ELRF™ & ICRFS™ Best's Schedule P

Insureware with AM Best



Insureware & Best's Financial Suite - P/C US

Insureware and AM Best have created ELRF[™] Best's Schedule P 2021.

This application, freely available with a Best's Financial Suite - P/C, US subscription, is:

- pre-loaded with Best's Financial Suite P/C, US data;
- organized in a structured database; and
- primed for Insureware's analytical tools and modeling frameworks!

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ELRF Best's Schedule P 2021

Best's Financial Suite - P/C, US data + Analytical tools

Insureware Best's Schedule P 2021 products provide:

- Pre-calculated critical financial information:
 - o Reserves Held;
 - o %IBNR;
 - o Total Loss Ratio;
 - o Survival Ratios; and
 - o Much more!

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Drill down by key financial metrics and glean hidden insights.

o All available Best's Financial Suite - P/C, US loss development arrays (triangles):

= Ultimates Held

- o Paid losses;
- o Case Reserve Estimates (CRE); + = Reserves Held
- o BULK and IBNR; =
- o Incurred Losses;
- o Number of Claims Reported;
- o Number of Claims Closed.

Insureware's analytical tools are fully ready for use on any loss development array:

- Link Ratio Techniques
- Extended Link Ratio Family (ELRF) modeling framework
 - o The regression formulation of link ratios
- Probabilistic Trend Family (PTF) and Multiple Probabilistic Trend Family (MPTF) modeling frameworks *ICRFS™* Best's Schedule P 2021 only.

Construct a complete picture of a company's reported liabilities, their holdings, and their financial positioning in the industry





Data Organization

Best's Financial Suite - P/C, US data are grouped by company and Line of Business into triangle groups.

In Insureware parlance, triangle groups contain data (triangles, premiums, exposures, models, and more) related to the same Line of Business – or other grouping category. These building blocks are then provided to the modeling frameworks for analysis.



Triangle groups contain building blocks for easy analysis:

- Triangles (loss development arrays);
- Exposure, Inflation, Premium vectors; and
- Datasets which link triangles with [optional] exposure, inflation or premium vectors.

Net data are available in triangle format for ready analysis.

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lane .	Triangle	Exposure	Premium	Assoc Triangle	TrangleType	1/0
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HØ)	AHB	[None]	EP	(None)	Reserves held	1
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The Mack Method and The Bootstrap Technique

Two modeling frameworks are included: the Extended Link Ratio Family (ELRF) and Link Ratio Techniques (LRT). The ELRF module formulates link ratio methods as regression estimators and extends them.

ELRF models include:

- Mack (regression formulation of volume weighted average, chain ladder);
- Exclusion of whole periods or individual points from estimations;
- Murphy;
- · Bornhuetter-Ferguson; and
- Much more!

Within an interactive, intuitive, graphical interface.

Comprehensive diagnostic tests validate that assumptions made by link ratio and related methods are carried by the data - including the bootstrap technique. Link ratio techniques:

- Volume weighted average, Chain ladder;
- Arithmetic average;
- Last N diagonal weighted average;
- Two parameter smoothing;
- Three parameter smoothing;
- Bornhuetter-Ferguson; and
- Much more!



Analytical tools

ICRFS[™] Best's Schedule P 2021

You have ELRF™ Best's Schedule P 2021 and want more modeling power?

Insureware has created ICRFS[™] Best's Schedule P 2021 for you.

This premium application from Insureware adds the innovative probabilistic modeling frameworks of ICRFS[™] to the functionality of ELRF[™] Best's Schedule P 2021.

ICRFS[™] Best's Schedule P 2021 empowers you to answer questions like:

- Are our company's loss costs similar to our competitors?
- How do our company's trends, risk diversification, and loss ratios rank in the industry?
- Which companies could be targeted for reinsurance or acquisition?
- What correlations should be used to calculate our risk diversification?

