
Investment Analytics
Volatility Arbitrage Program
Program Description
1
Investment Analytics (Bermuda) Ltd
Canon's Court, 22 Victoria Street,
Hamilton, HM12, Bermuda
Tel: (212) 786-1781 Fax: (212) 208-2492
Email: jkinlay@investment-analytics.com

Disclaimer

All information herein is qualified in its entirety by the more detailed information contained in the Information for Investors and Due Diligence document. This brochure does not constitute an offer to sell or a solicitation of an offer to purchase any investment product. Any investment strategy described herein involves significant investment considerations and risks which are described in the Information for Investors and Due Diligence document. Each potential licensee should read the Information for Investors and Due Diligence document in its entirety and should carefully consider the risk warnings and disclosures set out therein before making any investment decision.

Past performance is no guarantee of future results.

While every effort has been made to provide data from sources considered to be reliable, no guarantee of accuracy is given. Contents of the brochure are subject to change and periodic revisions without prior notice.

Table of Contents

3

This presentation provides detailed information on the technologies underpinning the Investment Analytics Volatility Arbitrage Program.

More information about the Program can be found in:

1. The Strategy Presentation
2. The 2-page Strategy Summary
3. The Zephyr Style Advisor Report
4. The Detailed Strategy Analysis
5. The Due Diligence Questionnaire

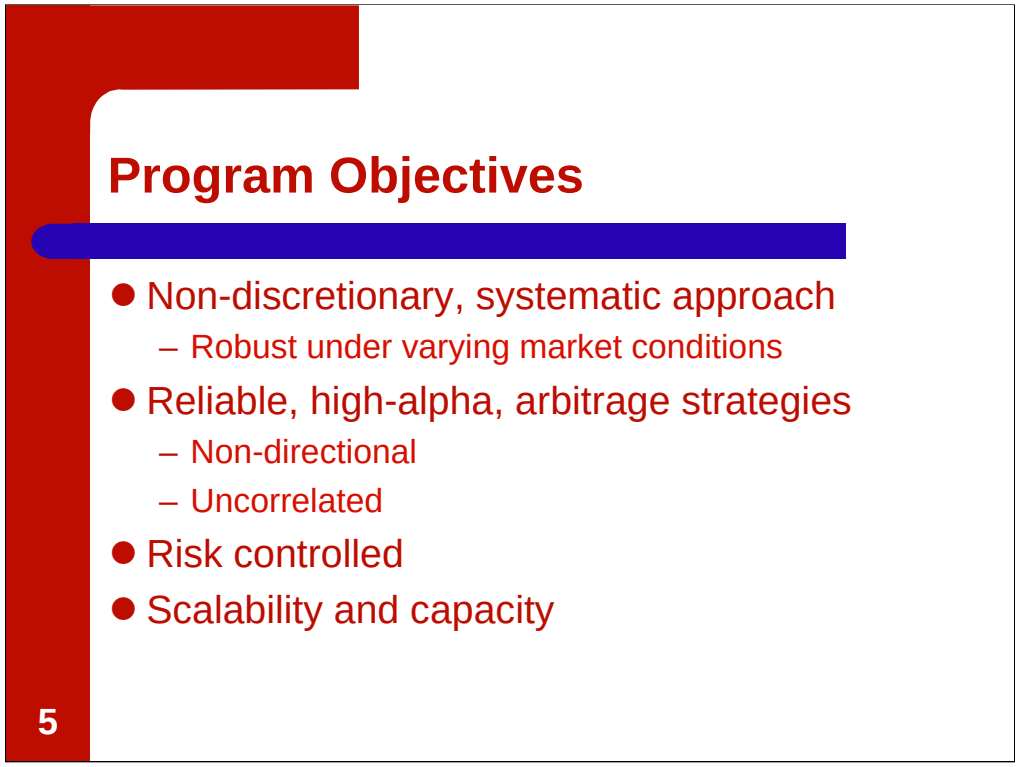
All of the above are available on the web site at www.investment-analytics.com

Origins

"Using the power of computational econometrics to navigate financial markets."

4

Jonathan Kinlay founded the investment research and consultancy firm Investment Analytics in 1998. The firm provides independent research focusing on applications of sophisticated mathematical and financial modeling techniques to problems of strategy development and repair, performance analysis and risk management for clients in the investment management industry in Europe and North America. Investment Analytics has developed a highly successful proprietary investment program based on sophisticated econometric models that are used to forecast asset volatility and identify option arbitrage opportunities. The program was licensed to the hedge fund Caissa Capital, which Mr. Kinlay founded in 2002, before going on to found the Proteom Fund in 2004.



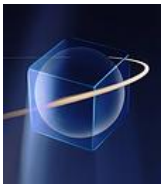
The Volatility Arbitrage Program, is built on econometric models that produce exceptionally accurate forecasts of future asset volatility, with a proven track record of exceptional investment performance. The program uses a non-discretionary, systematic approach that is independent of trader capability and other idiosyncratic factors and has demonstrated its robustness and reliability under a wide variety of market conditions.

Arbitrage strategies developed using the Program are non-directional strategies have proven themselves to be reliable, high-alpha generators that are uncorrelated to the market.

Because the program is systematic in its approach it can be scaled very rapidly. The Program has been successfully implemented in markets with capacity running into $billions.

Arbitrage Program Platform

- Econometric Models
- Data Management System
- Model Management System
- Portfolio Management System
- Trade Sheets
- Risk Management System



6

The Program is based on advanced econometric models developed on the basis of proprietary research carried out since 1996. The models are used to produce forecasts of future volatility of exceptional accuracy. There are a number of **different classes of model** which focus on different aspects of volatility behavior and which perform better under different market conditions.

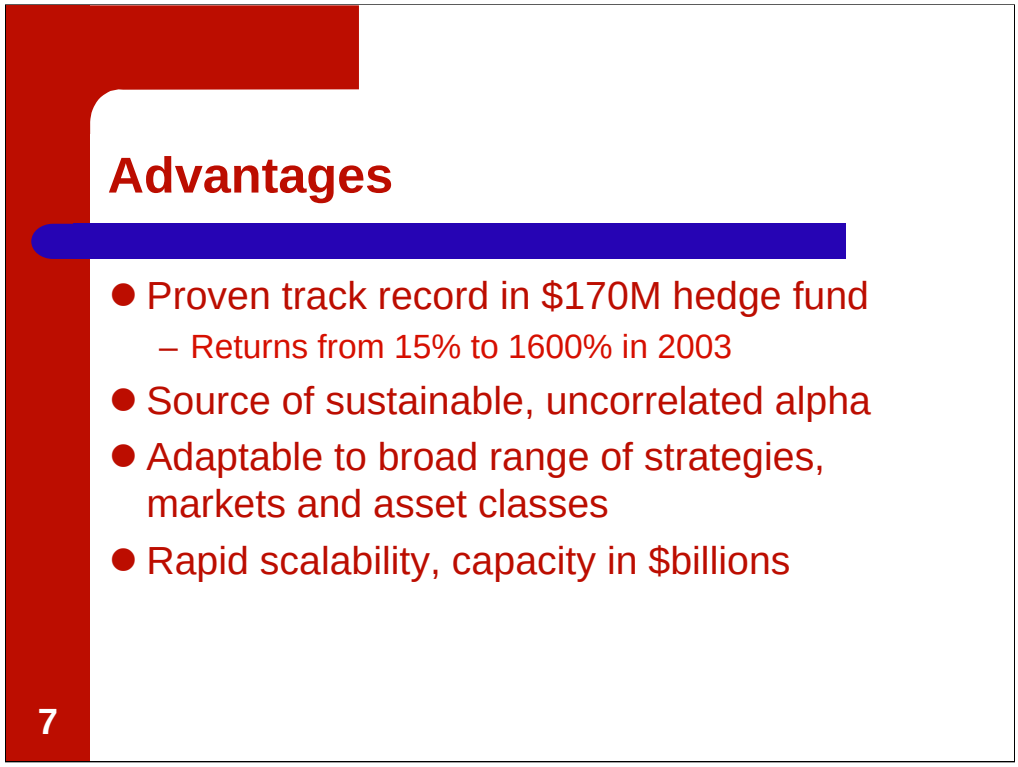
The **Data Management System** automatically downloads end-of-day information on the assets in the investment universe in which the Program is implemented. For the S&P500 strategies this dataset comprises stock and option price data for options with maturities of up to sixty days ahead. The data is cleaned and prepared for input to the Model Management System.

