



CVX[®]

**Risk Analysis Automation
for Institutional Investors**

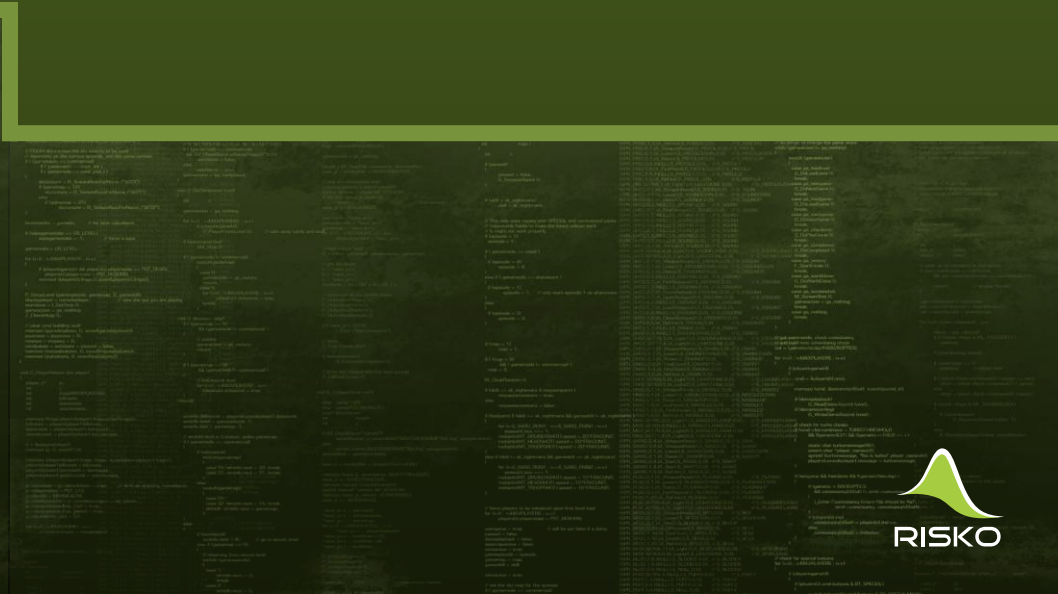
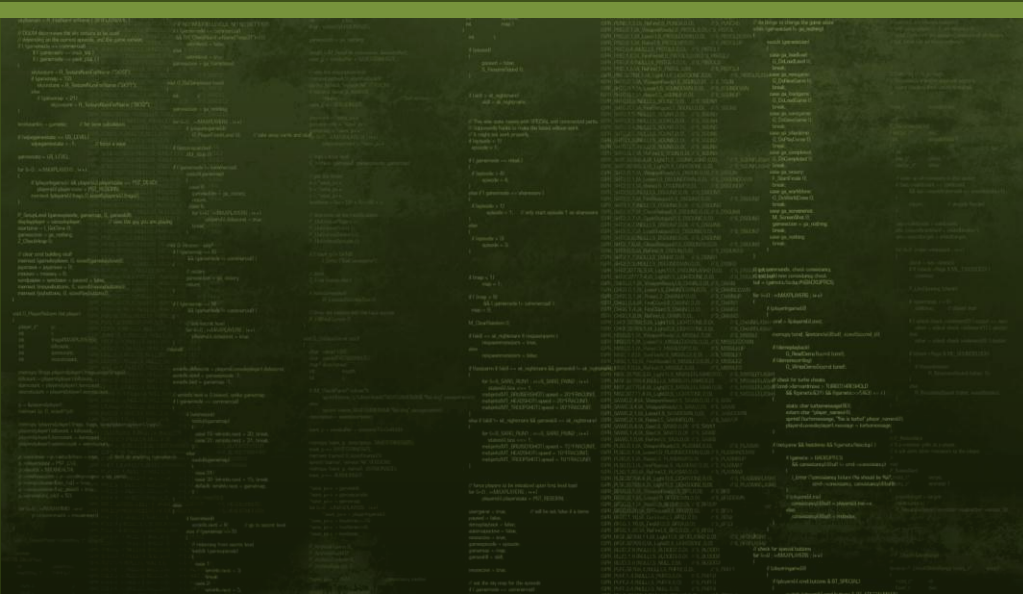
▶ **Product overview**

Automates and empowers

Risk analysis for internal decision making and compliance.

Optimizes

User productivity, analysis transparency and cost effectiveness.



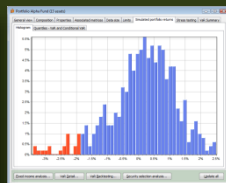
»» SUMMARY

CVX® allows risk and investment areas to automate the application of risk analysis, security selection and ALM models, from the capture and integration of data to the generation of reports for decision making and regulatory compliance.

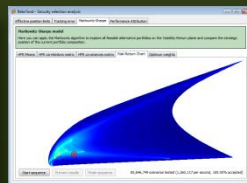
More than 30 specialized modules, including...



Data integration



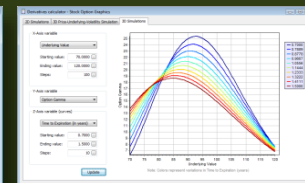
Simulation



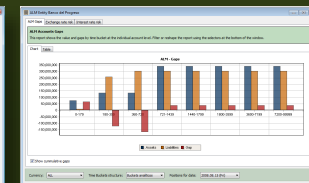
Optimization



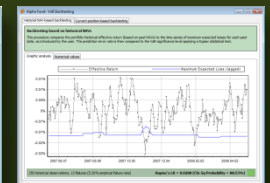
Forecasting



Valuation



ALM



Back-testing

Full valuation VaR/CVaR | Risk decomposition | Investment limits | Stress testing | Performance Attribution | Hedging effectiveness | Credit transition | Tracking Error ...