s ICRFS** Best's 020 Schedule P 2020	ELRF** Best's Schedule P 2020	Data and modeling frameworks	ICRES** Best's Schedule P 2020	ELRF ^{III} Best's Schedule P 2020	Data and modeling frameworks
	Extended Link Ratio Family (ELRF)				Database
res Yes	Yes	Mack	Yes	Yes	Best's Financial Suite - P/C, US data by LoB and total
Yes Yes	Yes	Murphy	Yes	Ves	Associated key fields
res Yes	Yes	Trends (down accident years) and intercepts	Yes	Yes	Industry Totals
res Yes	Yes	Optimisation			Critical financial information including:
fes Yes	Yes	Bornhuetter-Ferguson	Yes	Yes	Reserves and Ultimates Held
fes Yes	Yes	Bootstrap	Yes	Yes	Gross and Net Premium
/es Yes	Yes	Quantiles, V@Rs, and T-V@Rs	Yes	Yes	%iBNR
		Probabilistic Trend Family (PTF)	Yes	Yes	Total Loss Ratios
Yes		Full trend identification (including calendar)	Yes	Yes	Survival Ratios
Yes		Volatility quantification	Yes	Yes	Ratios relative to industry
Yes		Modeling wizard			Best's Financial Suite - P/C, US triangles
Yes		One year ahead statistics (CDR)	Yes	Yes	Paid Losses
Yes		Liability stream	Yes	Yes	Case Reserve Estimates
Yes		Risk capital by Acc. or Cal. Year	Yes	Yes	incurred Losses (not including BULK and IBNR)
Yes		Reinsurance	Yes	Yes	Bulk and IBNR
Yes		Variation in Mean Ultimate	Yes	Yes	Premium
Yes		Quantiles, V@Rs, and T-V@Rs	Yes	Yes	Number of Claims Reported
		Aultiple Probabilistic Trend Family (MPTF)	Yes	Yes	Number of Claims Closed
Yes		Full trend identification (including calendar)			Additional Triangles
Yes		Volatility quantification	Yes	Yes	Reserves Held
Yes		Correlations	Yes	Yes	Ultimates Held
Yes		One year ahead statistics (CDR)			Link Ratio methods
Yes		Liability stream	Yes	Yes	Link Ratio Techniques (LRT)
Yes		Risk capital by Acc. or Cal. Year	Yes	Yes	Aggregate Link Ratio Techniques (ALRT)
Yes		Reinsurance	Yes	Yes	Payment Per Claim Incurred (PPCI)
Yes		Variation in Mean Ultimate	Yes	Yes	Projected Case Estimates (PCE)
Yes		Solvency II one-year ahead metrics	Yes	Yes	Bornhuetter-Ferguson (BF)
Yes	C	Ultimate year risk horizon metrics	Yes	Yes	Fisher-Lange (FL)

ELRF[™] Best's Schedule P 2021 versus ICRFS[™] Best's Schedule P 2021

Probabilistic Trend Family Modeling Frameworks

ICRFS[™] Best's Schedule P 2021 contains the two additional modeling frameworks of PTF and MPTF.

The Probabilistic Trend Family (PTF) modeling framework enables analysts to describe the trends in the data in all time directions (development, accident, and calendar) along with the volatility around those trends. The Multiple Probabilistic Trend Family (MPTF) modeling framework extends this further by also including correlations between lines of business – measured from the data.

Forecast scenarios are data driven. Future trends are related to trends found in the past data coupled with business knowledge and future expectations.

- Probabilistic Trend Family (PTF):
- Identify trends in the three directions (development, accident, and calendar);
- Measure the volatility around the trends;
- Use the modeling wizard to quickly generate starting models;
- Compare loss costs between companies and much more!





- Multiple Probabilistic Trend Family (MPTF):
- Measure correlation between multiple Lines of Business directly from the data;
- Determine risk capital allocation and diversification credit for entire companies;
 - Calculate Solvency II one-year ahead statistics and associated risk for individual Lines of Business or whole companies;
 - Create company profiles to visually compare performance and much more!

About Insureware

Insureware is not your typical long-tail liability risk management firm: we are R&D focused. Our team of world-class statisticians originated many of the ideas that the industry now aspires to. They have published numerous papers not only in actuarial journals but also in preeminent statistical journals. Insureware creates and supports the only comprehensive, enterprise wide, long-tail liability risk management software in the world.

Insureware has advised on a wide-range of insurance matters including:

- Reserve due diligence;
- Mergers and Acquisitions;
- Assessing risk capital and Solvency II capital requirements for submissions to regulators and rating agencies;
- Underwriting and pricing; and
- Reinsurance transactions.

Insureware creates unique collaborative partnerships with each client. The partnership facilitates the growth of incomparable knowledge, benefits, and applications.

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