

# TESTING FOR POLICY AFFECTED UNCERTAINTY IN ARMA-GARCH MODEL

Wojciech Charemza\*), Christian Francq\*\*), Svetlana Makarova\*\*\*)  
and Jean-Michel Zakoïan \*\*)

\*) Vistula University, UK

\*\*) CREST, Paris, France

\*\*\*) University College London, UK

This draft: May 2016

KEYWORDS: economic policy, uncertainty, hypothesis testing,  
maximum likelihood, GARCH.

JEL codes: C12, C13

## ABSTRACT

The paper proposes tests for detecting effects of policy decisions in the ARMA-GARCH forecast uncertainty. It is assumed that neither timing nor the magnitude of such decisions is known, and the outcomes can be detected by testing the distribution of innovations of the model. It is proved that the Lagrange Multiplier-type tests have well defined asymptotic properties. It is also shown that the power is reasonable for a range of alternatives. Finite sample critical values are obtained by simulation. Empirical application leads to identifying countries with significantly policy-affected uncertainty in series of daily and monthly 10-year government bonds for 37 countries.

## FUNDING:

This work was supported by the joint Economic and Social Research Council and the Agence Nationale de la Recherche (ANR, Project PRAM ANR-10-ORAR-008-01) through the Open Research Area project *Probabilistic Approach to Assessing Macroeconomic Uncertainties* No. RES-360-25-0003, and the Opus 8 project 2014/15/B/HS4/04263 *Modelling Macroeconomic Uncertainty* of the National Science Centre in Poland.

## ACKNOWLEDGEMENTS

This research used the ALICE High Performance Computing Facility at the University of Leicester. We are indebted to Carlos Díaz for stimulating discussion and help with programming and Seohyun Lee for help with collecting empirical data. We are also grateful to

the participants of the workshop *The Macroeconomics of Uncertainty and Volatility* at CITE, Stanford University, September 2016, for their helpful comments on the earlier version. We are solely responsible for the remaining deficiencies.

