



Optimal Structured Portfolios Design

How to design and manage optimal structured products portfolios using
Fairmat Cloud



Structured Products Portfolios

- Structured products may benefit investors in many ways by offering strategies or risk-profiles which are not achievable using linear products.
- While the assessment of the risk-reward profile of a single product is non trivial, the estimation of the risk-reward profile of a structured products portfolio is cumbersome, leaving this tasks to empirical assessments.
- We developed a quantitative framework for testing risk and performance of any structured products allocation. Designing an optimal structured products portfolio is not an easy task: for a any tested product allocation assessing the joint risk/return profile requires, aside the joint simulation of risk factors, the mapping of the relationships between the risk factors and the products' payouts.



The Optimal Portfolio Designer

Our portfolio designer tool proposes efficient portfolios starting from simple input like the **initial selection** of products, the **budget**, and the preferred **risk measure**.

This simplifies the designing of optimal structured portfolios because every other detail is handled by us including:

- The availability of a curated database of retail products (9000+), and the possibility of **autonomously** entering OTC products.
- The Availability of underlying market data (thousand of indices covered)
- Use of state of the art numerical methods and infrastructures. With our cloud infrastructure we can test the risk-reward profile of hundreds of portfolio allocations per second.
- The procedure requires the following few steps:



Step 1: define an universe portfolio

- In order to design an optimal portfolio you must chose the products you would like to be included in your portfolio.
- You may want to restrict the design to a specified set of products for several reasons (specific maturities, specific underling, providers, etc)
- One option to create a new portfolio containing the products of interest is to copy/pasting the ISINs of interest into a new balanced portfolio:

	ISIN	Quantity
1	DE000HV4AH60	1
2	DE000HV8BC78	1
3	DE000UZ03BA2	1
4	DE000XM3RPE4	1
5	IT0004965833	1
6	XS0801457218	1
7		

⬆ Apply Changes

- Alternatively you can use our screening tool to screen an initial set of products (see the next slide).



Step 1: products screening

You can also define an initial/universe portfolio by using the product screening tools and your **watch-list**:

- Open our screening tool <https://cloud.fairmat.com/InteractiveRiskMap>
- The screening tool allows you to filter products in several ways including market, currency, shape, underlying, issuers and maturity.

Interactive Risk Map

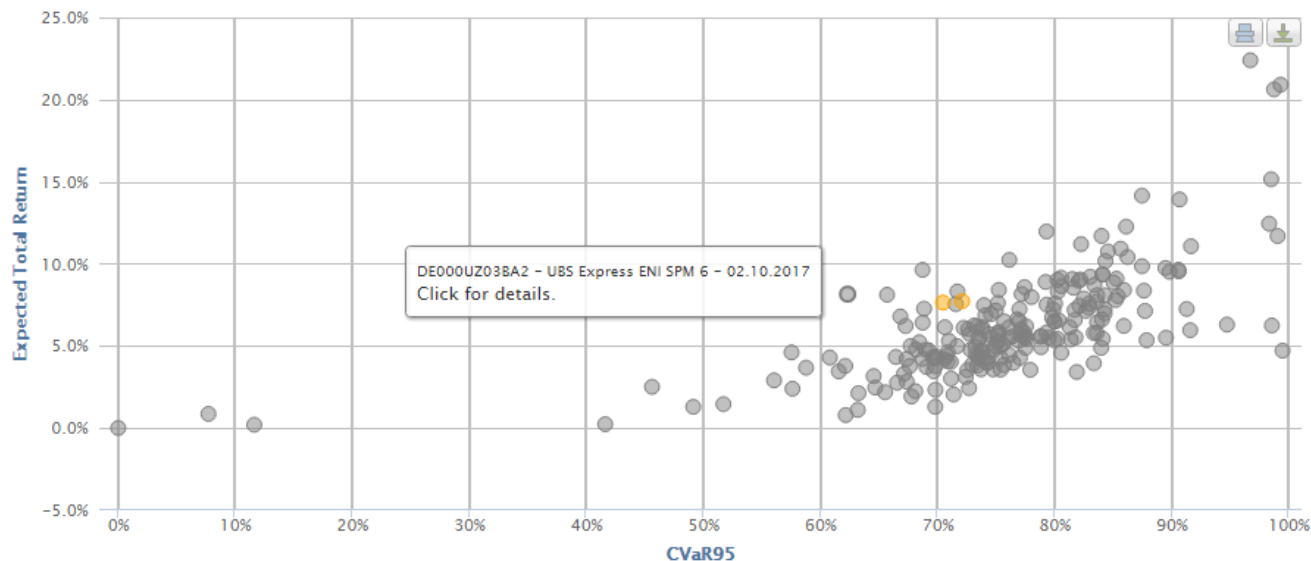
Market	Italy	Currency	EUR	Lifecycle	Post-Strike	Switch to products ranking ?
Product Type	Autocall	X	Maturity	4D	7Y	?
Underlying	Any	X	Your View on the Market	there will be modest market gains	?	
Issuer:	Any	X	Y-Axis (Performance)	Expected Total Return	?	
X-Axis (Risk)	CVaR95	?				

