ADDACTIS®
IBNRS®
SOLUTION

Reserving challenges in a continuously changing market

Assessing a company's reserve for future claims payments and premiums, and estimating the risk present in the claims reserves run-off, are fundamental elements of the financial management of any general (re)insurer.

To overcome all these increasing challenges that insurers are facing, **ADDACTIS® Worldwide** has developed a reserving software: **ADDACTIS® IBNRS®**. The features and functionalities of this advanced and modern tool are fully described below.

ADDACTIS® IBNRS® solution overview

ADDACTIS® IBNRS® is a non-life reserving solution, incorporating a full range of actuarial deterministic and stochastic methods.

ADDACTIS® IBNRS® delivers a Solvency II compliant environment for any deterministic and stochastic actuarial projections. With a few clicks, this software solution allows users to understand an entire claims analysis and to detect correlations between the different lines of business. In order to answer Solvency II, IFRS and SOX requirements, **ADDACTIS® IBNRS®** is designed to provide users with full audit trail and security checks.

ADDACTIS® IBNRS® has been at the forefront of the actuarial reserving methods for the last ten years and continues to be so. Our software solution includes a full range of reserving methods, from the more traditional ones such as Bootstraping, Mack or the BF-method, to the more innovative stochastic methods such as the Reversible Jump Markov Chain Monte Carlo as well as other worldwide used methods like Dynamic Fisher. Moreover, the latest version of our software is now embedding a genuine claims-by-claims reserving module! **ADDACTIS® IBNRS®** is an actuarial software solution which

is simple and user friendly. It is developed under a dynamic, object-oriented structure, and lets the user calculate, but also track and monitor non-life insurance reserves. In addition, **ADDACTIS® IBNRS®** allows insurers and reinsurers to evaluate the Solvency II reserves according to the latest European specifications and risks valuation and internal calibrations.

Essential functionalities for an advanced reserving process are included in **ADDACTIS® IBNRS®**. These are:

1. Data handling: data import and export;
2. Deterministic methods;
3. Stochastic methods;
4. Consolidation module;
5. Advanced reserving methods: RJMCMC & ICR;
6. BE SII.

These 6 topics are further described in detail below.

1) Data handling: data import and export

The first and most important part is the aggregation of the data. **ADDACTIS® IBNRS®** provides users with several ways to import the data: copy/paste, automated importation of triangles from **Microsoft® Excel**, direct importation from database including triangle building thanks to the link with **ADDACTIS® Workflow**.

Furthermore, it is possible to calculate other triangles inside the project, based on those previously imported.
Every other kind of data like inflation vectors, accounting rates can be easily imported or defined.

ADDACTIS® IBNRS® comes with a dll and an **Microsoft® Excel** adding providing the user with a full solution to build any type of taylor-made reporting. It is therefore possible to connect directly **Microsoft® Excel** reports to IBNRS results, with a full audit trail support.
These modules also enable to setup a full IT integration.

2) Deterministic methods

ADDACTIS® IBNRS® provides users with a full range of deterministic methods. These include:
- Chain Ladder;
- Bornhuetter-Ferguson and Cape Cod;
- Munich Chain Ladder;
- De Vylder;
- Fisher Lange;
- Average cost and Partial Paid projection;
- Loss Ratio;
- Generalized Linear Models (GLM) in an additional module.
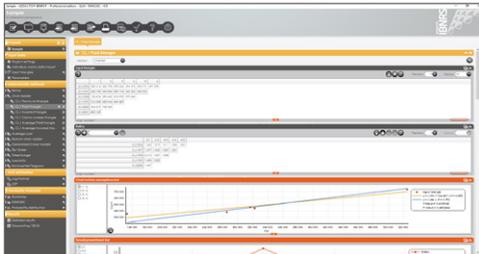
One of the most important asset of our software is the fast calculation. Every change in the data, parameters or configuration will automatically change the results accordingly and in real time.

Every method can be set up very easily by click thanks to the user friendly interface. A lot of graphical representations help users in their analysis.

