

**A MODIFIED MAXIMUM LIKELIHOOD ESTIMATION FOR THE THREE
PARAMETERS IN LOGNORMAL DISTRIBUTION MODEL**



**RESEARCH MANAGEMENT INSTITUTE (RMI)
UNIVERSITI TEKNOLOGI MARA
40450 SHAH ALAM, SELANGOR
MALAYSIA**

BY :

**FAIZ BIN ZULKIFLI
NOORIZAM DAUD
NORAZAN MOHAMED RAMLI**

NOVEMBER 2011

Contents

1. Letter of Report Submission.....	iii
2. Letter of Offer (Research Grant)	iv
3. Acknowledgements.....	v
4. Enhanced Research Title and Objectives	vi
5. Report.....	1
5.1 Proposed Executive Summary	1
5.2 Enhanced Executive Summary	2
5.3 Introduction	3
5.4 Brief Literature Review	4
5.5 Methodology	5
5.6 Results and Discussion	9
5.7 Conclusion and Recommendation.....	13
5.8 References/Bibliography	1
6. Research Outcomes	2
7. Appendix.....	3

3. Acknowledgements

We would like to convey thanks to the University and Faculty for providing the facilities and giving fund which under the excellence fund of Universiti Teknologi MARA, Malaysia with project code:600-RMI/ST/DANA 5/3/Dst (107/2010).

4. Enhanced Research Title and Objectives

Original Title as Proposed:

A Modified Maximum Likelihood Estimation for the Three Parameters in Lognormal Distribution.

Improved/Enhanced Title:

A Modified Maximum Likelihood Estimation for the Three Parameters in Lognormal Distribution Model.

Original Objectives as Proposed:

1. To propose a modified maximum likelihood method for the three parameters in the lognormal distribution.
2. To investigate the performance of the proposed method using real and simulated data.

Improved/Enhanced Objectives:

Nothing changes.

5. Report

5.1 Proposed Executive Summary

The introduction of the threshold parameters in three parameters lognormal distribution (λ, μ, σ) creates complications when we seek to estimate these parameters from sample. Hill (1963) has shown that global maximum likelihood estimators resulted in inadmissible estimates as the likelihood function of any ordered sample x_1, \dots, x_n tends to infinity when (λ, μ, σ) approach $(x_1, -\infty, \infty)$ respectively. Hence, in this project we would like to propose a new modified version of maximum likelihood estimation to cater for the above problem. The performance of the proposed method compared to the existing method suggested by Cohen and Whitten (1980), will be examined and verified through a rigorous simulation procedure using S-PLUS programming language. A sensitivity analysis will be conducted to study the behaviour of the estimators in meeting the asymptotic normality assumption. For illustration, the proposed method will be applied to real data sets such as biological and physical sciences data.