The Munich Chain Ladder - a claims reserving technique that closes the gap between paid and incurred based IBNR-estimates

Dr. Gerhard Quarg
Actuary
Munich Reinsurance Company
80791 Munich, Germany
Telephone no.: (089) 3891-2279
Fax no.: (089) 3891-72279
E-mail: gquarg@munichre.com

Abstract:

A big problem in claims reserving is the divergence of paid and incurred IBNR-estimates i.e. the estimated ultimate amounts based on paid data deviate more or less from the corresponding estimates based on incurred data. This usually happens for most accident years and is often significant. Furthermore, the type of data which shows higher ultimate amounts may change from accident year to accident year. A solution to this problem is presented in this paper, at least in the Chain Ladder setting:

First it is shown that there is a systematic weakness in the usual approach of applying Chain Ladder calculations to paid and incurred data separately. The reason is the following observation: In practise we find almost always a significant correlation between the paid-to-incurred ratios and the corresponding individual development factors of the paid and/or incurred data. More precisely, consider a fixed development year of the data triangle. Then, in the accident years whose previous paid-to-incurred ratio is below average, we usually observe rather above-average paid development factors and/or rather below-average incurred development factors. The accident years with an above-average paid-to-incurred ratio show the converse behaviour with below-average paid and above-average incurred development factors. This is not unexpected and can easily be checked using residual plots.

In the paper, this observation is elaborated to a distribution-free model for paid and incurred triangles generalising the Chain Ladder model to a new reserving technique - the Munich Chain Ladder method. The new method will bring the two projections close together if this was already the case in the old accident years. In any case it will narrow the gap between the paid and incurred based IBNR-estimates if the correlation mentioned is indeed contained in the data. The effectiveness of the Munich Chain Ladder method is illustrated by several real life examples.

Keywords:
Claims reserving, Chain Ladder, paid-to-incurred ratio, residual plots, correlation.