

## Recent Examples of Vol-Arb Trades

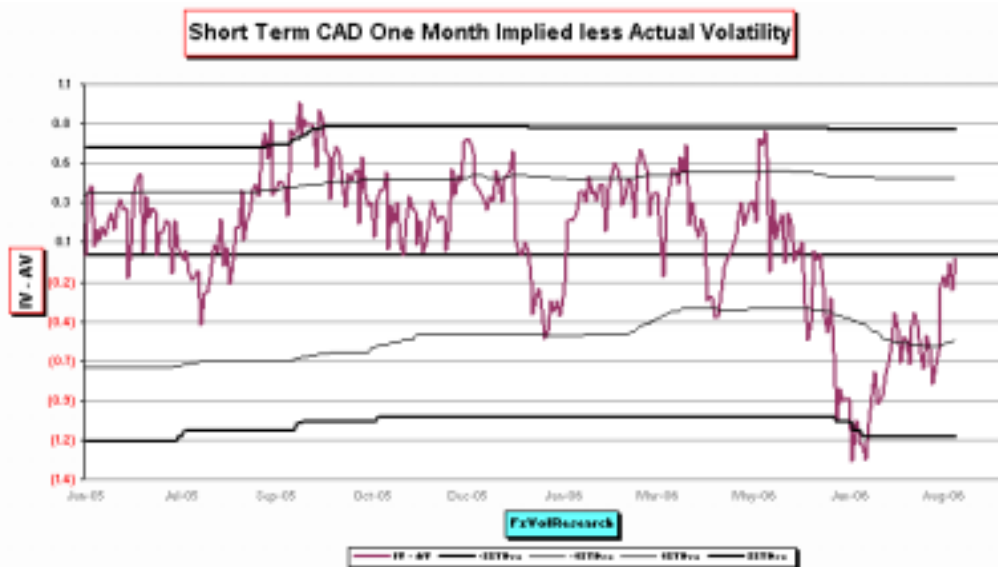
### Discretionary Interpretation of Systematic Indicators

#### 1. Canadian Dollar Gamma Trading

Vol-Arb trades are generated by the discretionary interpretation of systematic indicators. Generally Vol-Arb trades are signaled by extremes in implied less actual spreads (IV-AV) on their own and sometimes with extremes in IV at the same time.

A good recent example is the Canadian dollars' volatile consolidation in June. The trade was signaled by the  $-2$  standard deviation reading in the implied less actual vol spread (see chart 1 below). The implied less actual extremes took place at a time when C\$ implied vol was (and still is) high, but not at an extreme. When the one month implied vol was viewed in relation to the actuals (using our version of the Parkinson statistic) they suggested that gamma options were fundamentally undervalued. As you can see from the chart below by mid-June the undervaluation had lasted for several weeks. By August the IV-AV spread was back to flat and no further edge was left in the trade.

