

1 Introduction

This plug-in implements the informative CONSOB¹ (see Quaderno di Finanza N.63 : “A quantitative risk-based approach to the transparency on non-equity investment products”² and the Comunicazione n. DIN/DSE/9025454 of 24th march 2009) for the transparency of investments which is built on three pillars: the recommended investment horizon, the potential returns and the degree of risk associated (and, in the case of “benchmark” products, the management class in terms of deviation from the chosen benchmark) about an investment product. InformativaConsob plug-in implements the informative Consob about an investment in the “unit-linked” product.

2 How to use the plug-in

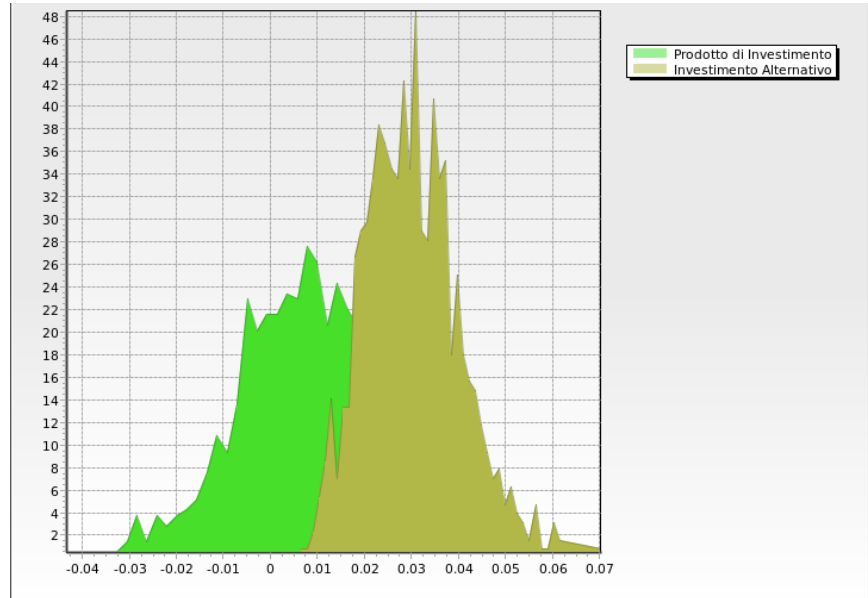
When the InformativaConsob plug-in is installed appear in the Fairmat user interface, under the Analysis menu, three news menu items which allows to choose between

- Consob First Pillar: costs and potential returns of the investment, respect to an alternative investment in the risk-free asset, at the end of the recommended investment horizon;
- Consob Second Pillar: degree of risk and, for the “benchmark” products, the management class in terms of deviation from the chosen benchmark (*delta-vol*);
- Consob Third Pillar: recommended investment time horizon.

Figure 1 presents an example of informative Consob output.

¹Italian Securities and Exchange Commission

²<http://www.consob.it/mainen/consob/publications/papers/papers.html?symlink=/mainen/consob/publications/papers/index.html>



Optimal Investment time (years) = 6
 Input Annual Product Volatility: 03.06%

Input Annual Benchmark Volatility: 03.52%
 Nominal Capital: € 100
 Financial Initial Costs: 02%
 Financial Company Forward Costs: 01.25%
 Insurance Initial Costs: 00%
 Insurance Company Forward Costs: 00.05%
 SGR Fee: 01.1%
 Rebate: 70%
 Invested Capital (Nominal Capital - Initial Costs): € 98
 Expected value of Investment: € 107.22
 Moneymarket threshold (2,5%): 01.32%
 Moneymarket threshold (97,5%): 05.42%
 Fairvalue: € 88.82
 Mark-up: € 11.18
 Insurance Mark-up: € 00.27
 Financial Mark-up: € 10.92

Actual Risk level: Medium (03.06%)
 Actual Management Style: Conservative, DeltaVol (-00.46%)

Event	Pr %	Medians (€)
ret<0	25.3	96.43
0<=ret<rf	42.7	104.43
ret=rf	42.7	114.86
ret>=rf	00.6	140.85

Figure 1: Example of informative output

3 Simulation Method

The implemented procedure is composed by the following simulation methods

- Pelsser Squared Gaussian model for the dynamics of interest rate under the *risk-neutral* measure. This model provides the advantage that the interest rates never become negative

$$dr = \theta^*(t, r) dt + 2\sigma\sqrt{r} dW^*, \quad (1)$$

where

$$\theta^*(t, r) = \sigma^2 + 2 \left(\frac{\partial}{\partial t} \alpha(t) + a\alpha(t) \right) \sqrt{r} - 2ar. \quad (2)$$

