

# Robust estimates, admissibility and shrinkage phenomenon

JANA JUREČKOVÁ

*Charles University in Prague, Czech Republic*

---

## Abstract

The robust estimates are usually considered with respect to their breakdown point, global sensitivity, maxbias and asymptotic variance, and their performance is compared with that of classical estimates under the normal model. We shall discuss the robust estimates from more viewpoints of the estimation theory. Many robust estimates of location and regression are inadmissible for any probability distribution with respect to standard loss functions and they even cannot be Bayesian ([1] and [2]). Then they are obviously not admissible in the multivariate models and their asymptotic quadratic risk can be often shrunken, at least in a  $\sqrt{n}$ -neighborhood of the true parameter value ([3] and [4]). Because even the Pitman estimator is not admissible in the multivariate normal model, we should discuss the interesting question with which class of estimates should be the robust estimates compared.

## References

- [1] J. Jurečková and L. B. Klebanov: (1997). Inadmissibility of robust estimators with respect to  $L_1$ -norm. *L<sub>1</sub>- Statistical Procedures and Related Topics* (Y. Dodge, ed.). *IMS Lecture Notes - Monograph Series* 31, 71–78.
- [2] J. Jurečková and L. B. Klebanov: (1998). Trimmed, Bayesian and admissible estimators. *Statist. & Probab. Letters* 42, 47–51.
- [3] J. Jurečková and X. Milhaud (1993). Shrinkage of maximum likelihood estimators of multivariate location. *Asymptotic Statistics*, Proc. 5th Prague Symp.. (P. Mandl and M. Hušková, eds.), pp. 303–318.
- [4] J. Jurečková and P. K. Sen (1996). *Robust Statistical Procedures: Asymptotic and Inter-relations*. J. Wiley, New York.