

Structural Equation Modeling Semiparametric Truncated Spline Using Simulation Data

Authors : Adji Achmad Rinaldo Fernandes

Abstract : SEM analysis is a complex multivariate analysis because it involves a number of exogenous and endogenous variables that are interconnected to form a model. The measurement model is divided into two, namely, the reflective model (reflecting) and the formative model (forming). Before carrying out further tests on SEM, there are assumptions that must be met, namely the linearity assumption, to determine the form of the relationship. There are three modeling approaches to path analysis, including parametric, nonparametric and semiparametric approaches. The aim of this research is to develop semiparametric SEM and obtain the best model. The data used in the research is secondary data as the basis for the process of obtaining simulation data. Simulation data was generated with various sample sizes of 100, 300, and 500. In the semiparametric SEM analysis, the form of the relationship studied was determined, namely linear and quadratic and determined one and two knot points with various levels of error variance ($EV=0.5; 1; 5$). There are three levels of closeness of relationship for the analysis process in the measurement model consisting of low (0.1-0.3), medium (0.4-0.6) and high (0.7-0.9) levels of closeness. The best model lies in the form of the relationship $X_1 \square Y_1$ linear, and. In the measurement model, a characteristic of the reflective model is obtained, namely that the higher the closeness of the relationship, the better the model obtained. The originality of this research is the development of semiparametric SEM, which has not been widely studied by researchers.

Keywords : semiparametric SEM, measurement model, structural model, reflective model, formative model

Conference Title : ICSEM 2024 : International Conference on Statistics, Econometrics and Mathematics

Conference Location : Amsterdam, Netherlands

Conference Dates : September 12-13, 2024