

# Stopping Rules for Double Bootstrap Tests

John C. Nankervis

Department of Economics  
University of Surrey  
Guildford GU2 5XH  
UK

Phone: +44 (0)1483 259320  
Fax: +44 (0)1483 259548  
email: [j.nankervis@surrey.ac.uk](mailto:j.nankervis@surrey.ac.uk)

March 2001

## **Abstract**

Although there are known theoretical advantages in iterating bootstrap testing procedures, the computer resources required are often prohibitive both in practice and in Monte Carlo studies. This paper sets out and evaluates simple stopping rules that involve implementing double bootstrap tests using algorithms designed to avoid unnecessary computations without any loss of accuracy. The effectiveness of the rules is examined under both the null and alternative hypotheses. Theoretical results show that the rules are effective in both cases. In cases where we consider rejecting the null hypothesis at a maximum nominal rejection probability of 0.05 and 0.10, the efficiency gains using the stopping rules are approximately 40 and 15 respectively. The stopping rules are applied to double bootstrap tests in a Time Series model and in a multinomial logit model.

**Key Words:** Double Bootstrap, Hypothesis Tests, Stopping Rules, Monte Carlo

**JEL Classification:** C12, C15, C22.