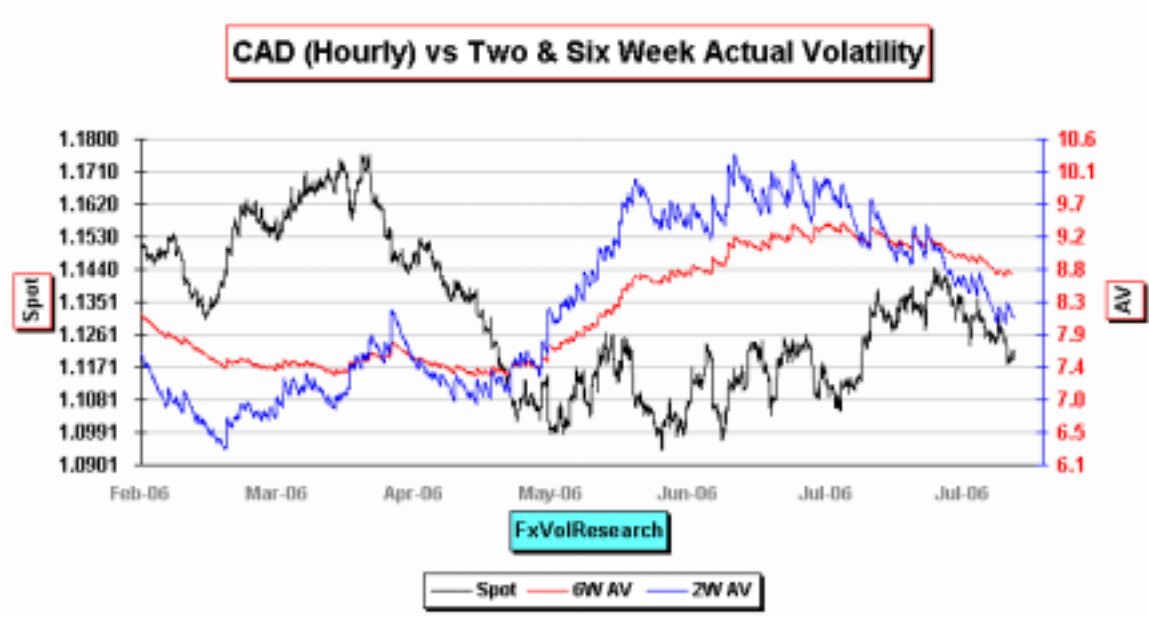
Chart 1: Canadian Dollar IV-AV Spreads



Another indicator suggested that gamma was cheap was the rising vol environment as defined by the two week actual volatility breaking above the six week (see chart 2 below). This occurred early in May and it implied that the trending spot price action was coming to an end (at least for the near term). By mid-June the two week actual volatility was ranging between 9.2% on the low and 10.2% on the high. One June 16<sup>th</sup> when the extreme in IV-AV was recorded the one month implied vol was 8.1% mid-market. A

good way to profit from the undervaluation was to buy one month 30 delta strangles and delta hedge them on a discretionary basis.

Chart 2: Canadian Dollar Two and Six Week Actual Vols



2nd Example: The South African Rand  
IV Extremes combined with IV-AV Extremes

Chart 3: Three Month ZAR IV-AV Spreads

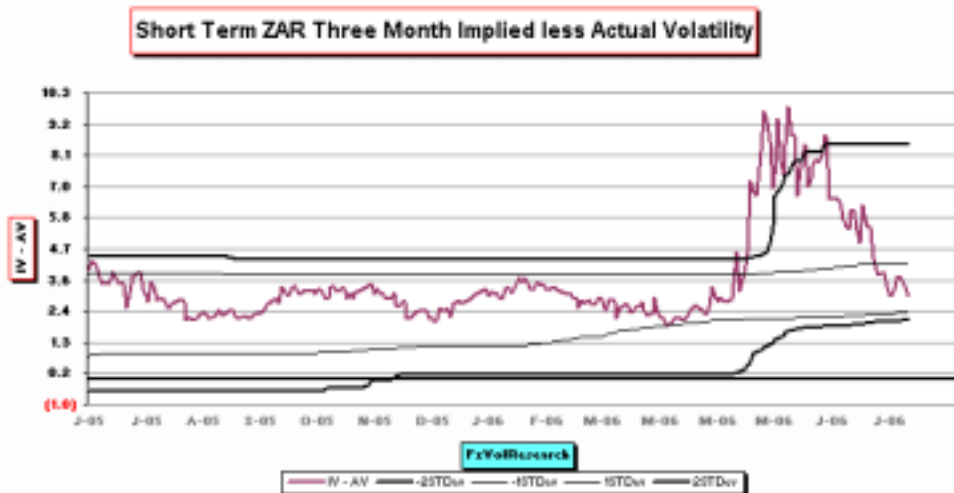
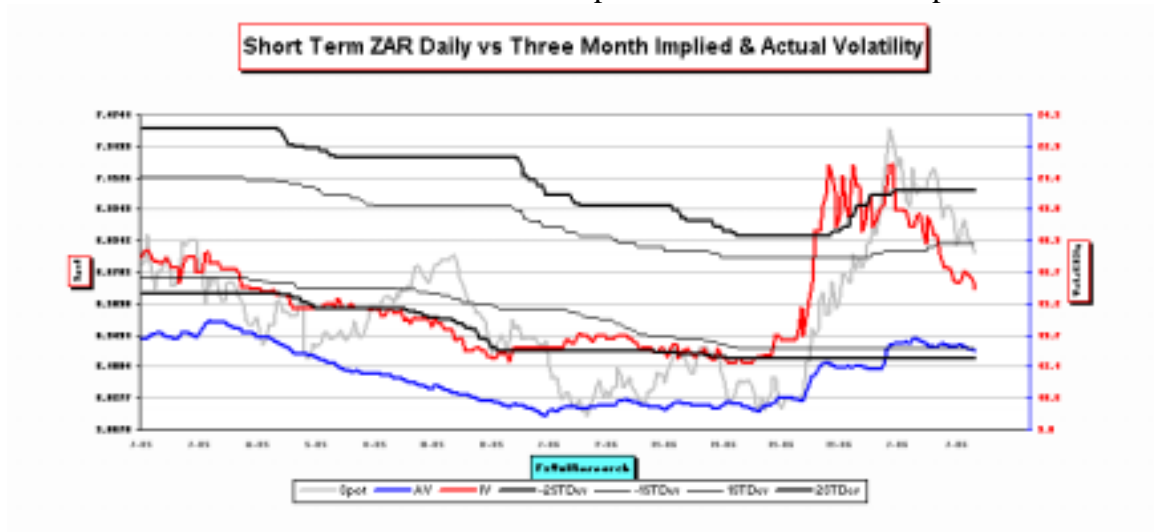


