



EM Applications

EM Applications provides investment risk solutions to the financial services industry. Portfolios incorporating equities, bonds, currencies and derivatives can be analysed to gain a better understanding of risk levels and characteristics, with single or program trading ideas generated to turn *analysis into action*. Coverage is broad, including exotic markets and complex derivatives. This powerful software is delivered in an easy to use, simple to customise, package that offers low total cost of ownership. Established in 1995, EMA's client base includes traditional asset managers, hedge funds, securities firms and consultants.

Robust Statistical approach

The models are based on a proprietary implementation of the *Expectation Maximisation* algorithm – the “EM” in “EMA”. The EM algorithm is specialised for “filling in” missing information, be it gaps in a trading history or unknown market factors. Using EM there is no need to make assumptions about factor loadings, factor returns or the distribution of residual returns – the minimal assumption set leading to a more robust statistical model.

Dynamic markets demand dynamic modelling techniques. The EM algorithm makes it possible to derive risk factors from any time series of asset returns be it an equity, fixed income index, currency or commodity. This facilitates the detection of new or previously unidentified relationships between assets, contributing to an unbiased and constantly evolving model which reflects the changing investment environment.

For many sophisticated portfolios, risk factors tell you only part of the story. EM Applications has created a proprietary mixed asset framework which integrates full asset repricing models to the factor based models. This permits advanced simulation based analytics such as Monte Carlo VaR with non-normal return distribution assumptions.

Multi-Asset, Variable Time Horizon

EMA's factorization methodology creates statistically robust systematic factors as time series which can be examined over any time-horizon within the last 200 weeks. Non-equity instruments can be modelled as composites of “key instruments” such as zero coupon yield curves. This ensures a comprehensive coverage within a wide selection of asset classes.

Over 70 models are regularly produced, including single asset class, single country models, to global multi-asset models, with both short term and longer term time horizons. EMA can be used to model several hundred thousand instruments including equities,

fixed income securities, derivatives, ETFs, traditional funds, hedge funds, real estate securities and commodities.

The easy-to-use and open platform allows you to extend the coverage far beyond listed instruments. OTC assets can be modelled by tweaking standard asset pricing models or by integrating proprietary models, providing for even the most complex derivative structures.

Engineered from the ground up to be multi asset and multi time horizon, our mixed asset models enable a single, consistent view across any asset class, over any period and region.

Products

EMA's products are quick to deploy, flexible and easy to use. Real-time analytics calculates the impact of trading ideas or use live market data and allow the creation of both pre-trade and post trade analytics.

Each application generates detailed yet intuitive reports that are easily customised to any investment style allowing users to obtain information that is directly relevant to their way of managing investments. Live reports can be sent by email or delivered via intranet pages and can handle hundreds of portfolios from a top down perspective or focus on specific asset classes from the bottom up.

The PC based solution does not require specialist hardware or software to function effectively. Users can access the system ‘out of the box’ or integrate it to their existing infrastructure. Whatever a client's specific infrastructure requirements, EMA has the experience to develop a solution.

EMA provides risk management solutions in three key areas: risk analysis and characterisation (Excerpt, Analysis API); idea generation and portfolio optimisation (Optema, Optimisation API); and bespoke risk modelling (Estema):



Excerpt – Portfolio Analysis: *Excerpt* provides users with a detailed real-time picture of the risks faced by their portfolios under present conditions and future

scenarios. Suitable for any investment style or asset class, *Excerpt* incorporates user-defined information, including: factors, instrument characteristics, scenarios and forecast horizons.

A full re-pricing of all instruments together with a robust multi-factor model and a powerful simulation engine delivers meaningful risk modelling of non-linear portfolios, and satisfies regulatory requirements worldwide. Many of the analytics available within *Excerpt* can also be delivered via EMA's powerful Analysis API.

Optema – Portfolio Optimisation: A powerful yet easy-to-use tool designed to assist in portfolio construction, revision and asset allocation. Suitable for benchmarked, long-short, fully hedged and 130/30 funds, *Optema* supports ad-hoc usage or it can be incorporated into a fully automated system.

Optema covers a wide range of features and techniques, from simple linear and quadratic constraints, tilts, transaction costs, turnover and trade restrictions, to a full implementation of the Black-Litterman asset allocation approach. Designed to enhance your investment process, *Optema* is integrated with *Excerpt* and its functionality is also available via the Optimisation API.

Estema – Customised Models: A comprehensive model estimation toolkit enabling users to construct customised risk models from any universe of returns data, by specifying

- The risk factors deemed most relevant for each investment, at the factor estimation stage, or simultaneously identified by our theory-based methodology, or both.
- The universe of instruments used in the model estimation process.

- The time period, time-weighting, and frequency of data used for model construction.

These customised models can then be used both for controlling portfolio risk and alpha generation. For example searching for mispricing opportunities by highlighting unexpected residual returns (as suggested by the Arbitrage Pricing Theory). The models can also be imported into *Excerpt* to take advantage of the comprehensive suite of risk control and portfolio construction functions.

Services

Risk Analytics

EMA offers a comprehensive set of parametric, historical and simulation-based analytics, providing in-depth insight into the true sources of risk at multiple levels:

- **Portfolio level:** Measure Tracking Error, Volatility, VaR, Scenario Analysis and Stress Testing, Betas and Correlations to any benchmark, index, instrument or factor, whether pre-specified or defined by the user.
- **Risk breakdowns:** Analyse the risk contribution from investments in any asset class, sector, country, currency, etc. including user defined categorisation of your instruments. View factor sensitivities according to any of c90,000 sectors, currencies, countries, styles, economic, and user-defined factors.
- **Instrument level:** analyse the risk contributions from each individual contract, how it impacts the entire portfolio or specific factor sensitivities under different trading assumptions or varying market parameters.

Risk Models

EMA supply both off-the-shelf pre-calculated risk models as well as bespoke risk models, ranging from single asset class/single country to global integrated multi-asset class models of varying time periods.

Support

All license agreements include access to an experienced technical support team by email and telephone.

Contact

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