The **Model Management System** takes the output from the Data Management System, updates all of the models and evaluates their current performance using a complex grading system. This ensures that the models which are operating most successfully under current market conditions are given the greatest weighting. The MMS then produces a volatility forecast for each asset.

The **Portfolio Management System** inputs the volatility forecasts into proprietary option pricing models, produces estimates of the theoretical value of each option, and identifies those which are significantly rich or cheap. It then uses sophisticated multivariate econometric techniques to construct volatility portfolios which have stable risk/return characteristics which meet the investment criteria.

This process results in a daily **Trading Sheet** containing detailed, specific recommendations of all of the options to be purchased or sold, the quantities and the target price.

Finally, at the end of each day the entire portfolio is loaded into our **Risk Management System** for evaluation. The risk management system identifies the overall risk of the portfolio and determines the recommended hedging action required to ensure that the strategy continues to operate within risk management guidelines.



•The Investment Analytics Volatility Arbitrage Program was implemented in the Caissa Capital LP fund in 2002 and provided the basis for the Strategic Volatility Fund, which returned over 15% in 2003, and the Volatility Opportunity Fund, which returned over 1550% in 2003.

•Detailed analysis of the results produced by these strategies demonstrate that the alpha is sustainable under varying market conditions and is correlated with the market.

•The Program is highly adaptable and can be applied in different strategies (e.g. convertible arbitrage), markets (e.g. European equities) and asset classes (commodities, currencies).

•The strategy is highly automated and independent of idiosyncratic factors such as trading expertise. It can there be scaled very rapidly and offers capacity ion the $billions.

Experience

- Jonathan Kinlay, PhD
  - CEO of Proteom Capital Management Ltd.
  - Founder & GP of $350M Caissa Capital fund
  - Managed $50M hedge fund for 7 Years
  - Founder, Investment Analytics
  - PhD Graduate Economics
  - Adjunct Professor, New York University
- Chris Rosevear, PhD
  - PhD Graduate Economics
  - 15 years as financial analyst
    - AG Becker, NatWest, Citibank
  - Technical consultant, MCSE qualified

8

Jonathan Kinlay has been involved in investment management since the early 1980's initially with Natwest and Chase Manhattan banks and then as a Director of a European hedge fund. More recently, in 2002 he founded the Caissa Capital hedge fund which had $3500M under management in its volatility arbitrage strategies when Mr Kinlay left to establish Proteom in 2004.

Chris Rosevear began his professional career as a corporate finance analyst at AG Becker in New York before moving to Natwest in London. He worked in treasury management at Citibank from 1983-1986 before going on to establish his own consulting firm, Finance Technique 2000 Ltd.

Jonathan Kinlay and Chris Rosevear initially worked together from 1983 to 1985 at NatWest and subsequently on various consulting projects over the last 20 years.

Key Investment Concepts

- Returns are non-Gaussian
- Volatility is stochastic
  - Varies over time
  - Predictably
  - With ‘long memory’
- Portfolio Construction
  - Cointegration
- Risk Management
  - Hedging extreme event risk

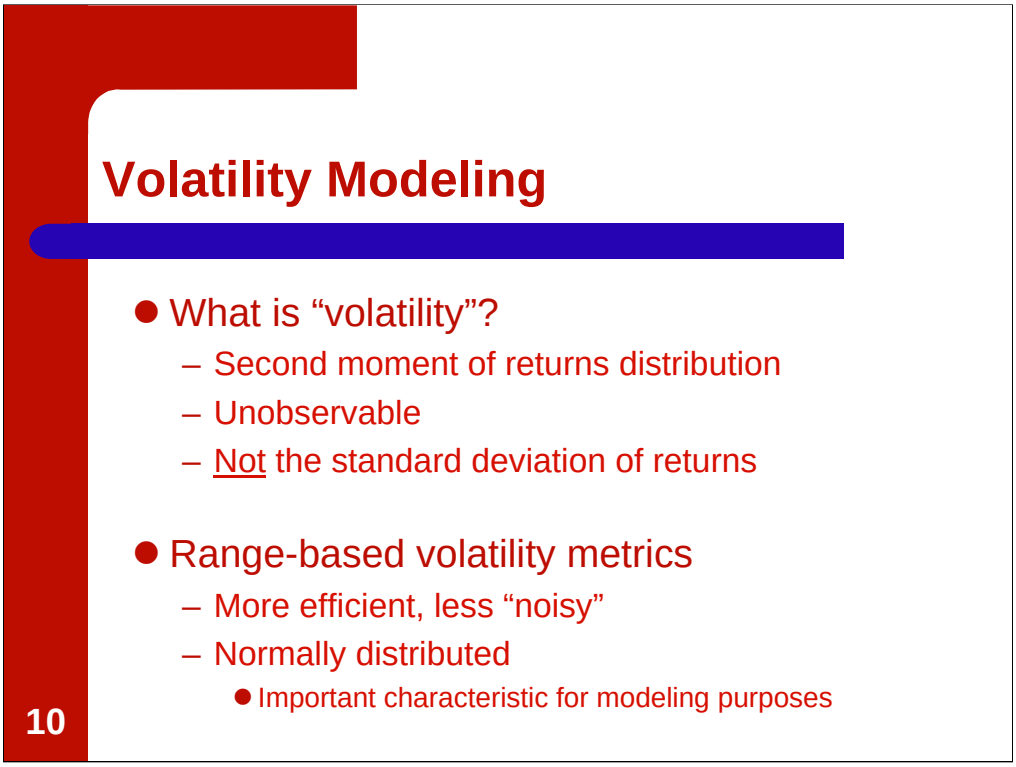
9

There is little point in seeking sources of sustainable alpha using Gaussian models which we know provide a poor fit to the empirical behavior of financial markets.

Traditional option pricing models fail to incorporate important information about the stochastic behavior of volatility, in particular its “long memory” behavior which causes it to behave much more predictably that asset return processes.

In terms of portfolio construction, things have moved on a long way from the 1950’s mean-variance optimization approach introduced by Markowitz. The concept of cointegration, developed by Nobel prize winning economist Clive Granger, provides a more modern and effective approach to constructing portfolios which has stable risk-return characteristics across a wide range of market conditions.

