This diploma thesis describes the Bornhuetter-Ferguson method, which is used to calculate the IBNR reserve. It is divided into deterministic and stochastic parts. The deterministic part deals with the derivation of development pattern and ultimate loss amount, which are needed to calculate the reserve. The stochastic part deals with reserve estimation error and prediction error. The calculation results of the reserve estimate and its error are compared with the results of the chain ladder method. The last chapter deals with the problematic areas of the described method.