On ruin probabilities for risk models with ordered claim arrivals

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We start by revisiting a non-standard risk model defined on a fixed time interval $[0,t]$. The total number of claims during $[0,t]$ has an arbitrary distribution; if n claims occur, their arrival times are distributed as the order statistics of n i.i.d. random variables with distribution function $F_t(s), \, 0\leq s\leq t$. We first discuss the variability of an associated aggregate claim process. We then focus on three particular risk models in which $F_t(s)$ is of linear or exponential form. An explicit formula for the non-ruin probabilities is obtained by exploiting properties of a family of Appell polynomials. The ultimate non-ruin probabilities are also derived as a limit.