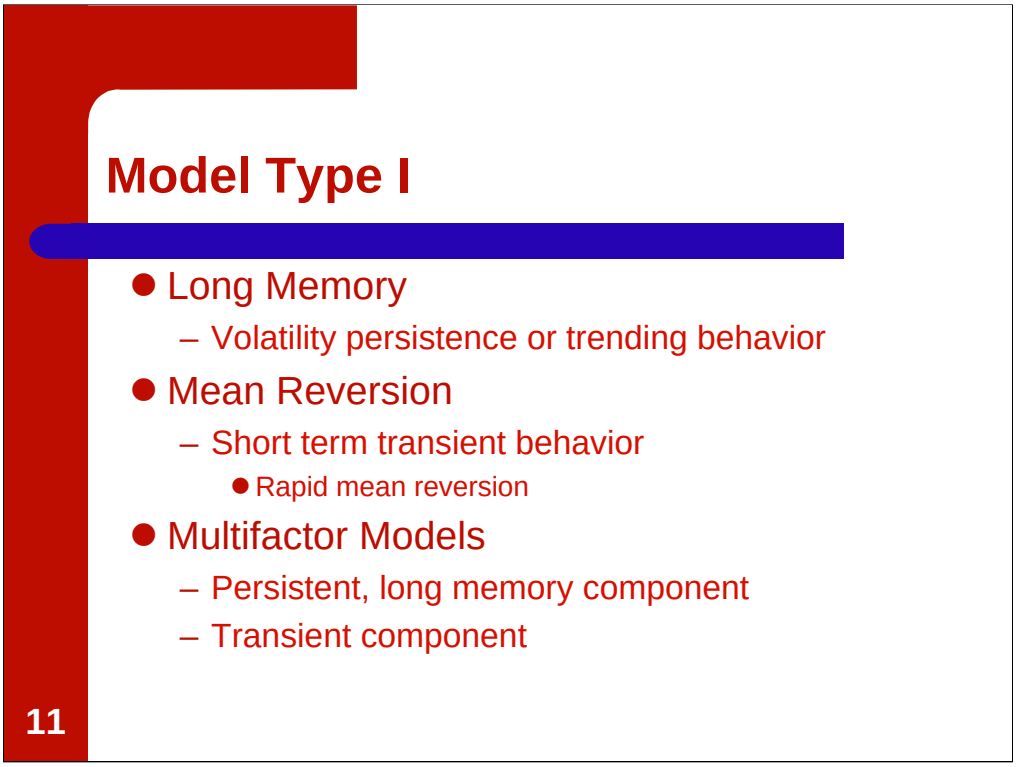
Finally, in terms of Risk Management, the traditional VaR methodology, while useful, is not enough. We know that risk management techniques that rely on unstable correlation are liable to break down during extreme market conditions, when the are most needed. Investment Analytics uses a risk management technique specifically developed for hedging extreme event risk.



Volatility is the second moment of the returns distribution. Unlike asset returns, it is unobservable both before and after the event.

The standard deviation of returns is NOT volatility - it is an *estimator* of volatility, and a very noisy one at that. It contains of great deal of measurement error. So a lot of what people are estimating and trading is not volatility – it’s noise.

These facts have been recognised since the 1970’s and attempts have been made by Parkinson, Garman and Klass and others to come up with estimators that are more efficient than standard deviation. It is only very recently that the math has been done to enable us to identify the optimal volatility metric, the one used by Investment Analytics. This metric, which is based on price ranges, is around 3x more efficient than standard deviation. This gives Investment Analytics an information advantage even model the modeling process begins – we are all looking through a “cloudy glass” at an unobservable process, its just that the clear we use is significantly less opaque. Another advantage is that, unlike standard deviation, the Investment Analytics metric is Normally distributed – about the only truly Normally distributed process in finance! As a result modeling procedures are much easier and more efficient.



The Investment Analytics Arbitrage Program operates on a ground-up approach with several different individual models for every asset in the investment universe. Each model emphasizes different aspects of volatility behavior and will perform best under different market conditions. The types of model include:

- **Long memory models** that model the important long term serial autocorrelation effects which are pervasive in asset volatility processes. These models perform best when the behavior of the process is dominated by reinforcing trends, such as applied in the period from 1995–1999 and from 2003–mid 2004 in US equity volatility markets.
- Short term models that capture transient **mean-reverting behavior** another important characteristic of volatility. These models typically give rise to contrarian trading recommendations.
- **Multifactor models** that model the interaction of long memory and transient volatility processes.

Model Type II

- Skewness and Kurtosis Models
  - Interaction between the volatility and returns process
- Asymmetry Models
  - Captures important asymmetry effects
- Markov State Models
  - Multiple “regimes” of volatility
  - Transition probabilities

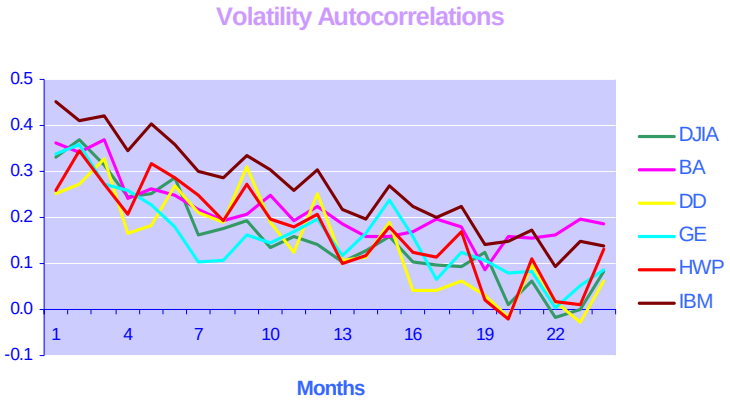
12

•Models that follow the interaction and feedback between the asset returns and volatility processes, which give rise to **skewness and kurtosis** in the returns process.

•**Asymmetry models** that take account of the tendency of volatility to spike more during market sell-off than during periods when the market is strong.

•**Markov models** that identify different volatility regimes and associated state transition probabilities.

Volatility Long Memory

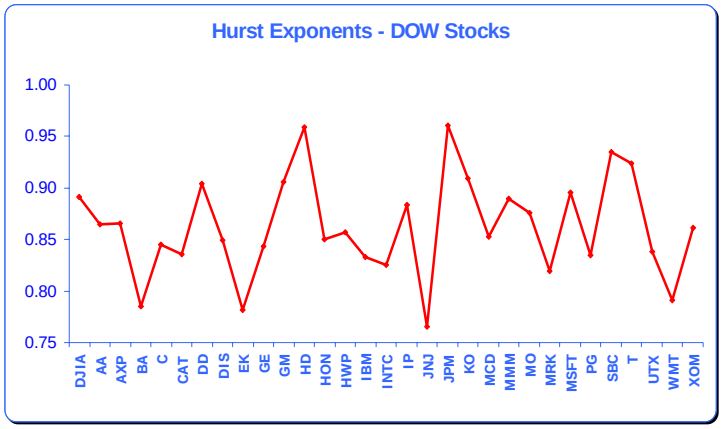


13

The conditional distribution of asset volatility has been the subject of extensive empirical research in the last decade. The overwhelming preponderance of evidence points to the existence of pronounced long term dependence in volatility, characterized by slow decay rates in autocorrelations and significant correlations at long lags (e.g. Crato and de Lima, 1993, and Ding, Granger and Engle, 1993).

Andersen, Bollerslev, Diebold and Ebens, 2000 find similar patterns for autocorrelations in the realized volatility processes for the Dow 30 stocks - autocorrelations remain systematically above the conventional Bartlett 95% confidence band as far out as 120 days. Comparable results are seen when autocorrelations are examined for daily log range volatility, as the chart illustrates. Here we see significant autocorrelations in some stocks as far back as two years.

DOW Stock Volatility – Long Memory



14

Tests for long range dependence were initially developed by Mandelbrot using a refined version of a test statistic, the Rescaled Range, initially developed by English hydrologist Harold Hurst (1951). Madelbrot and Wallis (1969) use the R/S statistic to detect long range dependence in the following way. For a random process there is scaling relationship between the rescaled range and the number of observations n of the form:

$R/S(n) \sim nH$ where H is known as the Hurst exponent. For a white noise process $H = 0.5$, whereas for a persistent, long memory process $H > 0$. The difference $d = (H-0.5)$ represents the degree of fractional integration in the process.

