

IDENTIFIABILITY OF THE MULTIVARIATE NORMAL BY THE MAXIMUM AND THE MINIMUM

Arunava Mukherjea

Abstract. In this paper, we have discussed theoretical problems in statistics on identification of parameters of a non-singular multi-variate normal when only either the distribution of the maximum or the distribution of the minimum is known.

[Full text](#)

References

- [1] T. Amemiya, *A note on a Fair and Jaffee model*, *Econometrica* **42** (1974), 759-762.
- [2] T. W. Anderson and S. G. Ghurye, *Identification of parameters by the distribution of a maximum random variable*, *J. of Royal Stat. Society* **39B** (1977), 337-342. [MR0488416 \(58 7960\)](#). [Zbl 0378.62020](#).
- [3] T. W. Adnerson and S. G. Ghurye, *Unique factorization of products of bivariate normal cumulative distribution functions*, *Annals of the Institute of Statistical Math.* **30** (1978), 63-69. [MR0507082](#). [Zbl 0444.62020](#).
- [4] A. P. Basu, *Identifiability problems in the theory of competing and complementary risks: a survey* in *Statistical Distributions in Scientific Work*, vol. **5**, (C.Taillie, et. al, eds.), D. Reidel Publishing Co., Dordrecht, Holland, 1981, 335-347. [MR0656347](#). [Zbl 0472.62097](#).
- [5] A. P. Basu and J. K. Ghosh, *Identifiability of the multinormal and other distributions under competing risks model*, *J. Multivariate Analysis* **8** (1978), 413-429. [MR0512611](#). [Zbl 0396.62032](#).

2010 Mathematics Subject Classification: 62H05; 62H10; 60E05.

Keywords: Multivariate normal distributions; Identification of parameters.

<http://www.utgjiu.ro/math/sma>

- [6] A. P. Basu and J. K. Ghosh, *Identifiability of distributions under competing risks and complementary risks model*, Commun. Statistics **A9** (14) (1980), 1515-1525. [MR0583613](#). [Zbl 0454.62086](#) .
- [7] T. Bedford and I. Meilijson, *A characterization of marginal distributions of (possibly dependent) lifetime variables which right censor each other*, The Annals of Statistics **25**(4) (1997), 1622-1645. [MR1463567](#). [Zbl 0936.62014](#).
- [8] S. M. Berman, *Note on extreme values, competing risks and semi-Markov processes*, Ann. Math. Statist. **34** (1963), 1104-1106. [MR0152018](#). [Zbl 0203.21702](#).
- [9] M. Dai and A. Mukherjea, *Identification of the parameters of a multivariate normal vector by the distribution of the maximum*, J. Theoret. Probability **14** (2001), 267-298. [MR1822905](#). [Zbl 1011.62050](#).
- [10] H. A. David, *Estimation of means of normal population from observed minima*, Biometrika **44** (1957), 283-286.
- [11] H. A. David and M. L. Moeschberger, *The Theory of Competing Risks*, Griffin, London, 1978. [MR2326244](#). [Zbl 0434.62076](#).
- [12] J. Davis and A. Mukherjea, *Identification of parameters by the distribution of the minimum*, J. Multivariate Analysis **9** (2007), 1141-1159. [MR0592960](#). [Zbl 1119.60008](#).
- [13] M. Elnaggar and A. Mukherjea, *Identification of parameters of a tri-variate normal vector by the distribution of the minimum*, J. Statistical Planning and Inference **78** (1999), 23-37. [MR1705540](#). [Zbl 0928.62039](#).
- [14] R. C. Fair and H. H. Kelejian, *Methods of estimation for markets in disequilibrium: a further study*, Econometrica **42** (1974), 177-190. [MR0433788](#). [Zbl 0284.90011](#).
- [15] F.M. Fisher, *The Identification Problem in Econometrics*, McGraw Hill, New York, 1996.
- [16] D. C. Gilliland and J. Hannan, *Identification of the ordered bi-variate normal distribution by minimum variate*, J. Amer. Statist. Assoc. **75**(371) (1980), 651-654. [MR0590696](#). [Zbl 0455.62089](#).
- [17] J. Gong and A. Mukherjea, *Solution of the problem on the identification of parameters by the distribution of the maximum random variable: A multivariate normal case*, J. Theoretical Probability **4** (4) (1991), 783-790. [MR1132138](#). [Zbl 0743.60021](#).

- [18] A. Mukherjea, A. Nakassis and J. Miyashita, *Identification of parameters by the distribution of the maximum random variable: The Anderson-Ghuyie theorem*, J. Multivariate Analysis **18** (1986), 178-186. [MR0832994](#). [Zbl 0589.60013](#).
- [19] A. Mukherjea and R. Stephens, *Identification of parameters by the distribution of the maximum random variable: the general multivariate normal case*, Prob. Theory and Rel. Fields **84** (1990), 289-296. [MR1035658](#). [Zbl 0685.62048](#).
- [20] A. Mukherjea and R. Stephens, *The problem of identification of parameters by the distribution of the maximum random variable: solution for the tri-variate normal case*, J. Multivariate Anal. **34** (1990), 95-115. [MR1062550](#). [Zbl 0699.62009](#).
- [21] A. Nadas, *On estimating the distribution of a random vector when only the smallest coordinate is observable*, Technometrics **12** (4) (1970), 923-924. [Zbl 0209.50004](#).
- [22] A. A. Tsiatis, *A non-identifiability aspect of the problem of computing risks*, Proc. Natl. Acad.Sci. (USA) **72** (1975), 20-22. [MR0356425](#). [Zbl 0299.62066](#).
- [23] A. A. Tsiatis, *An example of non-identifiability in computing risks*, Scand. Actuarial Journal **1978** (1978), 235-239. [Zbl 0396.62084](#).

Arunava Mukherjea
Department of Mathematics,
The University of Texas-Pan American,
1201 West University, Edinburg, Tx, 78541, USA.
e-mail: arunava.mukherjea@gmail.com
