

# **An overview of model reduction methods for large-scale systems**

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# Model Reduction Methods For Vector Autoregressive Processes

**Hanfu Chen**

A decorative graphic element consisting of a light blue horizontal bar with a rounded right end, and a red circular shape with a gradient, partially overlapping the bar's end.

## **Model Reduction Methods For Vector Autoregressive Processes:**

**Model Reduction Methods for Vector Autoregressive Processes** Springer, 2012-09-12      **Model Reduction Methods for Vector Autoregressive Processes** Ralf Brüggemann, 2012-09-25 1 1 Objective of the Study Vector autoregressive VAR models have become one of the dominant research tools in the analysis of macroeconomic time series during the last two decades The great success of this modeling class started with Sims 1980 critique of the traditional simultaneous equation models SEM Sims criticized the use of too many incredible restrictions based on supposed a priori knowledge in large scale macroeconometric models which were popular at that time Therefore he advocated largely unrestricted reduced form multivariate time series models unrestricted VAR models in particular Ever since his influential paper these models have been employed extensively to characterize the underlying dynamics in systems of time series In particular tools to summarize the dynamic interaction between the system variables such as impulse response analysis or forecast error variance decompositions have been developed over the years The econometrics of VAR models and related quantities is now well established and has found its way into various textbooks including inter alia Litterke 1991 Hamilton 1994 Enders 1995 Hendry 1995 and Greene 2002 The unrestricted VAR model provides a general and very flexible framework that proved to be useful to summarize the data characteristics of economic time series Unfortunately the flexibility of these models causes severe problems In an unrestricted VAR model each variable is expressed as a linear function of lagged values of itself and all other variables in the system      **Mathematical Reviews**, 2004      *Solving Linear Rational Expectations Models* Gary A. Anderson, 2006      **American Book Publishing Record**, 2004      System-theoretic Methods in Economic Modelling S. Mittnik, E. Y. Rodin, 1989 The value of applying system theoretic concepts to economic modelling problems arises from the fact that it offers a unifying framework for modelling dynamic systems In addition to offering this powerful conceptual framework it provides a wide range of tools useful in applied work System theoretic techniques enter predominantly two stages of economic modelling efforts the stage of model construction and the stage of model application in accordance with the modelling The objective of this and subsequent volumes on System Theoretic Methods in Economic Modelling I is to initiate and or intensify dialogues between researchers and practitioners within and across the disciplines involved This first volume brings together papers exhibiting a wide range of system theoretic techniques and applications to economic problems The papers have been divided into two groups following roughly but not necessarily the above classification into the construction and application stages of economic modelling The papers in the first group focus on the identification of dynamic and static systems while the papers in the second group address dynamic optimization problems      *JOURNAL OF Econometrics COMPUTATION IN ECONOMETRIC MODELS* Warren T. Dent, 1980      *Statistical Theory and Method Abstracts*, 2000      Current Index to Statistics, Applications, Methods and Theory, 1999 The Current Index to Statistics CIS is a bibliographic index of publications in statistics probability and related fields

**Journal of Business & Economic Statistics** American statistical association, *A VAR Model for the Monetary Sector of the Cyprus Economy* Aris Spanos, Elena Andreou, George Syrichas, 1997 *Journal of Economic Literature*, 1996  
*Dissertation Abstracts International*, 2009 **Principles and Practice of Agricultural Analysis** Harvey Washington Wiley, 1908 *Proceedings of the 14th International Conference on Flexible Automation and Intelligent Manufacturing* Lihui Wang, National Research Council Canada, International Conference on Flexible Automation and Intelligent Manufacturing (14th : 2004 : Ryerson University), 2004 **Optimization Heuristics in Econometrics** Peter Winker, 2001 Many problems in statistics and econometrics offer themselves naturally to the use of optimization heuristics Standard methods applied to highly complex problems often produce approximate results of unknown quality based on heavy assumptions Optimization heuristic methods provide powerful results to many complex problems combined with relatively simple implementation The techniques used in optimization heuristics can be applied to problems encountered in econometrics statistics and operations research Offers a self contained introduction to optimization heuristics in econometrics and statistics Features many examples of optimization heuristic methods applied to real problems Includes detailed coverage of the threshold accepting heuristic methods applied to real problems Provides suggestions for further reading Split into three parts the book opens with a general introduction to optimization in statistics and econometrics followed by detailed discussion of a relatively new and very powerful optimization heuristic threshold accepting The final part consists of many applications of the methods described earlier encompassing experimental design model selection aggregation of time series and censored quantile regression models Those researching and working in econometrics statistics and operations research are given the tools to apply optimization heuristic methods to real problems in their work Postgraduate students of statistics and econometrics will find the book provides a good introduction to optimization heuristic methods **Identification and System Parameter Estimation, 1988** Hanfu Chen, 1989 **Identification and System Parameter Estimation**, 1989 **Adaptive Signal Processing** Simon S. Haykin, 1991 Proceedings of the Business and Economic Statistics Section American Statistical Association. Business and Economic Statistics Section, 1991

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