

# Testing for Threshold Homogeneity\*

Daniele Massacci

EIEF and University of Surrey

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## Abstract

Threshold regression models have become popular in the empirical analysis of economic and financial data. Despite the large number of theoretical contributions, the issue of testing for threshold homogeneity in a system of threshold regression models has not been addressed yet: the least squares estimator for the threshold value is super-consistent (i.e.,  $N$  consistent given a sample of size  $N$ ), which makes it difficult to derive a useful distribution theory for a relevant test statistic. This paper proposes a Wald test for threshold value homogeneity in a system of  $P$  threshold regression models that provides an asymptotically  $\chi^2(P-1)$  distributed test statistic under the null hypothesis: the test is based on a two-step least squares estimator for the threshold parameters in which the second step allows to obtain a  $N^{1/2}$  asymptotically normally distributed estimator. A comprehensive Monte Carlo analysis shows the good finite sample properties of the test. Thanks to the conventional asymptotic distribution, the test statistic is easy to implement for empirical purposes, as shown in an application to international stock returns.

**JEL classification:** C12, C32, G15.

**Keywords:** System of Threshold Models, Threshold Homogeneity, Statistical Inference, Wald Test, International Stock Returns.

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