

ELRF™ & ICRFS™ Best's Schedule P

Insureware with AM Best



Insureware
Innovative Statistical Solutions for P&C Insurance

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

Insureware and AM Best have created ELRF™ Best's Schedule P 2022.

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!

Contents

ELRF™ Best's Schedule P 2022	3
Data Organization	4
The Mack Method and The Bootstrap Technique	5
ICRFS™ Best's Schedule P 2022	6
Probabilistic Trend Family Modeling Frameworks	7

ELRF Best's Schedule P 2022

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

Insureware Best's Schedule P 2022 products provide:

- Pre-calculated critical financial information:

- o Reserves Held;
- o %IBNR;
- o Total Loss Ratio;
- o Survival Ratios; and
- o Much more!

Triangle Group	Line of Business	Reserves Held	Ultimates Held	Survival Ratio	Loss Ratio
Travelers Gap (SL)	D-Workers Com.	11,197,664	25,470,207	8.06	88.37
State Ins Fund (SL)	D-Workers Com.	8,890,050	16,139,441	10.96	76.75
Harford Ins Gap (SL)	D-Workers Com.	7,825,477	18,320,200	9.42	80.07
Liberty Mutual Ins.	D-Workers Com.	7,008,584	16,408,561	9.73	71.87
Chubb PNA Gap (SL)	D-Workers Com.	5,145,261	9,412,367	10.26	55.23
State Compensatio...	D-Workers Com.	4,957,342	8,622,589	7.89	75.96
Evolution Mathema...	D-Workers Com.	4,307,824	9,227,008	6.44	57.54
American Internat...	D-Workers Com.	3,415,686	15,446,725	5.91	74.49
Zurich Ins US PC...	D-Workers Com.	3,325,302	6,950,060	10.33	74.12
Old Republic Ins G...	D-Workers Com.	2,456,427	6,546,425	7.16	67.12
W. R. Berkley Ins...	D-Workers Com.	2,034,955	6,367,341	4.44	53.13
Texas Mutual Ins...	D-Workers Com.	2,021,356	5,440,413	8.49	54.00
CNA Ins Corp (SL)	D-Workers Com.	1,862,221	4,900,152	7.54	64.85
AmTrust Gap (SL)	D-Workers Com.	1,627,279	5,208,632	4.40	50.00
Great American P...	D-Workers Com.	1,553,367	5,029,671	4.30	56.26
AF Gap (SL) 19880	D-Workers Com.	1,722,525	6,086,073	3.10	57.00

Drill down by key financial metrics and glean hidden insights.

- o All available Best's Financial Suite - P/C, US loss development arrays (triangles):
- o Paid losses;
- o Case Reserve Estimates (CRE);
- o BULK and IBNR;
- o Incurred Losses;
- o Number of Claims Reported;
- o Number of Claims Closed.

+ = Reserves Held

+ = Ultimates Held

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

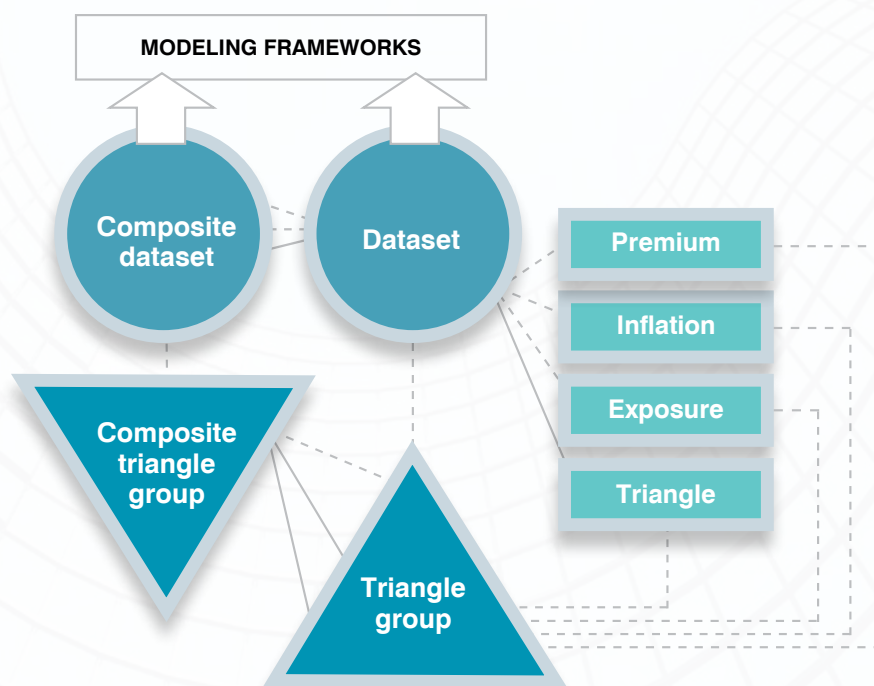
- Link Ratio Techniques
- Extended Link Ratio Family (ELRF) modeling framework
 - o The regression formulation of link ratios
- Probabilistic Trend Family (PTF) and Multiple Probabilistic Trend Family (MPTF) modeling frameworks – ICRFS™ Best's Schedule P 2022 only.