Here we estimate Hurst exponents for the volatility processes of the Dow 30 stocks and find estimates of H in the region 0.75-0.95. These are **VERY** persistent long-memory processes.

Multifactor Models

- Transient (h_t) & long term (q_t) components
- Volatility asymmetry (δ)

$$\ln h_t - \ln h_{t-1} = k_h(\ln q_{t-1} - \ln h_{t-1}) + \phi_h X^D_{t-1} + \delta_h R_{t-1}/h_{t-1}$$

$$\ln q_t - \ln q_{t-1} = k_q(\vartheta - \ln q_{t-1}) + \phi_q X^D_{t-1} + \delta_q R_{t-1}/h_{t-1}$$

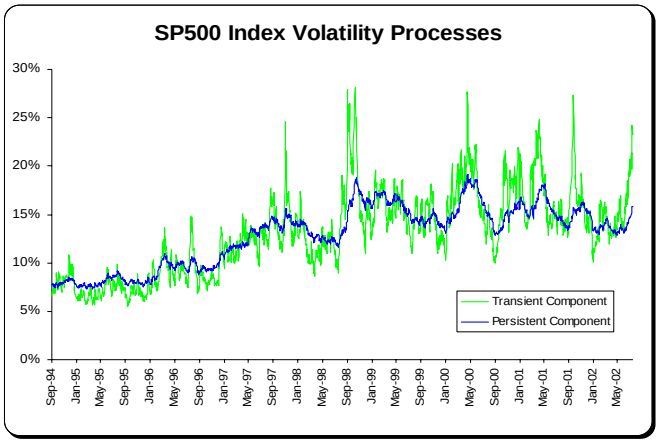
15

This is an example of one of the two-factor models we use in the modeling system. It is a two factor model combining long term (trending) man volatility with short term, mean reverting, transient volatility.

ln *qt* can be interpreted as a slowly-moving stochastic mean around which log volatility ln *ht* makes large but transient deviations (with a process determined by the parameters kh, fh and dh).

The parameters q, kq, fq and dq determine the long-run mean, sensitivity of the long run mean to lagged absolute returns, and the asymmetry of absolute return sensitivity respectively.

Two-Factor Model for SP500 Index



16

This is an example of a two-factor model of S&P500 index volatility. Notice the slow-moving long term stochastic mean process (in blue) which tends to trend. Around is oscillates the short term transient process (in green) which tends to mean revert with a half life of a few days.

Model Management System

- MMS updates each model daily
  - 800+ models in total!

- Rates model performance
  - Around 30 statistical criteria
  - Current vs. historical performance for each model
  - Relative performance of each model
  - Regime shift detection
- Produces forecasts
  - Automatically biases in favor of best performing models
  - Makes system very robust to changing market conditions

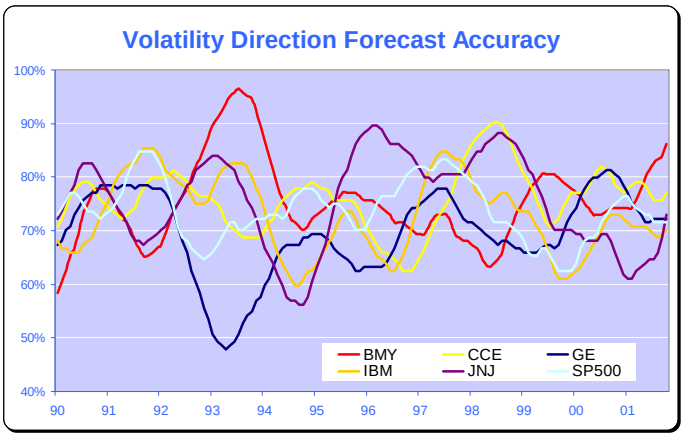
17

There are between 4-6 models for each stock. With 200 stocks in the investment universe, there are in excess of 800 models in total.

The models are maintained by a Model Management System ("MMS") that analyses the data processed by the data management system, updates each of the models, produces current forecasts and evaluations the performance of each of the models. The MMS rates each model on the basis of approximately 30 different criteria and compares the current performance of each model with its historical performance, with the performance of other models of the same process and with the performance of models for other asset processes. The MMS then selects the best models, whose aggregate results lie in the upper quartile of performance. In this way the system automatically biases volatility forecasts to favor models best suited to current market conditions, while filtering out models which are currently performing with lower accuracy.

Note that, in addition to the forecasting models, there is a class of models whose purpose is to detect regime shifts in the underlying volatility processes. Regime shifts may occur as a result of, for instance, merger activity, new product launches, or large-scale changes in the firm's capital structure. They may also occur across entire markets, as happened in Asian markets in 1997. Our models detect these kind of changes very quickly and reliably: for instance they have detected regime shifts in stocks like IBM in the mid-1980's when the IBM PC was launched; also automotive stocks in the early 1980's at the time of the Chrysler bail-out; and in banking stocks during the Latin-American debt crisis of the late 1980's. More recently, they identified regime shifts in the technology sector in the mid 1990's and again in 2000. Various complex econometric procedures are applied to examine and adjust models for volatility processes which have undergone a regime shift. The regime-shift detection procedures make the entire methodology much more robust and reliable than most stat. arb. systems.

Volatility Forecasting



18

There are approximately 30 different criteria used to asses the performance of each model. The Model Management System uses an adaptive weighting system to evaluate these criteria and judge their relative importance. An overall performance "score" is produced which is used to compare the performance of each model against its historical performance and against its peers.

The criteria break down into two broad categories: measures of forecasting performance and measures of statistical goodness of fit. Both sets of criteria are important, but greater weight is assigned to forecasting performance in assessing the overall model performance. The single most important model criterion is direction prediction accuracy, as this closely correlates with strategy performance. The direction prediction criterion measures the ability of the model to forecast the direction of the underlying process one period ahead. A random predictor would expect to achieve a DP score of 50%. The Investment Analytics models achieve a DP accuracy level of close to 75%, across all assets and time periods. This means that, on average, the models correctly predict the future direction of volatility three periods out of four.

