

# DEALING WITH ENDOGENEITY IN THRESHOLD MODELS USING COPULAS

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June 2019

We suggest a new method dealing with the problem of endogeneity of the threshold variable in structural threshold regression models based on copula theory. This method enables us to relax the assumption that the threshold variable is normally distributed and to capture the dependence structure between the threshold regression error term and the threshold variable independently of the marginal distribution of the threshold variable. For Gaussian and Student's  $t$  copulas, this dependent structure can be captured by copula-type transformations of the distribution of the threshold variable, for each regime of the model. Augmenting the threshold model under these transformations can control for the endogeneity problem of threshold variable. The single-factor correlation structure of the threshold regression error term with these transformations allows us to consistently estimate the threshold and the slope parameters of the model based on a least squares (LS) method. Based on a Monte Carlo study, we show that our method is robust to non-linear dependence structures between the regression error term and the threshold variable implied by the Archimedean family of copulas. We illustrate the method estimating a model of the foreign-trade multiplier for seven OECD economies.

**Keywords:** Threshold model, SUR systems, Copulas, foreign trade multiplier

**JEL classification:** C12, C13, C21, C22

The full working paper can be found [here](#).