



Barra Europe Stochastic Factor Model (EURS1)

The **Barra Europe Stochastic Factor Model (EURS1)** is the first in a family of statistical factor models from MSCI. It incorporates an advanced and innovative estimation process to provide an alternative view of risk and return that complements the Barra fundamental models and helps clients overcome many problems commonly associated with statistical factor modeling. The model also offers daily forecast variants, catering to institutional investors with high-frequency trading strategies.

Key Features

- » Innovative modeling approach incorporating machine-learning and signal-processing techniques.
- » Parsimonious, stable, and interpretable factor structures: 20 equity factors and 4 currency factors.
- » Six model versions: daily, weekly, and monthly return horizons, each available in fast and slow variants to cater to a comprehensive range of investment horizons and strategies.
- » Broad coverage of 17 Western European countries, more than 12,000 assets, and 24 currencies.
- » Deep, daily history of risk forecasts enabling extensive user backtesting from January 1997.

- » New, wavelet-based asset volatility modeling approach that adjusts to rapid changes in asset volatilities to provide smoother and more accurate risk forecasts.
- » Factor-learning approach that continuously adapts to different market conditions to uncover hidden, cross- and sub-sector dynamics and correlations.
- » Hybrid structural model extends the coverage to incorporate IPOs and illiquid assets.

Key Benefits

Stable Factors

The Barra Europe Stochastic Factor Model retains the advantages of a compact and parsimonious structure that is commonly associated with a statistical approach while providing stable factors and exposures. The factor stability affords meaningful time-series risk and return attribution using the model factors. This is in contrast to an ordinary principal components analysis (PCA) approach, where the factors and exposures can be unstable over time.



Comparison of factor exposures for BP using a PCA approach and EURS1. A PCA model was constructed for EURS1 estimation universe assets. The resulting exposures were unstable for all factors other than factor 1. In contrast, the EURS1 factor exposures are stable across time, enabling meaningful time-series risk and returns attribution.

Flexible Model

The Barra Europe Stochastic Factor Model learns the factor space entirely from asset returns. This overcomes problems of bias or missing factors that can be associated with fundamental or time-series factor models. Accordingly, the model is able to help the manager detect hidden, dynamic factors that emerge and evolve with different market regimes. This can include the detection of correlations between groups of assets that lie within broader industry or country factors, thus uncovering alternative opportunities for portfolio diversification. The factor stability attained from the estimation process avoids the problem of over-fitting noise and spurious correlations.

Hedging with EURS1. The model is able to help the manager detect hedging opportunities across industries or sectors that may be missed with a fundamental modeling approach. Here the ex-post volatilities attained from hedging BMW with Daimler, Renault, and Christian Dior are shown. This example indicates the opportunity to hedge with Christian Dior when viewing BMW as a luxury goods manufacturer. The effectiveness of adopting the hedges is particularly clear following the increase in market volatility in mid-2011 that was related to the European sovereign debt crisis.







Multiple Versions Available

This model is suitable for managers with a wide range of investment horizons. The daily, fast model is the most responsive version and can serve as a trading type model, catering to those with short-term horizons and high-frequency strategies. The monthly, slow version provides more stable forecasts for those with longer-term perspectives who rebalance their portfolios less frequently.

EURS1 volatility forecasts. The average asset-level volatility forecasts of the EURS1 estimation universe for daily, weekly, and monthly forecast horizons from January 2007 to January 2012 are shown.



The Barra Europe Stochastic Factor Model offers a complementary view to Fundamental Factor Models. At any point in time one model may capture risk that is not captured by the other and vice versa. In this regard, combining the insights offered by the stochastic modeling approach with a fundamental factor model provides institutional investors with a powerful suite of tools for portfolio construction and risk management.

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Returns captured by stochastic factors, not by fundamental factors
Returns captured by fundamental factors, not by stochastic factors

About MSCI

MSCI Inc. is a leading provider of investment decision support tools to investors globally, including asset managers, banks, hedge funds and pension funds. MSCI products and services include indexes, portfolio risk and performance analytics, and governance tools.

The company's flagship product offerings are: the MSCI indexes with approximately USD 7.5 trillion estimated to be benchmarked to them on a worldwide basis¹; Barra multi-asset class factor models, portfolio risk and performance analytics; RiskMetrics multi-asset class market and credit risk analytics; IPD real estate information, indexes and analytics; MSCI ESG (environmental, social and governance) Research screening, analysis and ratings; ISS corporate governance research, data and outsourced proxy voting and reporting services; and FEA valuation models and risk management software for the energy and commodities markets. MSCI is headquartered in New York, with research and commercial offices around the world.

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¹ As of March 31, 2013, as reported on July 31, 2013 by eVestment, Lipper and Bloomberg

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