CVX® FEATURES

Processing speed Virtually real time	Security Users have independent workspaces
Designed by Experts in investment management	Auditing Detailed logs and partial results for key calculations
Deployment 3 - 4 months	Licensing SAAS – Annual

KEY MODULES:

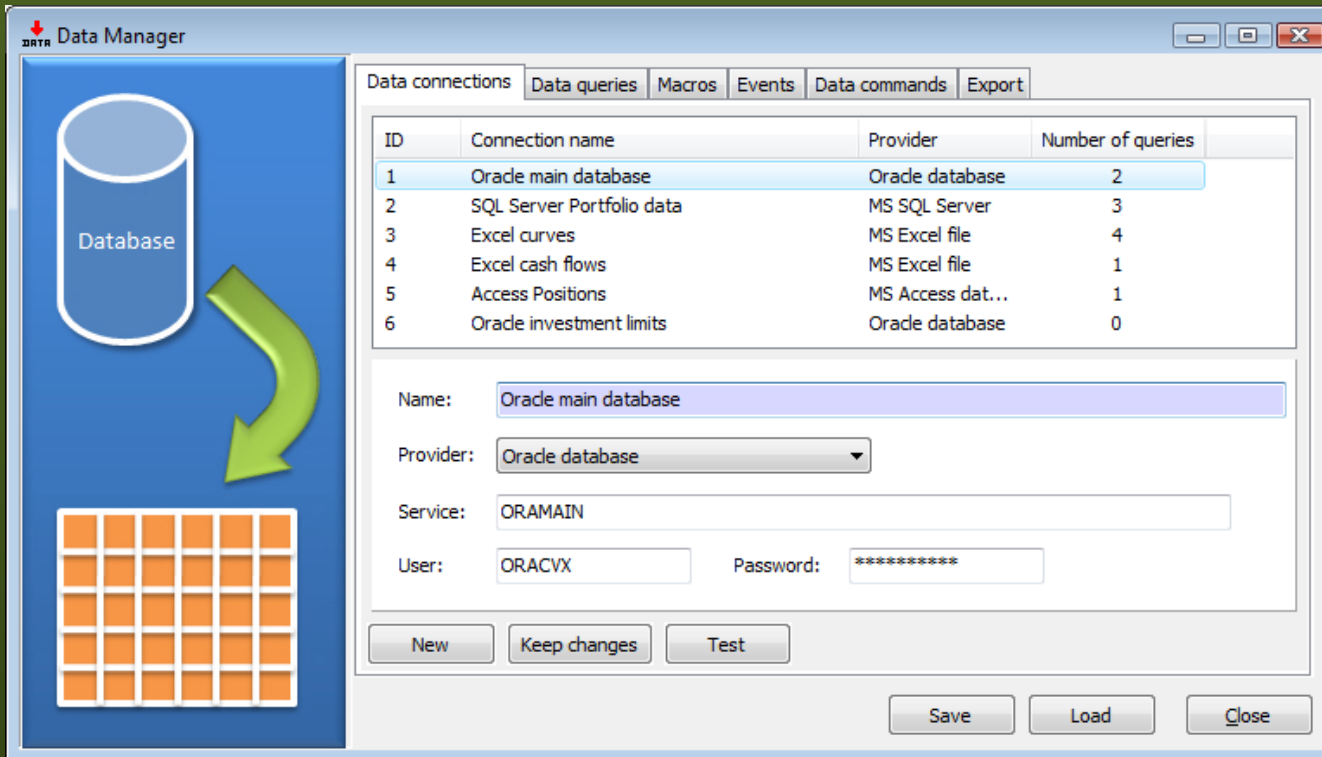
- Data capture from Bloomberg®, PMS®, PiP®, SQL Server®, Oracle®, Excel®
 - Calculation of VaR and CVaR indicators using full valuation.
 - VaR / CVaR decompositions.
 - Back-testing
 - Estimation of impacts and sensitivities.
 - Investment limits, VaR limits and alerts.
 - ALM models for liquidity gaps, exchange rate risk and interest rate risks.
 - What-if simulation and stress-testing.
 - Performance attribution.
 - Portfolios cash flows forecasting.
 - Estimation of expected losses using credit transition matrices.
 - Valuation of derivative instruments.
 - Hedging effectiveness (prospective and retrospective).
 - Markowitz and tracking error optimization models.
 - Dynamic decomposition of value variations.
 - Dynamic analysis of VaR variations.
 - Automatic validation of data quality using consistency tests.
 - Log of intermediate results for auditing purposes.
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CVX[®]

Main modules

Integration of multiple data sources – Data Manager



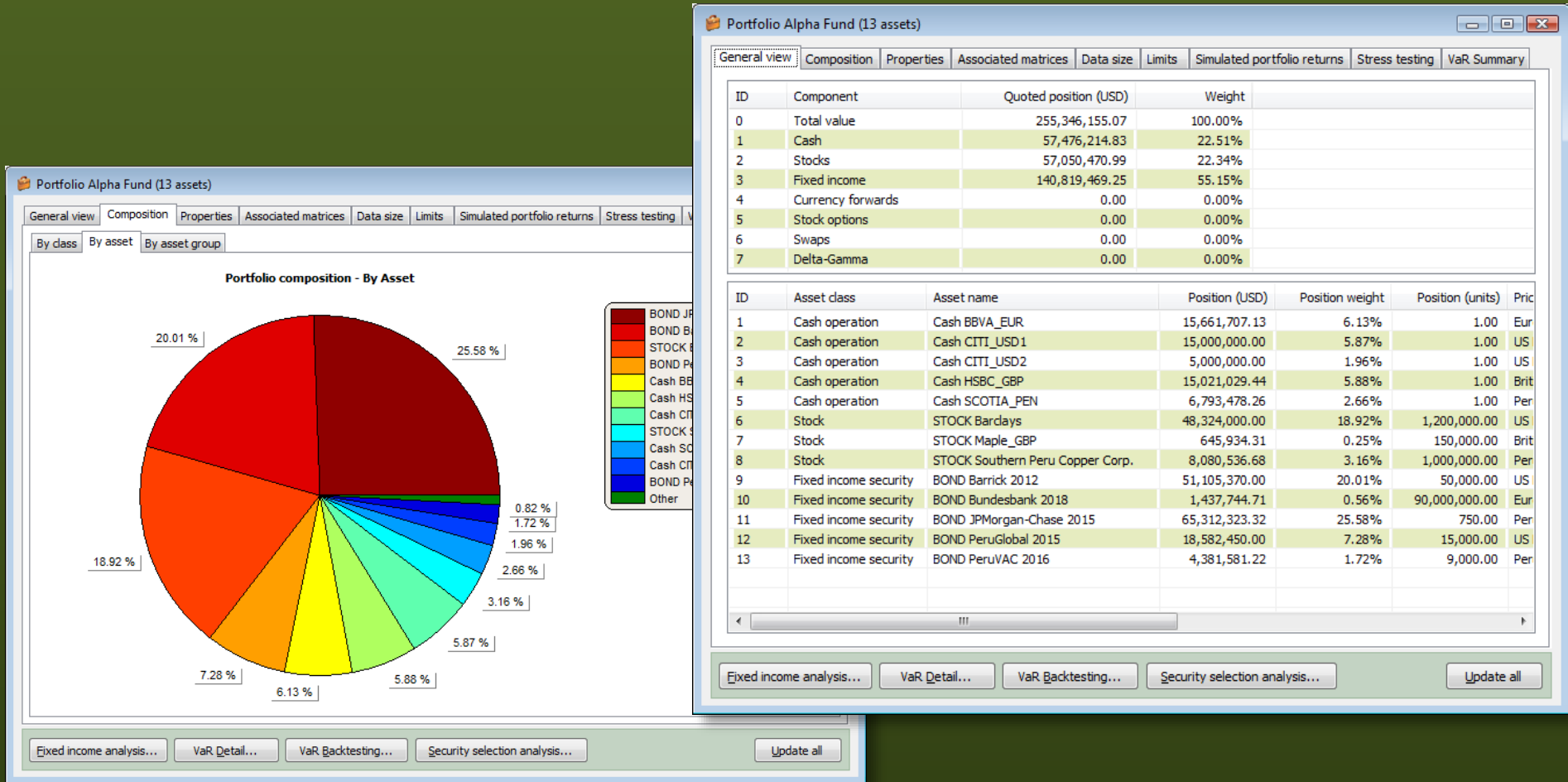
- The Data Manager is able to import all market and portfolio information from multiple sources automatically.
- Compatible with suppliers such as PMS®, PiP® and Bloomberg®.
- Manages connections with Oracle®, MS SQL Server®, MS Excel®, MS Access®.
- CVX macros automate capture, consistency checking and pre-cleaning of imported data.
- The system works offline, it only connects to the database when the user wants to update the data.
- It allows to save all imported information into a single encrypted .i3 file.

