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Econometric Modelling with Interval Coefficients

A Non-Stochastic Approach

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Abstract

Starting with critical remarks on the compatibility of the probability approach adopted in econometrics with the widely accepted requirements of Popperian epistemology, a new, non-stochastic approach to macroeconomic modelling is presented. This new methodology is based on the assumption that coefficients in a structural relationship vary erratically within numerically fixed interval boundaries. Within this framework, allowance for observational errors can easily be made by extending the interval concept to the variables. Thus, the stochastic foundations of the traditional econometric approach are replaced by elements of interval mathematics. Since conditional predictions of the endogenous variable derived from such a model are fixed intervals as well, econometric interval hypotheses can be tested effectively even in situations of scarce empirical data, as is typically the case in the macroeconomic field. From the falsificationist point of view, this constitutes a clear advantage of the interval model, compared to the stochastic model. The issue of "estimation" of the interval coefficients is also attempted by using epistemological instead of statistical criteria. The suggestion is to select from all a priori feasible and hitherto corroborated structures of a given econometric interval model, the one with the highest empirical content. It is shown that this decision rule results in a linear programming task, if the economic relationship is linear. Finally, some implications of the interval model are indicated.