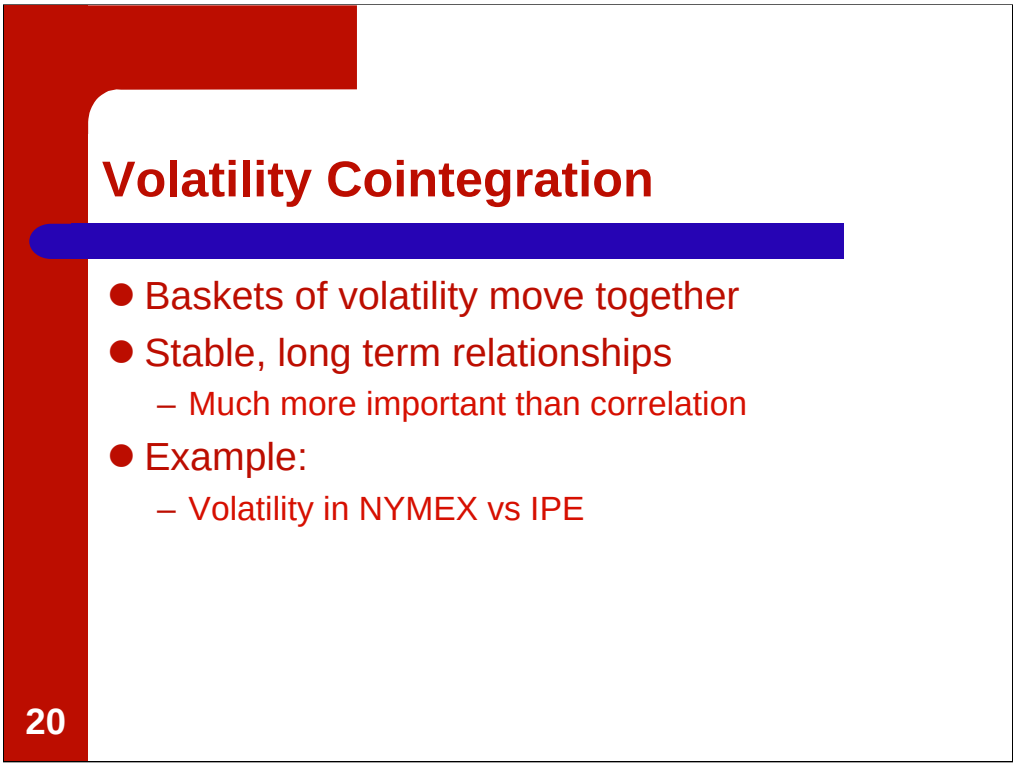
Portfolio Construction

- Proprietary, multi-factor option pricing models
  - Stochastic volatility
  - Long memory, mean-reversion and asymmetry
  - Skewness, kurtosis
  - Interaction between returns and volatility
- Cointegration Analysis
  - How volatility processes "correlate"
  - Long/short volatility "baskets"
    - Stable risk/return characteristics
    - Cointegrating vectors determine allocations
  - Genetic algorithms used to select baskets

19

The Portfolio Management System uses the volatility forecasts output from the Model Management System as input to proprietary option pricing models. These are sophisticated multi-factor models that use Monte-Carlo simulation and take into consideration the stochastic nature of volatility, long memory and mean reversion effects in the volatility process and also skewness, kurtosis and asymmetry effects in the return distribution. The models also take account of complex interaction between the returns and volatility processes.

The PMS then looks at the multivariate behavior of the volatility processes of the various assets in the investment universe and looks for cointegrated baskets of assets which have stable risk/return characteristics. Genetic algorithms are then applied to identify baskets which most closely match the required investment objectives of the strategy.



The concept of cointegration was due to Nobel prize winning economist Clive Granger in the 1990's. It is best illustrated by means of an example. Consider the prices series of a spot and futures contract on a commodity such as gold. Both series are non-stationary – the prices of gold can vary anywhere between $200 and $800 an ounce (or higher). If fact the series are integrated order 1, meaning that the first difference of each series (i.e. the returns process) is a stationary white noise process. Non-stationery series are, understandably, very difficult to trade profitably.

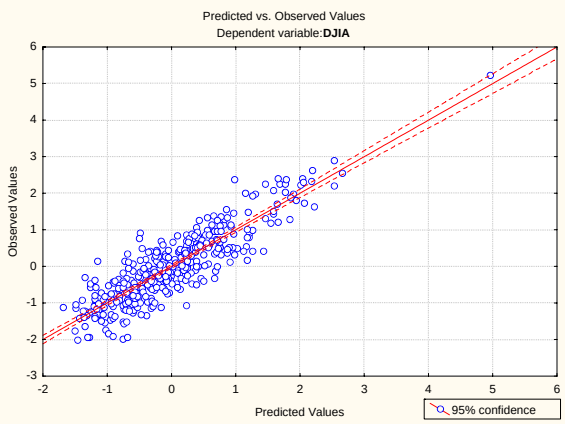
Now consider a series consisting of the differential between the spot and futures prices, i.e. the Basis. This too is a stochastic process, but unlike the price series it is stationary – it fluctuates inside a range. The reason for this behavior is of course that cash and carry arbitrage obliges the basis to remain within bounds. In this example, we would say that the spot and future price series are cointegrated order 1. There are two important points to note. The first is that cointegrated "baskets" such as the Basis in the above example, are inherently more stable, and hence easier to trade, than the underlying non-stationery price processes. The second point is that cointegration relationships tend to be more reliable than correlation relationships because they relate to some underlying economic factor (cash and carry arbitrage, in the example). Hence portfolios constructed using the principles of cointegration will tend to have more reliable risk/return characteristics than portfolios constructed using classical portfolio theory, which is based on (unstable) correlations.

During the portfolio construction stage the modelling system decides on the amounts of capital to the available arbitrage opportunities. The system examines the multivariate behaviour of the volatility processes and identifies cointegrated baskets, comprising long and short volatility positions that typically have more stable risk-returns characteristics than the individual underlying processes. The procedure is comparable to the mean-variance optimization procedure due to Markovitz, but is significantly more sophisticated. The resulting baskets or portfolios tend to have more stable and robust performance characteristics that portfolios constructed in the traditional way using correlations, as the latter are notoriously unstable, especially during market crashes.

The cointegrated baskets identified by the system as tested by a simulation processes to ensure that their performance characteristics meet the minimum criteria and behave robustly under varying market conditions. A genetic algorithm is employed to select the most appropriate baskets for trading.

Dow Cointegration Model

- DJIA
  - DD
  - GE
  - IP
  - MMM
  - MRK
  - UTX
  - XOM
- R^2 = 78%

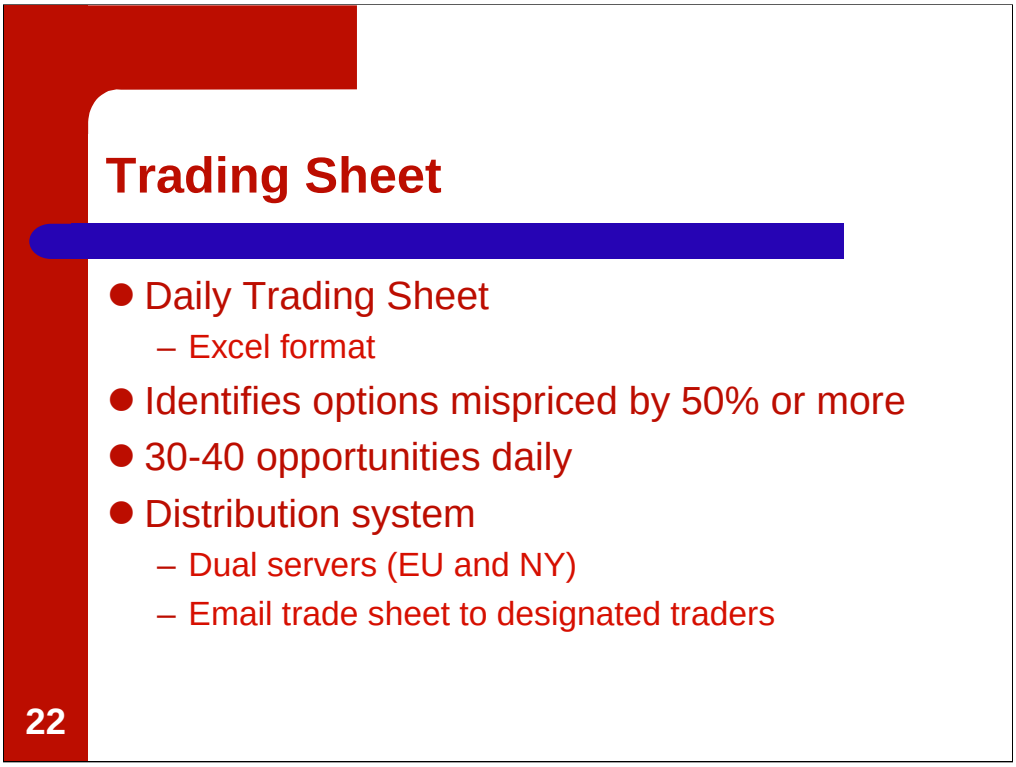


21

Cointegration is important because it suggests the possibility of constructing volatility portfolios with stable behavioral properties, which is clearly desirable for investment purposes. The regression relationship is statistically highly significant. The adjusted R2 of 78% indicates that a substantial proportion of the variation in Dow index volatility is explained by variation in the log-range of these seven constituent stocks.

