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THE PERFORMANCE OF MEDIATION ANALYSIS BASED ON ROBUST ESTIMATOR

(Prestasi Analisis Pengantara Berdasarkan Penganggar Teguh)

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ABSTRACT

Mediation is said to occur when the relationship between the dependent variable *Y* and the independent variables *X* can be accounted for by an intermediate variable *M*. Simple mediation model involves a series of regression equations. The Ordinary Least Squares (OLS) method is often used to estimate the parameters of the mediation model. However, many researchers are not aware of the fact that the OLS estimators suffer a huge set back in the presence of outliers. In order to rectify this problem, robust methods which are not easily affected by outliers, have been introduced. In this paper, we have proposed a robust M and MM procedure for the estimation of mediation parameters in the presence of single outlier. The performance of the MM, M and OLS estimates are compared by numerical example. The empirical evidence shows that the MM, M and OLS estimators are equally good when there is no outlier in the data. Nevertheless, when contamination occurs in the data, the performance of the MM is the best followed by the M and the OLS estimators.

Keywords: mediation analysis; outliers; M-estimator; MM-estimator

ABSTRAK

Pengantara dikatakan berlaku apabila hubungan di antara pemboleh ubah bersandar *Y* dengan pemboleh ubah tak bersandar *X* boleh diterangkan oleh pemboleh ubah perantaraan *M*. Model pengantara ringkas melibatkan suatu siri persamaan regresi. Kaedah Kuasa dua Terkecil (OLS) biasa digunakan untuk menganggarkan parameter bagi model pengantara. Bagaimanapun, kebanyakan penyelidik tidak menyedari hakikat bahawa penganggar OLS mudah dipengaruhi oleh titik terpencil. Bagi mengatasi masalah ini, kaedah teguh yang tidak mudah dipengaruhi oleh titik terpencil, telah diperkenalkan. Dalam makalah ini, kami mencadangkan kaedah teguh M dan MM bagi menganggarkan parameter pengantara dengan kehadiran satu titik tunggal terpencil. Prestasi penganggar MM, M dan OLS dibandingkan dengan menggunakan contoh berangka. Bukti empirik menunjukkan bahawa pengganggar MM, M dan OLS lebih kurang sama bagi data yang tidak mempunyai titik terpencil. Namun, bagi data yang prestasi MM adalah yang terbaik, diikuti oleh penganggar M dan OLS.

Kata kunci: analisis pengantara; titik terpencil; penganggar-M; penganggar-MM

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