» Navigate through all relevant investment objects

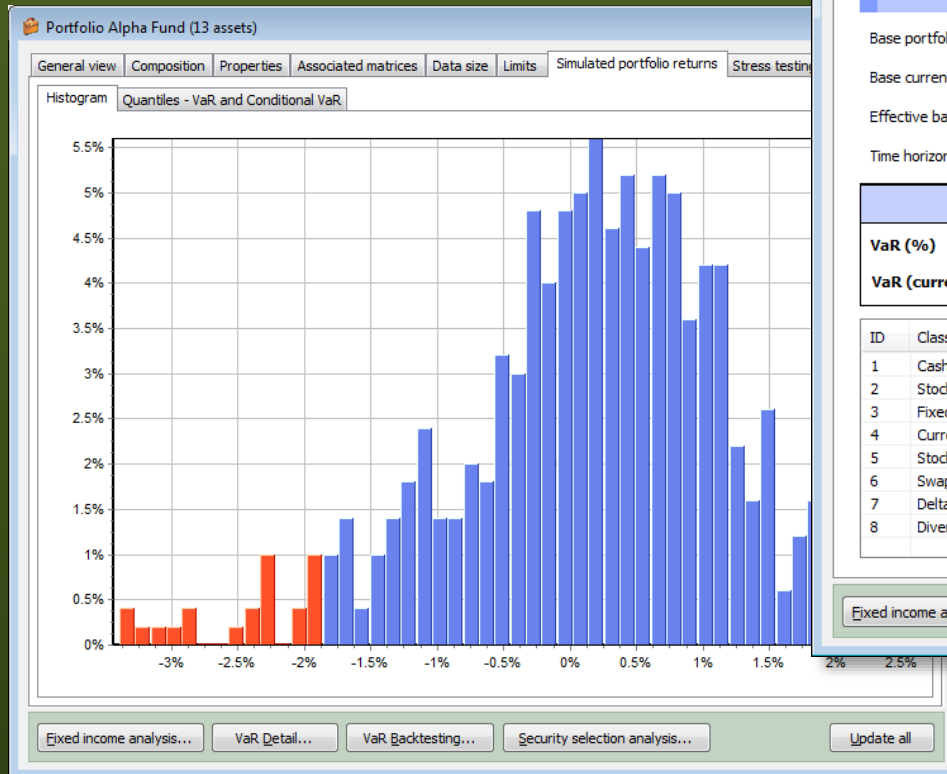


- The Navigator provides a consistent and intuitive interface to access and work with all the information about investment objects.
- It allows managing an arbitrary number of portfolios, assets, ALM entities, curves, currencies, groups of assets, limits, stress scenarios, samples, etc.
- It is possible to simultaneously open as many windows of objects as the user requires.
- The system offers each user an independent workspace, so that he can make "what-if ..." changes of any kind without affecting the work of other users.

Portfolio overview – Summary, detailed and drill-down reports



» Risk Analysis – Summary, detailed and drill-down reports



Portfolio Alpha Fund (13 assets)

General view | Composition | Properties | Associated matrices | Data size | Limits | Simulated portfolio returns | Stress testing | **VaR Summary**