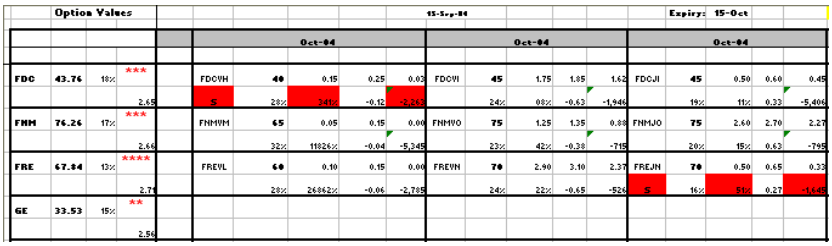
In other words, we can construct a cointegrated basket comprising the volatility processes of these constituent stocks and, if we wish, hedge that portfolio using Dow options. This is a more sophisticated approach to the familiar dispersion trading strategy.

In the Investment Analytics strategies the system identifies similar cointegrated volatility baskets and creates the overall portfolio by combining them in a sensible way.



The final stage of the modelling process entails the creation and distribution a trading sheet containing the detailed trading recommendations. The sheet gives the current volatility forecast for every stock in the investment universe, but highlights only those option trades which meet the pricing differential criterion. Options that have been selected for purchase (sale) are highlighted in blue (red), and the sheet gives the market bid and offer prices and the theoretical price based on the systems volatility forecasts. In addition, the output shows the quantity of options to be bought or sold, the % price differential and the option delta, so that trades can readily be executed on a market-neutral basis. Trading sheets are contained in an Excel workbook, which is emailed by an automated email server to a specified list of email recipients, usually members of the trading and risk management teams.

Trading Sheet - Example



Option Values				15-Sep-04					Expiry: 15-Oct					Expiry: 15-Oct			
				Oct-04					Oct-04					Oct-04			
FDC	43.76	18%	***	FDCVH	40	0.15	0.25	0.03	FDCVI	45	1.75	1.85	1.62	FDCJI	45	0.50	0.60	0.45
			2.65	S	28%	341%	-0.12	-2,260		24%	08%	-0.63	-1,946		19%	11%	0.33	-5,406
FNM	76.26	17%	***	FNMVM	65	0.05	0.15	0.00	FNMVO	75	1.25	1.35	0.88	FNMJO	75	2.60	2.70	2.27
			2.60		32%	11826%	-0.04	-5,345		23%	42%	-0.38	-715		20%	15%	0.63	-795
FRE	67.84	13%	****	FREVL	60	0.10	0.15	0.00	FREVN	70	2.90	3.10	2.37	FREJN	70	0.50	0.65	0.33
			2.71		28%	24862%	-0.06	-2,765		24%	22%	-0.65	-526	S	16%	51%	0.27	-1,645
GE	33.53	15%	**															
			2.56															

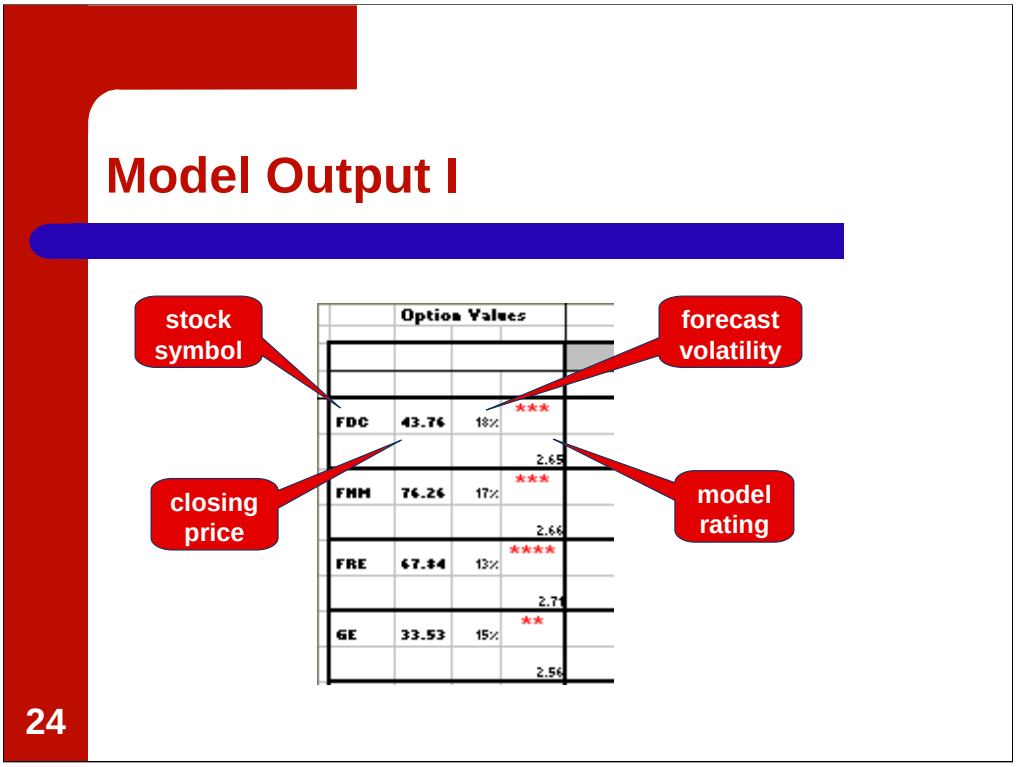
23

This is an example of a typical daily trading sheet. The sheet is created in Excel format (other formats are possible) and emailed to a chosen list of traders and risk management. The model output may also be input directly into trading system for review and execution.

Each daily trade sheet shows the available opportunities to buy or sell options meet user-designated criteria which include:

- Minimum % difference between market and model prices
- Minimum $ option value

Recommended option trades which meet these criteria are highlighted in blue (buy) or red (sell), for each stock in the investment universe. The basic stock information is shown on the left of the trade sheet. Option information is shown across the page, with put option data on the left and call option data on the right.



