

TWO PROBLEMS IN TAIL PROBABILITY ESTIMATION

ABSTRACT. We will discuss two problems in tail probability estimation. First, we discuss the tail behavior of the distribution of the sum of asymptotically independent risks whose marginal distributions belong to the maximal domain of attraction of the Gumbel distribution. We impose conditions on the distribution of the risks (X, Y) such that $P(X + Y > x) \sim (const)P(X > x)$. With examples we show that sub-exponentiality of the marginal distributions is not a necessary condition for the relation $P(X + Y > x) \sim (const)P(X > x)$. Second, we discuss how the model of hidden regular variation estimates hidden risks more accurately than multivariate regular variation. We discuss subtleties of the model of hidden regular variation, detection of the model from data and estimation procedures of the joint tail probability using this model.