VaR Summary

Base portfolio value: 255,346,150.73 Mean return (%): 0.1333%

Base currency: US Dollars Number of used observations: 500

Effective base date: 2008.08.15 (Fri) Confidence level: 95.00%

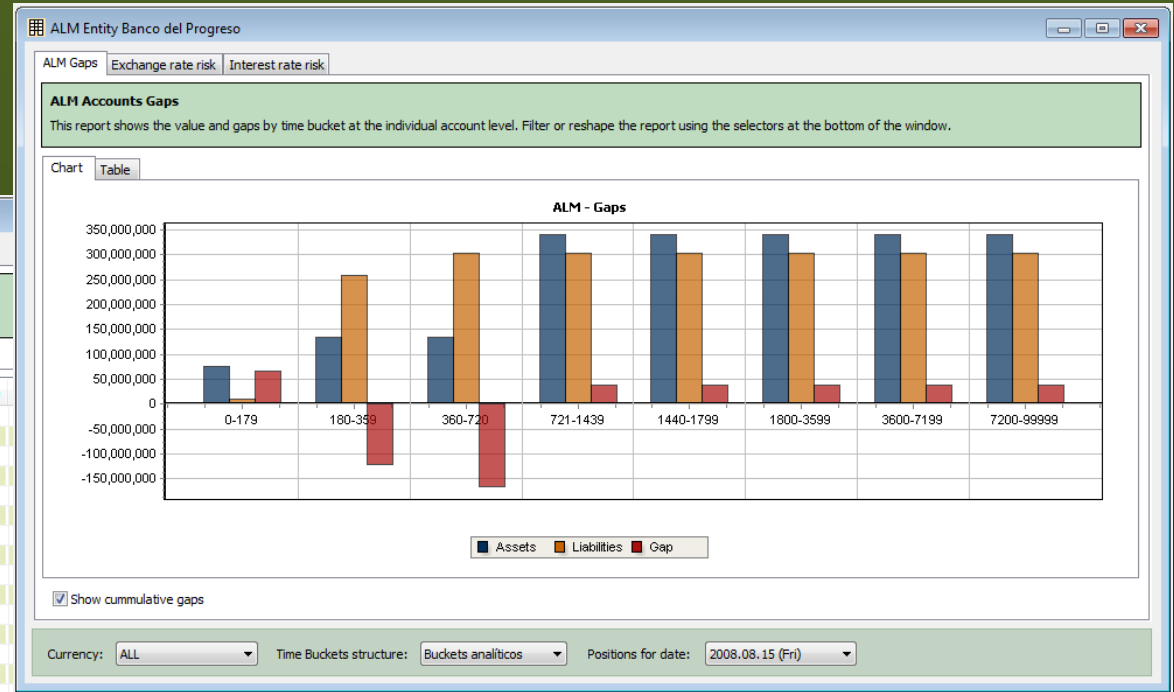
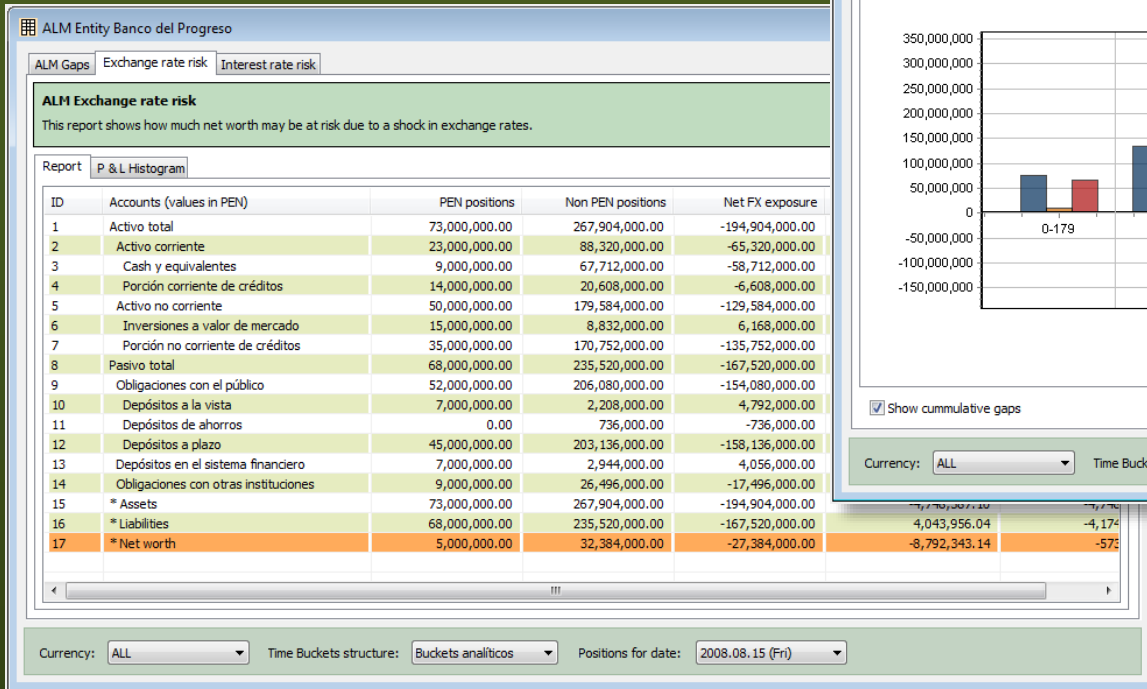
Time horizon for VaR returns (days): 5 Omega: 1.3886

	Absolute Historical	Relative to mean	Portfolio Normal	Conditional VaR
VaR (%)	-1.7825%	-1.9158%	-1.5692%	-2.3641%
VaR (currency)	-4,551,453.91	-4,891,819.07	-4,006,858.64	-6,036,523.04

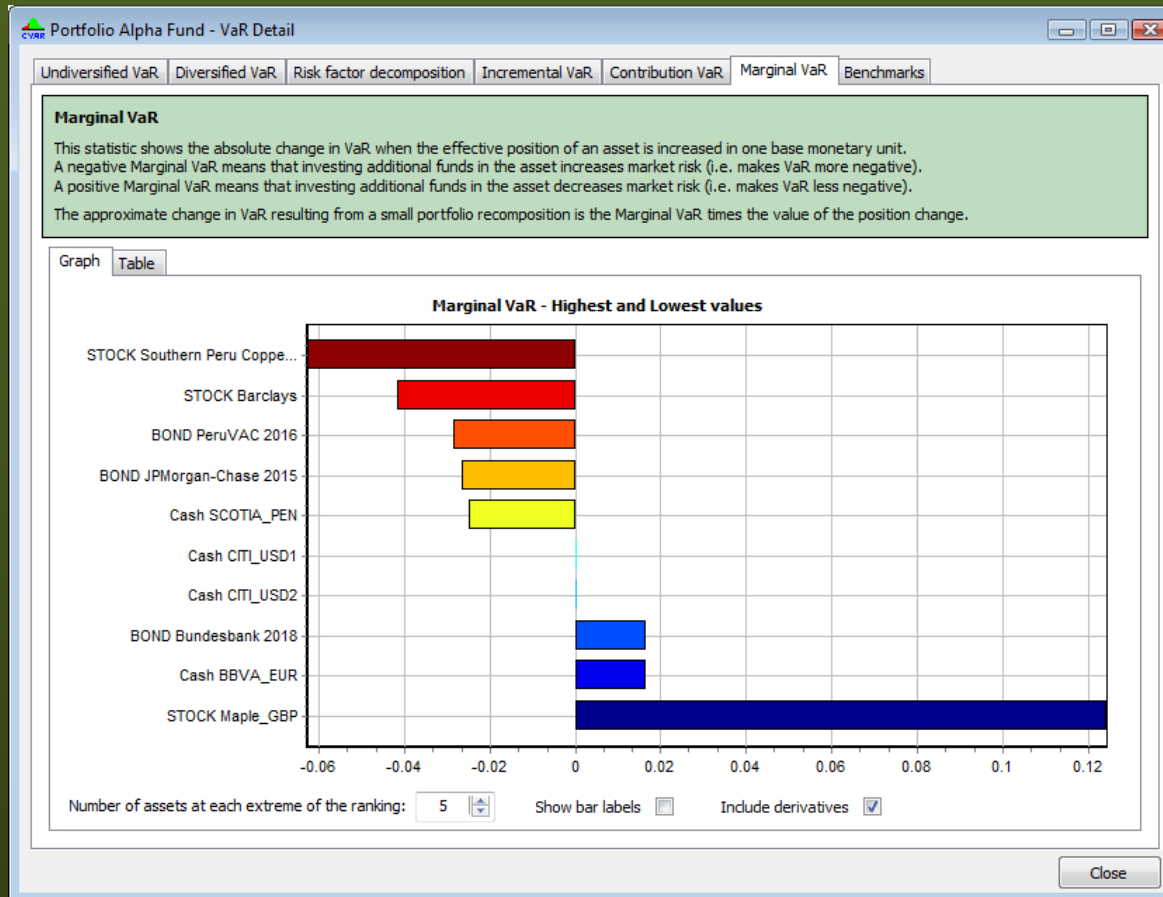
ID	Class name	Full valuation (USD)	Class VaR%	Position VaR%	Position VaR (USD)
1	Cash	57,476,214.83	-0.7197%	-0.1620%	-413,659.89
2	Stocks	57,050,470.99	-5.9544%	-1.3304%	-3,397,019.32
3	Fixed income	140,819,464.91	-1.4119%	-0.7786%	-1,988,182.69
4	Currency forwards	0.00	NAN%	0.0000%	0.00
5	Stock options	0.00	NAN%	0.0000%	0.00
6	Swaps	0.00	NAN%	0.0000%	0.00
7	Delta-Gamma	0.00	NAN%	0.0000%	0.00
8	Diversification effect			0.4885%	1,247,407.99