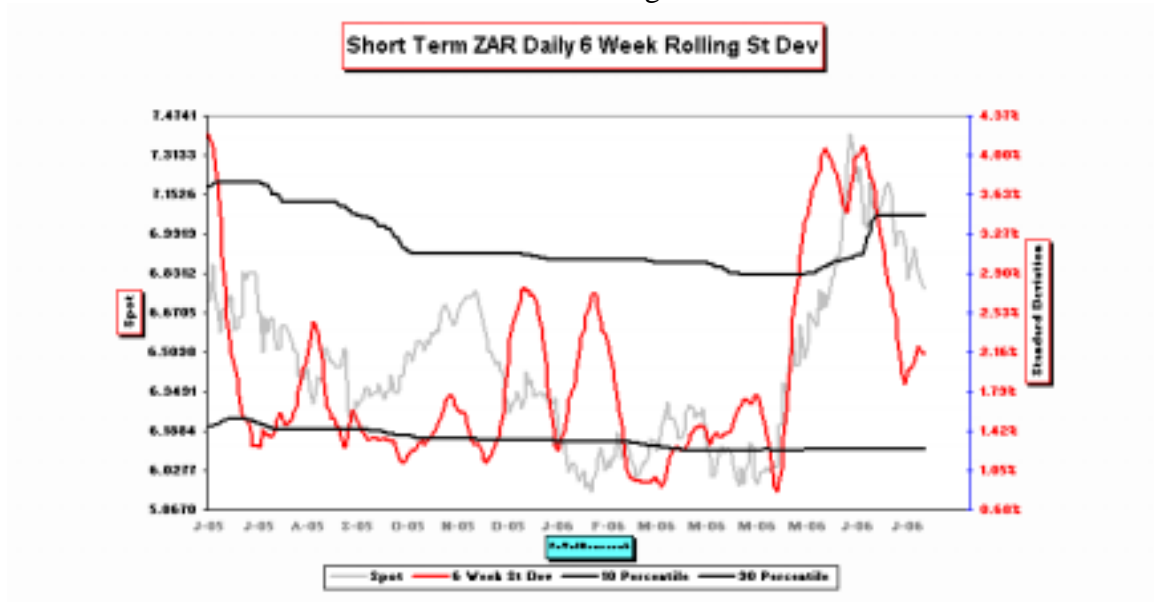
Chart 3 above shows once again a clear overvaluation of ZAR three month implied vols vs. the actuals which took place in May & June of this year. The IV-AV spread was well in excess of +2 standard deviations. The implied volatility was greater than >9.0 vols over the actuals. The situation was similar in the other tenors, however in the three month the extreme was at its most overbought. In this case the IV-AV extreme was recorded at the same time as the IV extreme as you can see in the chart 4 below.