- Money-market account for the alternative investment in the risk-free asset

$$B_t = \exp \left\{ \int_0^t r_s ds \right\} \quad (3)$$

- the underlying fund is modelled as a Geometric Brownian Motion under the *risk-neutral* measure with a stochastic interest rate r_t (Pelsser model). The model takes into account company's (financial and insurance) costs and OICR's fee and rebate. The u represents all the upfront costs, while rc the forward costs removing the rebate effect.

$$V_t = V_0 (1 - u) \exp \left\{ \left(r_t - rc - \frac{\sigma_V^2}{2} \right) t + \sigma_V W_t^* \right\} \quad (4)$$

4 Implementation details

- Recommended investment time horizon: average conditioned to 2 calibrated percentiles of the cumulative distribution function of the stopping times, that is the first hitting time for the stochastic process of the fund V_t to reach (or cross) the barrier V_0 (plus the possible stochastic exit-penalty)

$$\frac{\int_{\alpha_{min}}^{\alpha_{max}} x f_X(x) dx}{\int_{\alpha_{min}}^{\alpha_{max}} f_X(x) dx} \quad (5)$$

- the potential return of the investment is calculated on the notional capital

$$\ln \left(\frac{\tilde{V}_T}{V_0} \right) \quad (6)$$

5 .fair Template implementation notes

In order to be able to be processed by DirettivaConsob plug-in, the Fairmat model describing the fund evolution must have the following characteristics (you can find an example of a well formed file in <http://www.fairmat.com/resources>)

5.1 Configuration/Scenarios

The template must contain two configurations: the first one describes the evolution of the investment total returns, while the second one describes the evolution of the MMA investment.

5.2 Compulsory symbols

The following symbols are compulsory and must be defined in order to execute the Consob analysis.

- `obiettivo` or `obiettivo2`: barrier function for computing the third Pillar (i.e. the recommended investment time horizon).
- `UseLogRet`, 1 : uses Log-Return for the distribution comparison, 0 : the capitals
- `FCFIN`, Financial company forward costs
- `ICFIN`, Financial initial costs
- `FCASS`, Insurance company forward costs
- `ICASS`, Insurance initial costs
- `SgrFee`, OICR's fee
- `rebate`, OICR's rebate
- `N`, the nominal capital
- `InitialCost`, the upfront (sum of initial costs)
- `IPY`, the number of time steps per year: The plug-in change the usual numerical settings
- `R3`, the recurrence function which describes the evolution of the investment product
- `RiskLevel`, the declared risk level: it can assume the following values
 - 1, Low
 - 2, Medium-Low
 - 3, Medium

- 4, Medium-High
- 5, High
- 6, Very-High

5.3 Optional symbols

The following symbols are optional

- for all products
 - **Penalty**, exit-penalty for early exit from the investment
 - **MarkupFwdCompany**, additional company fix costs
- for “*benchmark*” products
 - **ManagementStyle**, qualitative variable which describe the distance from the benchmark. It can assume the following values
 - * 1, Conservative
 - * 2, Significant
 - * 3, Relevant
 - * 4, Not significant
 - **SigmaB**, volatility benchmark
- for “*recurrence-premium*” products
 - **rc**, annual recurrence premium
- **CRP**, shift for risk scenarios.
- **ActualCRP**. The plug-in will run 3 times the analysis and will set **ActualCRP** to the values of $\{0, \text{CRP}, -\text{CRP}\}$. Enter it where needed. For example it can model the annual risk-premium for underlying option and will be entered in the stochastic process drift.

5.4 Index-Linked Modelling

Index-Linked must have the following structure:

- Functional operators behaviour should be set to ‘Calculate the transformation at any date but take the value at the decision date’.

5.4.1 Abandonment Costs

The abandonment costs are calculated as the difference of the Value of the Index at any Abandonment Date and the payoff the holder get when he/she abandons the contract (the *Exit Value*). The *Exit Value* is modelled by a sub tree which may not be linked to the product valuation. The *Exit Value* block must have the following characteristics:

- The name of the exit value root must be 'ExitV'
- The payment blocks must be parametrized by a variable called **ExitDate**. Fairmat will calculate the value of the Exit Value structure for every integer value of **ExitYear** between 1 and the contract Maturity. **ExitDate** will be set to the values of

$$\{StartIndex + 1, StartIndex + 2, \dots, StartIndex + floor(M) - 1\}.$$

If the variable **StartIndex** is not present, the effective date will be used. Alternatively if a Vector called **ExitDates** is present, **ExitDate** will assume all values in **ExitDates**.