Fixed income analysis... VaR Detail... VaR Backtesting... Security selection analysis... Update all

ALM models for liquidity, exchange rate and interest rate risks

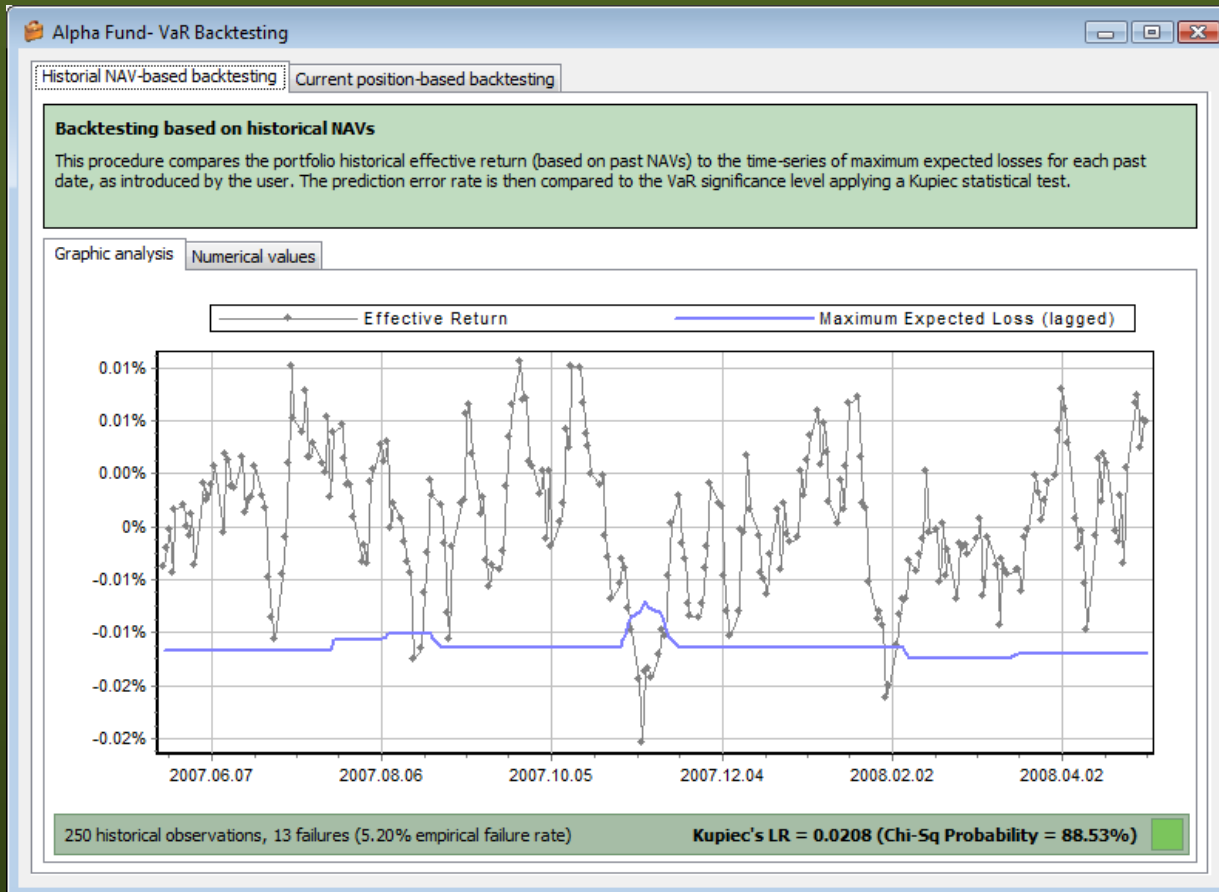


» Risk Decompositions



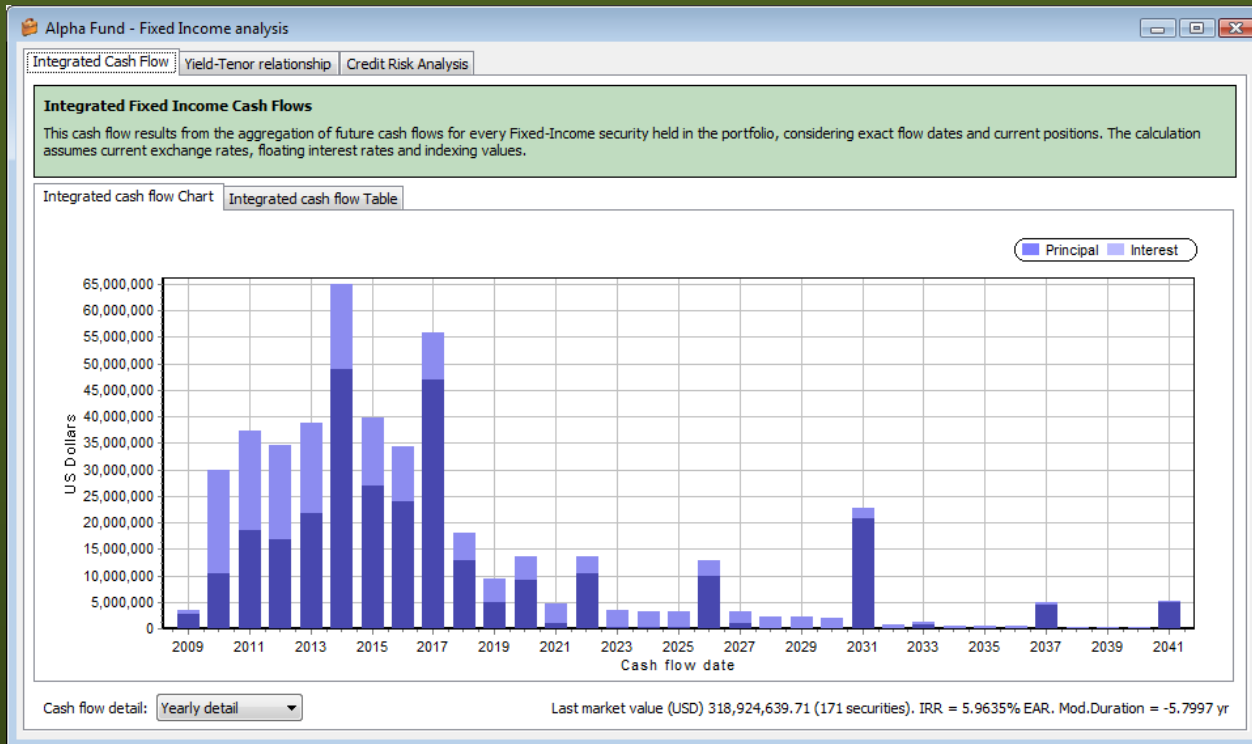
- CVX® allows risk indicators to be decomposed by asset, group of assets or risk factors.
- The calculated decompositions include diversified and non-diversified VaR, marginal VaR and CVaR, incremental VaR and Contribution VaR.
- All tables and graphs can be exported with a click to add them in presentations or spreadsheets.
- Each report has a brief reference text that helps users to correctly interpret the results.

