This presentation considers the problem of an insurance company to optimize its reserve process by proportional reinsurance. Usually, the reinsurance level will be determined by a ruin probability constraint or by minimizing the ruin probability (see e.g. Hipp and Vogt (2003), Schmidli (2001, 2002, and 2004), or Eisenberg and Schmidli (2008)). Instead of conditioning on the ruin probability, this presentation will maximize the controlled reserve process by a worst-case scenario approach.

The worst-case scenario approach has been introduced in the context of portfolio optimization by Korn and Wilmott (2002). This approach has been extended so far in various ways (e.g. considering different utility function (Korn and Menkens (2005)), optimizing investment portfolio of an insurance company (Korn (2005)), in a stochastic differential game context (Korn and Steffensen (2007)).

We start by making the so-called small claims assumption that is the claims will be modeled as a Brownian motion with drift. Second, the claims will be modeled as the sum of a Brownian motion with drift and a Poisson process and third, claims will be modeled as a Poisson process. Results will be computed, analyzed, and compared with the results of minimizing the ruin probability.

This is work in progress and joint research with Ralf Korn (TU Kaiserslautern) and Mogens Steffensen (U of Copenhagen).