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Building Congruent Econometric Models using Automatic Econometric Model Selection Tools

Abstract

We discuss the theory and practice of econometric modelling and forecasting in a non-stationary and evolving world, when the model differs from the economic mechanism. The framework, its basic concepts, and main implications will be sketched, based on the theory of reduction. Models with no losses on reduction are congruent; those that explain rival models are encompassing. The main reductions correspond to key econometrics concepts (causality, exogeneity, invariance, etc.), and are the null hypotheses of model-evaluation tests, summarized by a taxonomy of evaluation information. Congruent and encompassing sub-models can, therefore, be justified. Model selection theory poses great difficulties: statistics and tests for selecting models and evaluating their specifications have interdependent distributions, usually altered by every modelling decision. Recent research on model selection for general-to-specific (Gets) modelling will be described, emphasizing automatic procedures. Gets mimics reduction by simplifying a congruent general unrestricted model to a dominant minima representation. Computer automation of selection algorithms has revealed high success rates, and allows operational studies of alternative strategies. Theoretical and practical developments to Gets are noted, especially its excellent performance across different (unknown) states of nature. We note the consistency of its selection procedure, and show that model selection is non-distortionary at relevant sample sizes. Collinear data; indicator saturation methods and their generalization to more candidate variables than observations; simultaneous systems modelling; a 'quick modeler' option; and tests for, and modelling of, non-linearity and invariance will all be described.