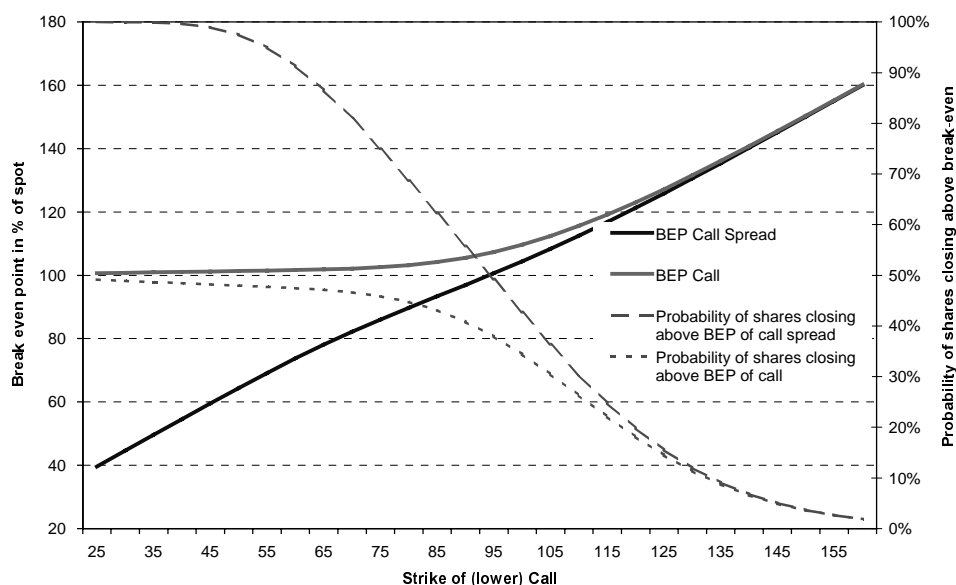
Break-even calculation for options and spreads

Option position	Break-even calculation
Long call	BEP = Strike + Call price
Call spread	BEP = Lower strike + Price of long call - Price of short call
Long put	BEP = Strike - Put price
Put spread	BEP = Higher strike - Price of long put + Price of short put

We compare the break-even points of outright options with the break-even points of the corresponding option spreads. We assume a spot price of CHF100, time to maturity of one year, implied volatility of 22.5% and a risk-free interest rate of 2.7%. The spreads consist of the same long option position plus a short option position with a strike price which is CHF15 higher for call spreads and CHF15 lower for put spreads.

For the outright call position the break-even point is at least slightly above the current share price (for deep-in-the-money calls). The probability of the underlying share price closing above this break-even point is always less than 50%.

Break even point of call versus call spread



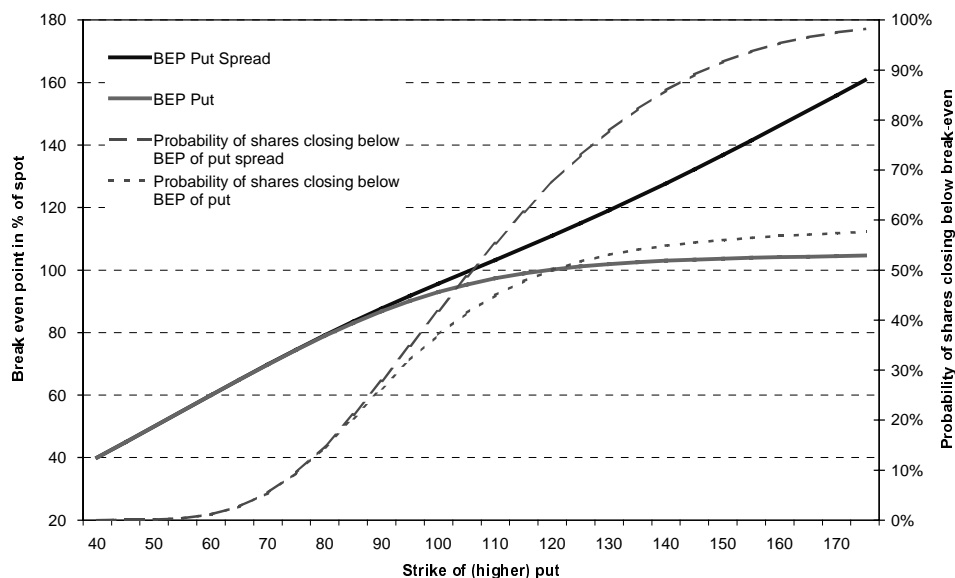
Source: Warburg Dillon Read

With the call spread, however, it is possible to lower the break-even point of the strategy below the current spot level as the call sold partially offsets the price of the call bought. By lowering the strike prices the break-even point of the call spread decreases, and the likelihood of the shares closing above the break-even point of the call spread increases. Given that the break-even point of the call spread is always below that of the outright call, the corresponding probability that the shares close above the break-even point of the bull call spread exceeds the probability on the long call strategy.

For the outright put position with realistic strike prices¹ the investor's break-even point ranges from slightly above to well below the current share price. For the indicated range of strike prices, the probability of the underlying share price closing below this break-even point is between 0% and 58%.

With the put spread, it is possible to increase the break-even point of the strategy well above the current spot price level as the put sold partially offsets the price of the put bought. By doing so, the likelihood of the shares closing below the break-even point of the put spread increases. Given that the break-even point of the put spread is always above that of the outright put, the corresponding probability that the shares close below the break-even point of the bear put spread exceeds the probability on the long put strategy.

Break even point of put versus put spread



Source: Warburg Dillon Read

¹ For extremely deep in-the-money puts, the probability approaches 100%.

Which spread should be chosen?

From a theoretical point of view, all strategies have an expected return equal to the risk-free rate. There is no superior spread based on a theoretical explanation given the assumptions of the Black-Scholes option pricing model. Only a market expectation which differs from the model's growth rate (the risk-free rate) makes certain strike prices preferable to others.

Under some legal frameworks, eg, the Swiss Federal Ordinance on Occupational Retirement, Survivors' and Disability Pension Plans (BVV2), pension funds have to deposit enough liquidity to cover the strike price of long options in order to avoid financial leverage. If we take into account this deposit as well as a bid/ask spread of 21% (for options sold) to 24% (for options bought) of implied volatility, we get different returns. For call spreads the largest returns can be expected if their strike prices are set around the current spot price. For put spreads the largest returns can be expected if their strike prices are set either deep-in-the-money or far out-of-the-money.

Conclusions

Spread positions shift the break-even point of a strategy to levels preferable to those on outright option positions.

The probability of the strategy generating a profit increases as the strike prices are chosen in-the-money rather than out-of-the-money.

In a Black-Scholes world, all strategies have an expected return equal to the risk-free rate. If a bid/ask spread based on implied volatility – and, in the case of an unleveraged portfolio, the deposited funds to cover the strike price of a long option position – are taken into account, call spreads are best set around current share price levels in order to increase the expected return. Put spreads are better off deep-in-the-money or far out-of-the-money. Taking the cumulative probability of a profitable trade into account, a put spread has the best risk return profile, when set deep-in-the-money.