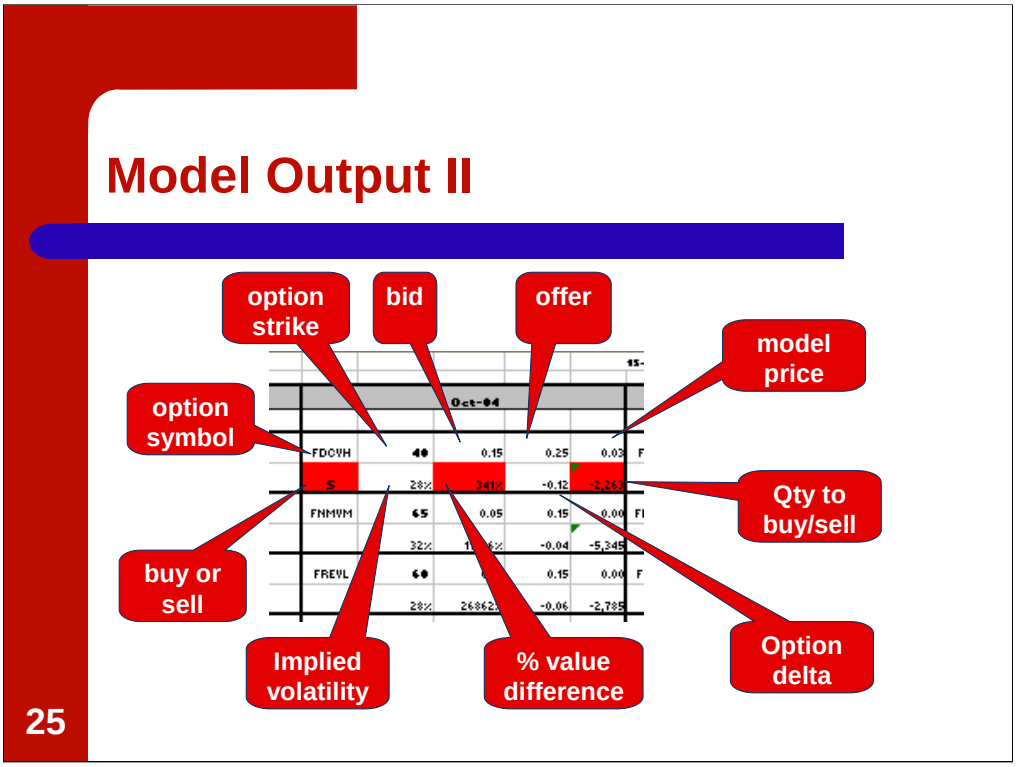
The basic stock information shown on the left of the trade sheet includes:

•**Stock symbol**

•**Closing price** (as of previous market close)

•**Forecast volatility** – this is the optimal model forecast of future volatility over the life of the option (typically 20-60 days).

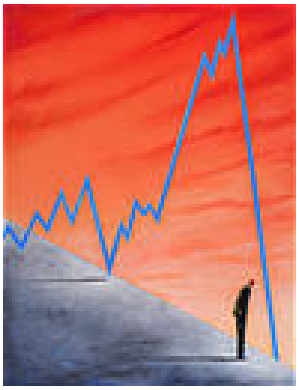
•**Model rating** – the current performance of each forecasting model is rated according to a complex grading system and translated into a simple “star” system for ease of reference. Only trading recommendations from three- and four-star models are included in he trade sheet.



Each option section of the trade sheet shows the following information:

- **Option symbol**
- **Option strike price**
- **Option bid price** – as of previous market close
- **Option offer price** – as of previous market close
- **Option model price** – the value of the option as computed by the arbitrage system using forecast volatility
- **Option implied volatility** – for an option sale opportunity this will be **higher** then the volatility forecast by the models. For an option buy opportunity it will be **lower** than the volatility forecast by the models.
- **% Value difference** – the percentage difference between the model price of the option and the option bid or offer price (depending on whether the opportunity is a sale or purchase).
- **Option delta** – allows the trader to easily delta-hedge each position
- **Quantity** to buy or sell

Risk Management



- Extreme Markets / Event Risk
  - Operate portfolio within Value-at-Risk limit
  - Stress test for 20% down move
  - CrashMetrics methodology to hedge tail risk
  - Diversification (across stocks, option maturities, multiple entry points)
- Volatility Risk
  - Stress test for 50% increase in volatility
  - Attempt to remain Gamma positive or limit negative Gamma
  - Buy cheap wing protection

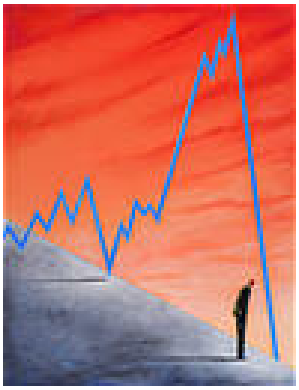
26

•The SVF portfolio is operated within a 1% daily VaR limit (95% confidence). The VOF portfolio is operated within a 20% daily VaR limit (95% confidence). There have been fewer than expected penetrations of that limit since inception.

•In addition the portfolio is stress tested for 20% market crashed to ensure that losses are within limits. The portfolio is very highly diversified across 300 stocks, with multiple option strikes and maturities. The degree of diversification is comparable to that of the entire S&P 500 index. We also use CrashMetrics specifically to hedge the tail risk in the portfolio.

•The portfolio is also stress tested for quantum leaps in volatility. We attempt to keep the portfolio Gamma neutral or positive in the wings and also Theta positive (which we achieve buy buying cheap Gamma and selling expensive Theta).

Risk Management



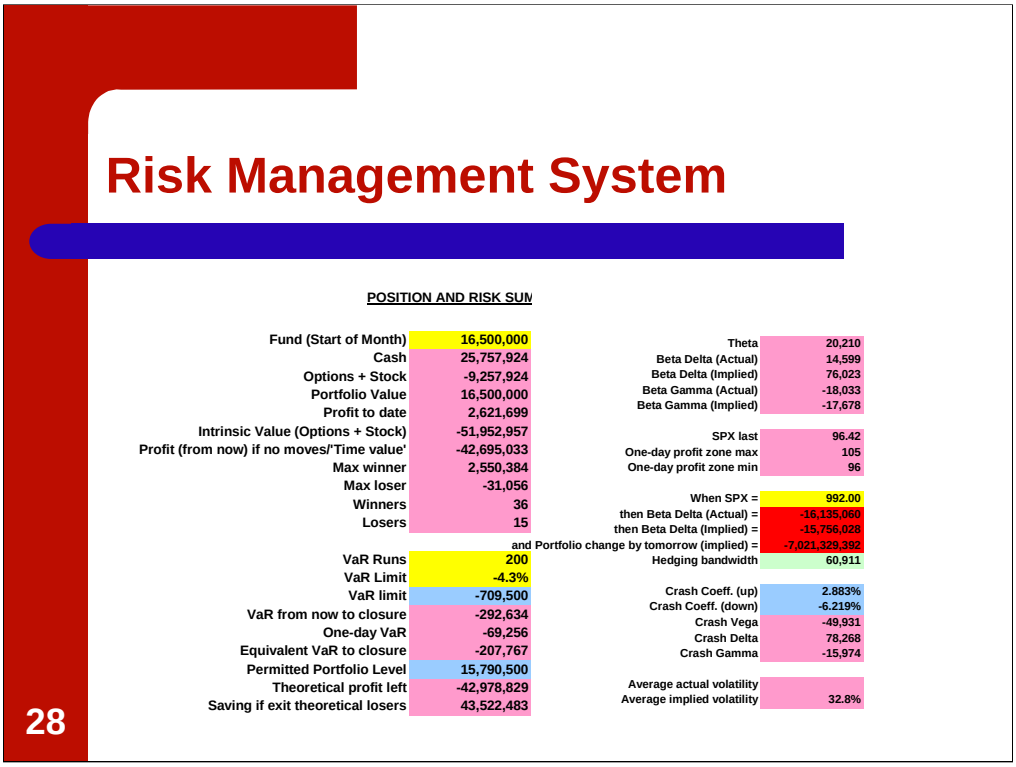
- Liquidity Risk
  - Screen stocks for liquidity
  - Invest in only most highly liquid SP500 names (plus SPX and QQQ)
  - Maximum allocation to any single stock is 4% of capital
- Execution Risk
  - Monitor earnings
  - Screen trades in stocks with M&A activity, FDA approvals, etc

27

•All of the stocks in the universe are screened to ensure adequate liquidity both in the options and underlying stocks (for hedging purposes). The allocation to any individual names is capped at 4% of capital.

•At the time of execution model recommendations are screened by experienced traders for event-specific risks such as earnings, FDA approval decisions, or merger activity.

