In this thesis we study the small sample asymptotics. We introduce the saddlepoint approximation which is important to approximate the density of estimator there. To derive this method we need some basic knowledge from probability and statistics, for example the central limit theorem and the M-estimators. They are presented in the first chapter.
In practical part of this work we apply the theoretical background on the given M-estimators and selected distribution. We also apply the central limit theorem on our estimators and compare it with small sample asymptotics. At the end we show and summarize the calculated results.