Chart 4 : Three Month ZAR Implied and Actual Vol vs. Spot



When you have an IV-AV extreme co-inside with IV extremes it almost always suggests that the existing spot directional trend is overextended. The final piece of evidence to support this view was supported by the double top and roll over in the six week standard deviation indicator as see in chart 5 below.

Chart 5: ZAR Six Week Rolling Standard Deviation

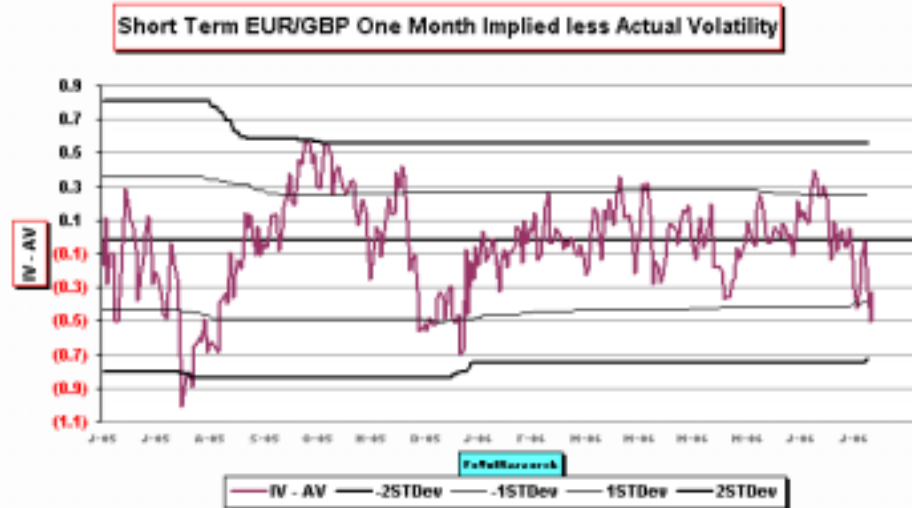


There were several potential trades that could have been done in this environment. The simplest would have been simply to buy a three month in-the-money South African Rand (ZAR) call (e.g. 75 delta) and sell and at-the-money forward ZAR call (50delta). Secondly one could have considered a ZAR call condors (i.e. buy 7.50 ZAR call, sell 7.20 ZAR call, sell 6.90 ZAR call and buy 6.60 ZAR call). This would also have been a situation (if it emerged in one of the major currencies) to consider a Reverse Knock Out call option i.e. and option that has a barrier that is in-the-money in relation to the spot e.g. a 7.40 ZAR call with a 6.40 Knock out. But in the case of the ZAR the RKO slippage would have been too great to make this trade attractive; better to spread the allocation between the Condor and the Call Spread.

## Current Vol-Arb Opportunities

EUR-GBP implied and actual vols have been low for some time. The short date strangle model (SDS) has been long one & two week EUR-GBP strangles for a good part of the July. Following the Bank of England unanticipated 25bp rate hike EUR-GBP actual vols rose while the implieds held stable. In our view this creates a short term gamma hedging opportunity. Either the implieds will rise in line with the actuals or the anomaly will persist and can be realized only by delta hedging. Since the SDS model is already long strangles and betting on a range break out any additional capital that is allocated to vol-arb would be directed at disciplined delta hedging.

Chart 6 : EUR-GBP Implied less Actual Vol Spreads



Vol-Arb is intended to complement or enhance the returns generated from the systematic components of the strategy. On the long side it is intended to generate returns when markets are range bound and implied vols are trading at a discount to the actuals. On the short side it is intended to fade both IV and IV-AV extremes using strategies that all have a limited loss profile. Short vol strategies should also diversify and reduce the long

gamma and long volatility bias of the systematic models as a whole. Realistically Vol-Arab should generate approximately 4%-6% per annum.

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August 7<sup>th</sup> 2006

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