Risk Management System



The Risk Management System uploads the entire portfolio at the end of each trading day and analyses a wide variety of risk factors. These tell the traders what hedging action is required to rebalance the portfolio to keep it close to delta-neutral (non-directional) and what the current re-hedging bandwidth is. This is usually calibrated to movements in an underlying index, such as the S&P500 index. The risk system also assesses the expected profitability of the current portfolio, the Value-at-Risk and the sensitivity factors ("Greeks"). It also identifies the exposure of the portfolio to market or volatility crashes and identifies the hedging action required to ensure that extreme market risk is contained within permissible levels.

The Risk Management System runs overnight and the output is emailed to traders and risk managers hours before the commencement of the next trading session. Specific hedging actions are highlighted and these are normally executed before any new trades are intiiated.

Profitability

•Intrinsic value
•Profit is no moves
•Theoretical profit (with delta hedging)
•Winners and losers
•$ Saving is exit losers

Value-at-Risk

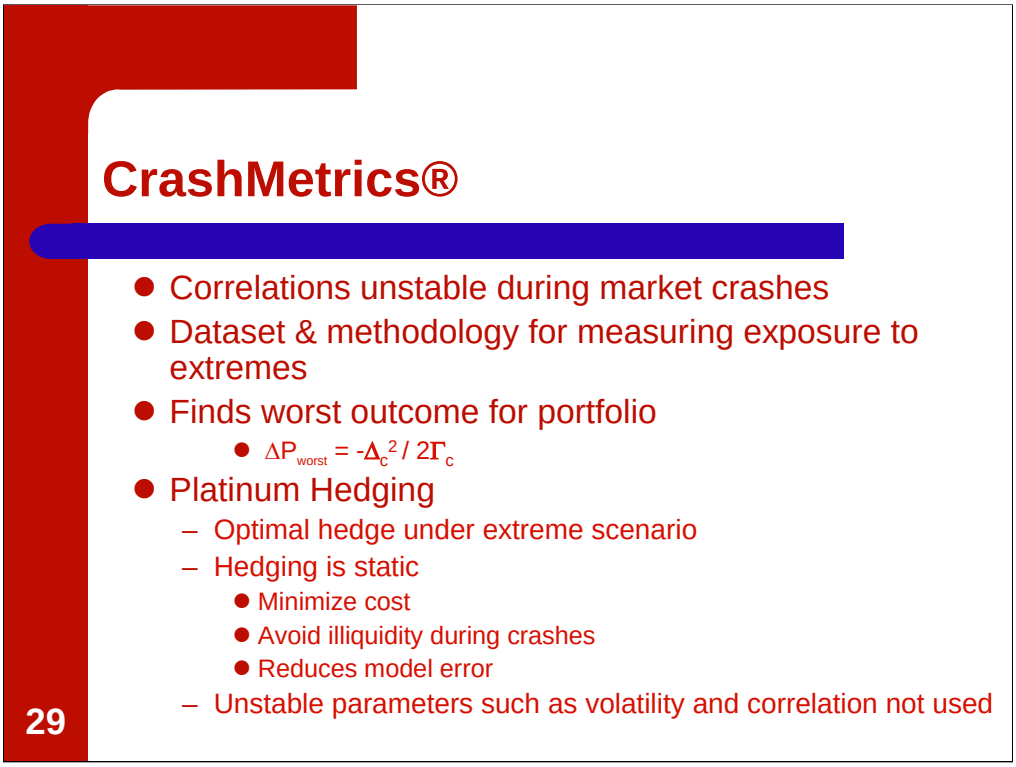
•VaR limit
•Current portfolio VaR
•VaR to expiration
•Current hedging bandwidth

Greeks

•Theta
•Delta (actual and implied)
•Gamma (actual and implied)
•Vega (actual and implied)
•Shadow Delta
•Shadow Gamma

Crash Risk

•Crash Kappa
•Crash Vega
•Crash Delta
•Crash Gamma



Correlations tend to 1 during market crashes, which negates the benefits of diversification for hedging purposes. It also means that VaR assessment is likely to be too low.

Investment Analytics uses a new approach to extreme risk management called CrashMetrics. This is like CAPM for crashes: we look at extreme days in the market and how each stock performed on those days. By regressing the excess return on the stock against excess returns on the index for those days we can estimate an "extreme beta", which we call a crash Kappa. This measures the sensitivity of a particular stock to a market crash. Kappas can vary significantly from ordinary betas. For example, P&G, which has a beta around 1, has a crash Kappa of around 1.7, one of the highest in the investment universe. In other words, P&G is a great stock to be long volatility in during market crashes!

Just as with betas, we can estimate the overall portfolio crash Kappa as the weighted average of the individual stock Kappas. This tells us how much the portfolio will lose in a market crash.

The final step in the process is to hedge the crash risk using a Platinum Hedge.

This is a combination of options which provides the required level of protection for least cost. Notice some advantage of this approach compared to other hedging approaches :

•The hedge is static, and doesn't require rebalancing as a crash is happening

•The hedge is ex-ante, "fire-and-forget" – it doesn't require markets to remain open during a crash episode

•This is a "worst case" approach to hedging, which consequently provides a lot of margin for error

•There is no dependency on unstable model parameters like correlations. Crash Kappas are typically very stable, much more so that CAPM Betas, as the regression correlations are considerably higher.

Summary

- Unique quantitative approach
  - Advanced proprietary econometric models
  - Sophisticated model management
  - Portfolio constructed using latest econometric theory
  - Built-in crash protection
- Proven track record
- Experienced, capable team

30

Further Information

- Web Site: www.investment-analytics.com
- Go to the web site for:
  - Technical Presentation
  - Two Page Strategy Summaries
  - Zephyr Style Advisor Reports
  - Detailed Strategy Analysis
  - Due Diligence Information
  - Offering Documents

31

Contact

Investment Analytics (Bermuda) Ltd

Canon's Court, 22 Victoria Street, Hamilton HM12, Bermuda

Americas	Europe
Jonathan Kinlay Phone: (212) 786 1781 Fax: (212) 208-2492 Cell: (646) 250-5883 Email: jkinlay@investment-analytics.com	Christopher Rosevear Phone: +44 (0) 207 681 1714 Fax: +44 (0) 1256 393 051 Cell: +44 (0) 7785 330050 Email: crosevear@investment-analytics.com

32

Notes

1. Returns include the reinvestment of dividends, capital gains and other earnings.
2. Nothing herein should be construed as a solicitation of clients, or as an offer to sell or a solicitation of an offer to invest in any fund.
3. NO REPRESENTATION IS MADE THAT ANY INVESTOR WILL OR IS LIKELY TO ACHIEVE RESULTS COMPRABLE TO THOSE SHOWN OR WILL MAKE ANY PROFIT AT ALL OR WILL BE ABLE TO AVOID INCURING SUBSTANTIAL LOSSES.
4. While every effort has been made to provide data from sources considered to be reliable, no guarantee of accuracy is given.
5. The contents herein are subject to change without prior notice.
6. This brochure is typically updated as at the most recent calendar month end.
7. Historical data are presented for informational purposes only.
8. Except where stated, strategies do not attempt to track any index or benchmark.
9. Benchmark data are total returns for the indices for the periods shown and are for comparison purposes only.
10. Cumulative benchmark data and performance data are compounded monthly.
11. Volatility is measured by the annualized standard deviation of monthly returns.
12. Investment programs described herein contain significant risks.
13. This presentation is provided for information purposes only and is subject to, and qualified fully by the Licensing Agreement and related documents.

Past performance is not necessarily an indicator of future results.