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*Asymptotic Analysis of Method of Moments Estimators of Parameters  $p$  and  $m$  for the Binomial Distribution*

An estimation of parameters of the Binomial distribution by a sample of fixed size  $n$ , when both parameters  $m$  and  $p$  are unknown, has remained an important statistical problem for more than three quarters of a century. Known estimates of  $m$  usually underestimate the true value. We consider only the Method of Moments and its modifications for estimation of parameters  $m$  and  $p$  of the Binomial distribution. We also apply the delta method is for the proof of asymptotic normality of the joint distribution of the estimators of  $m$  and  $p$  by the Method of Moments. The main difficulty here is that the estimators do not have moments of all orders and hence the parameters of asymptotic normality do not have direct interpretations as characteristics of accuracy properties of these estimators. We are mostly interested in the bias and variance of the Method of Moments and its modifications estimators. To achieve these goals it is necessary to solve the following problems:

1. Derivation of estimates of parameters of Binomial distribution by the Method of Moments;
2. Derivation of the parameters of asymptotic normality by the delta-method;
3. Comparison of the derived asymptotic with the true probabilistic characteristics of the estimators by the method of statistical simulations