221 products found



Step 1: products screening

Filtered products will be shown in an interactive Risk-Performance figure which will allows you to highlight products details (below) or to select them for inclusion into your watch-list (click the star button to do that)



NL0011007497 ☆

BNP Athena Certificate SPM 15 - 26.03.2018

Issuer:	BNP Paribas	Annualized Return:	4.48%	Fair Value:	43.49
Maturity:	3/25/2018	Total Return:	9.64%	Better than BTP:	33.69%
Underlying:	Saipem SPA	Volatility:	57.39%	Var95%:	63.18%
		Semideviation:	18.87%	Prob. of losing capital protection:	83.49%




Step 1: Watch-List

The watch-list is a short list of all your products of interest

		Quintes Index	AG				
DE000HV4AHH7	HVB Cash Collect Autocallable TOD 2.3 - 15.12.2017	Tod's SPA	UniCredit Bank AG	72.51	2.58%	29.12%	
IT0005123747	ALETTI Target Cedola SX5E Index 2.65 - 21.08.2020	EURO STOXX 50 Index	Banca Aletti Spa	87.91	0.29%	12.48%	
NL0011512033	BNP Athena Certificate ISP 16 - 07.01.2020	Intesa Sanpaolo SpA	BNP Paribas	72.28	3.13%	34.42%	

1 / 1

Total items: 8

Convert to Portfolio 

At any time you can convert the watch list into a portfolio. This will enable the possibility of running the portfolio analyses including the portfolio designer.



Step 2: setup design goals

Under the Preferences section you can configure your design goals as follows:

Portfolio Design

Budget (in main currency) 5000

Minimum Number of Shares 0 + -

Risk Measure

- CVaR95
- Volatility
- SemiDeviation**
- VaR95
- CVaR95
- VaR99
- CVaR99

Save

- By specifying the **budget** the designer will propose portfolios including combination of shares covering your budget.
- By specifying the **minimum number of shares** for each product or setting to 0 for allowing the system to discard products from the universe.
- By specifying the **risk measure** to be used (VaR, CVaR, Volatility, and Semi deviation).



Step 4: Launch the portfolio designer

By launching the portfolio designer Fairmat Cloud will generate 4 different products allocations characterized by different risk profiles: **Conservative**, **Moderate**, **Dynamic** and **Aggressive** by choosing products from the products universe.

