Econometrica, Vol. 79, No. 2 (March, 2011), 453–497

THE MODEL CONFIDENCE SET

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This paper introduces the *model confidence set* (MCS) and applies it to the selection of models. A MCS is a set of models that is constructed such that it will contain the *best* model with a given level of confidence. The MCS is in this sense analogous to a confidence interval for a parameter. The MCS acknowledges the limitations of the data, such that uninformative data yield a MCS with many models, whereas informative data yield a MCS with only a few models. The MCS procedure does not assume that a particular model is the true model; in fact, the MCS procedure can be used to compare more general objects, beyond the comparison of models. We apply the MCS procedure to two empirical problems. First, we revisit the inflation forecasting problem posed by Stock and Watson (1999), and compute the MCS for their set of inflation forecasts. Second, we compare a number of Taylor rule regressions and determine the MCS of the best regression in terms of in-sample likelihood criteria.

KEYWORDS: Model confidence set, model selection, forecasting, multiple comparisons.

1. INTRODUCTION

ECONOMETRICIANS OFTEN FACE a situation where several models or methods are available for a particular empirical problem. A relevant question is, "Which is the best?" This question is onerous for most data to answer, especially when the set of competing alternatives is large. Many applications will not yield a single model that significantly dominates all competitors because the data are not sufficiently informative to give an unequivocal answer to this question. Nonetheless, it is possible to reduce the set of models to a smaller set of models—a model confidence set—that contains the best model with a given level of confidence.

The objective of the model confidence set (MCS) procedure is to determine the set of models, $\mathcal{M}^*$, that consists of the best model(s) from a collection of models, $\mathcal{M}^0$, where *best* is defined in terms of a criterion that is user-specified. The MCS procedure yields a model confidence set, $\widehat{\mathcal{M}}^*$, that is a collection of models built to contain the best models with a given level of confidence. The process of winnowing models out of $\mathcal{M}^0$ relies on sample information about

[1]The authors thank Joe Romano, Barbara Rossi, Jim Stock, Michael Wolf, and seminar participants at several institutions and the NBER Summer Institute for valuable comments, and Thomas Trimbur for sharing his code for the Baxter–King filter. The Ox language of Doornik (2006) was used to perform the calculations reported here. The first two authors are grateful for financial support from the Danish Research Agency, Grant 24-00-0363, and thank the Federal Reserve Bank of Atlanta for its support and hospitality during several visits. The views in this paper should not be attributed to either the Federal Reserve Bank of Philadelphia or the Federal Reserve System, or any of its staff. The Center for Research in Econometric Analysis of Time Series (CREATES) is a research center at Aarhus University funded by the Danish National Research Foundation.

 DOI: 10.3982/ECTA5771