

## ON A ROBUST SIGNIFICANCE TEST FOR THE COX REGRESSION MODEL

TADEUSZ BEDNARSKI AND FILIP BOROWICZ

*Institute of Economic Sciences*  
*Wrocław University*  
*Pl. Uniwersytecki 1, 50–137 Wrocław, Poland*

**e-mail:** bednarski@prawo.uni.wroc.pl

**e-mail:** borowicz@prawo.uni.wroc.pl

### Abstract

A robust significance testing method for the Cox regression model, based on a modified Wald test statistic, is discussed. Using Monte Carlo experiments the asymptotic behavior of the modified robust versions of the Wald statistic is compared with the standard significance test for the Cox model based on the log likelihood ratio test statistic.

**Keywords:** robust estimation, Wald test.

**2000 Mathematics Subject Classification:** 62F35, 62N03.

### REFERENCES

- [1] T. Bednarski, *On sensitivity of Cox's estimator*, *Statistics and Decisions* **7** (1989), 215–228.
- [2] T. Bednarski, *Robust estimation in Cox's regression model*, *Scandinavian Journal of Statistics* **20** (1993), 213–225.
- [3] D.R. Cox, *Regression models and life tables*, *Journal of the Royal Statistical Society. Series B*, **34** (1972), 187–220.
- [4] D.R. Cox, *Partial likelihood*, *Biometrika* **62** (2) (1975), 269–276.

- [5] B. Krug, *Robust Estimation in Selected Additive Models*, PhD thesis (1998), Institute of Mathematics of the Polish Academy of Sciences.
- [6] D.Y. Lin, *Goodness-of-fit analysis for the Cox regression model based on a class of parameter estimators*, J. Amer. Statist. Assoc. **86** (1991), 725–729.
- [7] Ch. Minder and T. Bednarski, *A robust method for proportional hazards regression*, Statistics in Medicine **15** (1996), 1033–1047.
- [8] N. Reid and H. Crépeau, *Influence functions for proportional hazards regression*, Biometrika **72** (1985), 1–9.
- [9] S. Samuels, *Robustness for survival estimators*, Unpublished PhD thesis (1978), Dept. of Biostatistics, Univ. of Washington.

Received 26 November 2006

Revised 8 February 2007