<input checked="" type="checkbox"/>	Test Portfolio	6		
<input type="checkbox"/>	UK Portfolio	3		
<input type="checkbox"/>	UK Test	4		

1 / 1

Total items: 14

Duplicate

ON-DEMAND PORTFOLIOS ANALYTICS

- [Portfolio Backtesting](#)
- [Portfolio Greeks Derivatives](#)
- [Post-Strike Portfolio Backtesting](#)
- [Short-Term Portfolio VaR](#)
- [Optimal Portfolio Design](#)

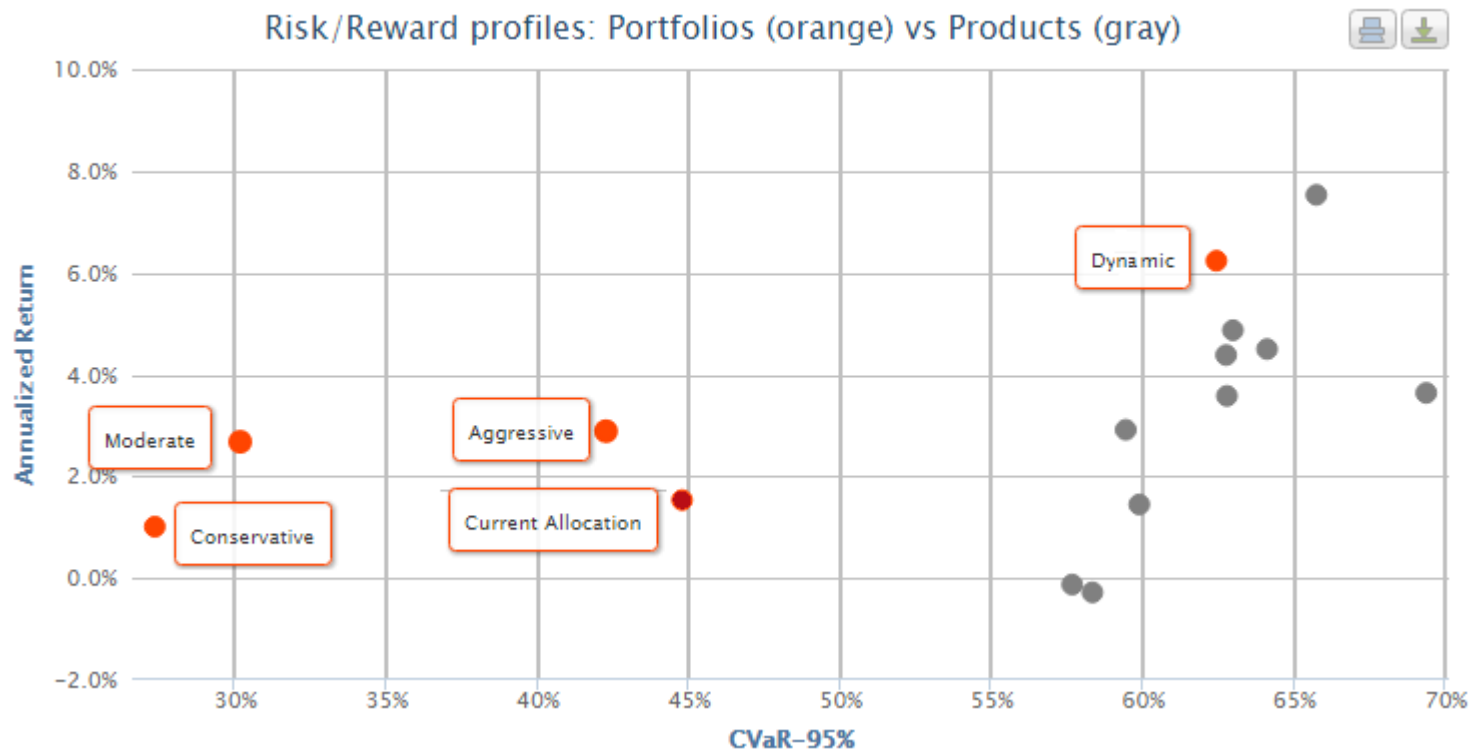
Valuation Date:

Request



Designer outputs – risk/reward profiles

The designer generates several outputs: the first is a synthesis figure profile in which the risk/reward profile of any proposed allocation is compared with the ones of products included in the universe products and with the current portfolio allocation:



Designer outputs – allocations details

Then, for any profile, the distribution of return, plus several return statistics, and the portfolio composition are given.

