Penentuan Premi Reasuransi Katastrofe Risiko Berganda dengan Prinsip Premi Standar Deviasi = Pricing Double Risk Catastrophe Reinsurance using Standard Deviation Premium Principle

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Abstrak

Extreme Value Theory (EVT) merupakan suatu metode yang dikembangkan untuk mengukur risiko-risiko yang bernilai ekstrem, termasuk risiko akibat kejadian katastrofe. Kejadian katastrofe dapat menimbulkan dampak kerugian yang sangat besar, sehingga diperlukan tindakan untuk meminimalisir hal tersebut. Salah satu strategi yang dapat dilakukan perusahaan asuransi adalah memanfaatkan reasuransi katastrofe. Dengan begitu, perusahaan reasuransi perlu menetapkan premi yang harus dibayar oleh perusahaan asuransi atas risiko yang dialihkan kepada perusahaan reasuransi. Risiko untuk penentuan premi reasuransi katastrofe dapat dimodelkan dengan salah satu model pada EVT, yaitu Peak Over Threshold (POT). Pada model POT, terdapat nilai threshold yang dapat ditentukan salah satunya dengan metode persentase. Pada penentuan premi reasuransi katastrofe, penting untuk diketahui bahwa risiko yang besarnya melebihi nilai threshold yang dimodelkan dengan distribusi Generalized Pareto. Kemudian, banyak kejadian katastrofe diasumsikan mengikuti proses Poisson. Pada skripsi ini, digunakan risiko berganda akibat kejadian katastrofe gempa bumi, yaitu risiko kematian dan kerusakan rumah. Kontrak reasuransi katastrofe yang digunakan adalah reasuransi kombinasi quota-share setelah excess-of-loss. Selanjutnya, dihasilkan formula eksplisit premi reasuransi katastrofe risiko berganda dengan menggunakan prinsip premi standar deviasi. Prinsip premi standar deviasi dipilih karena mempertimbangkan keberagaman data. Formula eksplisit premi reasuransi tersebut diaplikasikan pada data risiko kematian dan kerusakan rumah akibat gempa bumi di Indonesia pada rentang tahun 2000-2023 yang diperoleh dari situs Badan Nasional Penanggulangan Bencana (BNPB). Diperoleh hasil bahwa premi reasuransi katastrofe risiko berganda lebih besar dari premi reasuransi katastrofe risiko kematian dan premi reasuransi katastrofe risiko kerusakan rumah. Akan tetapi, premi reasuransi katastrofe risiko berganda lebih kecil jika dibandingkan dengan penjumlahan premi reasuransi katastrofe risiko kematian dan premi reasuransi katastrofe risiko kerusakan rumah.
.....Extreme Value Theory (EVT) is a method to quantifying any risk with extreme value, including risk caused by catastrophe event. During the tremendous loss caused by catastrophe event, preventive action is needed to minimize the impact of that kind of risk. One of action that can be option for insurance company to minimize impact from risk caused by catastrophe event is using catastrophe reinsurance. Since there is transferring risk process, reinsurer must set the amount of premium for reinsurance catastrophe contract. One of EVT model that can be used for modelling reinsurance catastrophe risk is Peak Over Threshold (POT). In POT model, threshold value can be determine by using percentage method. For this thesis, threshold value is assumed same as retention value, maximum amount of risk that can be covered by insurance company/ceding company. In pricing catastrophe reisurance, it important to know that risk value above threshold will be modelling by Generalized Pareto Distribution (GPD). In this theses, frequency of catastrophe event is assumed follow Poisson process. In this theses, pricing process will involve two risk (death risk and house damage) caused by earthquake as catastrophe event. Reinsurance scheme that is used in this theses is quota-share after catastrophe excess-of-loss (Cat XL). The next step is producing explicit

formula for pricing double risk catastrophe reinsurance using standard deviation premium principle (SDPP). SDPP is chosen because it consider other factor outside the actual claim named safety loading. With SDPP, safety loading is assumed proportional to standard deviation of loss caused by earthquake, so that this principle can be representation for risk uncertainty. The obtained explicit double risk catastrophe reinsurance formula will be applied to death and house damage risk caused by earthquake in Indonesia from year 2000-2023 that is obtained from Badan Nasional Penanggulangan Bencana (BNPB) official website. The result show that the amount of double risk catastrophe reinsurance premium is higher than death risk catastrophe reinsurance premium and house damage catastrophe reinsurance premium. However, double risk catastrophe reinsurance premium is lower than sum of death risk catastrophe reinsurance premium and house damage catastrophe reinsurance premium.