Quant Products for Equity clients

- With a team strong of 25 Quants and 15 years of experience, we are at the disposal of our clients to share our expertise,
- We elaborate research publications and tools for analyzing markets and the economy,
- We also propose specific solutions and a wide range of tools to reply to questions and problems which faced our clients,
- A dedicated team of Quants works out studies and adaptations of our models in order to determine the risk of client’s portfolios.

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Abstract

The term Hidden Markov Model (HMM) is now quite familiar in the speech of signal processing community and more and more accepted for communication systems. It is perhaps a little less daunting, and yet more mysterious than the term partially observed stochastic dynamical system model, which is a translation familiar to people in systems theory.

Why in finance?

As all financial practitioners know, financial markets go through different regimes. This knowledge is of utmost importance for pricing and hedging purposes. It can also be applied successfully to asset allocation.

The HMM applied to finance and more specifically to the VIX brings valuable information to investors.

Keywords:
Hidden Markov Model; EM algorithm; Maximum likelihood; Iterative method; Market Regimes; Prediction volatility characteristics; Diversification; Market timing; Risk perception indicator; Dynamic Asset Allocation; Conditional Back Testing; Proprietary indices; Conditional Bootstrap;

References:


Cash Services

- Quant Web Site
  Access to HMM applied to VIX

- Recurrent Publications
  Receive dashboard up to date

- Cash Strategies
  Sector Select : allows a dynamic allocation based on mixed recommendations (fundamental and technical)

- Execution Algorithms
  Most execution algorithms depend on market ecology. HMM classifies performances based upon volatility regimes

Derivatives

- Timing Vanilla Derivatives

- VIX Futures and Options

- Volatility Derivatives

- Correlation Products

Asset Allocation

- Regime dependent asset allocation

- Sector strategy

- NXS Sharpe Multi Asset
  Bloomberg Ticker: NXSHMA

- NXS Sharpe Euro Equity
  Bloomberg Ticker: NXSHEE

Quant Advisory

- Direct Quant Advisory

- Specific adaptation to proprietary portfolios

- One to One
Abstract

When an investor has a vision of the market, he looks for the best investment regarding the Performance/Risk ratio. Several questions can be asked:

What is the best Product/Strategy which is optimizing the Risk Profile?
What is the best Equity Basket associated to this Product/Strategy?

Regarding the very important number of assets within the market, it’s impossible to back-test all the combinations of baskets for a given payoff/strategy. Thus, we have developed an Investment Support Tool which optimizes the basket selection using a full scale approach.

The Fundamental Research, Indicators and Market Statistics, Investor’s Experience are a part of the Market Views and Scenarios, and Regimes.

A profitable investment has the highest Sharpe Ratio for an Investor’s Market View.

This solution can be described as follows:

• Selection of the Market: geographical areas, sectors, etc... which must appear in the baskets
• Definition of the investor’s market view: the investor can have a view for the entire market, for particular geographical areas, sectors, assets...
• Generation of random baskets and a reduction of the complexity
• Evaluation of the Sharpe Ratio in order to rank the baskets regarding their expected performance and risk.

Keywords:
Risk/Performance Optimization; Lloyds Algorithm; Bootstrap; Investor’s Market View; Investment Support Tool; Sharpe Ratio; basket quantization; product evaluation

References:


Sharpe Select

Solutions: Products & Services

Cash Services
- Recurrent publications
  Receive dashboard up to date
- Cash Strategies
- Market Behavior Scenario

Derivatives
- Basket / Correlation products
- Single-stock products
- Structured products

Asset Allocation
- "Delta-One" Strategies
  asset allocation
- Asset Allocation for
  structured products
- Diversification
  Opportunities

Quant Advisory
- Specific adaptation to
  proprietary portfolios
- One to One
Market Predictor

Abstract

In this project we propose an original mathematical model to predict equity market trends. Market Predictor aims to detect the several market cyclical – psychological effects.

Mathematically, Market Predictor is based on the quantization technique combined with the generation of multidimensional Markov chains.

Learning is done in three steps:

- The mono-dimensional quantization of daily returns,
- The generation of multidimensional patterns,
- And finally the calculation of transition matrices.

Using those transition matrices, future returns can be easily predicted from the class of the current trajectory.

Keywords:

Market prediction; Optimization Lloyd algorithm; Product quantization; Genetic algorithm; Statistic; Cyclical market effect; Hedging strategies

References:


Market Predictor

Solutions: Products & Services

Cash Services
- Quant Web Site
- Recurrent Publications
  Receive dashboard up to date
- Cash Strategies
  Allows allocation strategies
  based on market predictions

Derivatives
- Future
- Volatility
- Short Maturity Option

Asset Allocation
- Hedging Strategies
- Long/Short Strategies

Quant Advisory
- Daily Adviser
- One to One
Abstract
We study the features of a statistical tool made for detecting financial bubbles.

Some of the most famous bubbles (Internet 2000, Commodities 2008) are clearly identified.

We also highlight the relationship between this statistical indicator and the variance-covariance matrix of the universe of assets under consideration.

The statistic we use measures dispersion of performances with fixed starting date over a large universe of assets. It shows an explosive behavior when a bubble is building up and a dissipative behavior during market crashes.

Keywords:
Financial Bubbles; Dispersion; Ensemble Statistics; Bubble Risk; Economic Cycles

References:


**Cash Services**

- Cash Strategy
  - Sector based long-short strategies

**Derivatives**

- Hedging Strategy
  - against massive downward moves

**Asset Allocation**

- Timing Portfolio
  - Rebalancing
- Sector Selection

**Quant Advisory**

- Specific adaptation to proprietary portfolios
- One to One
Abstract

The popularity of Kalman filter is increasing in financial studies, notably to estimate diffusion processes. In this work, we show how we can use it to forecast the parameters of the mixed dividends model: cash dividends and proportional dividends, using historical data of Eurostoxx and dividend future.

Kalman Filter is an adaptive least square error filter that provides an efficient computational recursive solution for estimating a signal in presence of Gaussian noises. It is an algorithm which makes optimal use of imprecise data on a linear (or nearly linear) system with Gaussian errors to continuously update the best estimate of the system’s current state.

The Dividend Predictor applied to the dividend index detects the different regimes for the dividends. Also, it allows the construction of a mean reverting position to take advantage of the dividend investment. We can predict levels but also propose a model for pricing options on dividends that show reasonable values.

Keywords:
Kalman Filter; Dividend; Dividend Risk Prediction; Recursive Estimator; Epsilon Indicator, dividend Options

References:
Dividend Predictor

Solutions: Products & Services

**Cash Services**
- Quant web site

**Derivatives**
- Pricing American options
- Hedging dividends swap

**Asset Allocation**
- Epsilon Calibration
- Build Long-Short
- Strategies on Epsilon

**Quant Advisory**
- Specific adaptation to proprietary portfolios
- One to One
Abstract

The market is never as efficient as we describe in classical theories. The non-zero autocorrelation may appear for some stocks returns, even for basket returns. The lead-lag phenomenon exists also for certain assets. We propose a multi-resolution volatility based method for the selection of pair basket in order to benefit from the presence of autocorrelation and inter-stocks lead-lag.

Keywords:
Pair trading; portfolio selection; autocorrelation; lead-lag

References:


Solutions: Products & Services

**Cash Services**
- Quant web site

**Derivatives**
- Correlation product
- Single stock

**Asset Allocation**
- Long-short arbitrage
- Mean-reversion portfolio selection
- Trend-Following portfolio selection

**Quant Advisory**
- Specific adaptation to proprietary portfolios
- One to One
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