» Back-testing



- CVX® evaluates the predictive capacity of the VaR results automatically.
- You can use both the historical NAV method and the current position method.
- The results include the LR test of Kupiec.

Fixed-Income Analysis



- **CVX®** automatically integrates the cash flows of the fixed income component of any portfolio.
- It calculates durations, actual rates of return (IRR), key-rate sensitivities, convexities, etc.
- It can generate credit risk reports considering default probabilities and credit transition matrices.

Assets valuation

Derivatives Calculator

Currency forwards | Stock options | **Currency options** | Normal function

Spot price: Time to expiration (years):

Strike price: Interest rate:

Option class: **Call option** Annualized standard deviation:

Option type: **European** Convenience yield (bps):

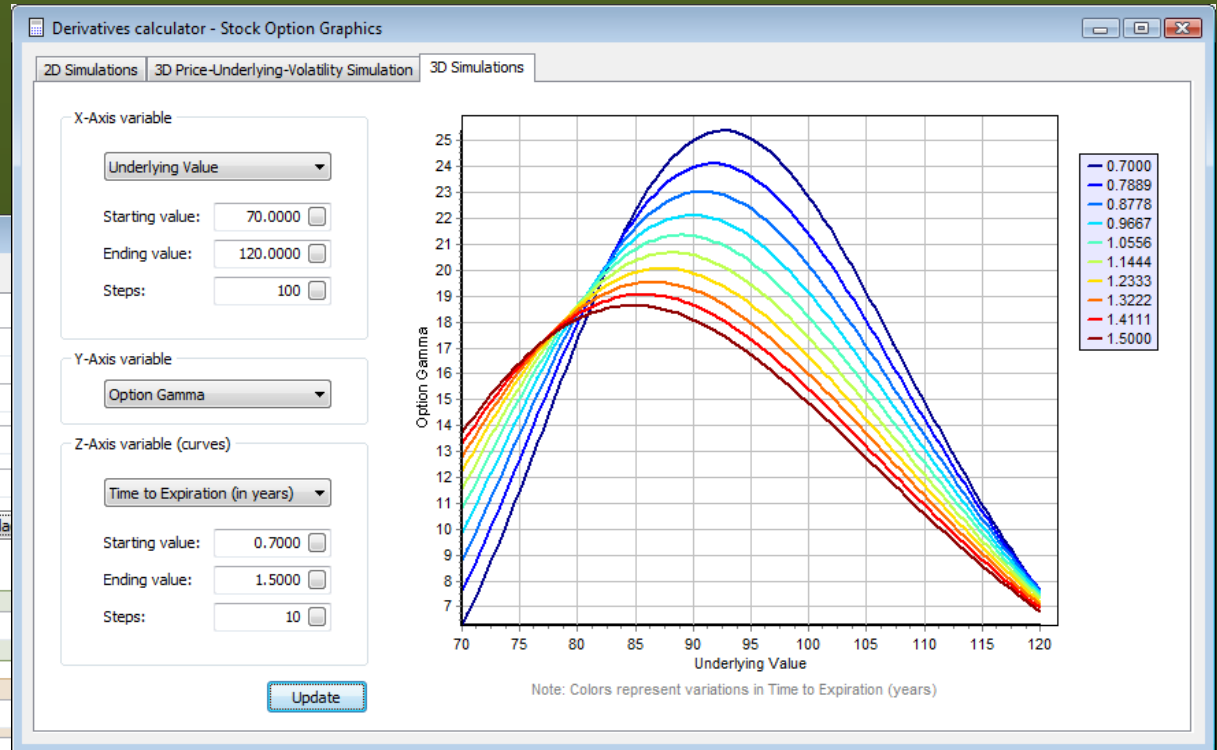
Contract size (multiplier): Valuation technique:

Value / (Strike * Size): % Option value:

