VIX

March 2009

SOCIETE GENERALE
Corporate & Investment Banking


Summary

- **VIX – The Product**

- **VIX and Clients**

- **Strategies and Payoffs**

VIX – The Products


VIX - Basic

- **VIX is 30-day vol**
  Futures are 30-day forward vol

- **All options priced on that month’s futures contract**

- **On BBG : “VIX (index) CT”**
  “VIX (index) OMON”

VIX – Trading / Settlement

- **Multiplier is 100 for options**
  Multiplier is 1000 for futures

- **Settlement is European and cash**

- **Expiration is 30 days before the following month’s SPX expiry**
  Expires on opening print


VIX – Behavior

- **Trades with a “reverse” smile/skew**
- **Implied vols and skew naturally increase as expiration approaches**
- **Term structure implies mean reversion (both short and long term)**


VIX – Liquidity

- **Decent (and improving) in options**
- **Less liquid in futures, but new “minis” should help improve that**
- **Varies widely based on strike, maturity, and type of option**

VIX - Other indices / Clients

- **VIX versus other indices**
  - Negative correlation with equities
  - Positive correlation with credit

- **Clients**
  - Hedge funds
  - Insurance/pension funds
  - Prop desks
  - Credit accounts


VIX – Websites

- http://www.cboe.com/micro/vix/vixwhite.pdf **(VIX “white paper”)**
- www.cboe.com/vix
- www.cboe.com/volatility

VIX and Clients

Different type of clients using VIX

- Volatility accounts
- Directional funds and other type of hedge funds
- Long only funds
- Funds of funds
- Credit funds


Important aspects of VIX to be aware of before trading…

- **VIX Options are based on the futures contract of that month, not VIX spot. Very important consideration.**

- **You must manage your VIX positions at least semi-actively (even/especially the ones that are in place as hedges).**

- **There is still a mean-reversion aspect to the VIX (if not in the very short-term, then at least in the medium and long-term)…**
  If you buy VIX calls as a macro hedge, and your 60 cent options become 5 dollar options, it is smart and responsible trading to roll the position up and/or out to take some profits, which can be done while still maintaining a similar position in case the move in your favor continues.


VIX as a hedge

- For crash protection, low-delta VIX calls are a smart product to own; but one can also look at more complex structures that provide leverage on the upside (with no tail risk) but are cost effective (such as selling puts or put spreads to finance the purchase of calls or call spreads).
  - VIX tends to have technical levels and clear trading ranges ; for example, lately the 40 level mark on VIX spot is a clear trigger for VIX options purchase.
  - Buying options with too long a maturity will not give you the reactivity you are looking for; on the other hand, the front month VIX is very volatile and decays out very quickly…
  - Look for 2nd month or 3rd month (6-10 week range)--it is usually the "sweet spot" to put on a hedge.
  - VIX tends to gap up and slide down, so your hedges maintain value better than index or ETF puts.

VIX screen liquidity

- **Customers are often worried about the fairly large spreads and lack of screen liquidity**
  - **Liquidity depends on maturity and strike…**
    Near-term options and lower-delta options have tighter markets; if you have a dynamic book and know where the liquidity can be found, trading 5k, 10k, or even 25k inside the screen b/o is not impossible.
  - **The rules of market liquidity in crises apply to VIX**

    When there's a global market sell-off (and a subsequent increase in demand for vol), liquidity in all markets will tend to dry up. Because of the natural leverage in VIX options (especially the near-term/low-delta calls), liquidity dries up faster and harsher than in other listed option markets. For example; at the first hint of Bear Stearns possibly going under, front-month 40 delta calls went from .20 wide, 1500 up, to .60 wide, 500 up.
  - The lack of “delta liquidity” in the future market is a reality and should be addressed with **VIX "minis"** (futures that are 1/10 of current futures size, to begin trading in March 2009) which will over-take the current futures and dramatically increase liquidity by the end of 2009.

Strategies – Hedge (1/2)

- **Buy call**
  - You gain exposure to vol spikes
  - Most “pure” hedge
  - Unlimited upside

- **Buy call spread**
  - Cheapens hedge
  - No risk (other than initial premium outlay)
  - Limited upside (although takes advantage of range-bound-ness)

- **Buy call spread collar (buy the call spread vs sell the put)**
  - Very cheap hedge (possibly take in a credit, depending on the strikes)
  - Downside tail risk if the market slowly rallies

Strategies – Hedge (2/2)

- **Sell put**
  - Take in premium
  - Very possible for market to rally (you make money on long position) AND put expires worthless
  - Short tail risk on the downside

- **Buy risk reversal (buy call/sell put); cheapens hedge**
  - Cheap (and highly-levered) hedge
  - Increased exposure to a market downturn/spike in vol
  - Short downside tail risk