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.

Name	Triangle	Exposure	Premium	Assoc Triangle	TriangleType	I/C
PL(I)	PL(I)	(None)	EP	CRE(I)	Paid losses	I
PL(I)EP	PL(I)	Exp_EP	EP	CRE(I)	Paid losses	I
CRE(I)	CRE(I)	(None)	EP	(None)	Case reserve estimates	I
CRE(I)EP	CRE(I)	Exp_EP	EP	(None)	Case reserve estimates	I
ISNR(I)	ISNR(I)	(None)	EP	(None)	Incurred but not reported losses	I
RH(I)	RH(I)	(None)	EP	(None)	Reserves held	I
RH(I)EP	RH(I)	Exp_EP	EP	(None)	Reserves held	I
PL(I)C	PL(I)C	(None)	EP	CRE(I)	Paid losses	C
PL(I)CEP	PL(I)C	Exp_EP	EP	CRE(I)	Paid losses	C
IL(I)C	IL(I)C	(None)	EP	CRE(I)	Incurred losses	C
IL(I)CEP	IL(I)C	Exp_EP	EP	CRE(I)	Incurred losses	C
UH(I)C	UH(I)C	(None)	EP	(None)	Ultimates held	C
UH(I)CEP	UH(I)C	Exp_EP	EP	(None)	Ultimates held	C



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!



ICRFS™ Best's Schedule P 2022

You have ELRF™ Best's Schedule P 2022 and want more modeling power?

Insureware has created ICRFS™ Best's Schedule P 2022 for you.

This premium application from Insureware adds the innovative probabilistic modeling frameworks of ICRFS™ to the functionality of ELRF™ Best's Schedule P 2022.

ICRFS™ Best's Schedule P 2022 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?

ELRF™ Best's Schedule P 2022 versus ICRFS™ Best's Schedule P 2022.

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

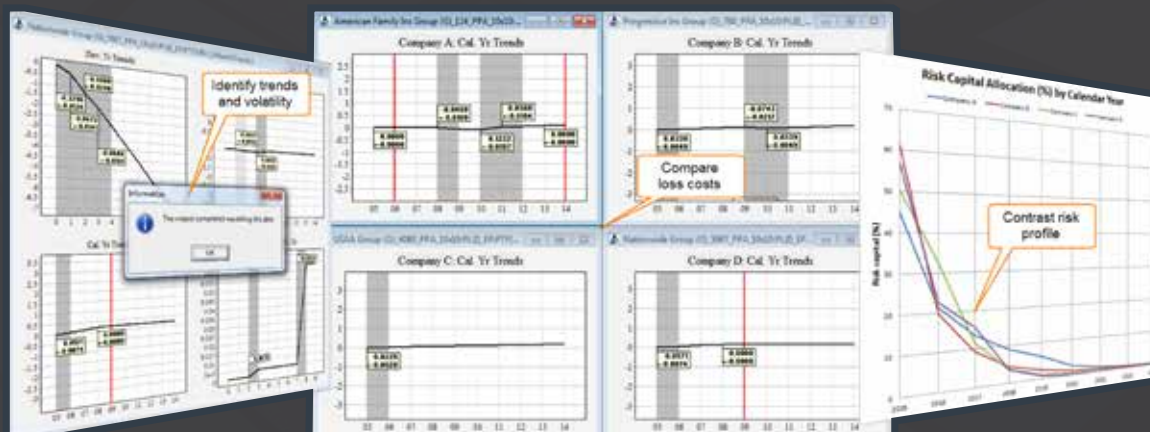
Probabilistic Trend Family Modeling Frameworks

ICRFS™ Best's Schedule P 2022 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.

www.insureware.com

Email: info@insureware.com



Insureware
Innovative Statistical Solutions for P&C Insurance