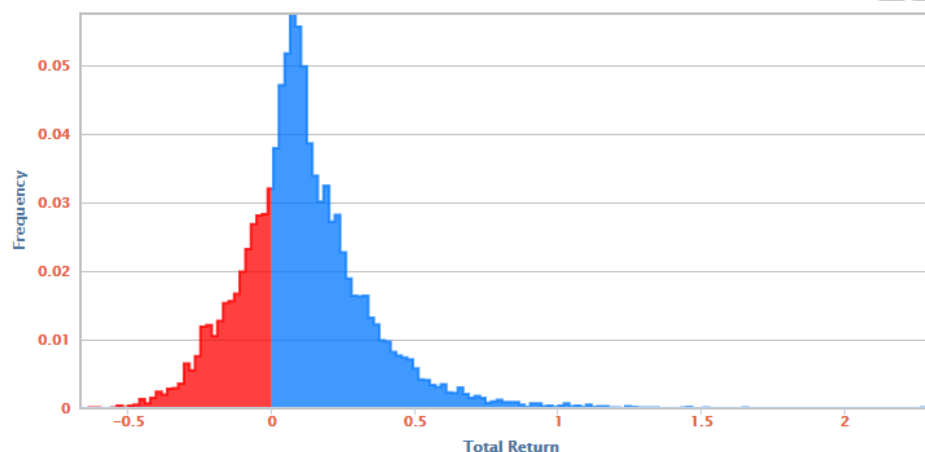
Historical Performance ⓘ

Annualized Return	1.81 %
Volatility	9.19 %
Semideviation	1.95 %
Sharpe Ratio (Ann)	0.77
VaR 90% (at maturity)	-15.24 %
CVaR 90% (at maturity)	-24.73 %
VaR 95% (at maturity)	-22.90 %
CVaR 95% (at maturity)	-30.66 %
VaR 99% (at maturity)	-36.28 %
CVaR 99% (at maturity)	-42.26 %
Chances of gain or return of capital	71.91 %

Composition for Aggressive profile ⓘ

IT000	1.14
NL001	7.20
NL001	0.41
NL0010	4.24
NL0010	12.94
XS0969	0.57
DE000D	4.48

Total Return Distribution for Aggressive profile



Methodology

let be $R_j(x)$ the return given by entering in contract j at the current market price. $R_j(x)$ depends on the future realization of the underlying x .

For a given vector of positions \mathbf{q} , the portfolio expected return is :

$$R = \sum q_j R_j(x)$$

While the calculation of the portfolio expected return can be spitted into the calculation of the single terms returns, this is not possible for the portfolio risk measures.

For this reason we calculate expected value and risk functionals $E[.]$ and $Risk[.]$ with simulation techniques such as Monte Carlo simulation or Bootstrapping.



Methodology

In order to design optimal portfolios we solve the following mathematical programming problem:

$$\begin{aligned} & \text{maximize}_q E \left[\sum q_j R_j(x) \right] - \lambda \text{Risk} \left[\sum q_j R_j(x) \right] \\ & \text{subject to} \\ & \quad \text{positive constraints} \\ & \quad \text{budget constraints} \\ & \quad \text{etc..} \end{aligned}$$

For different values of λ , the risk aversion coefficient.



Conclusions

- The new portfolio designer provides investors and advisors full awareness on the effects of structured products combinations.
- Jointly with the other tools (products fair values and portfolio Greeks and VaR) Fairmat Cloud further simplifies management, reporting and compliance.



More information

- Visit cloud.fairmat.com to start: by **signing up** you will receive 5 Fairmat Cloud credits and you will be able to use the system instantly.
- Find more details at <https://cloud.fairmat.com/public/help>
- For any question contact us at info@fairmat.com, or call us at +39 045 80 12 030

- Stay updated on