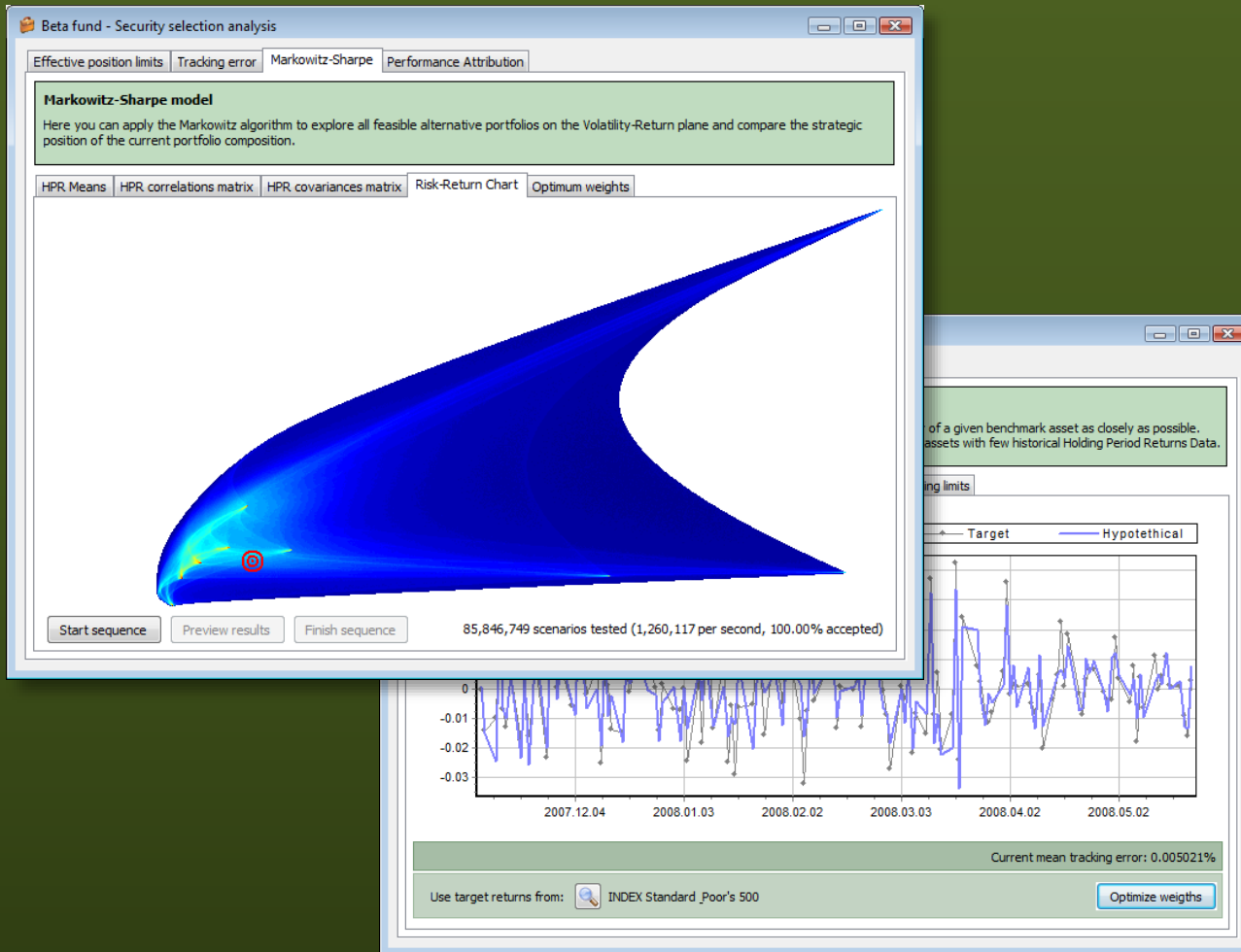
Option Delta: Option Rho (+1bp):

Option Gamma: Option Theta (-1 day):

Option Vega (+1% SD):

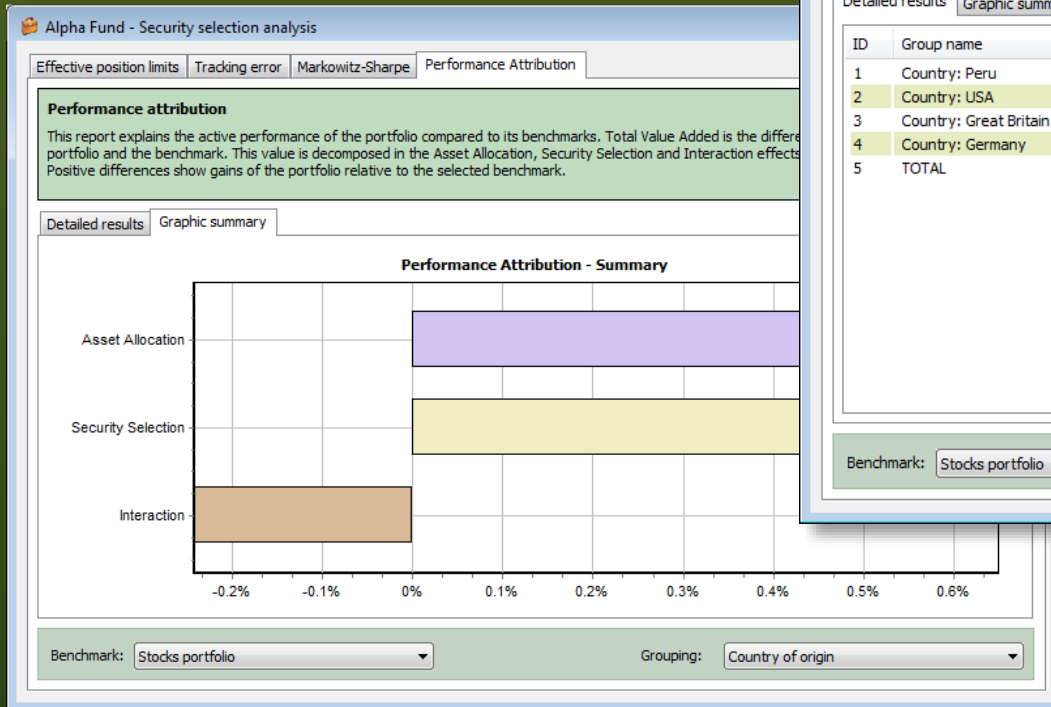


» Optimization models



- CVX® can apply a Markowitz-Sharpe optimization model including restrictions provided by the user.
- The optimizer identifies the portfolio of minimum variance and maximum Sharpe ratio and makes it possible to visually examine the strategic position of the portfolio in the universe of possible positions.
- Additionally, it is possible to optimize the Tracking-Error of the portfolio relative to any benchmark.

Performance-Attribution Models



Alpha Fund - Security selection analysis

Effective position limits | Tracking error | Markowitz-Sharpe | Performance Attribution

Performance attribution

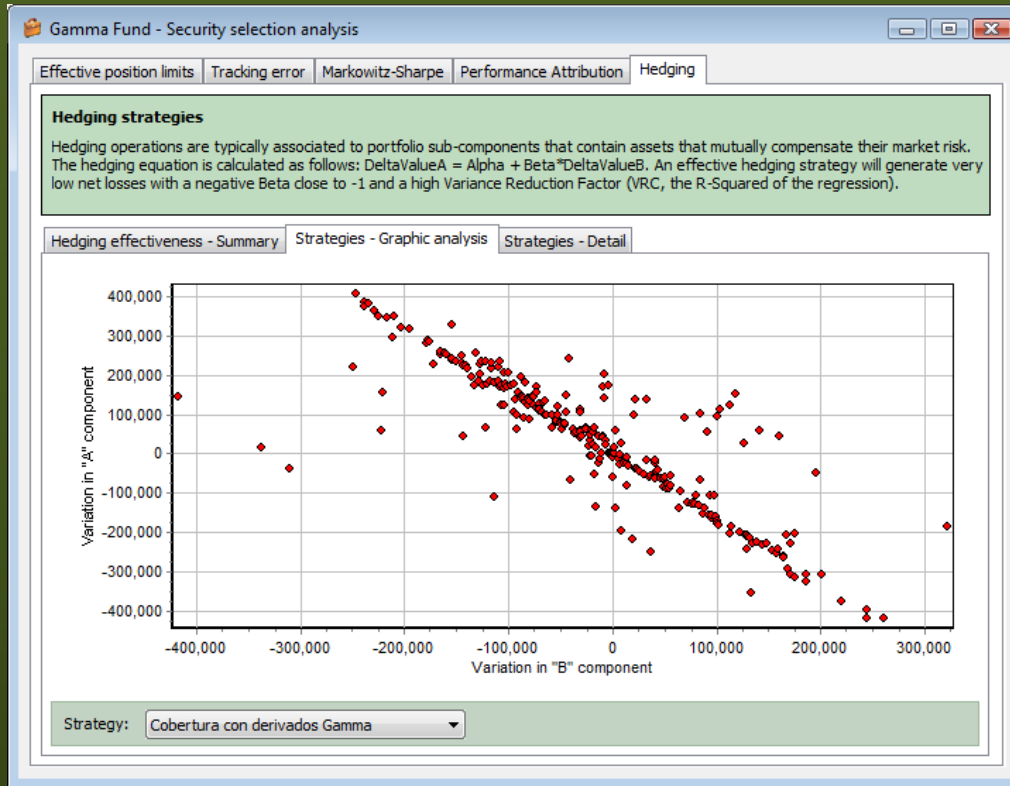
This report explains the active performance of the portfolio compared to its benchmarks. Total Value Added is the difference in total returns between the portfolio and the benchmark. This value is decomposed in the Asset Allocation, Security Selection and Interaction effects following the Brinson model. Positive differences show gains of the portfolio relative to the selected benchmark.

