

In this thesis we are interested in the calculation of economic capital for the total loss which is the sum of partial dependent losses, whose dependence structure is described by Archimedean and hierarchical Archimedean copulas. Firstly, the concept of economic capital and the ways of its aggregation are introduced. Then the basic definitions and properties of copulas are listed, as well as the dependence measures. After that we work with definition and properties of Archimedean copulas and their simulation. We also mention the most popular families of Archimedes copulas. Next, hierarchical Archimedean copulas are defined, as well as the algorithm for their sampling. Finally, we present methods for estimating the parameters of copulas and the recursive algorithm for estimating the hierarchical Archimedean copula structure. In the last chapter we perform simulation studies of selected models using hierarchical Archimedes copulas.