All the methods give results for the reserves, which are displayed in a summary table to enable comparisons between each of them, and to select one or more methods to calculate the final result.
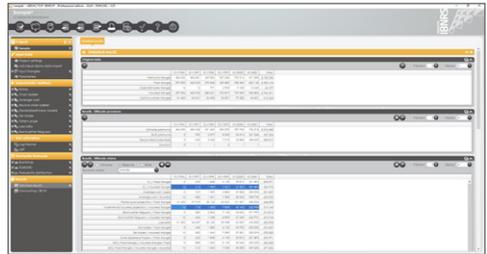
3) Stochastic methods

With the Solvency II framework, insurers have now to calculate a distribution of their reserves in order to obtain the error results from the reserves calculations. To do so, **ADDACTIS® IBNRS®** offers several methods to estimate the distribution:

- **Over-dispersed Poisson non-parametric Bootstrap**: this method is non parametric and simply uses the information available on the distribution to calculate all main indicators (mean, standard deviation, density...) based on this one.

- **Probability distribution module**: in this module it is possible to choose one specific method to derive the distribution under a hypothesis (normal or lognormal), choosing between Mack, Merz & Wüthrich, or any other stochastic method (Bootstrap, RJMCMC).
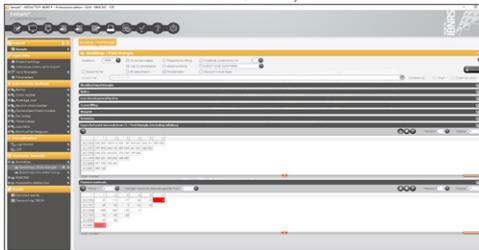
4) Consolidation module

ADDACTIS® IBNRS® enhances a complete consolidation module by line of business, subline,…Users could either consolidate the results of several **IBNRS®** projects or consolidate the input triangles and perform projections on these consolidated data.

All results are then available (ultimates, best estimates, durations, etc…). **ADDACTIS® IBNRS®** also provides users with specific calculations modules to evaluate the diversification effect, as well as to calibrate the correlations between the different lines of business:

- The probability distribution consolidation module takes into account the correlation between lines of business;
- The synchronised bootstrapping enables the automatic analysis of diversification effects, without the need of linear correlations definition as correlations are estimated through synchronized resampling.

5) Advanced reserving methods: RJMCMC & ICR

ADDACTIS® IBNRS® also embeds two innovative methods:

- **RJMCMC** (Reversible Jump Markov Chain Monte Carlo): This method is interesting because it does not require minimum Chain Ladder assumptions; moreover this is the first method enabling automated definition of zones within the triangle where different models are automatically defined to fit the quantity of available data.

- **Individual Claims Reserving method** (ICR): This method consists in estimating the individual reserves for each claim (both RBNS and IBNR claims) using a three parts hierarchal model.
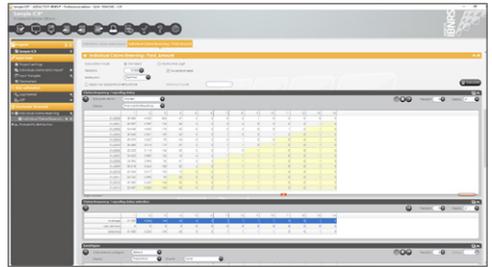
6) BE SII

ADDACTIS® IBNRS® embeds a module dedicated to the Solvency II calculation for non-life reserving.

It provides the user with a completed, discounted run-off triangle, the Premium and Claims reserves Best Estimates (gross and net of reinsurance), and finally the total risk margin.

ADDACTIS® IBNRS® solution features

ADDACTIS® IBNRS® is/has:

- **Easy to use**: with data input wizards, menus to navigate through methods, and template to guide users through reserving methodologies;
- **Transparent**: A full audit trail is provided for all changes made to each project. **ADDACTIS® IBNRS®** also allows exporting and printing files containing the methods used and parameters selections – all at the push of a button;
- **Fast**: **ADDACTIS® IBNRS®** can carry out thousands of calculations in a couple of seconds;
- **Clear reporting**: **ADDACTIS® IBNRS®** facilitates modern business requirements for clear reporting and updates automation;

- **Wide ranging technical functionality**: including the main deterministic and stochastic methods used to estimate non-life reserve amounts, **ADDACTIS® IBNRS®** also calculates both the VaR and Tail VaR measure for reserves, as well as the Solvency Best estimate and Risk margin.

ADDACTIS® IBNRS® solution IT requirements

ADDACTIS® IBNRS® is an independent software solution without any external components or dependencies. It works on any recent 32 or 64 bit Windows platform (Windows 7 or later/ Windows server 2008 or later) with standard requirements on hardware for these kind of solutions.Local and server licences are available for the product.

All software products are **ADDACTIS® Worldwide** full property and have no external dependency.

The ADDACTIS® Way