- **Buy call vs selling put spread**
  - Cheap (and levered) hedge
  - Maintain unlimited exposure on the upside if vols spike
  - No downside tail risk to be short

Strategies – Prop

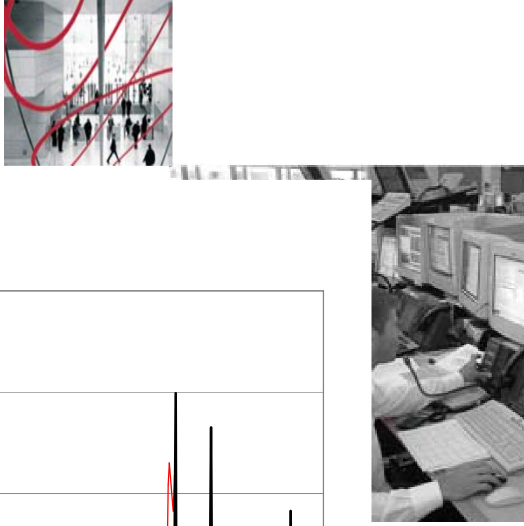
- **Sell straddle (buy upside call)**
  - Take advantage of mean reversion; usually used in 2-4 month range
  - Short tail risk if you do not buy the upside call

- **Buy 1x2 put spread**
  - Very cheap way to get short vol exposure
  - Limited tail risk on the downside; usually can be traded around
  - Ideal situation: market up 4-8%

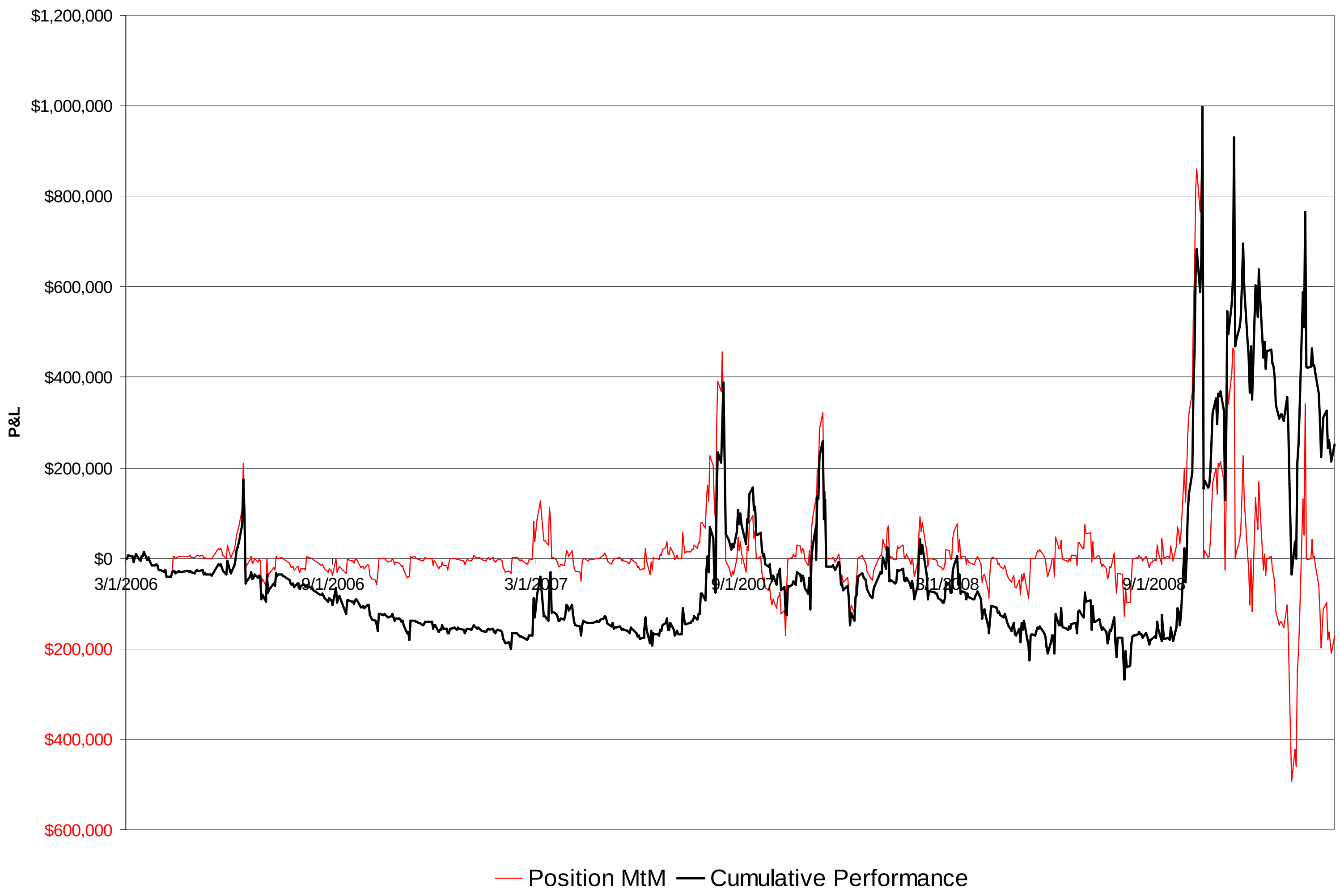
- **Sell iron butterfly (sell straddle to buy strangle)**
  - Take advantage of high vol of vol and VIX mean-reversion
  - No tail risk on either upside or downside
  - Excellent risk/reward with little chance to show big m-to-m loss