Detailed results | Graphic summary

ID	Group name	W(Port)	W(Bench)	Ret(Port)	Ret(Bench)	Asset Alloc.	Security Sel.	Interaction	Total
1	Country: Peru	26.76%	25.03%	-0.30%	-1.62%	-0.03%	0.33%	0.02%	0.33%
2	Country: USA	47.47%	0.00%	-0.39%	0.00%	0.00%	0.00%	-0.18%	-0.18%
3	Country: Great Britain	25.22%	74.97%	-1.19%	-1.36%	0.68%	0.13%	-0.09%	0.72%
4	Country: Germany	0.55%	0.00%	0.99%	0.00%	0.00%	0.00%	0.01%	0.01%
5	TOTAL	100.00%	100.00%	-0.56%	-1.43%	0.65%	0.46%	-0.24%	0.87%

Benchmark: Stocks portfolio | Grouping: Country of origin

» Hedging-Effectiveness Analysis



Fund - Security selection analysis

Effective position limits | Tracking error | Markowitz-Sharpe | Performance Attribution | Hedging

Hedging strategies

Hedging operations are typically associated to portfolio sub-components that contain assets that mutually compensate their market risk. The hedging equation is calculated as follows: $\Delta\text{Value}_A = \text{Alpha} + \text{Beta} \cdot \Delta\text{Value}_B$. An effective hedging strategy will generate very low net losses with a negative Beta close to -1 and a high Variance Reduction Factor (VRC, the R-Squared of the regression).

Hedging effectiveness - Summary | Strategies - Graphic analysis | Strategies - Detail

Hedging strategy	A Count	B Count	Valid obs	Beta value	Alpha value	VRC value
Cobertura con derivados Gamma	1	1	280	-1.2616	10,789.7903	72.68%

Flexible Report Generation

Informe Diario de Riesgos - Cuenta C. 997878

Al Miércoles, 03 Mar 2010
Muestra: 252 días // Cálculos diarios

Cartera	Límite VaR%	VaR Cartera %	Riesgo extremo (R)	Ratio Omega (R)	Desv. Estándar (R)	VaR Benchmark (R)	Desv. Benchmark
SICAV RVUSD	-3.50%	-2.50%	-2.89%	142	1.44%	-1.78%	1.63
SICAV RVEUR	-3.00%	-1.60%	-2.08%	151	1.03%	-1.68%	1.97
RVGlobalUSD	-3.00%	-2.40%	-2.05%	143	1.46%	-1.76%	1.63
RVGlobalEUR	-3.00%	-1.77%	-2.17%	155	1.07%	-1.68%	1.97
DividendosEuros	-3.00%	-1.72%	-2.44%	141	1.15%	-2.23%	1.33
DividendosUSD	-3.50%	-2.18%	-2.70%	144	1.38%	-2.18%	1.01
USA 20	-3.50%	-1.89%	-2.57%	148	1.23%	-2.25%	1.44
Euro 20	-3.00%	-1.97%	-2.32%	141	1.54%	-2.23%	1.33
Novo SICAV (4)	Por definir	-0.82%	-0.80%	138	0.48%		
MonetarioEUR	-0.08%	-0.02%	-0.05%	128	0.04%		
MonetarioUSD	-0.04%	-0.03%	-0.05%	137	0.02%		
RentaFija USD	-0.75%	-0.54%	-0.79%	105	0.31%	-0.62%	1.81
RentaFija EUR	-0.35%	-0.20%	-0.39%	111	0.30%	-0.29%	2.38

A. Resumen de perfil de riesgo

Variable	Margen de error (%)	Horizonte de cálculo	VaR Cartera %Diario (1)	Riesgo extremo	Ratio Omega (3)	Desviación estándar	Rating medio	Pérdidas esperadas por default (1 año)
Valor	5.0%	1 día	-0.453%	-0.600%	1.37	0.30%	AA-	-0.019% - \$55.44

(1) Pérdidas esperadas Diarias con un nivel de Confianza del 95% en una muestra de 252 días (Riesgo de Mercado).
 (2) Valor Esperado de las Pérdidas que superan al VaR.
 (3) Ratio de Pérdidas Esperadas/Pérdidas Esperadas (RTE: R1 a)

B. Pruebas de estrés

Plazo	Net result (USD)	Net result (%)	Supuestos (tasas CP, LP, T/C y Acciones)
1 día	-112,575.05	-2.45%	+0.5% ; +1% ; -2% ; -5%
5 días	-182,104.73	-3.96%	+0.5% ; +1.25% ; -2% ; -10%
15 días	-205,760.70	-4.47%	+0.5% ; +1% ; -5% ; -15%

C. Riesgo crediticio

Notch	Posición	Peso	Probabilidad de default	Pérdida esperada
AAA	1,775,154.38	64.07%	0.01%	177.52
AA+	56,061.35	2.02%	0.02%	11.21
AA-	73,943.04	2.67%	0.04%	29.58
A+	621,484.74	22.43%	0.05%	310.74
A-	163,510.36	5.90%	0.10%	163.51
BBB	80,638.89	2.91%	0.20%	161.28
Total	2,770,792.76	100.00%	0.031%	853.84

Flujos de caja proyectados del componente de renta fija

- CVX's report generation module allows you to create sophisticated reports in seconds.
- Report templates can be configured directly in MS Excel, including tables, graphs, images, etc.
- This component is in charge of filling the user's templates with the updated information produced by CVX's calculation engine.



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