The use of Artificial Neural Networks to adjust and robustness study of experience tables of maintenance in disability

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Résumé en anglais	Pricing and, more important, reserving "life / death" and "disability" risks are strictly defined by the regulation, which imposes particular constraints on the technical rate and the laws of occurrence or maintenance. However, the assessment of portfolios reserving differs from the standard one proposed by the BCAC. Insurance companies are increasingly forced toseek the construction of experience tables to manage these risks, especially since it is unrealistic today to expect offset losses by financial products. Traditional adjustment methods, in actuarial literature, usually used to smooth the recovery curve rate estimated usually by the robust Adjusted Kaplan-Meier estimator, induce a model error due a boundary bias. The available data are usually sparse and poor quality on the border. Thus a boundary bias is due to weight allocation by the fixed symmetric argument outside the support of the gross curve, when smoothing close to the boundary is carried out. The objective of this work is the use of Artificial Neural Networks (ANN) for adjustment and smoothing experience tables of maintenance in disability applied to a two cycles real set data. The artificial neural networks are parametric nonlinear models able to play an "universal approximator" role achieving a local and global approximation. Two architectures networks are particularly suited to model and smooth gross output rates: Feedforward Neural Networks (FNN) and Radial Basis Functions (RBF) Networks. The robustness of the ANN globally and especially at the edge of curve can be also studied. Graphical tests are used to compare output surfaces rates obtained by neural networks with those obtained by Whittaker-Henderson framework.
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