Pay-off Graphs for Common Strategies

- **Assumes trading 100 lots of strategy every day to smooth out trading levels.**
- **Trades are second listed maturity and listed strike closest to percent-strike of strategy.**
- **All positions closed one week prior to expiration.**



Long Second Expiry 115%/150% Call Spread Short 80% Put



Source: SG US Equity Derivatives Strategy

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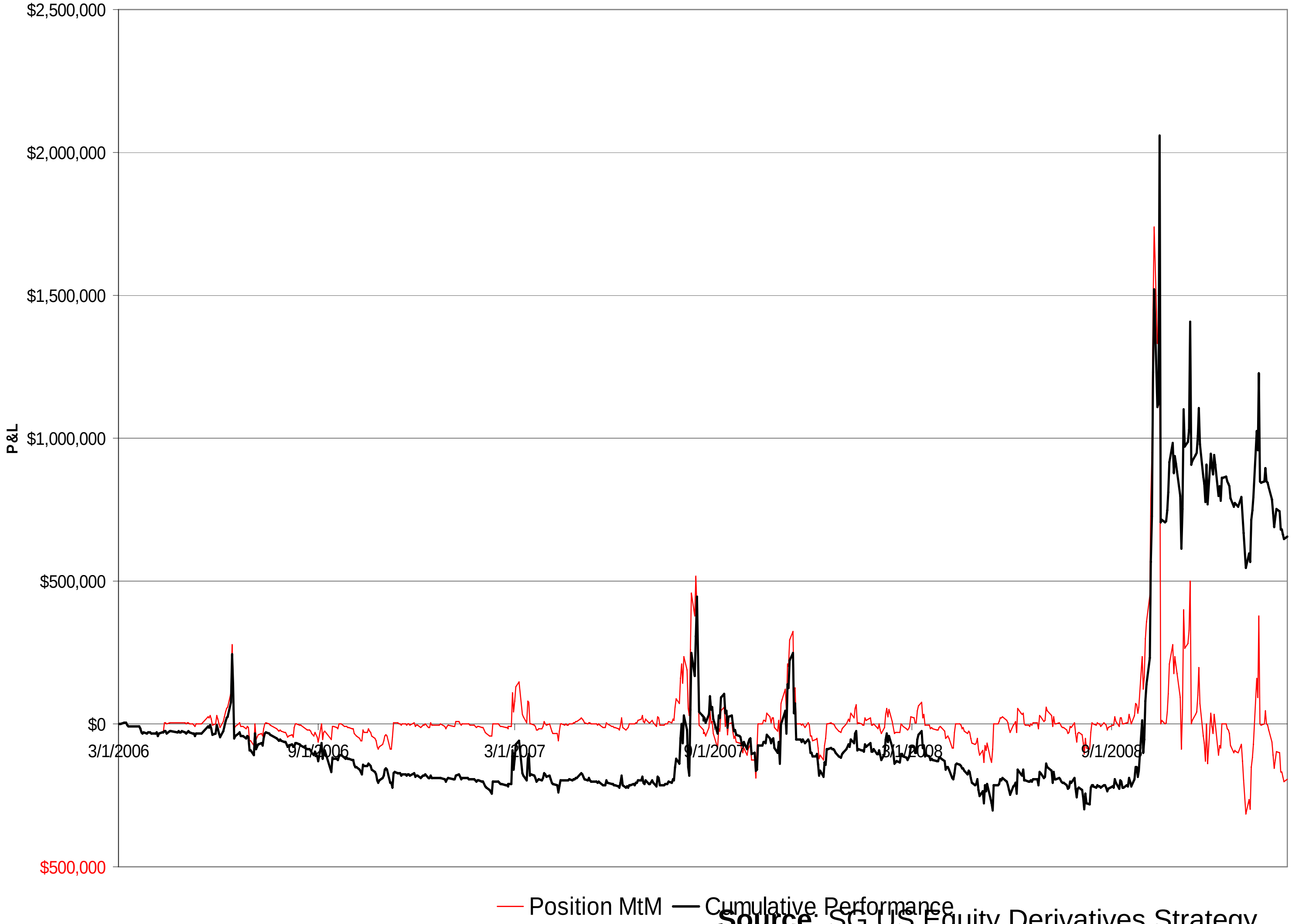
Long Second Expiry 130% Call Short 85%/75% Put Spread



