

Title: Generalized stable distributions and their applications

Author: Mgr. Lenka Slámová, MSc.

Department: Department of probability and mathematical statistics

Supervisor: Prof. Lev Klebanov, DrSc.

Abstract: This thesis deals with different generalizations of the strict stability property with a particular focus on discrete distributions possessing some form of stability property. Three possible definitions of discrete stability are introduced, followed by a study of some particular cases of discrete stable distributions and their properties. The random normalization used in the definition of discrete stability is applicable for continuous random variables as well. A new concept of casual stability is introduced by replacing classical normalization in the definition of stability by random normalization. Examples of casual stable distributions, both discrete and continuous, are given. Discrete stable distributions can be applied in discrete models that exhibit heavy tails. Applications of discrete stable distributions on rating of scientific work and financial time series modelling are presented. A method of parameter estimation for discrete stable family is also introduced.

Keywords: discrete stable distribution, casual stability, discrete approximation of stable distribution