Ruin Probabilities in the context of the Winner's Curse

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In an auction, the winner's curse is a tendency for the winning bid to exceed the intrinsic value or true worth of an item. The gap in auctioned versus intrinsic value can typically be attributed to incomplete information, emotions, or a variety of other subjective factors that may influence bidders. The current research about the winner's curse in the insurance business is scarce, but there is a growing importance of this phenomenon in the insurance market nowadays. It is probable that within the next 10 or 20 years most insurance policies will be sold entirely on online insurance comparison websites. These websites appeared on the internet a few years ago and can show quotes for many different insurers at the same time. The ubiquity of these aggregator sites advertising and the ease of access to a huge range of premium quotes means that client behaviour is changing and most policyholders are tempted to check the competitiveness of their renewal quotes every year. In this sense, selling insurance on those websites becomes a reverse auction process, where clients will look for the lowest prices to pay for their policies, and therefore the company which offer such prices wins the auction. However, it is likely that the winning company is the one that made the worst estimation of their premium and will therefore collect a small premium for the protection provided. In the long run, this can lead to insolvency, because the insurance company can quickly pick up large volumes of unprofitable and undesirable business. The General Insurance Research Organization, some years ago, treated this problem so seriously that it set up a special group of actuaries to examine this topic and prepare a comprehensive report, which can be found in GIRO (2009). To price properly the offered products on aggregators, the insurance company has to effectively estimate the possible loss. Here, estimating the loss is the most important problem to solve. One natural tool for this purpose comes from calculating VaR as in Palmowski (2017). However, we will develop a new approach that relies on ruin probabilities in order to assess the losses and the evolution of surplus of the insurer in a winner's curse scenario. By considering a modified surplus process where both the premium income and the claims are random and modeled by different renewal processes, we calculate ruin probabilities in some specific scenarios.

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