The objective of this thesis is to study the estimation of multiple regression coefficients when residuals have longe tailed distribution than normal distribution, skewed distribution and double exponential distribution by comparing the Ordinary least square method, Bootstrap method and M-estimator using Huber' robust criteria. They are compared by using mean square errors. The distribution used in case of longer tailed distribution are Scale Contaminated normal distribution with scale factors of 3 and 10 and percent contaminations of 1, 5, 10 and 25. Other case of skewed distribution are Lognormal distribution with $\mu = 0$ and $\sigma^2 = 1$, and Gamma distribution with coefficient of variance of 58%, 70% and 100%. Double exponential distribution with $\alpha = 0$, $\beta = 5, 10$. This study used the number of independent variables of 2 for the sample size of 4, the number of independent variables of 3 for the sample size of 5, 10 and 20 and the number of independent variable of 5 for the sample size of 50 and 100. Data is obtained through simulation using Monte Carlo technique, and repeating 200 times for the longer tailed distribution than normal distribution, repeating 100 times for skewed distribution, and resampling 100 times for Bootstrap Method

The results of this study are as follow :
1. In case, residuals have longer tailed distribution than normal distribution. Shape of the residuals distributions are determined by percent contamination and scale factor for contaminate normal distribution. The M-estimator using Huber' robust criteria gives better results than the Ordinary least square and Bootstrap method when scale factor and percent contamination increases.
2. In case, residuals have skewed distribution, such as, Lognormal and Gamma distribution. The result is that the Ordinary least square method, Bootstrap and M-estimator method give closed results when using Box and Cox's Power Transformation.
3. In case, residuals have double exponential distribution. The result is that the M-estimator gives the best efficiency when small sample size and Oridanary lest square gives the best when the samples size are large.