Source: SG US Equity Derivatives Strategy

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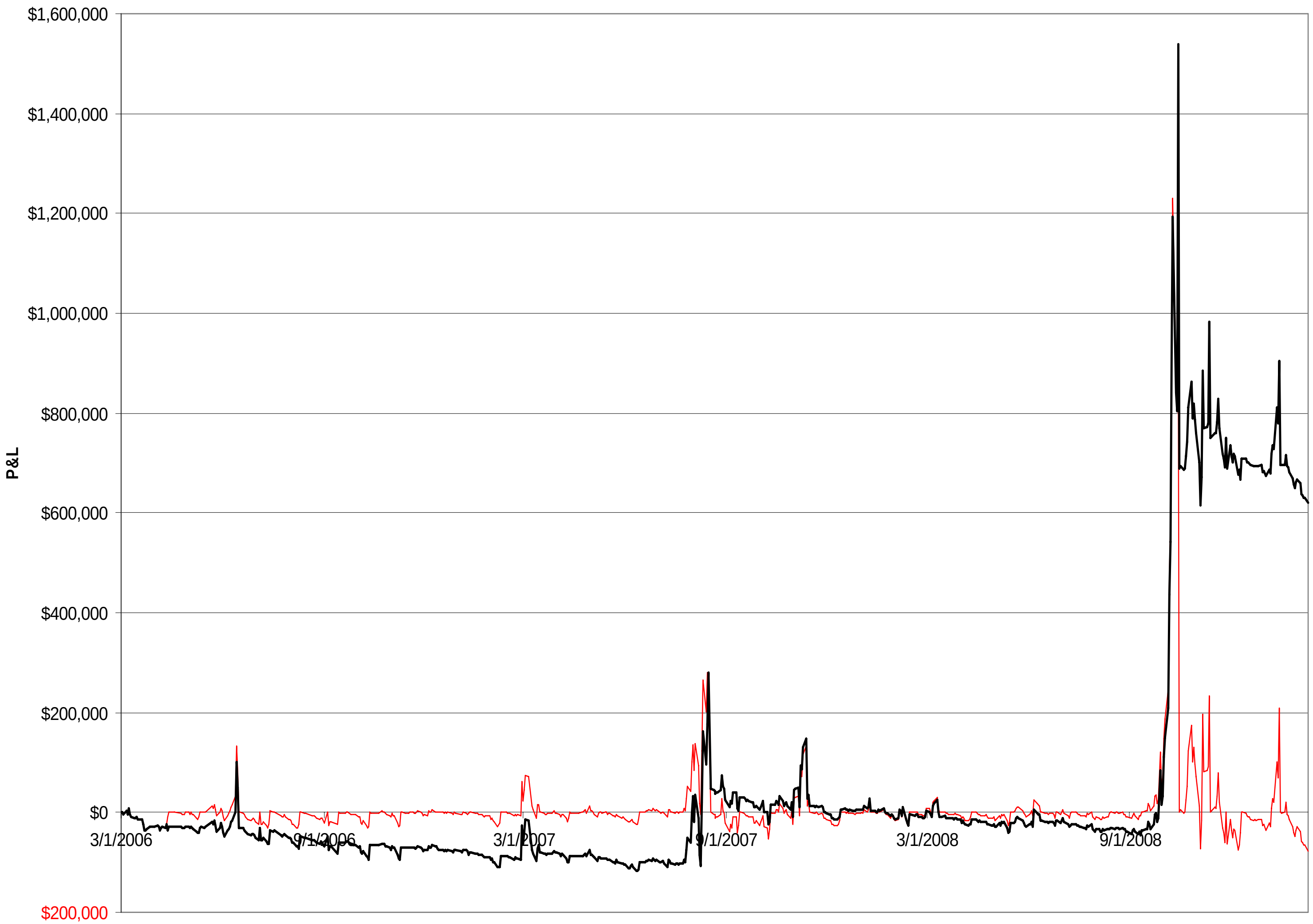
Long Second Expiry 150% Call



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Characteristics and Risks of Standardized Options
Options Disclosure Document

- **Please visit the hyperlink below to read a copy of the Options Disclosure Document. It explains the characteristics and risks of exchange traded options and must be read prior to buying or selling an option.**

http://www.optionsclearing.com/publications/risks/riskchap1.jsp

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